

Smooth/Low Speed Cylinders

C□Y/C□X Series

Reducing stick-slip in a low speed range

Smooth Cylinders C□Y Series

Stable operation possible even at a low speed of **5 mm/s** (Measurement based on JIS B 8377)

Low sliding possible even in bi-directional operation

Can be operated regardless of the direction of pressure.

Interchangeable with the standard models

(CJ2Y, CM2Y, MBY, CA2Y, CS2Y)

Lightweight/Improved functions

(New structure equivalent to the standard models)

- Better visibility for auto switches (only when the D-M9□/A9□ are used in the CJ2Y, CM2Y, CG1Y)
- Female rod end available as standard (CG1Y, CM2Y, CQSY, CQ2Y)

CJ2Y
(ø10, ø16)



CM2Y
(ø20 to ø40)



CG1Y
(ø20 to ø100)



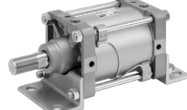
MBY
(ø32 to ø100)



CA2Y
(ø40 to ø100)



CS2Y
(ø125 to ø160)



CQSY
(ø12 to ø25)



CQ2Y
(ø32 to ø100)



Reducing adhesion/quick extension

Low Speed Cylinders C□X Series

Smooth operation possible even at **0.5 mm/s**

(1 mm/s for ø16 or smaller)

Minimum operating pressure is reduced in half.

(Compared to previous version)

The new structure has improved low friction characteristics. (CM2X, CQSX, CQ2X)

Interchangeable with the standard models

Improved functions

(New structure equivalent to the standard models)

- Better visibility for auto switches (only when the D-M9□/A9□ are used in the CJ2X, CM2X)
- Female rod end available as standard (CM2X, CQSX, CQ2X)

CJ2X
(ø10, ø16)



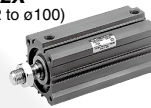
CM2X
(ø20 to ø40)



CQSX
(ø12 to ø25)



CQ2X
(ø32 to ø100)



CUX
(ø10 to ø32)



Clean room specification
10-/11- Series



Low-Speed Rotary Actuators

* Refer to the Web Catalog for details.

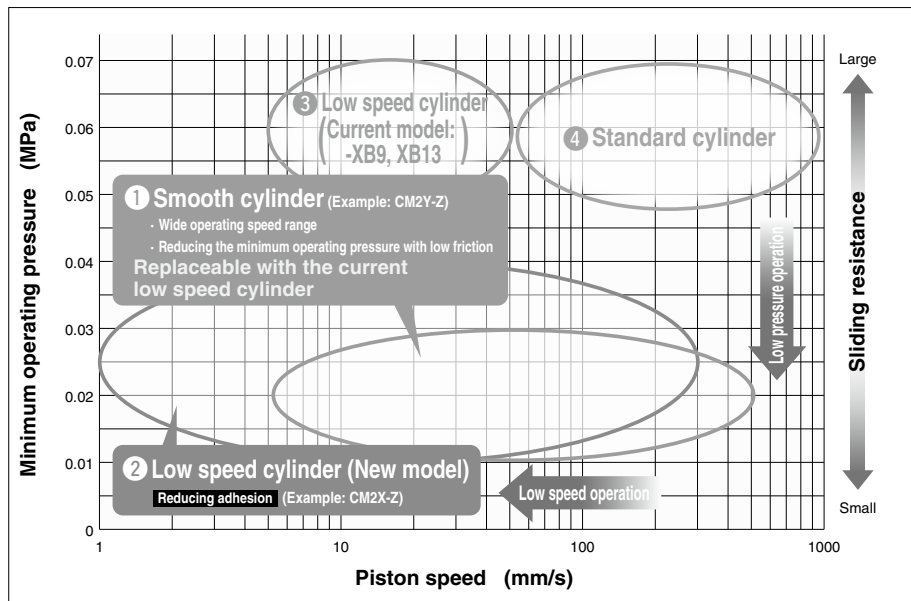
Low-speed compact rotary actuator
CRQ2X Series



Low-speed rotary table
MSQX Series



Smooth/Low Speed Cylinders



1 Smooth cylinder

- Low speed operation (from 5 mm/s)
- Low pressure operation
- Pressure on both sides

- Pressing force control
- Balance control of winders etc.
- General low-speed operating applications
- Tension control

2 Low speed cylinder (New model)

- Low speed operation (from 0.5 mm/s)
- Low pressure operation
- Pressure on both sides
- Reducing adhesion

- Load transfer without a lateral load (Lightweight trays etc.)
- Transfer with less adhesion (Wafers etc.)
- Higher-accuracy pressing force control

3 Low speed cylinder (Current model: -XB9, XB13)

- Low speed operation

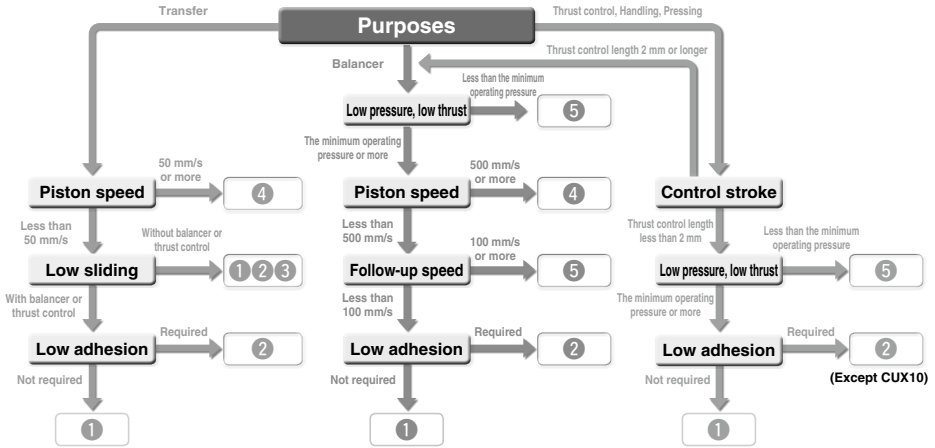
4 Standard non-lube cylinder

- General applications

| Function | 1 Smooth cylinder | 2 Low speed cylinder (New model) | 3 Low speed cylinder (Current model: -XB9, XB13) | 4 Standard non-lube cylinder |
|----------------------------|-------------------|----------------------------------|--|------------------------------|
| 1 Low pressure operation | ⊙ | CUX10: × Others: ⊙ | △ | △ |
| 2 Low speed operation | ○ | ⊙ | ○ | △ |
| 3 Reducing adhesion | ○ | ⊙ | ○ | △ |
| 4 Reducing quick extension | ○ | ⊙ | ○ | △ |
| 5 Pressing force control | ⊙ | CUX10: × Others: ⊙ | ○ | △ |
| 6 Low sliding | ⊙ | ⊙ | ○ | △ |

⊙: Excellent ○: Good △: Usable ×: Handle with caution.

■ Selection Procedures (Reference Example)



- ① Consider using the smooth cylinder. ② Consider using the low speed cylinder (New model).
- ③ Consider using the low speed cylinder (Current model: -XB9, XB13).
- ④ Consider using the standard non-lube cylinder. ⑤ Please consult with SMC.

■ Glossary Explanation

| | |
|-------------------------------|---|
| Average piston speed | Cylinder full stroke (length) divided by air pressure operating time. |
| Adhesive phenomenon | Quick extension or delay occurs when cylinders are not operated for long hours. |
| Thrust control | Control the pressing force by controlling air pressure in the cylinder. |
| Balancer | Cylinders move along with the moving workpiece. |
| Balancer follow-up speed | The speed of an air cylinder moving along with the workpiece at a small stroke. |
| Calculating thrust controlled | Calculate the cylinder thrust multiplying piston area by pressure. Piston area varies depending on models and bore sizes. |

■ Applicable Model/Bore Size

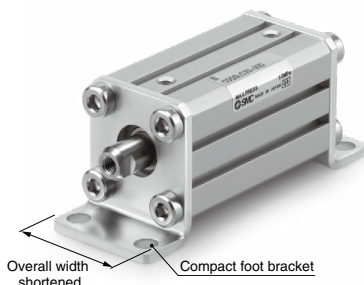
| Type | ① Smooth cylinder | ② Low speed cylinder (New model) | ③ Low speed cylinder (Current model: -XB9, XB13) | Representative model |
|------------|-------------------|----------------------------------|--|----------------------|
| Small | ● | ● | ● | CJ2 |
| Round | ● | ● | ● | CM2 |
| Tie-rod | ● | | ● | CG1 |
| | ● | | | MB |
| Compact | ● | | | CA2 |
| | ● | | | CS2 |
| Free mount | ● | ● | ● | CQS |
| | ● | ● | ● | CQ2 |

○: Standard

| Bore size (mm) | ① Smooth cylinder | | | | | | | ② Low speed cylinder (New model) | | | | | |
|----------------|-------------------|---------|---------|--------|---------|------------|--------|----------------------------------|------------|------------|--------|--------|--------|
| | Round | Tie-rod | Compact | Round | Compact | Free mount | Round | Compact | Free mount | Free mount | | | |
| Model | CJ2Y | CM2Y | CG1Y | CA2Y | CS2Y | MBY | CQSY | CQ2Y | CJ2X | CM2X | CQSX | CQ2X | CUX |
| ø10 | ● | | | | | | | | ● | | | | ● |
| ø12 | | | | | | | ● | | | | ● | | |
| ø16 | ● | | | | | | ● | | ● | | ● | | ● |
| ø20 | | ● | ● | | | | | | ● | ● | ● | | ● |
| ø25 | | ● | ● | | | | ● | | ● | ● | ● | | ● |
| ø32 | | ● | ● | | | | | | ● | ● | ● | | ● |
| ø40 | ● | ● | ● | | | | | | ● | | | | ● |
| ø50 | | ● | ● | | | | | | | | | | ● |
| ø63 | | ● | ● | | | | | | | | | | ● |
| ø80 | | ● | ● | | | | | | | | | | ● |
| ø100 | | ● | ● | | | | | | | | | | ● |
| ø125 | | | | ● | | | | | | | | | |
| ø140 | | | | | | | | | | | | | |
| ø160 | | | | | | | | | | | | | |
| | P. 151 | P. 167 | P. 184 | P. 211 | P. 225 | P. 196 | P. 238 | P. 246 | P. 264 | P. 260 | P. 299 | P. 308 | P. 323 |

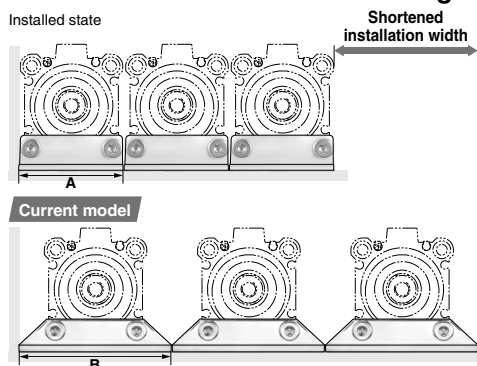
Added compact foot brackets.

- Compact foot bracket has the same width as the cylinder. Overall width reduced by up to **43%** (ø12)



- More compact installation space possible

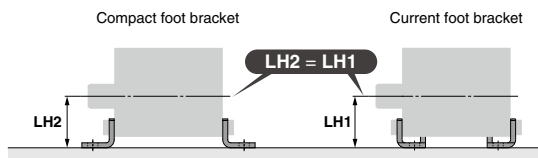
- Short pitch mounting is possible.
- Allows installation close against a wall.



| Bore size (mm) | Compact foot type width A (mm) | Current foot type width B (mm) | Reduced width for short pitch mounting (mm) | | |
|----------------|--------------------------------|--------------------------------|---|---------|---------|
| | | | 1 unit | 2 units | 3 units |
| 12 | 25 | 44 | 19 | 38 | 57 |
| 16 | 29 | 48 | 19 | 38 | 57 |
| 20 | 36 | 62 | 26 | 52 | 78 |
| 25 | 40 | 66 | 26 | 52 | 78 |
| 32 | 45 | 71 | 26 | 52 | 78 |
| 40 | 52 | 78 | 26 | 52 | 78 |
| 50 | 64 | 95 | 31 | 62 | 93 |
| 63 | 77 | 113 | 36 | 72 | 108 |
| 80 | 98 | 140 | 42 | 84 | 126 |
| 100 | 117 | 162 | 45 | 90 | 135 |

* Short pitch mounting is possible only without auto switch. Please consult with SMC for mounting with auto switch.

- Height from the bottom of brackets to the center of a cylinder is the same as the current model.



Applicable Cylinders: CQSY (P. 238), CQ2Y (P. 246) (Smooth Cylinders), CQSX (P. 299), CQ2X (P. 308) (Low Speed Cylinders)

Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately

Note) Mounting bracket is shipped together with the product, but not assembled.

For CM2Y

Example) CDM2Y **C** 20-50Z- **N** **W** -M9BW

● Mounting

Pivot bracket

| | |
|------------|--|
| Nil | None |
| N | Pivot bracket is shipped together with the product, but not assembled. |

* Applicable to only mounting C, T, U, E, V, and UZ.

Kit of pivot bracket and single clevis



Kit of pivot bracket and trunnion



Rod end bracket

| | |
|------------|----------------------|
| Nil | None |
| V | Single knuckle joint |
| W | Double knuckle joint |

With rod end bracket

V: Single knuckle joint **W**: Double knuckle joint



For CA2Y

Example) CDA2Y **D** 40-100Z- **N** **W** -M9BW

● Mounting

Pivot bracket

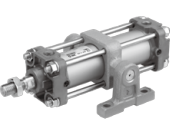
| | |
|------------|--|
| Nil | None |
| N | Pivot bracket is shipped together with the product, but not assembled. |

* Applicable to only mounting D (Double clevis) and T (Center trunnion).

Kit of pivot bracket and double clevis



Kit of pivot bracket and trunnion

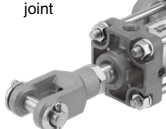


Rod end bracket

| | |
|------------|----------------------|
| Nil | None |
| V | Single knuckle joint |
| W | Double knuckle joint |

With rod end bracket

V: Single knuckle joint **W**: Double knuckle joint



Applicable Cylinders: CJ2Y (P. 151), CM2Y (P. 167), CG1Y (P. 184), CA2Y (P. 211), MBY (P. 196) (Smooth Cylinders)

Smooth Cylinders

CJ2Y/CM2Y/CG1Y/MBY/ CA2Y/CS2Y/CQSY/CQ2Y Series

| Series | Action | Bore size (mm) | Minimum operating pressure (MPa) | Page |
|--|-----------------|-----------------|----------------------------------|------|
| CJ2Y  | Double acting | 10, 16 | 0.03 | 151 |
| CM2Y  | | 20, 25, 32, 40 | 0.02 | 167 |
| CG1Y  | | 20, 25, 32, 40 | 0.02 | 184 |
| | | 50, 63, 80, 100 | 0.01 | |
| MBY  | | 32, 40 | 0.02 | 196 |
| | | 50, 63, 80, 100 | 0.01 | |
| CA2Y  | | 40 | 0.02 | 211 |
| | | 50, 63, 80, 100 | 0.01 | |
| CS2Y  | | 125, 140, 160 | 0.005 | 225 |
| CQSY  | | 12, 16 | 0.03 | 238 |
| | 20, 25 | 0.02 | | |
| CQ2Y  | 32, 40 | 0.02 | 246 | |
| | 50, 63, 80, 100 | 0.01 | | |

Smooth Cylinder

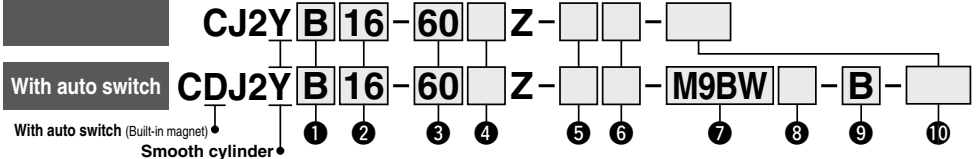
Double Acting, Single Rod

CJ2Y Series

ø10, ø16



How to Order



1 Mounting

| | |
|---|--------------------|
| B | Basic |
| E | Double-side bossed |
| D | Double clevis |
| L | Single foot |
| M | Double foot |
| F | Rod flange |
| G | Head flange |

2 Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

3 Cylinder standard stroke (mm)
Refer to "Standard Strokes" on page 152.

4 Head cover port location

| | | |
|-----|-----------------------|--|
| Nil | Perpendicular to axis | |
| R | Axial | |

5 Pivot bracket

| | |
|-----|---|
| Nil | None |
| N | Pivot bracket is shipped together with the product. |

6 Rod end bracket

| | |
|-----|--------------------------|
| Nil | None |
| V | Single knuckle joint |
| W** | Double knuckle joint |
| T | Rod end cap (Flat type) |
| U | Rod end cap (Round type) |

7 Auto switch

| | |
|-----|---------------------|
| Nil | Without auto switch |
|-----|---------------------|

9 Auto switch mounting type

| | |
|---|---------------|
| A | Rail mounting |
| B | Band mounting |

8 Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

10 Made to Order
Refer to page 152 for details.

* Foot/Flange brackets are shipped together with the product, but not assembled.
* Rod end bracket is shipped together with the product, but not assembled.
* A knuckle joint pin is not provided with the single knuckle joint.
** Refer to page 158 for the double knuckle joint (with one-touch connecting pin).

* For double clevis, the product is perpendicular to the cylinder axis.
* For double-side bossed, the product is perpendicular to the cylinder axis.
* For applicable auto switches, refer to the table below.
* For rail mounting, screws and nuts for 2 auto switches come with the rail.
* Refer to page 165 for auto switch mounting brackets.

* Refer to "Ordering Example of Cylinder Assembly" on page 152.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | | Lead wire length (m) | | | | Pre-wired connector | Applicable load | | |
|-------------------------|--|------------------|-----------------|-----------------|--------------|--------------|---------------------|--------------------|---------------------|--------------------|----------------------|-------|-------|-------|---------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting | | Rail mounting | | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | | None (N) | |
| | | | | | | | Perpendicular | In-line | Perpendicular | In-line | | | | | | | | |
| Solid state auto switch | — | Grommet | No | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | M9NV | M9N | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | M9PV | M9P | ● | ● | ○ | — | ○ | | | |
| | | Connector | 2-wire | 12 V | M9BV | M9B | M9BV | M9B | ● | ● | ○ | — | ○ | | | | | |
| | | | | — | — | H7C | J79C | — | — | — | ● | — | — | — | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NWV | M9NW | M9NWV | M9NW | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | M9PWV | M9PW | M9PWV | M9PW | ● | ● | ○ | — | ○ | | | |
| | Water resistant (2-color indicator) | Grommet | No | 2-wire | 12 V | — | M9BWV | M9BW | M9BWV | M9BW | ● | ● | ○ | — | ○ | — | | |
| | | | | 3-wire (NPN) | | | M9NAV ^{*1} | M9NA ^{*1} | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ● | ○ | — | | | ○ |
| | With diagnostic output (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 5 V, 12 V | — | M9PAV ^{*1} | M9PA ^{*1} | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ● | ○ | — | ○ | | IC circuit |
| | | | | 2-wire | | | M9BAV ^{*1} | M9BA ^{*1} | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ● | ○ | — | ○ | | |
| Reed auto switch | — | Grommet | No | 2-wire | 24 V | 12 V | — | A96V | A96 | A96V | A96 | ● | — | ● | — | — | IC circuit | |
| | | | | | | | — | — | — | A72 | A72H | ● | — | ● | — | — | | |
| | | | | | | | 100 V | A93V ^{*2} | A93 | A93V ^{*2} | A93 | ● | ● | ● | — | — | | |
| | | | | | | | 100 V or less | A90V | A90 | A90V | A90 | ● | — | ● | — | — | | |
| | | Connector | No | 2-wire | 24 V | 24 V or less | — | C73C | A73C | — | — | ● | — | ● | ● | — | IC circuit | |
| | | | | | | | — | C80C | A80C | — | — | ● | — | ● | ● | — | | |
| | | | | | | | — | — | — | A79W | — | — | — | — | — | — | | — |
| | | | | | | | — | — | — | — | — | — | — | — | — | — | | — |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.
* Lead wire length symbols: 0.5 m Nil (Example) M9NW, 1 m M (Example) M9NWM, 3 m L (Example) M9NWL
* Since there are other applicable auto switches than listed above, refer to page 166 for details.
* Solid state auto switches marked with "C" are produced upon receipt of order.
* The D-A90/M90/A70/A80/C73/C77/C79 auto switches are shipped together, but not assembled. (For band mounting, only the auto switch mounting brackets are assembled before shipment.)

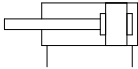


CJ2Y Series



Symbol

Rubber bumper



Made to Order
[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC3 | Special port location |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |

Mounting Brackets/Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|----------|
| | 10 | 16 |
| Foot | CJ-L010C | CJ-L016C |
| Flange | CJ-F010C | CJ-F016C |
| T-bracket* | CJ-T010C | CJ-T016C |

* A T-bracket is used with double clevis (D).

Specifications

| Bore size (mm) | | 10 | 16 |
|-------------------------------|-----|---|----|
| Action | | Double acting, Single rod | |
| Fluid | | Air | |
| Proof pressure | | 1.05 MPa | |
| Maximum operating pressure | | 0.7 MPa | |
| Ambient and fluid temperature | | Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing) | |
| Cushion | | Rubber bumper (Standard equipment) | |
| Lubrication | | Not required (Non-lube) | |
| Stroke length tolerance | | $^{+1.0}_0$ | |
| Piston speed | | 5 to 500 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J | |
| | ø16 | 0.090 J | |

Minimum Operating Pressure

Unit: MPa

| Bore size (mm) | | 10 | 16 |
|----------------------------|--|------|----|
| Minimum operating pressure | | 0.03 | |

Standard Strokes

| Bore size (mm) | Standard stroke (mm) | Maximum manufacturable stroke (mm) |
|----------------|---|------------------------------------|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 | 400 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 | 400 |

Note 1) Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
 Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Mounting and Accessories

●--Mounted on the product. ○--Please order these separately. △--Order separately.

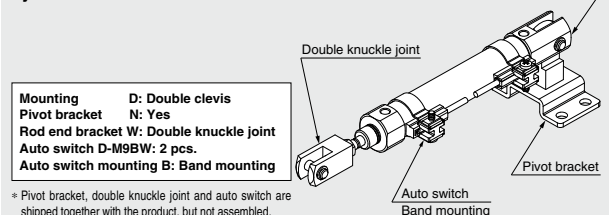
| Mounting | | Basic | Foot | Flange | Double*1 clevis |
|----------|--|-------|------|--------|-----------------|
| Standard | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ○ | ○ | ○ | ○ |
| | Double knuckle joint*1 | ○ | ○ | ○ | ○ |
| | Double knuckle joint (With one-touch connecting pin) | △ | △ | △ | △ |
| | Rod end cap (Flat/Round type) | ○ | ○ | ○ | ○ |
| | T-bracket | — | — | — | ○ |

*1 A pin and retaining rings are included with double clevis and/or double knuckle joint.

*2 Stainless steel mounting brackets and accessories are also available. Refer to page 159 for details.

Ordering Example of Cylinder Assembly

Cylinder model: CDJ2YD16-60Z-NW-M9BW-B



* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

⚠ Precautions

Be sure to read this before handling the products.

Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut or to the rod cover body.
If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below. Apply a Loctite® (no. 242 Blue) for mounting thread.

| Bore size (mm) | Proper tightening torque for mounting thread (N·m) (Tightening torque for mounting nut) |
|----------------|--|
| 10 | 3.0 to 3.2 |
| 16 | 5.4 to 5.9 |

- To remove and install the retaining ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C retaining ring).
Especially with ø10, use ultra thin pliers.
- In the case of auto switch rail mounting type, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

Weights

| | | (g) | |
|---|--|-----|----|
| Bore size (mm) | | 10 | 16 |
| Basic weight (When the stroke is zero) | Basic | 22 | 46 |
| | Axial piping | 22 | 46 |
| | Double clevis (including clevis pin) | 24 | 54 |
| | Head-side bossed | 23 | 48 |
| Additional weight per 15 mm of stroke | | 4 | 7 |
| | Single foot | 8 | 25 |
| Mounting bracket weight | Double foot | 16 | 50 |
| | Rod flange | 5 | 13 |
| | Head flange | 5 | 13 |
| | | | |
| Accessories | Single knuckle joint | 17 | 23 |
| | Double knuckle joint (including knuckle pin) | 25 | 21 |
| | Double knuckle joint (With one-touch connecting pin) | 26 | 22 |
| | Rod end cap (Flat type) | 1 | 2 |
| | Rod end cap (Round type) | 1 | 2 |
| | T-bracket | 32 | 50 |

* Mounting nut and rod end nut are included in the basic weight.
Note) Mounting nut is not included in the basic weight for the double clevis.

Calculation: Example) **CJ2YL10-45Z**

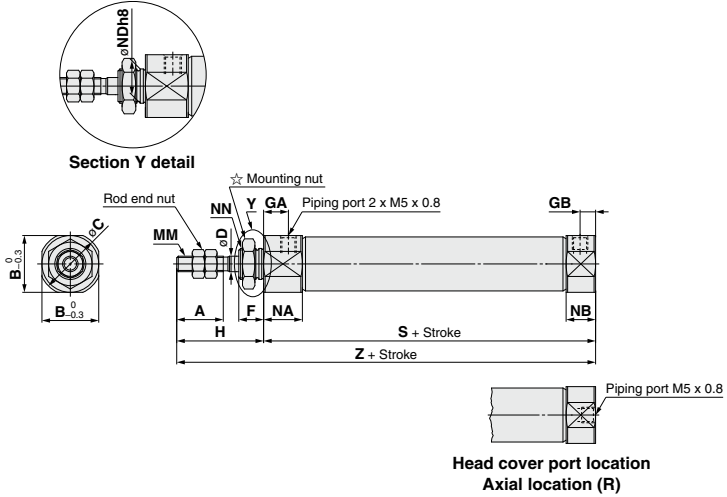
- Basic weight..... 22 (ø10)
 - Additional weight..... 4/15 stroke
 - Cylinder stroke..... 45 stroke
 - Mounting bracket weight..... 8 (Axial foot)
- $22 + 4/15 \times 45 + 8 = 42 \text{ g}$

CJ2Y Series

Dimensions

Basic (B)

CJ2YB **Bore size** – **Stroke** **Head cover port location** **Z**

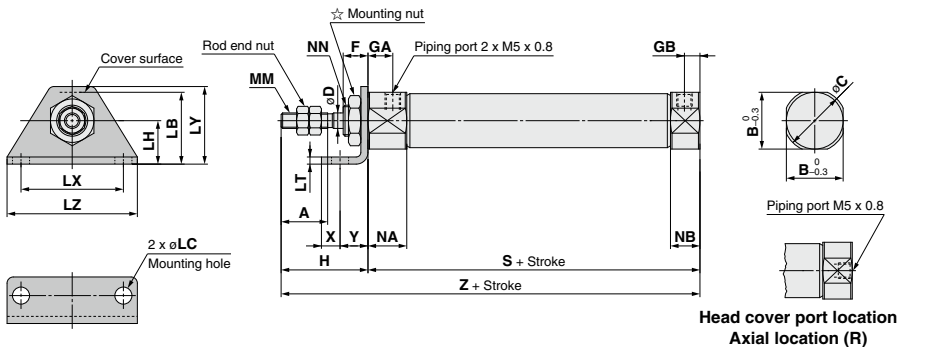


☆ Refer to page 158 for details of the mounting nut.

| Bore size | A | B | C | D | F | GA | GB | H | MM | NA | NB | NDh8 | NN | S | Z |
|-----------|----|------|----|---|---|----|----|----|----------|------|-----|-----------------|-----------|----|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | $8_{-0.022}^0$ | M8 x 1.0 | 46 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | $10_{-0.022}^0$ | M10 x 1.0 | 47 | 75 |

Single foot (L)

CJ2YL **Bore size** – **Stroke** **Head cover port location** **Z**



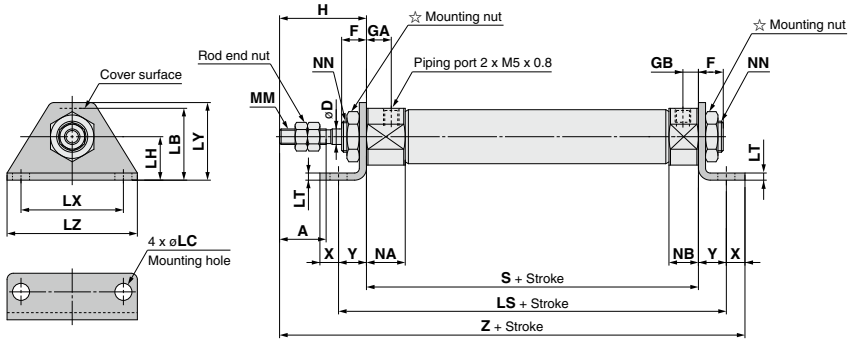
☆ Refer to page 158 for details of the mounting nut.

| Bore size | A | B | C | D | F | GA | GB | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | S | X | Y | Z |
|-----------|----|------|----|---|---|----|----|----|----|-----|----|-----|----|------|----|----------|------|-----|-----------|----|---|---|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | 5 | 7 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | 6 | 9 | 75 |

Dimensions

Double foot (M)

CJ2YM **Bore size** – **Stroke** Z



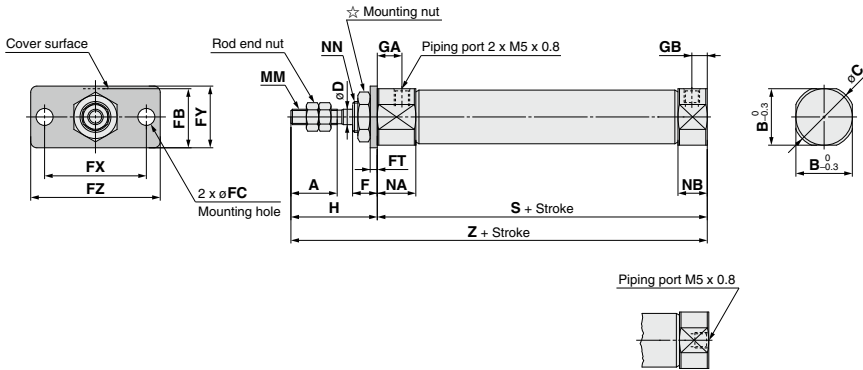
☆ Refer to page 158 for details of the mounting nut.

| Bore size | A | D | F | GA | GB | H | LB | LC | LH | LS | LT | LX | LY | LZ | MM | NA | NB | NN | S | X | Y | Z |
|-----------|----|---|---|----|----|----|----|-----|----|----|-----|----|------|----|----------|------|-----|-----------|----|---|---|----|
| 10 | 15 | 4 | 8 | 8 | 5 | 28 | 15 | 4.5 | 9 | 60 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | 5 | 7 | 86 |
| 16 | 15 | 5 | 8 | 8 | 5 | 28 | 23 | 5.5 | 14 | 65 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | 6 | 9 | 90 |

(mm)

Rod flange (F)

CJ2YF **Bore size** – **Stroke** **Head cover port location** Z



Head cover port location Axial location (R)

☆ Refer to page 158 for details of the mounting nut.

* The overall cylinder length does not change.

| Bore size | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | MM | NA | NB | NN | S | Z |
|-----------|----|------|----|---|---|----|-----|-----|----|----|----|----|----|----|----------|------|-----|-----------|----|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | 75 |

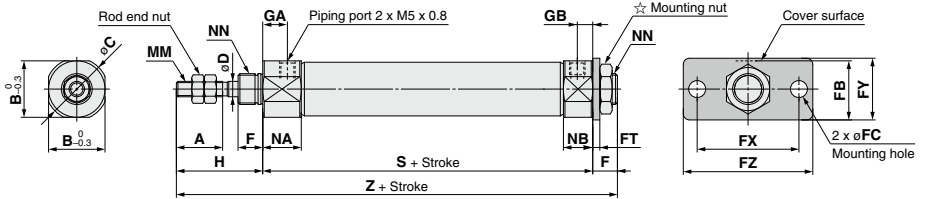
(mm)

CJ2Y Series

Dimensions

Head flange (G)

CJ2YG Bore size – Stroke Z

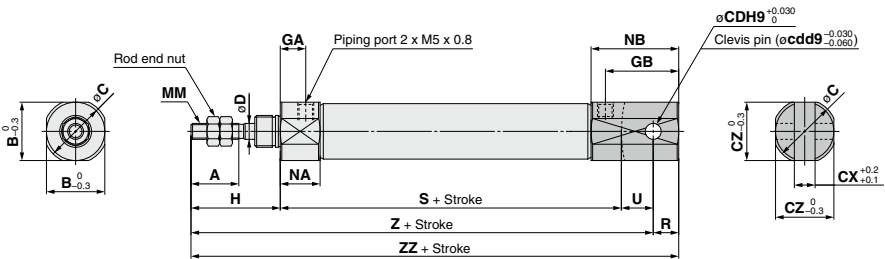


☆ Refer to page 158 for details of the mounting nut.

| Bore size | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | MM | NA | NB | NN | S | Z |
|-----------|----|------|----|---|---|----|-----|-----|----|----|----|----|----|----|----------|------|-----|-----------|----|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | 82 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | 83 |

Double clevis (D)

CJ2YD Bore size – Stroke Z



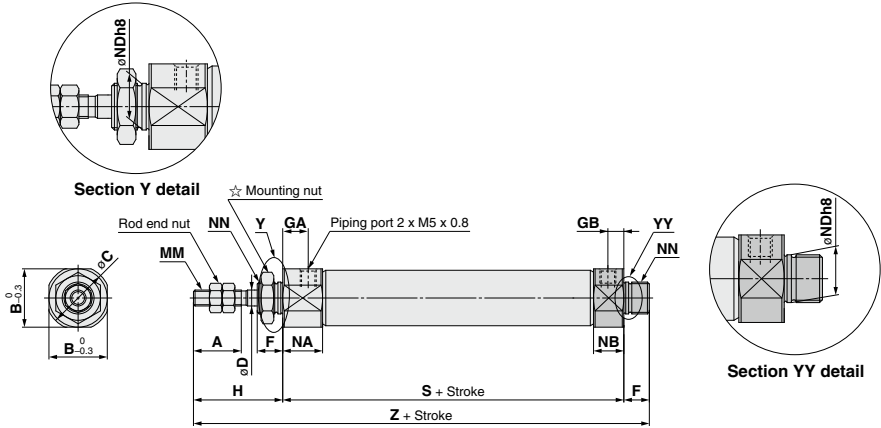
* A clevis pin and retaining rings are included.

| Bore size | A | B | C | CD (cd) | CX | CZ | D | GA | GB | H | MM | NA | NB | R | S | U | Z | ZZ |
|-----------|----|------|----|---------|-----|------|---|----|----|----|----------|------|------|---|----|----|----|----|
| 10 | 15 | 12 | 14 | 3.3 | 3.2 | 12 | 4 | 8 | 18 | 28 | M4 x 0.7 | 12.5 | 22.5 | 5 | 46 | 8 | 82 | 87 |
| 16 | 15 | 18.3 | 20 | 5 | 6.5 | 18.3 | 5 | 8 | 23 | 28 | M5 x 0.8 | 12.5 | 27.5 | 8 | 47 | 10 | 85 | 93 |

Dimensions

Double-side bossed (E)

CJ2YE Bore size – Stroke Z



☆ Refer to page 158 for details of the mounting nut.

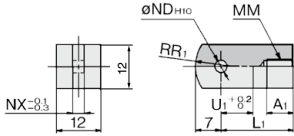
| Bore size | A | B | C | D | F | GA | GB | H | MM | NA | NB | NDh8 | NN | S | Z |
|-----------|----|------|----|---|---|----|----|----|----------|------|-----|-----------------|-----------|----|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | $8_{-0.022}^0$ | M8 x 1.0 | 46 | 82 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | $10_{-0.022}^0$ | M10 x 1.0 | 47 | 83 |

CJ2Y Series

Dimensions of Accessories (options)

Single Knuckle Joint

Material: Rolled steel

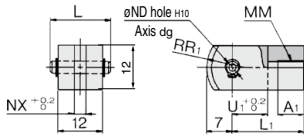


(mm)

| Part no. | Applicable bore size | A ₁ | L ₁ | MM | ND _{H10} | NX | R ₁ | U ₁ |
|----------|----------------------|----------------|----------------|----------|------------------------------------|-----|----------------|----------------|
| I-J010C | 10 | 8 | 21 | M4 x 0.7 | 3.3 ^{+0.048} ₀ | 3.1 | 8 | 9 |
| I-J016C | 16 | 8 | 25 | M5 x 0.8 | 5 ^{+0.048} ₀ | 6.4 | 12 | 14 |

Double Knuckle Joint

Material: Rolled steel



(mm)

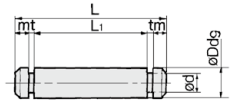
| Part no. | Applicable bore size | A ₁ | L | L ₁ | MM |
|----------|----------------------|----------------|------|----------------|----------|
| Y-J010C | 10 | 8 | 15.2 | 21 | M4 x 0.7 |
| Y-J016C | 16 | 11 | 16.6 | 21 | M5 x 0.8 |

| Part no. | ND _{d9} | ND _{H10} | NX | R ₁ | U ₁ |
|----------|---|------------------------------------|-----|----------------|----------------|
| Y-J010C | 3.3 ^{+0.030} _{-0.060} | 3.3 ^{+0.048} ₀ | 3.2 | 8 | 10 |
| Y-J016C | 5 ^{+0.030} _{-0.060} | 5 ^{+0.048} ₀ | 6.5 | 12 | 10 |

* A knuckle pin and retaining rings are included.

Knuckle Pin

Material: Stainless steel



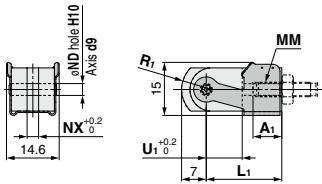
(mm)

| Part no. | Applicable bore size | Dd ₉ | d | L | L ₁ | m | t | Included retaining ring |
|----------|----------------------|---|-----|------|----------------|-----|-----|-------------------------|
| CD-J010 | 10 | 3.3 ^{+0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| IY-J015 | 16 | 5 ^{+0.030} _{-0.060} | 4.8 | 16.6 | 12.2 | 1.5 | 0.7 | Type C 5 |

* For ø10, a clevis pin is diverted.

* Retaining rings are included with a knuckle pin.

Double Knuckle Joint (With One-touch Connecting Pin)

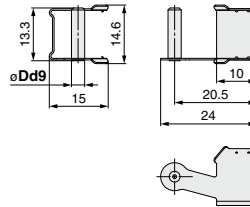


(mm)

| Part no. | Applicable bore size | A ₁ | L ₁ | MM | ND _{d9} | ND _{H10} | NX | R ₁ | U ₁ |
|----------|----------------------|----------------|----------------|----------|---|------------------------------------|-----|----------------|----------------|
| Y-J10 | 10 | 8 | 21 | M4 x 0.7 | 3.3 ^{+0.030} _{-0.060} | 3.3 ^{+0.048} ₀ | 3.2 | 8 | 10 |
| Y-J16 | 16 | 11 | 21 | M5 x 0.8 | 5 ^{+0.030} _{-0.060} | 5 ^{+0.048} ₀ | 6.5 | 12 | 10 |

One-touch Connecting Pin for Double Knuckle Joint

Material: Stainless steel

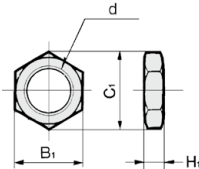


(mm)

| Part no. | Applicable bore size | Dd ₉ |
|----------|----------------------|---|
| IY-J10 | 10 | 3.3 ^{+0.030} _{-0.060} |
| IY-J16 | 16 | 5 ^{+0.030} _{-0.060} |

Mounting Nut

Material: Carbon steel

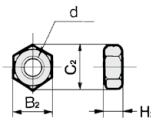


(mm)

| Part no. | Applicable bore size | B ₁ | C ₁ | d | H ₁ |
|----------|----------------------|----------------|----------------|-----------|----------------|
| SNJ-010C | 10 | 11 | 12.7 | M8 x 1.0 | 4 |
| SNJ-016C | 16 | 14 | 16.2 | M10 x 1.0 | 4 |

Rod End Nut

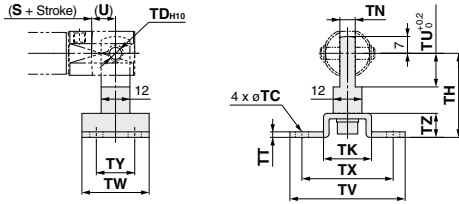
Material: Carbon steel



(mm)

| Part no. | Applicable bore size | B ₂ | C ₂ | d | H ₂ |
|----------|----------------------|----------------|----------------|----------|----------------|
| NTJ-010C | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015C | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

Pivot Bracket (T-bracket)



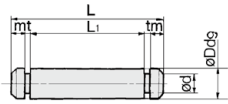
| Part no. | Applicable bore size | TC | TD _{H10} | TH | TK | TN | TT | TU | TV | TX | TY | TZ | |
|----------|----------------------|-----|------------------------------------|----|----|-----|-----|----|----|----|----|----|----|
| CJ-T010C | 10 | 4.5 | 3.3 ^{+0.048} ₀ | 29 | 18 | 3.1 | 2 | 9 | 40 | 22 | 32 | 12 | 8 |
| CJ-T016C | 16 | 5.5 | 5 ^{+0.048} ₀ | 35 | 20 | 6.4 | 2.3 | 14 | 48 | 28 | 38 | 16 | 10 |

* A T-bracket includes a T-bracket base, single knuckle joint, hexagon socket head bolt and spring washer.

* For dimensions of (U) and (S + Stroke), refer to the double clevis drawing on page 156.

Clevis Pin

Material: Stainless steel

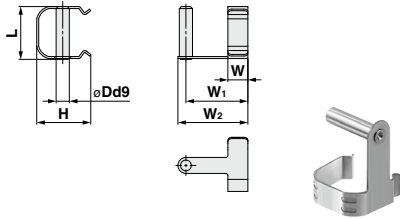


| Part no. | Applicable bore size | Dd9 | d | L | L ₁ | m | t | Included retaining ring |
|----------|----------------------|---|-----|------|----------------|-----|-----|-------------------------|
| CD-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| CD-Z015 | 16 | 5 ^{-0.030} _{-0.060} | 4.8 | 22.7 | 18.3 | 1.5 | 0.7 | Type C 5 |

* Retaining rings are included with a clevis pin.

One-touch Connecting Pin for Double Clevis

Material: Stainless steel



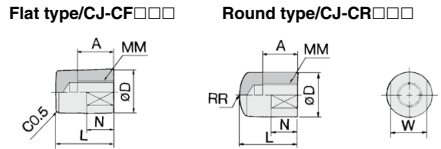
| Part no. | Applicable bore size | Dd9 | H | L | W |
|----------|----------------------|---|------|------|---|
| CD-J10 | 10 | 3.3 ^{-0.030} _{-0.060} | 13.4 | 13.2 | 4 |
| CD-J16 | 16 | 5 ^{-0.030} _{-0.060} | 18.2 | 19.5 | 5 |

| Part no. | W ₁ | W ₂ | Note |
|----------|----------------|----------------|---|
| CD-J10 | 12 | 15 | Cannot be mounted on cylinders with air cushion, or rail mounting type auto switches. |
| CD-J16 | 15 | 18 | |

* Please pay attention to the applicable cylinder.

Rod End Cap

Material: Polycacetal



| Part no. | Applicable bore size | A | D | L | MM | N | R | W |
|----------|----------------------|----|----|----|----------|---|----|----|
| CJ-CF010 | 10 | 8 | 10 | 13 | M4 x 0.7 | 6 | 10 | 8 |
| CJ-CF016 | 16 | 10 | 12 | 15 | M5 x 0.8 | 7 | 12 | 10 |

Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Part No. (Dimensions: Same as standard type)

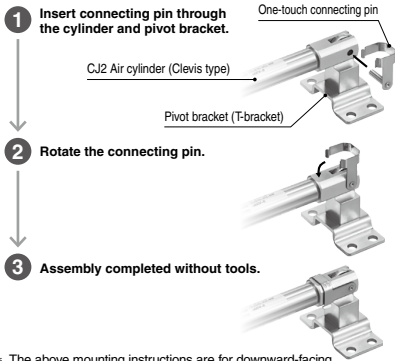
| Bore size (mm) | Foot | Flange | Single knuckle joint | Double knuckle joint* | Mounting nut | Rod end nut |
|----------------|------------|------------|----------------------|-----------------------|--------------|-------------|
| 10 | — | — | I-J010SUS | Y-J010SUS | — | NTJ-010SUS |
| 16 | CJ-L016SUS | CJ-F016SUS | I-J016SUS | Y-J016SUS | SNJ-016SUS | NTJ-015SUS |

* A knuckle pin and retaining rings are shipped together.

Precautions

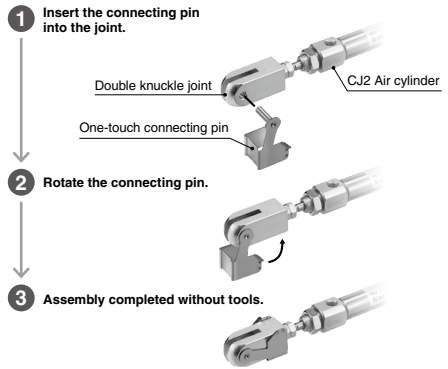
Assembly Procedures

1. Double Clevis (With One-touch Connecting Pin) (CD-J□)



* The above mounting instructions are for downward-facing ports. Refer to the following for upward-facing ports.

2. Double Knuckle Joint (With One-touch Connecting Pin) (IV-J□)



How to Mount the Double Clevis (With One-touch Connecting Pin)

When connecting a double clevis cylinder to a pivot bracket (T-bracket), it is recommended that the pivot bracket (T-bracket) and the cylinder be connected with the one-touch connecting pin first, before fastening the pivot bracket.

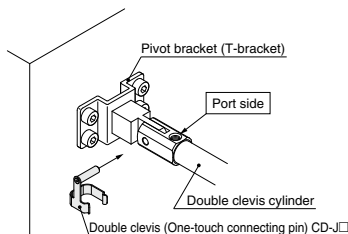
When connecting the cylinder after the pivot bracket (T-bracket) has been fastened, mount the cylinder according to the following procedure.

⚠ Warning

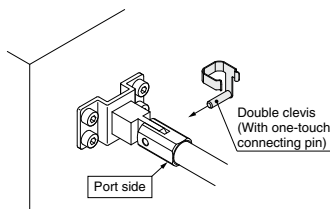
For assembling the clevis type to the pivot bracket, refer to the figure below.

1. Insert the double clevis (One-touch connecting pin) from the direction in the figure.

When port is facing upward

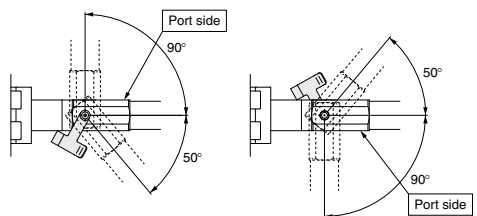


When port is facing downward

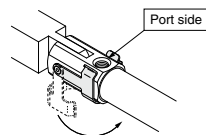


⚠ Warning

* Perform the mounting within the following range.



2. Push the one-touch connecting pin into the cylinder body (Double clevis) until it clicks and is firmly fastened.



* Attach the double knuckle joint within 180° (±90° from center). Other mounting methods are the same as the above.

CJ2Y Series

Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

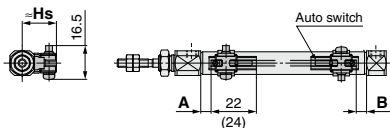
Solid state auto switch

<Band mounting>

D-M9□

D-M9□W

D-M9□A



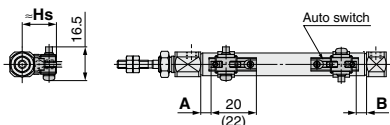
() : Dimension of the D-M9□A

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V

D-M9□MV

D-M9□AV



() : Dimension of the D-M9□AV

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

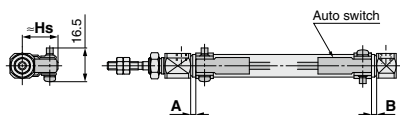
D-H7□

D-H7□W

D-H7BA

D-H7NF

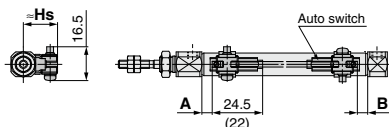
D-H7C



Reed auto switch

<Band mounting>

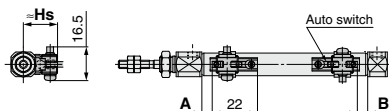
D-A9□



() : Dimension of the D-A96

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

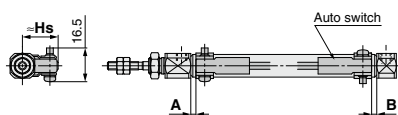
D-A9□V



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80

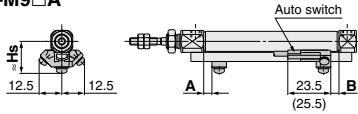
D-C73C□/C80C



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

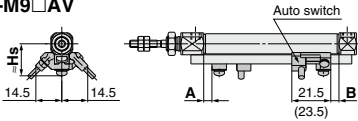
<Rail mounting>

D-M9□
D-M9□W
D-M9□A



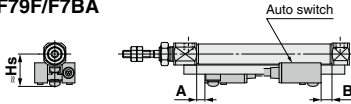
() : Dimension of the D-M9□A

D-M9□V
D-M9□WV
D-M9□AV

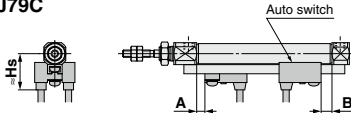


() : Dimension of the D-M9□AV

D-F7□/J79
D-F7□W/J79W
D-F79F/F7BA

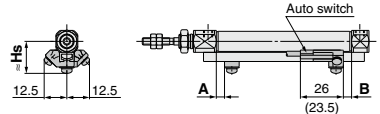


D-F7□V/F7□WV
D-F7BAV
D-J79C



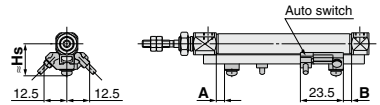
<Rail mounting>

D-A9□

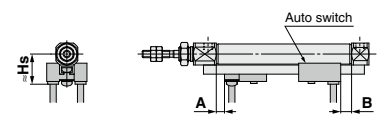


() : Dimension of the D-A96

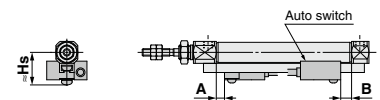
D-A9□V



D-A7□/A80
D-A73C/A80C
D-A79W



D-A7□H/A80H



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Auto Switch Proper Mounting Position

| | | Band mounting (mm) | | | | | | | |
|-------------------|---|--------------------|-----------------|-----------|------------------------------------|-----|--|-----|--|
| Auto switch model | Band mounting | | | | | | | | |
| | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | | D-A9□ D-A9□V | | D-C7□ D-C80 D-C73C D-C80C | | D-H7□ D-H7C D-H7NF D-H7□W D-H7BA | | |
| Bore size | A | B | A | B | A | B | A | B | |
| 10 | (5) 6 | (5) 6 | (1) 2 | (1) 2 | 2.5 | 2.5 | 1.5 | 1.5 | |
| 16 | (5.5) 6.5 | (5.5) 6.5 | (1.5) 2.5 | (1.5) 2.5 | 3 | 3 | 2 | 2 | |

* The values in () are measured from the end of the auto switch mounting bracket.

| | | Rail mounting (mm) | | | | | | | | | | | |
|-------------------|---|--------------------|-----------------|-----|----------------|-----|---|-----|--------|-----|--------|-----|--|
| Auto switch model | Rail mounting | | | | | | | | | | | | |
| | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | | D-A9□ D-A9□V | | D-A7□ D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C D-F7BA D-F7BAV | | D-F7NT | | D-A79W | | |
| Bore size | A | B | A | B | A | B | A | B | A | B | A | B | |
| 10 | 4.5 | 4.5 | 0.5 | 0.5 | 3 | 3 | 3.5 | 3.5 | 8.5 | 8.5 | 0.5 | 0.5 | |
| 16 | 5 | 5 | 1 | 1 | 3.5 | 3.5 | 4 | 4 | 9 | 9 | 1 | 1 | |

* Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

| | | Band mounting (mm) | | | | | | | | | | |
|-------------------|------------------------------------|--------------------|--|--|---|--|------------------|--|-------|--|----------------|--|
| Auto switch model | Band mounting | | | | | | | | | | | |
| | D-M9□ D-M9□W D-M9□A D-A9□ | | D-M9□V D-M9□WV D-M9□AV D-A9□V | | D-C7□/C80 D-H7□/H7□W D-H7NF D-H7BA | | D-C73C D-C80C | | D-H7C | | D-A7□ D-A80 | |
| Bore size | Hs | | Hs | | Hs | | Hs | | Hs | | Hs | |
| 10 | 17 | | 18 | | 17 | | 19.5 | | 20 | | 16.5 | |
| 16 | 20.5 | | 21 | | 20.5 | | 23 | | 23.5 | | 19.5 | |

| | | Rail mounting (mm) | | | | | | | | | | |
|-------------------|--|--------------------|--|--|------------------|--|------------------------------|--|--------|--|--------|--|
| Auto switch model | Rail mounting | | | | | | | | | | | |
| | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ D-A9□V | | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BA/F79F D-F7NT | | D-A73C D-A80C | | D-F7□V D-F7□WV D-F7BAV | | D-J79C | | D-A79W | |
| Bore size | Hs | | Hs | | Hs | | Hs | | Hs | | Hs | |
| 10 | 17.5 | | 17.5 | | 23.5 | | 20 | | 23 | | 19 | |
| 16 | 21 | | 20.5 | | 26.5 | | 23 | | 26 | | 22 | |

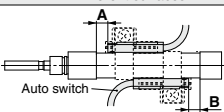
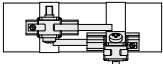
Minimum Stroke for Auto Switch Mounting

| | | (mm) | | | | |
|----------------------|---|-------------------------|--------------------|--------------|--|--|
| Auto switch mounting | Auto switch model | Number of auto switches | | | | |
| | | With 1 pc. | With 2 pcs. | | With n pcs. (n: Number of auto switches) | |
| | | | Different surfaces | Same surface | Different surfaces | Same surface |
| Band mounting | D-M9□ D-M9□W D-M9□A D-A9□ | 10 | 15 Note 1) | 45 Note 1) | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 45 + 15 (n - 2) (n = 2, 3, 4, 5...) |
| | D-M9□V | 5 | 15 Note 1) | 35 | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 35 + 25 (n - 2) (n = 2, 3, 4, 5...) |
| | D-M9□WV D-M9□AV | 10 | 15 Note 1) | 35 | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 35 + 25 (n - 2) (n = 2, 3, 4, 5...) |
| | D-A9□V | 5 | 10 | 35 | $10 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 35 + 25 (n - 2) (n = 2, 3, 4, 5...) |
| | D-C7□ D-C80 | 10 | 15 | 50 | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 50 + 20 (n - 2) (n = 2, 3, 4, 5...) |
| | D-H7□/H7□W D-H7BA D-H7NF | 10 | 15 | 60 | $15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 60 + 22.5 (n - 2) (n = 2, 3, 4, 5...) |
| | D-C73C D-C80C D-H7C | 10 | 15 | 65 | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3) | 50 + 27.5 (n - 2) (n = 2, 3, 4, 5...) |
| Rail mounting | D-M9□V | 5 | — | 5 | — | 10 + 10 (n - 2) (n = 4, 6... Note 4) |
| | D-A9□V | 5 | — | 10 | — | 10 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-M9□ D-A9□ | 10 | — | 10 | — | 15 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-M9□WV D-M9□AV | 10 | — | 15 | — | 15 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-M9□W | 15 | — | 15 | — | 20 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-M9□A | 15 | — | 20 | — | 20 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-A7□/A80 D-A7□H/A80H D-A73C/A80C | 5 | — | 10 | — | 15 + 10 (n - 2) (n = 4, 6... Note 4) |
| | D-A7□H D-A80H | 5 | — | 10 | — | 15 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-A79W | 10 | — | 15 | — | 10 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-F7□ D-J79 | 5 | — | 5 | — | 15 + 15 (n - 2) (n = 4, 6... Note 4) |
| | D-F7□V D-J79C | 5 | — | 5 | — | 10 + 10 (n - 2) (n = 4, 6... Note 4) |
| | D-F7□W/J79W D-F7BA/F79F/F7NT | 10 | — | 15 | — | 15 + 20 (n - 2) (n = 4, 6... Note 4) |
| | D-F7□WV D-F7BAV | 10 | — | 15 | — | 10 + 15 (n - 2) (n = 4, 6... Note 4) |

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 4) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation. However, the minimum even number is 4. So, 4 is used for the calculation when "n" is 1 to 3.

Note 1) Auto switch mounting

| Auto switch model | With 2 auto switches | |
|-------------------|---|---|
| | Different surfaces Note 1) | Same surface Note 1) |
| |  <p>The proper auto switch mounting position is 5.5 mm inward from the switch holder edge. The above A and B indicate values for band mounting in the table of page 163.</p> |  <p>The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.</p> |
| D-M9□/M9□W/M9□A | Less than 20 stroke Note 2) | Less than 55 stroke Note 2) |
| D-A90/A93 | — | Less than 50 stroke Note 2) |

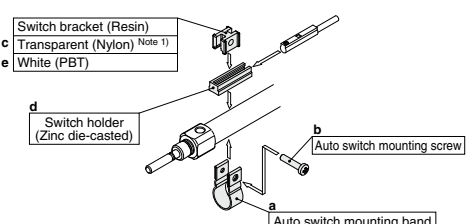
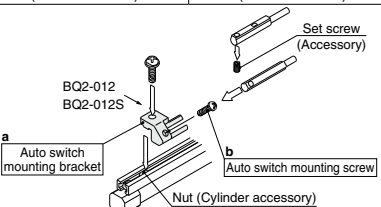
Note 2) Minimum stroke for auto switch mounting in types other than those mentioned in Note 1.

Operating Range

| Auto switch model | Bore size (mm) | | |
|-------------------|---|-----|-----|
| | 10 | 16 | |
| Band mounting | D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 2.5 | 3 |
| | D-A9□ | 6 | 7 |
| | D-C7□/C80/C73C/C80C | 7 | 7 |
| | D-H7□/H7□W D-H7BA/H7NF | 4 | 4 |
| | D-H7C | 8 | 9 |
| Rail mounting | D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 3 | 3.5 |
| | D-A9□/A9□V | 6 | 6.5 |
| | D-A7□/A80/A7H/A80H D-A73C/A80C | 8 | 9 |
| | D-A79W | 11 | 13 |
| | D-F7□/J79/F7□W/J79W D-F7□V/F7□WV/F79F D-J79C/F7BA/F7BAV D-F7NT | 5 | 5 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

| Auto switch mounting | Auto switch model | Bore size (mm) | |
|----------------------------------|--|--|--------------------------------------|
| | | 10 | 16 |
| Band mounting | D-M9□ D-M9□V D-M9□W D-M9□WV D-A9□ D-A9□V | BJ6-010 (A set of a, b, c, d) | BJ6-016 (A set of a, b, c, d) |
| | D-M9□A ^{Note 2)} D-M9□AV ^{Note 2)} | BJ6-010S (A set of a, b, d, e) | BJ6-016S (A set of a, b, d, e) |
| Band mounting |  | | |
| Band mounting | D-C7□/C80 D-C73C/C80C D-H7□/H7□W D-H7BA/H7NF | BJ2-010 (A set of band and screw) | BJ2-016 (A set of band and screw) |
| Rail mounting ^{Note 4)} | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A ^{Note 5)} D-M9□AV ^{Note 5)} D-A9□ D-A9□V | BQ2-012(S) (A set of a and b) | BQ2-012(S) (A set of a and b) |
| | |  | |

Note 1) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please contact SMC regarding other chemicals.

Note 2) When the indicator LED for mounting the switch bracket. As the indicator LED is projected from the switch unit, indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

Note 3) When the cylinder is shipped, the auto switch mounting bracket and the auto switch will be included.

Note 4) For the D-M9□A(V), order the BQ2-012S, which uses stainless steel mounting screws.

Band Mounting Brackets Set Part No.

| Set part no. | Contents |
|--------------|---|
| BJ2-□□□ | • Auto switch mounting band (a) • Auto switch mounting screw (b) |
| BJ4-1 | • Switch bracket (White/PBT) (e) • Switch holder (d) |
| BJ5-1 | • Switch bracket (Transparent/Nylon) (c) • Switch holder (d) |

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

BBA4: For D-C7/C8/H7 types

Note 5) Refer to page 1440 for details on the BBA4.

When the D-H7BA type auto switch is shipped independently, the BBA4 is attached.

CJ2Y Series

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Mounting | Model | Electrical entry | Features | |
|-------------|---------------|------------------|---|---|--|
| Solid state | Band mounting | D-H7A1/H7A2/H7B | Grommet (In-line) | — | |
| | | D-H7NW/H7PW/H7BW | | Diagnostic indication (2-color indicator) | |
| | Rail mounting | D-F79/F7P/J79 | | — | |
| | | D-F79W/F7PW/J79W | | Diagnostic indication (2-color indicator) | |
| | | D-F7NV/F7PV/F7BV | — | | |
| | | D-F7NVV/F7BVV | Diagnostic indication (2-color indicator) | | |
| Reed | Band mounting | D-C73/C76 | Grommet (In-line) | — | |
| | | D-C80 | | Without indicator light | |
| | Rail mounting | D-A73H/A76H | | — | |
| | | D-A80H | | Without indicator light | |
| | | D-A73 | — | | |
| | | D-A80 | Without indicator light | | |
| | | | | Grommet (Perpendicular) | |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1360.

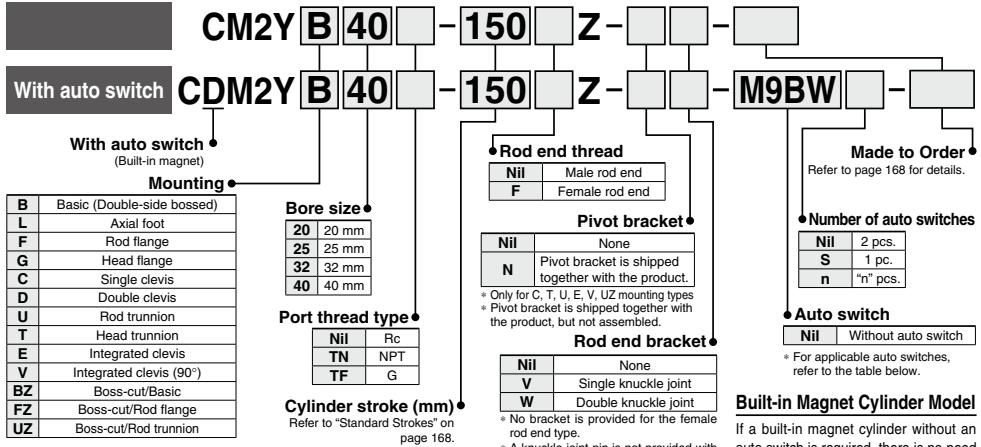
Smooth Cylinder

CM2Y Series

ø20, ø25, ø32, ø40



How to Order



* Refer to "Ordering Example of Cylinder Assembly" on page 169.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length (m) | | | | | Pre-wired connector | Applicable load | | | |
|-------------------------------------|---|----------------------|-----------------|-------------------------|--------------|--------------|-------------------|---------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|---|------------|
| | | | | | DC | AC | Perpendicular | In-line | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ○ | ○ | ○ | — | IC circuit | | | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ○ | ○ | ○ | | | | | |
| | | Connector | | 2-wire | 12 V | — | M9BV | M9B | ● | ● | ○ | ○ | ○ | — | — | | | |
| | | | | Terminal conduit | | | 3-wire (NPN) | — | G39A | — | — | ● | — | | | — | — | IC circuit |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 2-wire | 24 V | — | — | K39A | — | — | — | ● | — | — | — | — | | |
| | | | | 3-wire (NPN) | | | M9NVV | M9NV | ● | ● | ○ | ○ | ○ | — | — | IC circuit | | |
| | | | | 3-wire (PNP) | M9PVV | M9PV | ● | ● | ○ | ○ | ○ | — | — | — | | | | |
| | | | | 2-wire | M9BVV | M9BV | ● | ● | ○ | ○ | ○ | — | — | — | | | | |
| | | | | 3-wire (NPN) | M9NAV*1 | M9NA*1 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | — | IC circuit | | | |
| | | | | 3-wire (PNP) | M9PAV*1 | M9PA*1 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | — | — | | | |
| Water resistant (2-color indicator) | Grommet | Yes | 2-wire | 5 V, 12 V | — | M9BAV*1 | M9BA*1 | ○ | ○ | ○ | ○ | ○ | ○ | — | — | | | |
| | | | 3-wire (NPN) | | | — | H7NF | ● | ● | ○ | ○ | ○ | ○ | — | IC circuit | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 5 V | — | A96V | A96 | ● | ● | — | — | — | — | — | — | | |
| | | | | 2-wire | | | A93V*2 | A93 | ● | ● | ● | — | — | — | — | — | | |
| | | | | Connector | 24 V | — | 100 V or less | A90V | A90 | ● | ● | ● | — | — | — | — | — | IC circuit |
| | | | | | | | 100 V, 200 V | — | B54 | ● | ● | ● | — | — | — | — | — | |
| | | | | | | | 200 V or less | — | B64 | ● | ● | ● | — | — | — | — | — | |
| | | Terminal conduit | | 12 V | — | 24 V or less | — | C73C | ● | ● | ● | ● | — | — | — | — | — | |
| | | | | | | — | C80C | ● | ● | ● | ● | — | — | — | — | IC circuit | | |
| | | DIN terminal Grommet | | 12 V | — | 100 V, | — | A33A | — | — | — | — | ● | — | — | — | — | PLC |
| | | | | | | 200 V | — | A34A | — | — | — | — | — | ● | — | — | — | |
| | | | | | | — | — | A44A | — | — | — | — | — | — | ● | — | — | — |
| — | — | — | — | — | B59W | ● | ● | ● | — | — | — | — | — | — | | | | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Please consult with SMC regarding water resistant types with the above model numbers.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9NVW
3 m L (Example) M9NWL
5 m Z (Example) M9NZ
None N (Example) H7CN

* Solid state auto switches marked with "○" are produced upon receipt of order.

* Do not indicate suffix "N" for no lead wire on the D-A93/A44A/G39A/K39A models.

* Since there are other applicable auto switches than listed above, refer to page 183 for details.

* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* The D-A93/M93 auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

* The D-C7/C80C/H7C auto switches are assembled before shipment.



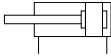
CM2Y Series



Integrated clevis

Symbol

Double acting, Single rod, Rubber bumper



Made to Order:
Individual Specifications
(For details, refer to page 169.)

| Symbol | Specifications |
|--------|--------------------------------|
| -X1854 | Low friction cylinder mounting |

Made to Order

[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC3 | Special port location |
| -XC6 | Made of stainless steel |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC10 | Dual stroke cylinder/Double rod type |
| -XC13 | Auto switch rail mounting |
| -XC20 | Head cover axial port |
| -XC25 | No fixed throttle of connection port |
| -XC27 | Double clevis and double knuckle joint pins made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC52 | Mounting nut with set screw |

Replacement Parts/Rod Seal

| Bore size (mm) | Part no. |
|----------------|----------|
| 20 | CM20Z-PS |
| 25 | CM25Z-PS |
| 32 | CM32Z-PS |
| 40 | CM40Z-PS |

Grease Pack for Maintenance

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|--------------------------------------|---|----|----|----|
| Action | Double acting, Single rod | | | |
| Piston speed | 5 to 500 mm/s | | | |
| Fluid | Air | | | |
| Proof pressure | 1.05 MPa | | | |
| Maximum operating pressure | 0.7 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Stroke length tolerance | $^{+1.4}_0$ mm | | | |
| Cushion | Rubber bumper | | | |
| Allowable leakage rate | 0.5 L/min (ANR) or less | | | |

Minimum Operating Pressure

| Unit: MPa | | | | |
|----------------------------|------|----|----|----|
| Bore size (mm) | 20 | 25 | 32 | 40 |
| Minimum operating pressure | 0.02 | | | |

Mounting Brackets/Part No.

| Mounting bracket | Min. order qty | Bore size (mm) | | | | Contents (for minimum order quantity) |
|-----------------------------|----------------|----------------|----------|----------|----------|--|
| | | 20 | 25 | 32 | 40 | |
| Axial foot* | 2 | CM-L020B | CM-L032B | CM-L040B | CM-L040B | 2 feet, 1 mounting nut |
| Flange | 1 | CM-F020B | CM-F032B | CM-F040B | CM-F040B | 1 flange |
| Single clevis** | 1 | CM-C020B | CM-C032B | CM-C040B | CM-C040B | 1 single clevis, 3 liners |
| Double clevis (with pin)*** | 1 | CM-D020B | CM-D032B | CM-D040B | CM-D040B | 1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings |
| Trunnion (with nut) | 1 | CM-T020B | CM-T032B | CM-T040B | CM-T040B | 1 trunnion, 1 trunnion nut |

* Order 2 feet per cylinder.

** 3 liners are included with a clevis bracket for adjusting the mounting angle.

*** A clevis pin and retaining rings (split pins for ø40) are included.

Mounting and Accessories/For details about accessories, refer to pages 177 to 179.

| Accessories | Standard | | | | Option | | | |
|----------------------------|---------------|-------------|------------|----------------------|------------------------------|------------------------------|-----------------------|---------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Note 3) Double knuckle joint | Note 4) Clevis pivot bracket | Note 6) Pivot bracket | Note 7) Pivot bracket pin |
| Basic (Double-side bossed) | ● (1 pc.) | ● | — | ● | ● | — | — | — |
| Axial foot | ● (2) | ● | — | ● | ● | — | — | — |
| Rod flange | ● (1) | ● | — | ● | ● | — | — | — |
| Head flange | ● (1) | ● | — | ● | ● | — | — | — |
| Integrated clevis | — Note 1) | ● | — | ● | ● | ● | — | — |
| Single clevis | — Note 1) | ● | — | ● | ● | — | ● | ● |
| Double clevis Note 3) | — Note 1) | ● | ● Note 5) | ● | ● | — | — | — |
| Rod trunnion | ● (1) Note 2) | ● | — | ● | ● | — | — | — |
| Head trunnion | ● (1) Note 2) | ● | — | ● | ● | — | ● | — |
| Boss-cut/Basic | ● (1) | ● | — | ● | ● | — | — | — |
| Boss-cut/Flange | ● (1) | ● | — | ● | ● | — | — | — |
| Boss-cut/Trunnion | ● (1) Note 2) | ● | — | ● | ● | — | — | — |

Note 1) Mounting nuts are not attached to the integrated clevis, single clevis and double clevis types.

Note 2) Trunnion nuts are mounted on the rod trunnion and head trunnion types.

Note 3) A pin and retaining rings (split pins for ø40) are included with the double clevis and double knuckle joint types.

Note 4) A pin and retaining rings are included with the clevis pivot bracket.

Note 5) Retaining rings (split pins for ø40) are included with the clevis pin.

Note 6) A pin and retaining rings are included with the pivot bracket.

Note 7) Retaining rings are included with the pivot bracket pin.

* Stainless steel mounting brackets and accessories are also available.

Refer to page 178 for details.

Standard Strokes

| Bore size (mm) | Standard stroke (mm) |
|----------------|--|
| 20, 25, 32, 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300 |

Note 1) Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Option: Ordering Example of Cylinder Assembly

Cylinder model: **CDM2YC40-150Z-NV-M9BW**

| | |
|---------------------|----------------------|
| Mounting | C: Single clevis |
| Pivot bracket | N: Yes |
| Rod end bracket V: | Single knuckle joint |
| Auto switch D-M9BW: | 2 pcs. |

* Pivot bracket, single knuckle joint and auto switch are shipped together with the product, but not assembled.

* Pivot bracket is only applicable to mounting C, T, U, E, V and UZ.

* No rod end bracket is provided for the female rod end type.

Weights

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|---------------------------------------|---------------------------------|------|------|------|------|
| Basic weight | Basic (Double-side bossed) | 0.14 | 0.21 | 0.28 | 0.56 |
| | Axial foot | 0.29 | 0.37 | 0.44 | 0.83 |
| | Flange | 0.20 | 0.30 | 0.37 | 0.68 |
| | Integrated clevis | 0.12 | 0.19 | 0.27 | 0.52 |
| | Single clevis | 0.18 | 0.25 | 0.32 | 0.65 |
| | Double clevis | 0.19 | 0.27 | 0.33 | 0.69 |
| | Trunnion | 0.18 | 0.28 | 0.34 | 0.66 |
| | Boss-cut/Basic | 0.13 | 0.19 | 0.26 | 0.53 |
| | Boss-cut/Flange | 0.19 | 0.28 | 0.35 | 0.65 |
| Boss-cut/Trunnion | 0.17 | 0.26 | 0.32 | 0.63 | |
| Additional weight per 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |
| Option bracket | Clevis bracket (with pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (with pin) | 0.07 | 0.07 | 0.07 | 0.20 |
| | Pivot bracket | 0.06 | 0.06 | 0.06 | 0.06 |
| | Pivot bracket pin | 0.02 | 0.02 | 0.02 | 0.03 |

Calculation: Example) **CM2YL32-100Z**

- Basic weight.....0.44 (Foot, ø32)
- Additional weight.....0.08/50 stroke
- Cylinder stroke.....100 stroke

$0.44 + 0.08 \times 100/50 = 0.60 \text{ kg}$

Same Mounting Dimensions as the Low Friction Cylinder

CM2Y **Mounting** **Bore size** - **Stroke** **Z** - X1854

Same mounting dimensions as the CM2Q ↓

In order to adjust the mounting dimensions of the low friction cylinder (CM2Q), extend the longitudinal dimension (S, ZZ) by 3 mm.

Specifications

| Cylinder bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------------|---------------------------|----|----|----|
| Action | Double acting, Single rod | | | |
| Direction of low friction | Bi-directional | | | |
| Fluid | Air | | | |
| Proof pressure | 1.05 MPa | | | |
| Maximum operating pressure | 0.7 MPa | | | |

* Low friction operates bi-directionally.

⚠ Precautions

- Be sure to read this before handling the products.
- Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

Operating Precautions

⚠ Warning

- Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ Caution

- Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

- Use caution to the popping of a retaining ring.

When replacing rod seals and removing and mounting a retaining ring, use a proper tool (retaining ring plier: tool for installing a type C retaining ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier. Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

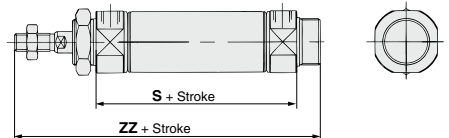
- Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

- The oil stuck to the cylinder is grease.
- The base oil of grease may seep out.

The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

Dimensions



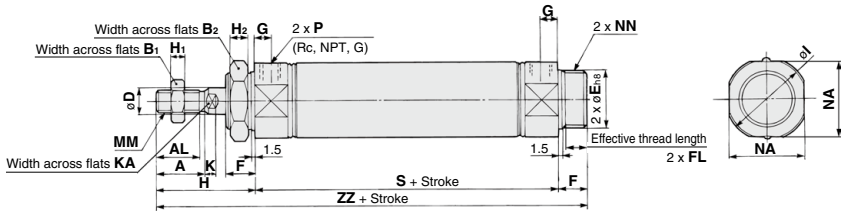
| Bore size (mm) | S | ZZ |
|----------------|----|-----|
| 20 | 65 | 119 |
| 25 | 65 | 123 |
| 32 | 67 | 125 |
| 40 | 91 | 157 |

* Add 3 mm to S and ZZ dimensions of the double acting, single rod type on pages 170 to 176 for the dimensions for each mounting bracket other than the basic type.

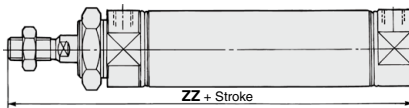
CM2Y Series

Basic (Double-side Bossed) (B)

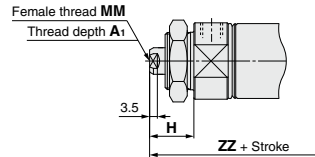
CM2YB –



Boss-cut



Female rod end



| Bore size | A | AL | B ₁ | B ₂ | D | E | F | FL | G | H | H ₁ | H ₂ | I | K | KA | MM | NA | NN | P | S | ZZ |
|-----------|----|------|----------------|----------------|----|-----------------------------------|----|------|----|----|----------------|----------------|------|-----|----|------------|------|-----------|-----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 10.5 | 8 | 41 | 5 | 8 | 28 | 5 | 6 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 62 | 116 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 8 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 62 | 120 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 10 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 64 | 122 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 13.5 | 11 | 50 | 8 | 10 | 46.5 | 7 | 12 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 88 | 154 |

Boss-cut (mm)

| Bore size | ZZ |
|-----------|-----|
| 20 | 103 |
| 25 | 107 |
| 32 | 109 |
| 40 | 138 |

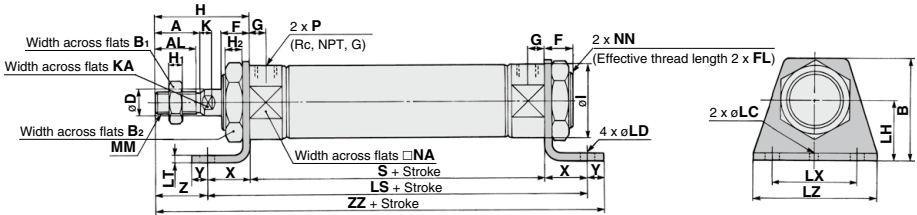
Female Rod End (mm)

| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 95 |
| 25 | 8 | 20 | M5 x 0.8 | 95 |
| 32 | 12 | 20 | M6 x 1 | 97 |
| 40 | 13 | 21 | M8 x 1.25 | 125 |

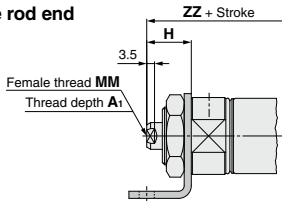
- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Axial Foot (L)

CM2YL –



Female rod end



Female Rod End

| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 110 |
| 25 | 8 | 20 | M5 x 0.8 | 110 |
| 32 | 12 | 20 | M6 x 1 | 112 |
| 40 | 13 | 21 | M8 x 1.25 | 142 |

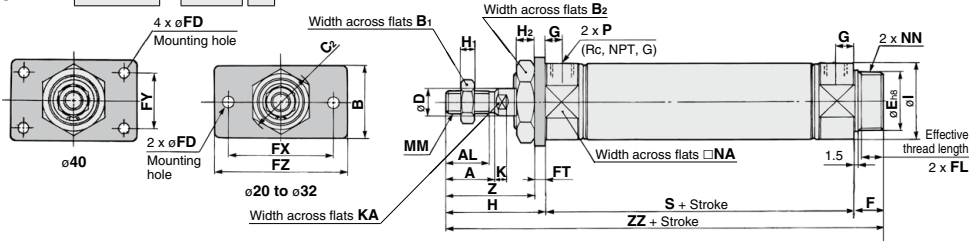
- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

* Mounting bracket is shipped together with the product.

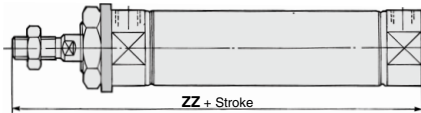
| Bore size | A | AL | B | B ₁ | B ₂ | D | F | FL | G | H | H ₁ | H ₂ | I | K | KA | LC | LD | LH | LS | LT | LX | LZ | MM | NA | NN | P | S | X | Y | Z | ZZ |
|-----------|----|------|----|----------------|----------------|----|----|------|----|----|----------------|----------------|------|-----|----|----|-----|----|-----|-----|----|----|------------|------|-----------|-----|----|----|----|----|-----|
| 20 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 10.5 | 8 | 41 | 5 | 8 | 28 | 5 | 6 | 4 | 6.8 | 25 | 102 | 3.2 | 40 | 55 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 62 | 20 | 8 | 21 | 131 |
| 25 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 10.5 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 8 | 4 | 6.8 | 28 | 102 | 3.2 | 40 | 55 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 62 | 20 | 8 | 25 | 135 |
| 32 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 10.5 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 10 | 4 | 6.8 | 28 | 104 | 3.2 | 40 | 55 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 64 | 20 | 8 | 25 | 137 |
| 40 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 13.5 | 11 | 50 | 8 | 10 | 46.5 | 7 | 12 | 4 | 7 | 30 | 134 | 3.2 | 55 | 75 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 88 | 23 | 10 | 27 | 171 |

Rod Flange (F)

CM2YF –

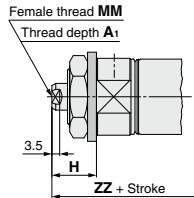


Boss-cut



| Bore size | ZZ |
|-----------|-----|
| 20 | 103 |
| 25 | 107 |
| 32 | 109 |
| 40 | 138 |

Female rod end



| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 95 |
| 25 | 8 | 20 | M5 x 0.8 | 95 |
| 32 | 12 | 20 | M6 x 1 | 97 |
| 40 | 13 | 21 | M8 x 1.25 | 125 |

- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

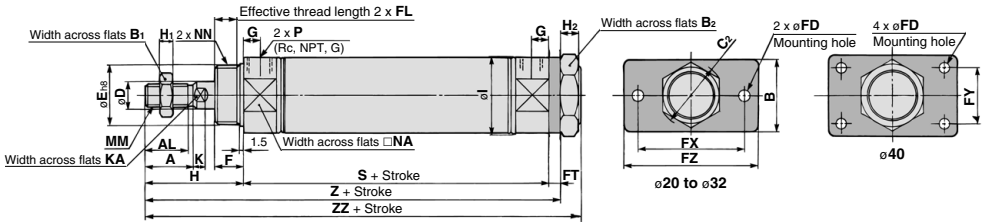
* Mounting bracket is shipped together with the product.

| Bore size | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FL | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | KA | MM | NA | NN | P | S | Z | ZZ |
|-----------|----|------|----|----------------|----------------|----------------|----|----------------------|----|------|----|----|----|----|----|----|----|----------------|----------------|------|-----|----|------------|------|-----------|-----|----|----|-----|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ^{0.0233} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 | 5 | 6 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 62 | 37 | 116 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ^{0.0233} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 8 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 62 | 41 | 120 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ^{0.0233} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 10 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 64 | 41 | 122 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ^{0.029} | 16 | 13.5 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 | 7 | 12 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 88 | 45 | 154 |

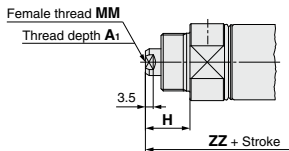
CM2Y Series

Head Flange (G)

CM2YG –



Female rod end



* Mounting bracket is shipped together with the product.

| Bore size | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FL | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I |
|-----------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|------|----|----|----|----|----|----|----|----------------|----------------|------|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 10.5 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 13.5 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 |

| Bore size | K | KA | MM | NA | NN | P | S | Z | ZZ |
|-----------|-----|----|------------|------|-----------|-----|----|-----|-----|
| 20 | 5 | 6 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 62 | 107 | 116 |
| 25 | 5.5 | 8 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 62 | 111 | 120 |
| 32 | 5.5 | 10 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 64 | 113 | 122 |
| 40 | 7 | 12 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 88 | 143 | 154 |

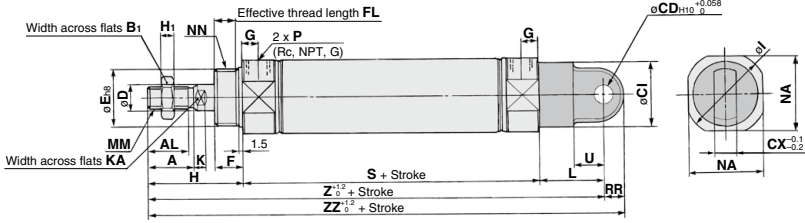
| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 95 |
| 25 | 8 | 20 | M5 x 0.8 | 95 |
| 32 | 12 | 20 | M6 x 1 | 97 |
| 40 | 13 | 21 | M8 x 1.25 | 125 |

* When female thread is used, use a thin wrench when tightening the piston rod.

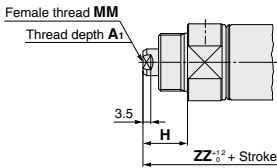
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Single Clevis (C)

CM2YC –



Female rod end



Female Rod End

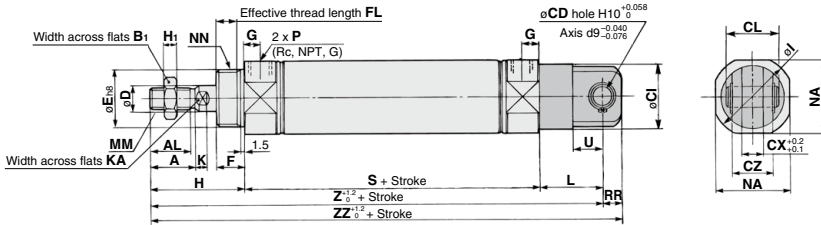
| Bore size | A1 | H | MM | (ZZ) |
|-----------|----|----|-----------|------|
| 20 | 8 | 20 | M4 x 0.7 | 121 |
| 25 | 8 | 20 | M5 x 0.8 | 121 |
| 32 | 12 | 20 | M6 x 1 | 123 |
| 40 | 13 | 21 | M8 x 1.25 | 159 |

- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

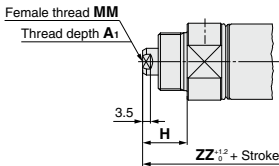
| Bore size | A | AL | B1 | CI | CD | CX | D | E | F | FL | G | H | H1 | I | K | KA | L | MM | NA | NN | P | RR | S | U | (Z) | (ZZ) |
|-----------|----|------|----|----|----|----|----|------------------------------------|----|------|----|----|----|------|-----|----|----|------------|------|-----------|-----|----|----|----|-----|------|
| 20 | 18 | 15.5 | 13 | 24 | 9 | 10 | 8 | 20 ⁰ / _{0.033} | 13 | 10.5 | 8 | 41 | 5 | 28 | 5 | 6 | 30 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 9 | 62 | 14 | 133 | 142 |
| 25 | 22 | 19.5 | 17 | 30 | 9 | 10 | 10 | 26 ⁰ / _{0.033} | 13 | 10.5 | 8 | 45 | 6 | 33.5 | 5.5 | 8 | 30 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 9 | 62 | 14 | 137 | 146 |
| 32 | 22 | 19.5 | 17 | 30 | 9 | 10 | 12 | 26 ⁰ / _{0.033} | 13 | 10.5 | 8 | 45 | 6 | 37.5 | 5.5 | 10 | 30 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 9 | 64 | 14 | 139 | 148 |
| 40 | 24 | 21 | 22 | 38 | 10 | 15 | 14 | 32 ⁰ / _{0.039} | 16 | 13.5 | 11 | 50 | 8 | 46.5 | 7 | 12 | 39 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 11 | 88 | 18 | 177 | 188 |

Double Clevis (D)

CM2YD –



Female rod end



Female Rod End

| Bore size | A1 | H | MM | (ZZ) |
|-----------|----|----|-----------|------|
| 20 | 8 | 20 | M4 x 0.7 | 121 |
| 25 | 8 | 20 | M5 x 0.8 | 121 |
| 32 | 12 | 20 | M6 x 1 | 123 |
| 40 | 13 | 21 | M8 x 1.25 | 159 |

- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

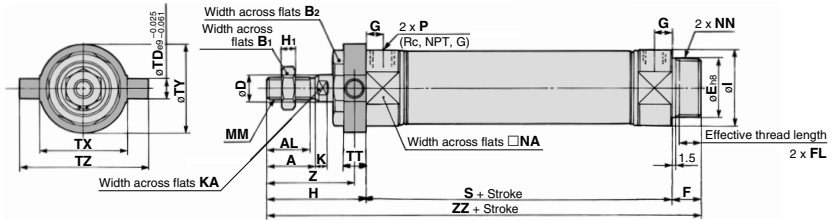
| Bore size | A | AL | B1 | CI | CL | CX | CZ | D | E | F | FL | G | H | H1 | I | K | KA | L | MM | NA | NN | P | RR | S | U | (Z) | (ZZ) | |
|-----------|----|------|----|----|----|------|----|----|----|------------------------------------|----|------|----|----|---|------|-----|----|----|------------|------|-----------|-----|----|----|-----|------|-----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 25 | 10 | 19 | 8 | 20 ⁰ / _{0.033} | 13 | 10.5 | 8 | 41 | 5 | 28 | 5 | 6 | 30 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 | 9 | 62 | 14 | 133 | 142 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 10 | 26 ⁰ / _{0.033} | 13 | 10.5 | 8 | 45 | 6 | 33.5 | 5.5 | 8 | 30 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 | 9 | 62 | 14 | 137 | 146 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 12 | 26 ⁰ / _{0.033} | 13 | 10.5 | 8 | 45 | 6 | 37.5 | 5.5 | 10 | 30 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 | 9 | 64 | 14 | 139 | 148 |
| 40 | 24 | 21 | 22 | 10 | 38 | 41.2 | 15 | 30 | 14 | 32 ⁰ / _{0.039} | 16 | 13.5 | 11 | 50 | 8 | 46.5 | 7 | 12 | 39 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 | 11 | 88 | 18 | 177 | 188 |

* A clevis pin and retaining rings (split pins for ø40) are shipped together.

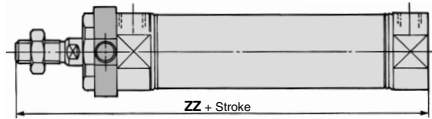
CM2Y Series

Rod Trunnion (U)

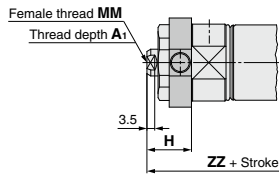
CM2YU -



Boss-cut



Female rod end



* Mounting bracket is shipped together with the product.

(mm)

| Bore size | A | AL | B ₁ | B ₂ | D | E | F | FL | G | H | H ₁ | I | K | KA | MM | NA | NN | P |
|-----------|----|------|----------------|----------------|----|-----------------------------------|----|------|----|----|----------------|------|-----|----|------------|------|-----------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 10.5 | 8 | 41 | 5 | 28 | 5 | 6 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 33.5 | 5.5 | 8 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 37.5 | 5.5 | 10 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 13.5 | 11 | 50 | 8 | 46.5 | 7 | 12 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 |

(mm)

| Bore size | S | TD | TT | TX | TY | TZ | Z | ZZ |
|-----------|----|----|----|----|----|----|------|-----|
| 20 | 62 | 8 | 10 | 32 | 32 | 52 | 36 | 116 |
| 25 | 62 | 9 | 10 | 40 | 40 | 60 | 40 | 120 |
| 32 | 64 | 9 | 10 | 40 | 40 | 60 | 40 | 122 |
| 40 | 88 | 10 | 11 | 53 | 53 | 77 | 44.5 | 154 |

Boss-cut (mm)

| Bore size | ZZ |
|-----------|-----|
| 20 | 103 |
| 25 | 107 |
| 32 | 109 |
| 40 | 138 |

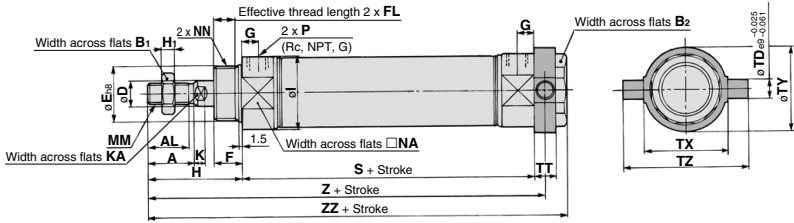
Female Rod End (mm)

| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 95 |
| 25 | 8 | 20 | M5 x 0.8 | 95 |
| 32 | 12 | 20 | M6 x 1 | 97 |
| 40 | 13 | 21 | M8 x 1.25 | 125 |

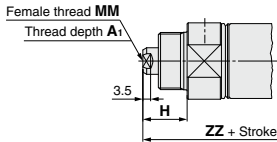
- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Head Trunnion (T)

CM2YT –



Female rod end



* Mounting bracket is shipped together with the product.

| Bore size | A | AL | B ₁ | B ₂ | D | E | F | FL | G | H | H ₁ | I | K | KA | MM | NA | NN | P |
|-----------|----|------|----------------|----------------|----|-----------------------------------|----|------|----|----|----------------|------|-----|----|------------|------|-----------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 10.5 | 8 | 41 | 5 | 28 | 5 | 6 | M8 x 1.25 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 33.5 | 5.5 | 8 | M10 x 1.25 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 37.5 | 5.5 | 10 | M10 x 1.25 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 13.5 | 11 | 50 | 8 | 46.5 | 7 | 12 | M14 x 1.5 | 42.5 | M32 x 2 | 1/4 |

| Bore size | S | TD | TT | TX | TY | TZ | Z | ZZ |
|-----------|----|----|----|----|----|----|-------|-----|
| 20 | 62 | 8 | 10 | 32 | 32 | 52 | 108 | 118 |
| 25 | 62 | 9 | 10 | 40 | 40 | 60 | 112 | 122 |
| 32 | 64 | 9 | 10 | 40 | 40 | 60 | 114 | 124 |
| 40 | 88 | 10 | 11 | 53 | 53 | 77 | 143.5 | 154 |

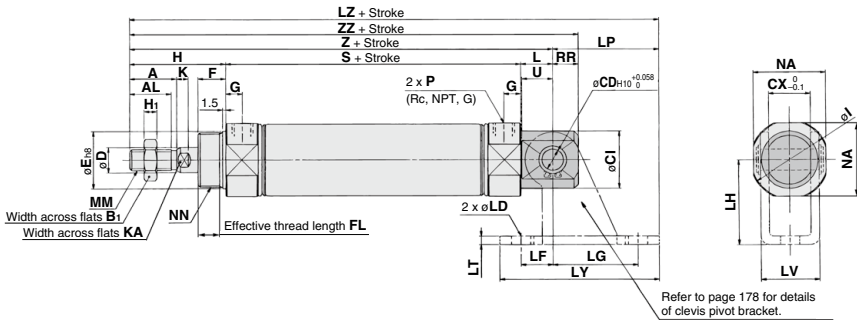
| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 97 |
| 25 | 8 | 20 | M5 x 0.8 | 97 |
| 32 | 12 | 20 | M6 x 1 | 99 |
| 40 | 13 | 21 | M8 x 1.25 | 125 |

- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

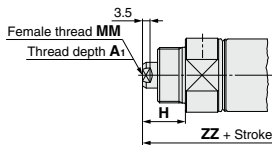
CM2Y Series

Integrated Clevis (E)

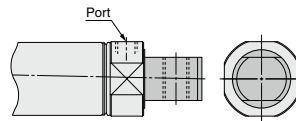
CM2YE -



Female rod end



Integrated clevis (90°) (V)



* The outer dimensions are the same as those for the integrated clevis (E).

| Bore size | A | AL | B ₁ | CD | CI | CX | D | E | F | FL | G | H | H ₁ | I | K | KA | L | MM | NA | NN |
|-----------|----|------|----------------|----|----|----|----|-----------------------------------|----|------|----|----|----------------|------|-----|----|----|------------|------|-----------|
| 20 | 18 | 15.5 | 13 | 8 | 20 | 12 | 8 | 20 ⁰ _{-0.033} | 13 | 10.5 | 8 | 41 | 5 | 28 | 5 | 6 | 12 | M8 x 1.25 | 24 | M20 x 1.5 |
| 25 | 22 | 19.5 | 17 | 8 | 22 | 12 | 10 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 33.5 | 5.5 | 8 | 12 | M10 x 1.25 | 30 | M26 x 1.5 |
| 32 | 22 | 19.5 | 17 | 10 | 27 | 20 | 12 | 26 ⁰ _{-0.033} | 13 | 10.5 | 8 | 45 | 6 | 37.5 | 5.5 | 10 | 15 | M10 x 1.25 | 34.5 | M26 x 1.5 |
| 40 | 24 | 21 | 22 | 10 | 33 | 20 | 14 | 32 ⁰ _{-0.039} | 16 | 13.5 | 11 | 50 | 8 | 46.5 | 7 | 12 | 15 | M14 x 1.5 | 42.5 | M32 x 2 |

| Bore size | P | RR | S | U | Z | ZZ |
|-----------|-----|----|----|------|-----|-----|
| 20 | 1/8 | 9 | 62 | 11.5 | 115 | 124 |
| 25 | 1/8 | 9 | 62 | 11.5 | 119 | 128 |
| 32 | 1/8 | 12 | 64 | 14.5 | 124 | 136 |
| 40 | 1/4 | 12 | 88 | 14.5 | 153 | 165 |

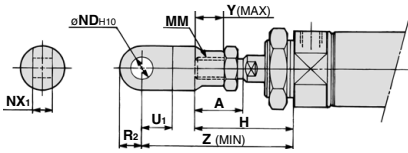
| Bore size | A ₁ | H | MM | ZZ |
|-----------|----------------|----|-----------|-----|
| 20 | 8 | 20 | M4 x 0.7 | 103 |
| 25 | 8 | 20 | M5 x 0.8 | 103 |
| 32 | 12 | 20 | M6 x 1 | 111 |
| 40 | 13 | 21 | M8 x 1.25 | 136 |

- * When female thread is used, use a thin wrench when tightening the piston rod.
- * When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

CM2Y Series

Dimensions of Accessories

With Single Knuckle Joint

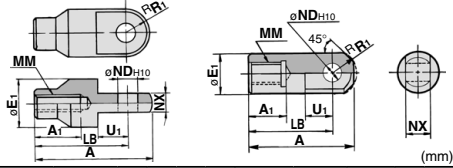


(mm)

| Bore size | A | H | MM | ND _{H10} | NX ₁ | U ₁ | R ₂ | Y | Z |
|-----------|----|----|------------|-----------------------------------|------------------------------------|----------------|----------------|----|----|
| 20 | 18 | 41 | M8 x 1.25 | 9 ^{+0.058} ₀ | 9 ^{+0.1} _{-0.1} | 14 | 10 | 11 | 66 |
| 25, 32 | 22 | 45 | M10 x 1.25 | 9 ^{+0.058} ₀ | 9 ^{+0.1} _{-0.1} | 14 | 10 | 14 | 69 |
| 40 | 24 | 50 | M14 x 1.5 | 12 ^{+0.070} ₀ | 16 ^{+0.1} _{-0.1} | 20 | 14 | 13 | 92 |

Single Knuckle Joint

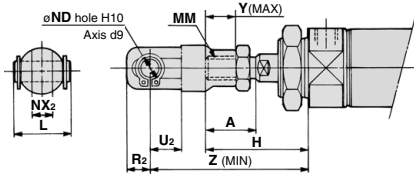
I-020B, 032B Material: Carbon steel I-040B Material: Free-cutting steel



(mm)

| Part no. | Applicable bore size | A | A ₁ | E ₁ | LB | MM | ND _{H10} | NX | R ₁ | U ₁ |
|----------|----------------------|----|----------------|----------------|----|------------|-----------------------------------|------------------------------------|----------------|----------------|
| I-020B | 20 | 46 | 16 | 20 | 36 | M8 x 1.25 | 9 ^{+0.058} ₀ | 9 ^{+0.1} _{-0.1} | 10 | 14 |
| I-032B | 25, 32 | 48 | 18 | 20 | 38 | M10 x 1.25 | 9 ^{+0.058} ₀ | 9 ^{+0.1} _{-0.1} | 10 | 14 |
| I-040B | 40 | 69 | 22 | 24 | 55 | M14 x 1.5 | 12 ^{+0.070} ₀ | 16 ^{+0.1} _{-0.1} | 15.5 | 20 |

With Double Knuckle Joint



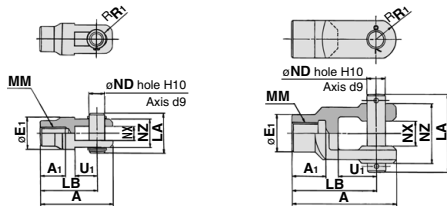
(mm)

| Bore size | A | H | L | MM | ND | NX ₂ | R ₂ | U ₂ | Y | Z |
|-----------|----|----|------|------------|----|------------------------------------|----------------|----------------|----|----|
| 20 | 18 | 41 | 25 | M8 x 1.25 | 9 | 9 ^{+0.1} _{-0.1} | 10 | 14 | 11 | 66 |
| 25, 32 | 22 | 45 | 25 | M10 x 1.25 | 9 | 9 ^{+0.1} _{-0.1} | 10 | 14 | 14 | 69 |
| 40 | 24 | 50 | 49.7 | M14 x 1.5 | 12 | 16 ^{+0.1} _{-0.1} | 13 | 25 | 13 | 92 |

Double Knuckle Joint

Y-020B, 032B Material: Carbon steel

Y-040B Material: Cast iron



(mm)

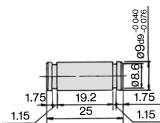
| Part no. | Applicable bore size | A | A ₁ | E ₁ | LA | LB | MM | ND | NX | NZ | R ₁ | U ₁ | Included pin part number | Retaining ring size Split pin |
|----------|----------------------|----|----------------|----------------|------|----|------------|----|------------------------------------|----|----------------|----------------|--------------------------|-------------------------------|
| Y-020B | 20 | 46 | 16 | 20 | 25 | 36 | M8 x 1.25 | 9 | 9 ^{+0.2} _{-0.1} | 18 | 5 | 14 | CDP-1 | Type C 9 for axis |
| Y-032B | 25, 32 | 48 | 18 | 20 | 25 | 38 | M10 x 1.25 | 9 | 9 ^{+0.2} _{-0.1} | 18 | 5 | 14 | CDP-1 | Type C 9 for axis |
| Y-040B | 40 | 68 | 22 | 24 | 49.7 | 55 | M14 x 1.5 | 12 | 16 ^{+0.3} _{-0.1} | 38 | 13 | 25 | CDP-3 | ø3 x 18 L |

* A knuckle pin and retaining rings (split pins for ø40) are included.

Double Clevis Pin/Material: Carbon steel

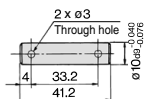
(mm)

Bore size/ø20, ø25, ø32
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40
CDP-2

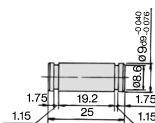


Split pin: ø3 x 18 L

Double Knuckle Pin/Material: Carbon steel

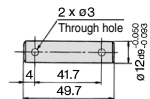
(mm)

Bore size/ø20, ø25, ø32
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40
CDP-3



Split pin: ø3 x 18 L

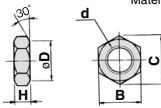
* Retaining rings (split pins for ø40) are included.

* Retaining rings (split pins for ø40) are included.

CM2Y Series

Rod End Nut

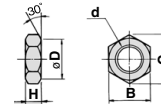
Material: Carbon steel



| Part no. | Applicable bore size | B | C | D | d | H |
|----------|----------------------|----|------|------|------------|---|
| NT-02 | 20 | 13 | 15.0 | 12.5 | M8 x 1.25 | 5 |
| NT-03 | 25, 32 | 17 | 19.6 | 16.5 | M10 x 1.25 | 6 |
| NT-04 | 40 | 22 | 25.4 | 21.0 | M14 x 1.5 | 8 |

Mounting Nut

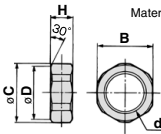
Material: Carbon steel



| Part no. | Applicable bore size | B | C | D | d | H |
|----------|----------------------|----|------|------|-----------|----|
| SN-020B | 20 | 26 | 30 | 25.5 | M20 x 1.5 | 8 |
| SN-032B | 25, 32 | 32 | 37 | 31.5 | M26 x 1.5 | 8 |
| SN-040B | 40 | 41 | 47.3 | 40.5 | M32 x 2.0 | 10 |

Trunnion Nut

Material: Carbon steel



| Part no. | Applicable bore size | B | C | D | d | H |
|----------|----------------------|----|----|------|-----------|----|
| TN-020B | 20 | 26 | 28 | 25.5 | M20 x 1.5 | 10 |
| TN-032B | 25, 32 | 32 | 34 | 31.5 | M26 x 1.5 | 10 |
| TN-040B | 40 | 41 | 45 | 40.5 | M32 x 2 | 10 |

Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

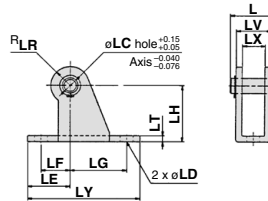
Part No. (Dimensions: Same as standard type)

| Bore size (mm) | Foot | Flange | Single knuckle joint | Double knuckle joint* | Mounting nut | Rod end nut |
|----------------|-------------|-------------|----------------------|-----------------------|--------------|-------------|
| 20 | CM-L020BSUS | CM-F020BSUS | I-020BSUS | Y-020BSUS | SN-020BSUS | NT-02SUS |
| 25, 32 | CM-L032BSUS | CM-F032BSUS | I-032BSUS | Y-032BSUS | SN-032BSUS | NT-03SUS |
| 40 | CM-L040BSUS | CM-F040BSUS | I-040BSUS | Y-040BSUS | SN-040BSUS | NT-04SUS |

* A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

Clevis Pivot Bracket (For CM2YE(V))

Material: Carbon steel

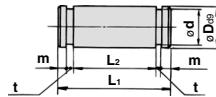


| Part no. | Applicable bore size | L | LC | LD | LE | LF | LG | LH | LR | LT | LX | LY | LV | Included pin part no. |
|----------|----------------------|------|----|-----|----|----|----|----|----|-----|----|----|------|-----------------------|
| CM-E020B | 20, 25 | 24.5 | 8 | 6.8 | 22 | 15 | 30 | 30 | 10 | 3.2 | 12 | 59 | 18.4 | CD-S02 |
| CM-E032B | 32, 40 | 34 | 10 | 9 | 25 | 15 | 40 | 40 | 13 | 4 | 20 | 75 | 28 | CD-S03 |

Note 1) A clevis pivot bracket pin and retaining rings are included.
 Note 2) It cannot be used for the single clevis (CM2YC) and the double clevis (CM2YD).

Clevis Pivot Bracket Pin (For CM2YE(V))

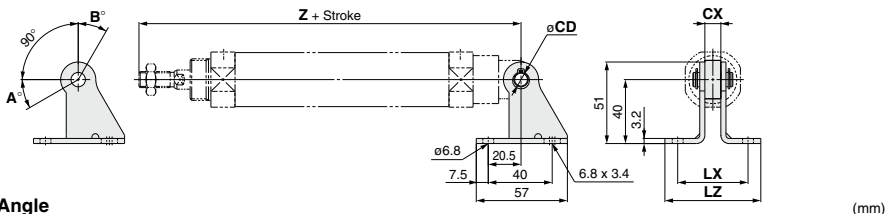
Material: Carbon steel



| Part no. | Applicable bore size | D ₉₉ | d | L ₁ | L ₂ | m | t | Included retaining ring |
|----------|----------------------|--|-----|----------------|----------------|------|------|-------------------------|
| CD-S02 | 20, 25 | 8 ^{+0.040} _{-0.076} | 7.6 | 24.5 | 19.5 | 1.6 | 0.9 | Type C 8 for axis |
| CD-S03 | 32, 40 | 10 ^{+0.040} _{-0.076} | 9.6 | 34 | 29 | 1.35 | 1.15 | Type C 10 for axis |

Note) Retaining rings are included.

With Single Clevis



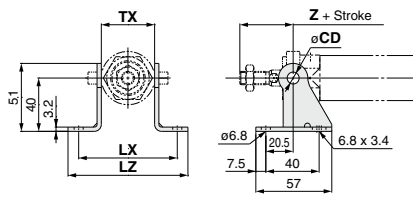
Rotation Angle

| Bore size (mm) | A° | B° | A° + B° + 90° |
|----------------|----|----|---------------|
| 20 | 25 | 85 | 200 |
| 25, 32 | 21 | 81 | 192 |
| 40 | 26 | 86 | 202 |

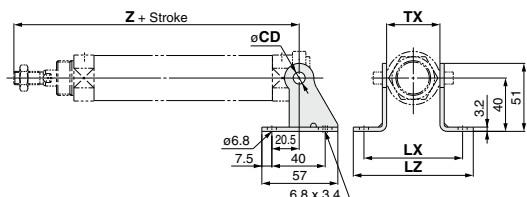
| Mounting | Part no. | Applicable bore size | CX | Z + Stroke | CD | LX | LZ |
|--------------------------|----------|----------------------|----|------------|----|----|----|
| CM2YC (Single clevis) | CM-B032 | 20 | 10 | 133 | 9 | 44 | 60 |
| | | 25 | | 137 | | | |
| | | 32 | | 139 | | | |
| | CM-B040 | 40 | 15 | 177 | 10 | 49 | 65 |

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

With Rod Trunnion



With Head Trunnion

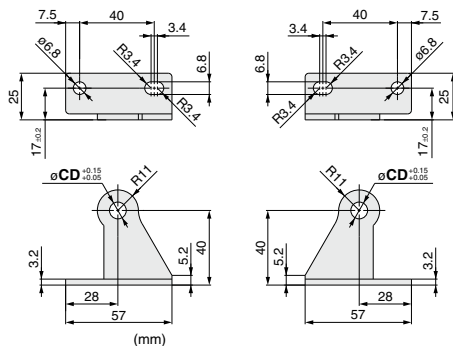


| Mounting | Part no. | Applicable bore size | TX | Rod trunnion | Head trunnion | CD | LX | LZ |
|------------------------------------|----------|----------------------|----|--------------|---------------|----|----|----|
| | | | | Z + Stroke | Z + Stroke | | | |
| CM2YU/CM2YT (Rod/Head trunnion) | CM-B020 | 20 | 32 | 36 | 108 | 8 | 66 | 82 |
| | | 25 | | 40 | 112 | | | |
| | CM-B032 | 32 | 40 | 40 | 114 | 9 | 74 | 90 |
| | | 40 | | 53 | 44.5 | | | |

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

Pivot Bracket

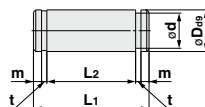
* Pivot brackets consists of a set of two brackets.



| Part no. | CD |
|------------------|----|
| CM-B020 (Note 2) | 8 |
| CM-B032 | 9 |
| CM-B040 | 10 |

Note 1) A pivot bracket pin and retaining rings are not included with the pivot bracket.
Note 2) Only for the trunnion

Pivot Bracket Pin (For CM2YC)



| Applicable bore size | Part no. | D ₉₉ | d | L ₁ | L ₂ | m | t | Included retaining ring |
|----------------------|----------|--|-----|----------------|----------------|------|------|-------------------------|
| 20 to 32 | CDP-1 | 9 ^{+0.040} _{-0.078} | 8.6 | 25 | 19.2 | 1.75 | 1.15 | Type C 9 for axis |
| 40 | CD-S03 | 10 ^{+0.040} _{-0.078} | 9.6 | 34 | 29 | 1.35 | 1.15 | Type C 10 for axis |

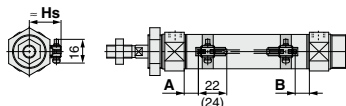
Note) Retaining rings are included with the pivot bracket pin.

CM2Y Series Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Solid state auto switch

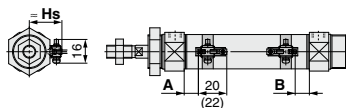
- D-M9□
- D-M9□W
- D-M9□A



() : Dimension of the D-M9□A

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

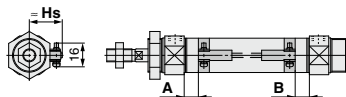
- D-M9□V
- D-M9□WV
- D-M9□AV



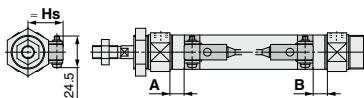
() : Dimension of the D-M9□AV

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

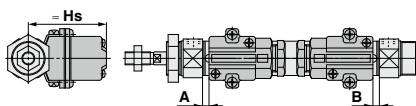
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

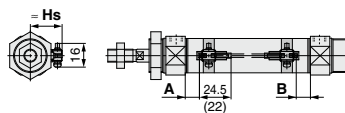


D-G39A/K39A



Reed auto switch

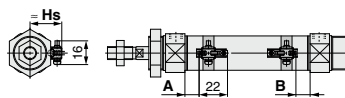
D-A9□



() : Dimension of the D-A96

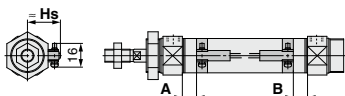
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

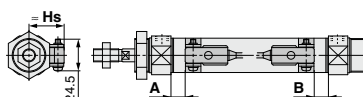


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

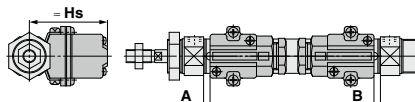
D-C7/C8/C73C/C80C



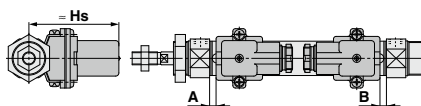
D-B5/B6/B59W



D-A33A/A34A



D-A44A



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-M9□(V) D-M9□W(V) D-M9□A(V) | | D-A9□(V) | | D-B5□ D-B64 | | D-C7□ D-C80 D-C73C D-C80C | | D-B59W | | D-A3□A D-G39A D-K39A D-A44A | | D-H7□ D-H7C D-H7□W D-H7NF | | D-G5NT | |
|-------------------|------------------------------------|------|----------|------|----------------|-----|------------------------------------|-----|--------|-----|--------------------------------------|-----|------------------------------------|-----|--------|-----|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| Bore size | | | | | | | | | | | | | | | | |
| 20 | 11 | 9.5 | 7 | 5.5 | 1.5 | 0 | 7.5 | 6 | 4 | 2.5 | 1 | 0 | 6.5 | 5 | 3 | 1.5 |
| 25 | 10 | 10 | 6 | 6 | 0.5 | 0.5 | 6.5 | 6.5 | 3.5 | 3.5 | 0 | 0 | 5.5 | 5.5 | 2 | 2 |
| 32 | 11.5 | 10.5 | 7.5 | 6.5 | 2 | 1 | 8 | 7 | 5 | 4 | 1.5 | 0.5 | 7 | 6 | 3.5 | 2.5 |
| 40 | 17.5 | 15.5 | 13.5 | 11.5 | 8 | 6 | 14 | 12 | 11 | 9 | 7.5 | 5.5 | 13 | 11 | 9.5 | 7.5 |

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

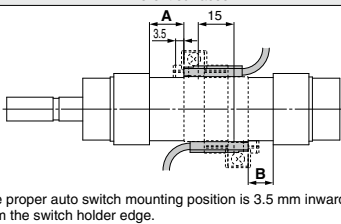
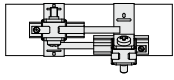
| Auto switch model | D-M9□V D-M9□WV D-M9□AV D-A9□V | | D-B5□ D-B64 D-B59W D-G5NT D-H7C | | D-M9□W D-M9□A D-A9□ D-C7□ D-C80 D-H7□ D-H7□W D-H7NF | | D-C73C D-C80C | | D-A3□A D-G39A D-K39A | | D-A44A | |
|-------------------|--|------|---|------|--|------|------------------|----|----------------------------|----|--------|----|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| Bore size | | | | | | | | | | | | |
| 20 | 23.5 | 25.5 | 22.5 | 25 | 60 | 69.5 | | | | | | |
| 25 | 26 | 28 | 25 | 27.5 | 62.5 | 72 | | | | | | |
| 32 | 29.5 | 31.5 | 28.5 | 31 | 66 | 75.5 | | | | | | |
| 40 | 33.5 | 35.5 | 32.5 | 35 | 70 | 79.5 | | | | | | |

Minimum Stroke for Auto Switch Mounting

| Auto switch model | Number of auto switches | | | | |
|----------------------------|-------------------------|---------------------------|---------------------------|---|---|
| | With 1 pc. | With 2 pcs. | | With n pcs. (n: Number of auto switches) | |
| | | Different surfaces | Same surface | Different surfaces | Same surface |
| D-M9□ | 5 | 15 <small>Note 1)</small> | 40 <small>Note 1)</small> | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $55 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□W | 10 | 15 <small>Note 1)</small> | 40 <small>Note 1)</small> | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $55 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□A | 10 | 25 | 40 <small>Note 1)</small> | $25 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $60 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-A9□ | 5 | 15 | 30 | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $50 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□V | 5 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $35 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-A9□V | 5 | 15 | 25 | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $25 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□WV D-M9□AV | 10 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $35 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-C7□ D-C80 | 10 | 15 | 50 | $15 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $50 + 45 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-H7□ D-H7□W D-H7NF | 10 | 15 | 60 | $15 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $60 + 45 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-C73C D-C80C D-H7C | 10 | 15 | 65 | $15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $65 + 50 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-B5□/B64 D-G5NT | 10 | 15 | 75 | $15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $75 + 55 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-B59W | 15 | 20 | 75 | $20 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $75 + 55 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-A3□A/G39A D-K39A/A44A | 10 | 35 | 100 | $35 + 30 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> | $100 + 100 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting

| Auto switch model | With 2 auto switches | |
|-------------------|--|--|
| | Different surfaces | Same surface |
| |  <p>The proper auto switch mounting position is 3.5 mm inward from the switch holder edge.</p> |  <p>The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.</p> |
| D-M9□ D-M9□W | Less than 20 stroke <small>Note 2)</small> | Less than 55 stroke <small>Note 2)</small> |
| D-M9□A | Less than 25 stroke <small>Note 2)</small> | Less than 60 stroke <small>Note 2)</small> |
| D-A9□ | — | Less than 50 stroke <small>Note 2)</small> |

Note 2) Minimum stroke for auto switch mounting in types other than those in Note 1.

Operating Range

| Auto switch model | (mm) | | | | Auto switch model | (mm) | | | |
|--------------------------|------|----|-----|----|-------------------|------|-----|-----|----|
| | 20 | 25 | 32 | 40 | | 20 | 25 | 32 | 40 |
| D-M9□(V) | 3.5 | 3 | 3.5 | 3 | D-B59W | 12 | 12 | 13 | 13 |
| D-M9□W(V) | | | | | D-H7□/H7□W | 4 | 4 | 4.5 | 5 |
| D-M9□A(V) | | | | | D-G5NT/H7NF | 7 | 8.5 | 9 | 10 |
| D-A9□(V) | 6 | 6 | 6 | 6 | D-H7C | 8 | 9 | 9 | 9 |
| D-C7□/C80 D-C73C/C80C | 7 | 8 | 8 | 8 | D-G39A/K39A | | | | |
| D-B5□/B64 D-A3□A/A44A | 8 | 8 | 9 | 9 | | | | | |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.
Note) The D-A9□ and D-A9□V cannot be mounted on ø50.

Auto Switch Mounting Brackets/Part No.

| Auto switch model | Bore size (mm) | | | |
|-----------------------------------|---|---|---|---|
| | ø20 | ø25 | ø32 | ø40 |
| D-M9□(V) D-M9□W(V) D-A9□(V) | Note 1) BM5-020 (A set of a, b, c, d) | Note 1) BM5-025 (A set of a, b, c, d) | Note 1) BM5-032 (A set of a, b, c, d) | Note 1) BM5-040 (A set of a, b, c, d) |
| D-M9□A(V) <small>Note 2)</small> | BM5-020S (A set of b, c, e, f) | BM5-025S (A set of b, c, e, f) | BM5-032S (A set of b, c, e, f) | BM5-040S (A set of b, c, e, f) |

* Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

| | | | | |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| D-H7□ D-H7□W D-H7NF D-C7□/C80 D-C73C/C80C | BM2-020A (A set of c and d) | BM2-025A (A set of c and d) | BM2-032A (A set of c and d) | BM2-040A (A set of c and d) |
| D-H7BA | BM2-020AS (A set of c and f) | BM2-025AS (A set of c and f) | BM2-032AS (A set of c and f) | BM2-040AS (A set of c and f) |
| D-B5□/B64 D-B59W D-G5NT | BA2-020 (A set of c and d) | BA2-025 (A set of c and d) | BA2-032 (A set of c and d) | BA2-040 (A set of c and d) |
| D-A3□A/A44A D-G39A/K39A | BM3-020 (A set of c and d) | BM3-025 (A set of c and d) | BM3-032 (A set of c and d) | BM3-040 (A set of c and d) |

Note 1) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please contact SMC regarding other chemicals.

Note 2) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

Band Mounting Brackets Set Part No.

| Set part no. | Contents |
|--------------|---|
| BJ4-1 | <ul style="list-style-type: none"> • Switch bracket (White/PBT) (e) • Switch holder (b) |
| BJ5-1 | <ul style="list-style-type: none"> • Switch bracket (Transparent/Nylon) (a) • Switch holder (b) |

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features |
|-------------|------------------|-------------------------|---|
| Solid state | D-H7A1/H7A2/H7B | Grommet (In-line) | — |
| | D-H7NW/H7PW/H7BW | | Diagnostic indication (2-color indicator) |
| | D-H7BA | | Water resistant (2-color indicator) |
| | D-G5NT | | With timer |
| Reed | D-B53/C73/C76 | | — |
| | D-C80 | Without indicator light | |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1360.

Smooth Cylinder

CG1Y Series

RoHS

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CG1Y B 25 - 100 Z - - -

With auto switch CDG1Y B 25 - 100 Z - - - M9BW - - -

With auto switch (Built-in magnet)

Mounting

| | |
|-----------|---|
| B | Basic |
| Z* | Basic (without trunnion mounting female thread) |
| L | Axial foot |
| F | Rod flange |
| G | Head flange |
| U* | Rod trunnion |
| T* | Head trunnion |
| D | Clevis |

Bore size

| | |
|-----|--------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |
| 50 | 50 mm |
| 63 | 63 mm |
| 80 | 80 mm |
| 100 | 100 mm |

Rod end thread

| | |
|------------|----------------|
| Nil | Male rod end |
| F | Female rod end |

Pivot bracket

| | |
|------------|---|
| Nil | None |
| N | Pivot bracket is shipped together with the product. |

Rod end bracket

| | |
|------------|----------------------|
| Nil | None |
| V | Single knuckle joint |
| W | Double knuckle joint |

Port thread type

| | | |
|------------|----------|-------------|
| Nil | Rc | ø20 to ø100 |
| TN | NPT | ø20 to ø100 |
| TF | M5 x 0.8 | ø20, ø25 |
| | G | ø32 to ø100 |

Made to Order
Refer to page 185 for details.

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------|
| Nil | Without auto switch |
|------------|---------------------|

* Not available for ø80 or ø100.
* Mounting bracket is shipped together with the product, but not assembled.
* The cylinder for F, G, L, D mounting types is Z: Basic (without trunnion mounting female thread).

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 185.

* Refer to "Ordering Example of Cylinder Assembly" on page 185.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDG1YB32-150Z

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) | | | | | Pre-wired connector | Applicable load | | | |
|-------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|----------------------|-----------------------------------|----------------------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|---|------------|------------|
| | | | | | DC | AC | Applicable bore size | | | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | None (N) | | | | | |
| | | | | | | | ø20 to ø63 | ø80, ø100 | | | | | | | | | | | |
| Solid state auto switch | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | Perpendicular M9NV | In-line M9N | In-line G59 | ● | ● | ○ | — | — | — | — | — | IC circuit |
| | | | | 3-wire (PNP) | | | | M9PV | M9P | G5P | ● | ● | ○ | — | — | — | — | — | |
| | | | | 2-wire | | | | M9BV | M9B | K59 | ● | ● | ○ | — | — | — | — | — | |
| | | Connector | | — | | | | H7C | ● | ● | ○ | ● | — | — | — | — | — | | |
| | | | | 3-wire (NPN) | | | | M9NVV | M9NV | ● | ● | ○ | — | — | — | — | — | | |
| | | | | 3-wire (PNP) | | | | M9PVV | M9PV | ● | ● | ○ | — | — | — | — | — | | |
| | Water resistant (2-color indicator) | Grommet | No | 2-wire | 24 V | 5 V, 12 V | — | Perpendicular M9NAV ^{#1} | In-line M9NA ^{#1} | — | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | IC circuit |
| | | | | 3-wire (NPN) | | | | M9PAV ^{#1} | M9PA ^{#1} | — | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | | | 3-wire (PNP) | | | | M9BAV ^{#1} | M9BA ^{#1} | — | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | Connector | | 2-wire | | | | — | G5BA ^{#1} | ● | ● | ○ | — | — | — | — | — | | |
| | | | | 4-wire (NPN) | | | | — | H7NF | ● | ● | ○ | — | — | — | — | — | | |
| | | | | 4-wire (PNP) | | | | — | G59F | ● | ● | ○ | — | — | — | — | — | | |
| Feed auto switch | Diagnostic indication (2-color indicator) | Grommet | No | 3-wire (NPN equivalent) | 24 V | 12 V | — | Perpendicular A96V | In-line A96 | — | ● | ● | ○ | — | — | — | — | IC circuit | |
| | | | | — | | | | A93V ^{#2} | A93 | — | ● | ● | ○ | — | — | — | — | | |
| | | | | — | | | | A90V | A90 | — | ● | ● | ○ | — | — | — | — | | |
| | | Connector | | — | | | | — | B54 | ● | ● | ○ | — | — | — | — | — | | |
| | | | | — | | | | — | B64 | ● | ● | ○ | — | — | — | — | — | | |
| | | | | — | | | | — | C73C | ● | ● | ○ | — | — | — | — | — | | |
| | — | Grommet | Yes | 2-wire | 24 V | 12 V | — | Perpendicular — | In-line — | — | ● | ● | ○ | — | — | — | — | Relay, PLC | |
| | | | | — | | | | — | — | ● | ● | ○ | — | — | — | — | | | |
| | | | | — | | | | — | — | ● | ● | ○ | — | — | — | — | | | |
| | | Connector | | — | | | | — | C80C | ● | ● | ○ | — | — | — | — | — | | |
| | | | | — | | | | — | — | ● | ● | ○ | — | — | — | — | — | | |
| | | | | — | | | | — | B59W | ● | ● | ○ | — | — | — | — | — | | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee the water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NLW
5 m..... Z (Example) M9NZW
None..... N (Example) H7CN

* Solid state auto switches marked with "○" are produced upon receipt of order.

* Since there are other applicable auto switches than listed, refer to page 195 for details.

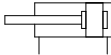
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* The D-A9□□M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)



Symbol

Rubber bumper



Made to Order
[Click here for details](#)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC6 | Made of stainless steel |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|--------------------------|
| 20 | CG1Y20Z-PS | Piston seal 1 pc. |
| 25 | CG1Y25Z-PS | Rod seal 1 pc. |
| 32 | CG1Y32Z-PS | Tube gasket 1 pc. |
| 40 | CG1Y40Z-PS | Grease pack (10 g) 1 pc. |

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
 GR-L-010 (10 g)
 GR-L-150 (150 g)

Specifications

| Bore size (mm) | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|--------------------------------------|--|---|------|------|------|------|------|------|------|
| Action | | Double acting, Single rod | | | | | | | |
| Type | | Non-lube | | | | | | | |
| Fluid | | Air | | | | | | | |
| Proof pressure | | 1.05 MPa | | | | | | | |
| Maximum operating pressure | | 0.7 MPa | | | | | | | |
| Ambient and fluid temperature | | Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing) | | | | | | | |
| Piston speed | | 5 to 500 mm/s | | | | | | | |
| Stroke length tolerance | | Up to 1000 ^{+1.4} ₀ mm, Up to 1500 ^{+1.8} ₀ mm | | | | | | | |
| Cushion | | Rubber bumper | | | | | | | |
| Mounting | | Basic, Basic (without trunnion mounting female thread), Axial foot, Rod flange, Head flange, Rod trunnion, Head trunnion, Clevis (used for changing the port location by 90°) | | | | | | | |
| Allowable leakage rate | | 0.5 L/min (ANR) or less | | | | | | | |
| Allowable kinetic energy (J) | Rubber bumper | 0.28 | 0.41 | 0.66 | 1.20 | 2.00 | 3.40 | 5.90 | 9.90 |
| | Male rod end Female rod end | 0.11 | 0.18 | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |

* Cylinder sizes ø80 and ø100 do not have rod trunnion and head trunnion types.
 Foot, flange and clevis types of cylinder sizes from ø20 to ø63 do not have trunnion mounting female thread.
 Operate the cylinder within the allowable kinetic energy.

Minimum Operating Pressure

| Bore size (mm) | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-----------------------------------|--|------|----|----|----|------|----|----|-----|
| Minimum operating pressure | | 0.02 | | | | 0.01 | | | |

Unit: MPa

Standard Strokes

| Bore size (mm) | Standard stroke (mm) Note 1) | Max. manufacturable stroke (mm) |
|-----------------------------|--|---------------------------------|
| 20 | 25, 50, 75, 100, 125, 150, 200 | Up to 1500 |
| 25, 32, 40, 50, 63, 80, 100 | 25, 50, 75, 100, 125, 150, 200, 250, 300 | Up to 1500 |

Note 1) Intermediate strokes not listed above are also available.
 Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Ordering Example of Cylinder Assembly

Cylinder model: **CDG1YD20-100Z-NW-M9BW**

Mounting D: Clevis
Pivot bracket N: Yes
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

Mounting Brackets/Part No.

| Mounting bracket | Order qty | Bore size (mm) | | | | | | | | Contents |
|------------------|-----------|----------------|------------|------------|------------|------------|------------|------------|------------|---|
| | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | |
| Foot | 2 (Note) | CG-L020 | CG-L025 | CG-L032 | CG-L040 | CG-L050 | CG-L063 | CG-L080 | CG-L100 | 2 foots, 8 mounting bolts |
| Flange | 1 | CG-F020 | CG-F025 | CG-F032 | CG-F040 | CG-F050 | CG-F063 | CG-F080 | CG-F100 | 1 flange, 4 mounting bolts |
| Trunnion pin | 1 | CG-T020 | CG-T025 | CG-T032 | CG-T040 | CG-T050 | CG-T063 | — | — | 2 trunnion pins, 2 trunnion bolts, 2 flat washers |
| Clevis | 1 | CG-D020 | CG-D025 | CG-D032 | CG-D040 | CG-D050 | CG-D063 | CG-D080 | CG-D100 | 1 clevis, 4 mounting bolts, 1 clevis pin, 2 retaining rings |
| Pivot bracket | 1 | CG-020-24A | CG-025-24A | CG-032-24A | CG-040-24A | CG-050-24A | CG-063-24A | CG-080-24A | CG-100-24A | 1 pivot bracket |

(Note) Order two foots per cylinder.

Accessory

- * For details about the single knuckle joint, double knuckle joint, knuckle pin, clevis pin, and rod end nut, refer to page 190.
- * Stainless steel mounting brackets and accessories are also available. Refer to page 191 for details.

Weights

| | | (mm) | | | | | | | |
|---------------------------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Bore size (mm) | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| Basic weight | Basic | 0.11 | 0.18 | 0.28 | 0.44 | 0.83 | 1.17 | 2.23 | 3.43 |
| | Axial foot | 0.22 | 0.31 | 0.44 | 0.66 | 1.31 | 1.89 | 3.19 | 5.18 |
| | Flange | 0.19 | 0.28 | 0.42 | 0.64 | 1.17 | 1.67 | 2.94 | 4.78 |
| | Trunnion | 0.12 | 0.20 | 0.31 | 0.49 | 0.97 | 1.31 | — | — |
| | Clevis | 0.16 | 0.26 | 0.43 | 0.67 | 1.23 | 1.85 | 2.94 | 4.71 |
| Pivot bracket | | 0.08 | 0.09 | 0.17 | 0.25 | 0.44 | 0.80 | 0.98 | 1.75 |
| Single knuckle joint | | 0.05 | 0.09 | 0.09 | 0.10 | 0.22 | 0.22 | 0.39 | 0.57 |
| Double knuckle joint (with pin) | | 0.05 | 0.09 | 0.09 | 0.13 | 0.26 | 0.26 | 0.64 | 1.31 |
| Additional weight per 50 mm of stroke | | 0.05 | 0.07 | 0.09 | 0.15 | 0.22 | 0.26 | 0.35 | 0.49 |
| Weight reduction for female rod end | | -0.01 | -0.02 | -0.02 | -0.05 | -0.10 | -0.10 | -0.18 | -0.27 |

Calculation (Example) **CG1YL20-100Z** (Foot, ø20, 100 st)

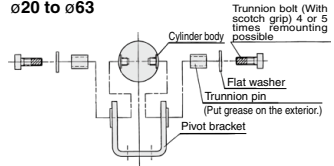
- Basic weight 0.22 (Foot, ø20)
 - Additional weight 0.05/50 stroke
 - Air cylinder stroke 100 stroke
- $$0.22 + 0.05 \times 100/50 = 0.32 \text{ kg}$$

Mounting Procedure

Mounting procedure for trunnion

Follow the procedures below when mounting a pivot bracket on the trunnion.

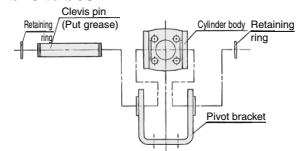
ø20 to ø63



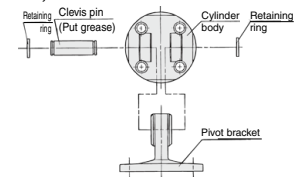
Mounting procedure for clevis

Follow the procedures below when mounting a pivot bracket on the clevis.

ø20 to ø63



ø80, ø100



⚠ Precautions

Be sure to read this before handling the products.

Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

Operating Precautions

⚠ Warning

1. Operate within the specified cylinder speed.
Otherwise, cylinder and seal damage may occur.
2. When the cylinder is used as mounted with a single side fixed or free (basic, flange types), a bending moment will be applied to the cylinder due to the vibration generated at the stroke end, and the cylinder may be damaged. In such a case, mount a bracket to reduce the vibration of the cylinder or use the cylinder at a piston speed low enough to prevent the cylinder from vibrating at the stroke end.

⚠ Caution

1. Tighten clevis bracket mounting bolts with the following proper tightening torque.
ø20: 1.5 N·m, ø25 to 32: 2.9 N·m, ø40: 4.9 N·m, ø50: 11.8 N·m, ø63 to 80: 24.5 N·m, ø100: 42.2 N·m

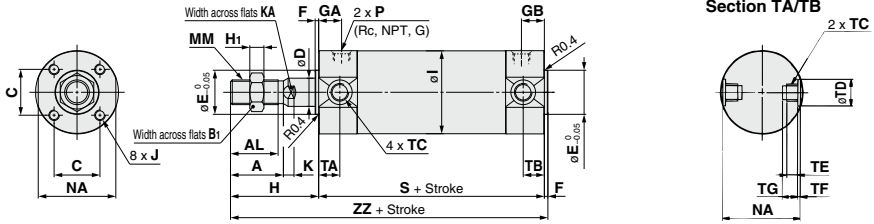
Disassembly/Replacement

⚠ Caution

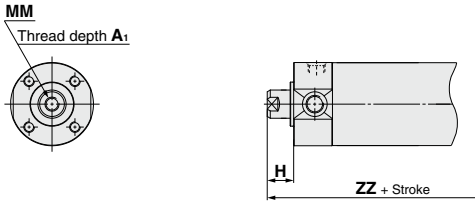
1. Do not replace the bushings.
The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.
2. To replace a seal, apply grease to the new seal before installing it.
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.
3. Cylinders with ø50 or larger bore sizes cannot be disassembled.
When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench etc., and then remove the cover. When retightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

Dimensions: $\phi 20$ to $\phi 100$

Basic: CG1YB



Female rod end



Section TA/TB

| Bore size (mm) | *TC | TD | TE | TF | TG |
|----------------|------------|----------------------------------|------|------|------|
| 20 | M5 x 0.8 | 8 ^{+0.08} ₀ | 4 | 0.5 | 5.5 |
| 25 | M6 x 0.75 | 10 ^{+0.08} ₀ | 5 | 1 | 6.5 |
| 32 | M8 x 1.0 | 12 ^{+0.08} ₀ | 5.5 | 1 | 7.5 |
| 40 | M10 x 1.25 | 14 ^{+0.08} ₀ | 6 | 1.25 | 8.5 |
| 50 | M12 x 1.25 | 16 ^{+0.08} ₀ | 7.5 | 2 | 10 |
| 63 | M14 x 1.5 | 18 ^{+0.08} ₀ | 11.5 | 3 | 14.5 |

* Cylinder sizes $\phi 80$ and $\phi 100$ do not have trunnion mounting female thread on the width across flats NA.

| Bore size (mm) | Stroke range (mm) | (mm) | | | | | | | | | | | | | | |
|----------------|-------------------|------|------|----------------|------|----|----|---|----|----------------|-----|---------------------|-----|----|------------|------|
| | | A | AL | B ₁ | C | D | E | F | H | H ₁ | I | J | K | KA | MM | NA |
| 20 | Up to 1500 | 18 | 15.5 | 13 | 14 | 8 | 12 | 2 | 35 | 5 | 26 | M4 x 0.7 depth 7 | 5 | 6 | M8 x 1.25 | 24 |
| 25 | | 22 | 19.5 | 17 | 16.5 | 10 | 14 | 2 | 40 | 6 | 31 | M5 x 0.8 depth 7.5 | 5.5 | 8 | M10 x 1.25 | 29 |
| 32 | | 22 | 19.5 | 17 | 20 | 12 | 18 | 2 | 40 | 6 | 38 | M5 x 0.8 depth 8 | 5.5 | 10 | M10 x 1.25 | 35.5 |
| 40 | | 30 | 27 | 19 | 26 | 16 | 25 | 2 | 50 | 8 | 47 | M6 x 1 depth 12 | 6 | 14 | M14 x 1.5 | 44 |
| 50 | | 35 | 32 | 27 | 32 | 20 | 30 | 2 | 58 | 11 | 58 | M8 x 1.25 depth 16 | 7 | 18 | M18 x 1.5 | 55 |
| 63 | | 35 | 32 | 27 | 38 | 20 | 32 | 2 | 58 | 11 | 72 | M10 x 1.5 depth 16 | 7 | 18 | M18 x 1.5 | 69 |
| 80 | | 40 | 37 | 32 | 50 | 25 | 40 | 3 | 71 | 13 | 89 | M10 x 1.5 depth 22 | 10 | 22 | M22 x 1.5 | 86 |
| 100 | | 40 | 37 | 41 | 60 | 30 | 50 | 3 | 71 | 16 | 110 | M12 x 1.75 depth 22 | 10 | 26 | M26 x 1.5 | 106 |

| Bore size (mm) | Stroke range (mm) | (mm) | | | | | | | | | |
|----------------|-------------------|------|----|----|-----|--------------|----|-----|--------|------|----------|
| | | S | TA | TB | ZZ | Rc, NPT port | | | G port | | |
| | | | | | | GA | GB | P | GA | GB | P |
| 20 | Up to 1500 | 77 | 11 | 11 | 114 | 12 | 12 | 1/8 | 12 | 12 | M5 x 0.8 |
| 25 | | 77 | 11 | 11 | 119 | 12 | 12 | 1/8 | 12.5 | 12.5 | M5 x 0.8 |
| 32 | | 79 | 11 | 11 | 121 | 12 | 12 | 1/8 | 10.5 | 10.5 | 1/8 |
| 40 | | 87 | 12 | 12 | 139 | 13 | 13 | 1/8 | 13 | 10 | 1/8 |
| 50 | | 102 | 13 | 13 | 162 | 14 | 14 | 1/4 | 14 | 14 | 1/4 |
| 63 | | 102 | 13 | 13 | 162 | 14 | 14 | 1/4 | 14 | 14 | 1/4 |
| 80 | | 122 | — | — | 196 | 20 | 20 | 3/8 | 17.5 | 17.5 | 3/8 |
| 100 | | 122 | — | — | 196 | 20 | 20 | 1/2 | 17.5 | 17.5 | 1/2 |

Female Rod End

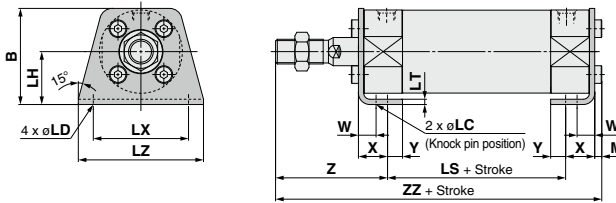
| Bore size | (mm) | | | |
|-----------|----------------|----|-----------|-----|
| | A ₁ | H | MM | ZZ |
| 20 | 8 | 13 | M4 x 0.7 | 92 |
| 25 | 8 | 14 | M5 x 0.8 | 93 |
| 32 | 12 | 14 | M6 x 1 | 95 |
| 40 | 13 | 15 | M8 x 1.25 | 104 |
| 50 | 18 | 16 | M10 x 1.5 | 120 |
| 63 | 18 | 16 | M10 x 1.5 | 120 |
| 80 | 21 | 19 | M14 x 1.5 | 144 |
| 100 | 25 | 22 | M16 x 1.5 | 147 |

* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

CG1Y Series

Mounting Bracket

Axial foot: CG1YL

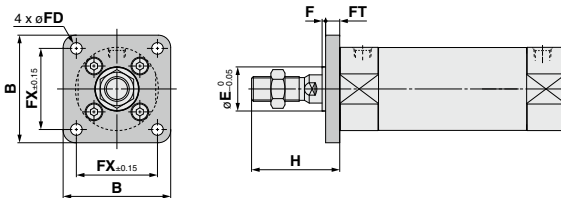


Axial Foot

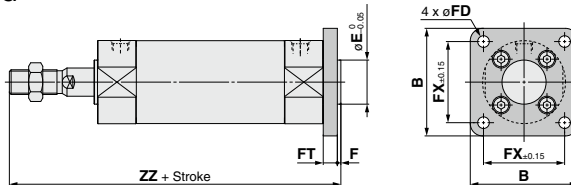
| Bore size (mm) | B | LC | LD | LH | LS | LT | LX | LZ | M | W | X | Y | Z | ZZ |
|----------------|------|----|----|----|----|-----|-----|-----|-----|------|------|-----|------|-------|
| 20 | 34 | 4 | 6 | 20 | 53 | 3 | 32 | 44 | 3 | 10 | 15 | 7 | 47 | 118 |
| 25 | 38.5 | 4 | 6 | 22 | 53 | 3 | 36 | 49 | 3.5 | 10 | 15 | 7 | 52 | 123.5 |
| 32 | 45 | 4 | 7 | 25 | 53 | 3 | 44 | 58 | 3.5 | 10 | 16 | 8 | 53 | 125.5 |
| 40 | 54.5 | 4 | 7 | 30 | 60 | 3 | 54 | 71 | 4 | 10 | 16.5 | 8.5 | 63.5 | 144 |
| 50 | 70.5 | 5 | 10 | 40 | 67 | 4.5 | 66 | 86 | 5 | 17.5 | 22 | 11 | 75.5 | 169.5 |
| 63 | 82.5 | 5 | 12 | 45 | 67 | 4.5 | 82 | 106 | 5 | 17.5 | 22 | 13 | 75.5 | 169.5 |
| 80 | 101 | 6 | 11 | 55 | 74 | 4.5 | 100 | 125 | 5 | 20 | 28.5 | 14 | 95 | 202.5 |
| 100 | 121 | 6 | 14 | 65 | 74 | 6 | 120 | 150 | 7 | 20 | 30 | 16 | 95 | 206 |

- * Other dimensions are the same as basic type.
- * For female rod end, since the wrench flap (K and KA portions) will be inside of the bracket when the piston rod is retracted at the stroke end, extend the piston rod to tighten the nut using a tool, and mount a workpiece on the rod end.
- * Refer to the basic type for the female rod end.

Rod flange: CG1YF



Head flange: CG1YG



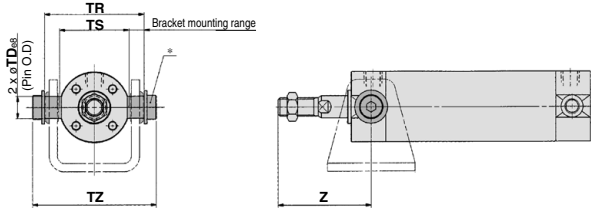
Flange

| Bore size (mm) | B | E | F | FX | FD | FT | H | Head flange ZZ |
|----------------|-----|----|---|-----|-----|----|----|----------------|
| 20 | 40 | 12 | 2 | 28 | 5.5 | 6 | 35 | 120 |
| 25 | 44 | 14 | 2 | 32 | 5.5 | 7 | 40 | 126 |
| 32 | 53 | 18 | 2 | 38 | 6.6 | 7 | 40 | 128 |
| 40 | 61 | 25 | 2 | 46 | 6.6 | 8 | 50 | 147 |
| 50 | 76 | 30 | 2 | 58 | 9 | 9 | 58 | 171 |
| 63 | 92 | 32 | 2 | 70 | 11 | 9 | 58 | 171 |
| 80 | 104 | 40 | 3 | 82 | 11 | 11 | 71 | 207 |
| 100 | 128 | 50 | 3 | 100 | 14 | 14 | 71 | 210 |

- Note) End boss is machined on the flange for øE.
- * Other dimensions are the same as basic type.
- * Refer to the basic type for the female rod end.

Mounting Bracket

Rod trunnion: CG1YU



Trunnion (mm)

| Bore size (mm) | TDe8 | TR | TS |
|----------------|--|------|----|
| 20 | 8 ^{+0.025} _{-0.047} | 39 | 28 |
| 25 | 10 ^{+0.025} _{-0.047} | 43 | 33 |
| 32 | 12 ^{+0.032} _{-0.059} | 54.5 | 40 |
| 40 | 14 ^{+0.032} _{-0.059} | 65.5 | 49 |
| 50 | 16 ^{+0.032} _{-0.059} | 80 | 60 |
| 63 | 18 ^{+0.032} _{-0.059} | 98 | 74 |

| Bore size (mm) | TZ | Rod side | |
|----------------|-------|----------|-----------|
| | | Z | Head side |
| 20 | 47.6 | 46 | 101 |
| 25 | 53 | 51 | 106 |
| 32 | 67.7 | 51 | 108 |
| 40 | 78.7 | 62 | 125 |
| 50 | 98.6 | 71 | 147 |
| 63 | 119.2 | 71 | 147 |

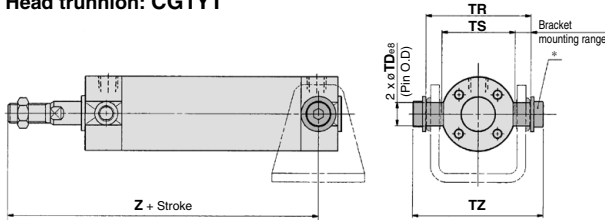
* Constructed of a trunnion pin, flat washer and hexagon socket head cap bolt.

Note) Refer to page 190 for pivot bracket.

* Other dimensions are the same as basic type.

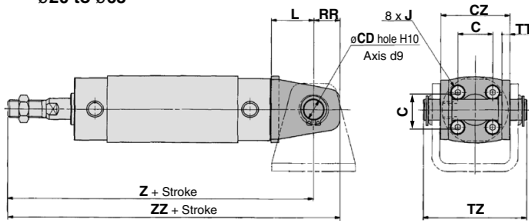
* Refer to the basic type for the female rod end.

Head trunnion: CG1YT



Clevis: CG1YD

ø20 to ø63



(The above shows the case port location is changed by 90°.)

Clevis (mm)

| Bore size (mm) | CD | CX | CZ | L | RR | V |
|----------------|----|----|----|----|----|----|
| 20 | 8 | — | 29 | 14 | 11 | — |
| 25 | 10 | — | 33 | 16 | 13 | — |
| 32 | 12 | — | 40 | 20 | 15 | — |
| 40 | 14 | — | 49 | 22 | 18 | — |
| 50 | 16 | — | 60 | 25 | 20 | — |
| 63 | 18 | — | 74 | 30 | 22 | — |
| 80 | 18 | 28 | 56 | 35 | 18 | 26 |
| 100 | 22 | 32 | 64 | 43 | 22 | 32 |

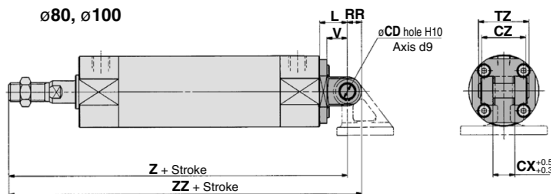
| Bore size (mm) | TZ | Z | ZZ | Applicable pin part no. |
|----------------|-------|-----|-----|-------------------------|
| 20 | 43.4 | 126 | 137 | CD-G02 |
| 25 | 48 | 133 | 146 | CD-G25 |
| 32 | 59.4 | 139 | 154 | CD-G03 |
| 40 | 71.4 | 159 | 177 | CD-G04 |
| 50 | 86 | 185 | 205 | CD-G05 |
| 63 | 105.4 | 190 | 212 | CD-G06 |
| 80 | 64 | 228 | 246 | IY-G08 |
| 100 | 72 | 236 | 258 | IY-G10 |

Note) * Refer to page 190 for pivot bracket.

* Other dimensions are the same as basic type.

* Refer to the basic type for the female rod end.

ø80, ø100



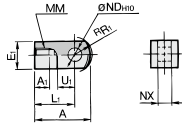
* A clevis pin and retaining rings are shipped together for the clevis type.

Dimensions of Accessories

Single Knuckle Joint

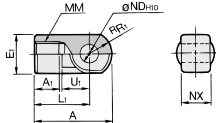
I-G02, G03

Material: Carbon steel



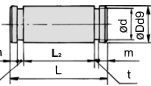
I-G04, G05, G08, G10

Material: Cast iron



| Part no. | Applicable bore size (mm) | A | A ₁ | E ₁ | L ₁ | MM | R ₁ | U ₁ | ND _{H10} | NX |
|----------|---------------------------|----|----------------|----------------|----------------|------------|----------------|----------------|--|------------------------------------|
| I-G02 | 20 | 34 | 8.5 | □16 | 25 | M8 x 1.25 | 10.3 | 11.5 | 8 ^{+0.058} _{-0.058} | 8 ^{+0.2} _{-0.2} |
| I-G03 | 25, 32 | 41 | 10.5 | □20 | 30 | M10 x 1.25 | 12.8 | 14 | 10 ^{+0.058} _{-0.058} | 10 ^{+0.2} _{-0.2} |
| I-G04 | 40 | 42 | 14 | □22 | 30 | M14 x 1.5 | 12 | 14 | 10 ^{+0.058} _{-0.058} | 18 ^{+0.3} _{-0.3} |
| I-G05 | 50, 63 | 56 | 18 | □28 | 40 | M18 x 1.5 | 16 | 20 | 14 ^{+0.070} _{-0.070} | 22 ^{+0.3} _{-0.3} |
| I-G08 | 80 | 71 | 21 | □38 | 50 | M22 x 1.5 | 21 | 27 | 18 ^{+0.070} _{-0.070} | 28 ^{+0.3} _{-0.3} |
| I-G10 | 100 | 79 | 21 | □44 | 55 | M26 x 1.5 | 24 | 31 | 22 ^{+0.084} _{-0.084} | 32 ^{+0.3} _{-0.3} |

Knuckle Pin

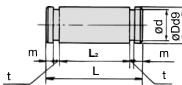


Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | Dd9 | L | d | L ₂ | m | t | Included retaining ring |
|----------|---------------------------|--|------|------|----------------|------|------|-------------------------|
| IY-G02 | 20 | 8 ^{-0.040} _{-0.076} | 21 | 7.6 | 16.2 | 1.5 | 0.9 | Type C8 for axis |
| IY-G03 | 25, 32 | 10 ^{-0.040} _{-0.076} | 25.6 | 9.6 | 20.2 | 1.55 | 1.15 | Type C10 for axis |
| IY-G04 | 40 | 10 ^{-0.040} _{-0.076} | 41.6 | 9.6 | 36.2 | 1.55 | 1.15 | Type C10 for axis |
| IY-G05 | 50, 63 | 14 ^{-0.050} _{-0.085} | 50.6 | 13.4 | 44.2 | 2.05 | 1.15 | Type C14 for axis |
| IY-G08 | 80 | 18 ^{-0.050} _{-0.085} | 64 | 17 | 56.2 | 2.55 | 1.35 | Type C18 for axis |
| IY-G10 | 100 | 22 ^{-0.050} _{-0.117} | 72 | 21 | 64.2 | 2.55 | 1.35 | Type C22 for axis |

* Retaining rings are included.

Clevis Pin



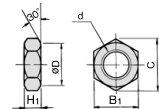
Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | Dd9 | L | d | L ₂ | m | t | Included retaining ring |
|----------|---------------------------|--|-------|------|----------------|------|------|-------------------------|
| CD-G02 | 20 | 8 ^{-0.040} _{-0.076} | 43.4 | 7.6 | 38.6 | 1.5 | 0.9 | Type C8 for axis |
| CD-G25 | 25 | 10 ^{-0.040} _{-0.076} | 48 | 9.6 | 42.6 | 1.55 | 1.15 | Type C10 for axis |
| CD-G03 | 32 | 12 ^{-0.050} _{-0.085} | 59.4 | 11.5 | 54 | 1.55 | 1.15 | Type C12 for axis |
| CD-G04 | 40 | 14 ^{-0.050} _{-0.085} | 71.4 | 13.4 | 65 | 2.05 | 1.15 | Type C14 for axis |
| CD-G05 | 50 | 16 ^{-0.050} _{-0.085} | 86 | 15.2 | 79.6 | 2.05 | 1.15 | Type C16 for axis |
| CD-G06 | 63 | 18 ^{-0.050} _{-0.085} | 105.4 | 17 | 97.8 | 2.45 | 1.35 | Type C18 for axis |

* Retaining rings are included.

* A clevis pin and a knuckle pin are common for the bore size ø80 and ø100.

Rod End Nut



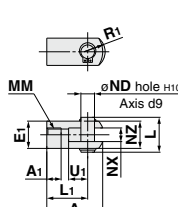
Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | d | H ₁ | B ₁ | C | D |
|----------|---------------------------|------------|----------------|----------------|--------|------|
| NT-02 | 20 | M8 x 1.25 | 5 | 13 | (15) | 12.5 |
| NT-03 | 25, 32 | M10 x 1.25 | 6 | 17 | (19.6) | 16.5 |
| NT-G04 | 40 | M14 x 1.5 | 8 | 19 | (21.9) | 18 |
| NT-05 | 50, 63 | M18 x 1.5 | 11 | 27 | (31.2) | 26 |
| NT-08 | 80 | M22 x 1.5 | 13 | 32 | (37.0) | 31 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | (47.3) | 39 |

Double Knuckle Joint

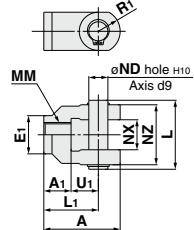
Y-G02, G03

Material: Carbon steel



Y-G04, G05, G08, G10

Material: Cast iron



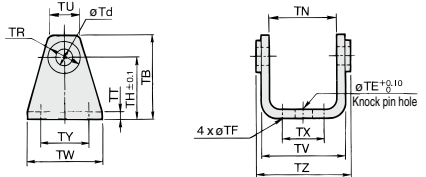
| Part no. | Applicable bore size (mm) | A | A ₁ | E ₁ | L ₁ | MM | R ₁ | U ₁ | ND | NX | NZ | L | Included pin part no. |
|----------|---------------------------|----|----------------|----------------|----------------|------------|----------------|----------------|----|------------------------------------|----|------|-----------------------|
| Y-G02 | 20 | 34 | 8.5 | □16 | 25 | M8 x 1.25 | 10.3 | 11.5 | 8 | 8 ^{+0.2} _{-0.2} | 16 | 21 | IY-G02 |
| Y-G03 | 25, 32 | 41 | 10.5 | □20 | 30 | M10 x 1.25 | 12.8 | 14 | 10 | 10 ^{+0.2} _{-0.2} | 20 | 25.6 | IY-G03 |
| Y-G04 | 40 | 42 | 14 | □22 | 30 | M14 x 1.5 | 12 | 14 | 10 | 18 ^{+0.3} _{-0.3} | 36 | 41.6 | IY-G04 |
| Y-G05 | 50, 63 | 56 | 18 | □28 | 40 | M18 x 1.5 | 16 | 20 | 14 | 22 ^{+0.3} _{-0.3} | 44 | 50.6 | IY-G05 |
| Y-G08 | 80 | 71 | 21 | □38 | 50 | M22 x 1.5 | 21 | 27 | 18 | 28 ^{+0.3} _{-0.3} | 56 | 64 | IY-G08 |
| Y-G10 | 100 | 79 | 24 | □44 | 55 | M26 x 1.5 | 24 | 31 | 22 | 32 ^{+0.3} _{-0.3} | 64 | 72 | IY-G10 |

* A knuckle pin and retaining rings are included.

Pivot Bracket (Order separately)

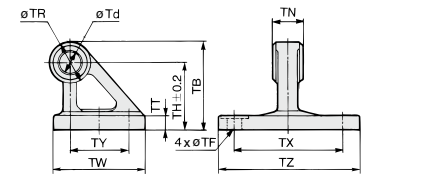
ø20 to ø63

Material: Carbon steel



ø80, ø100

Material: Cast iron



| Part no. | Applicable bore size (mm) | TB | Td | TE | TF | TH | TN | TR | TT |
|------------|---------------------------|----|----|----|------|--|----|-----|-----|
| CG-020-24A | 20 | 36 | 8 | 10 | 5.5 | 25 (29.3) | 13 | 3.2 | 3.2 |
| CG-025-24A | 25 | 43 | 10 | 10 | 5.5 | 30 (33.1) | 15 | 3.2 | 3.2 |
| CG-032-24A | 32 | 50 | 12 | 10 | 6.6 | 35 (40.4) | 17 | 4.5 | 4.5 |
| CG-040-24A | 40 | 58 | 14 | 10 | 6.6 | 40 (49.2) | 21 | 4.5 | 4.5 |
| CG-050-24A | 50 | 70 | 16 | 20 | 9 | 50 (60.4) | 24 | 6 | 6 |
| CG-063-24A | 63 | 82 | 18 | 20 | 11 | 60 (74.6) | 26 | 8 | 8 |
| CG-080-24A | 80 | 73 | 18 | — | 11 | 55 (28 ^{+0.1} _{-0.1}) | 36 | 11 | 11 |
| CG-100-24A | 100 | 90 | 22 | — | 13.5 | 65 (32 ^{+0.1} _{-0.1}) | 50 | 12 | 12 |

| Part no. | Applicable bore size (mm) | TU | TW | TX | TZ | Applicable pin O.D. |
|------------|---------------------------|--------|--------|----|-----|---------------------|
| CG-020-24A | 20 | (18.1) | (35.8) | 42 | 16 | 28.3 |
| CG-025-24A | 25 | (20.7) | (39.8) | 42 | 20 | 28.4 |
| CG-032-24A | 32 | (23.6) | (49.4) | 48 | 22 | 28.8 |
| CG-040-24A | 40 | (27.3) | (58.4) | 56 | 30 | 30.6 |
| CG-050-24A | 50 | (29.7) | (72.4) | 64 | 36 | 36.2 |
| CG-063-24A | 63 | (34.3) | (90.4) | 74 | 46 | 47.2 |
| CG-080-24A | 80 | — | — | 72 | 85 | 45 |
| CG-100-24A | 100 | — | — | 93 | 100 | 60 |

Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Part No.

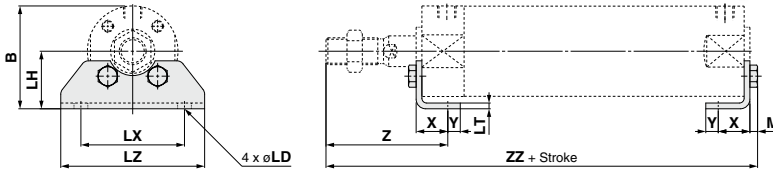
| Bore size (mm) | Axial foot*1 | Flange*1 | Single knuckle joint | Double knuckle joint*2 | Rod end nut |
|----------------|--------------|------------|----------------------|------------------------|-------------|
| 20 | — | — | I-G02SUS | Y-G02SUS | NT-02SUS |
| 25 | — | — | I-G03SUS | Y-G03SUS | NT-03SUS |
| 32 | CG-L032SUS | CG-F032SUS | | | |
| 40 | CG-L040SUS | CG-F040SUS | I-G04SUS | Y-G04SUS | NT-G04SUS |
| 50 | CG-L050SUS | CG-F050SUS | I-G05SUS | Y-G05SUS | NT-05SUS |
| 63 | CG-L063SUS | CG-F063SUS | | | |
| 80 | CG-L080SUS | CG-F080SUS | | | |
| 100 | CG-L100SUS | CG-F100SUS | I-G10SUS | Y-G10SUS | NT-10SUS |

*1 A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

Dimensions

The single knuckle joint, double knuckle joint, mounting nut, and rod end nut are the same as the standard type.

Axial foot



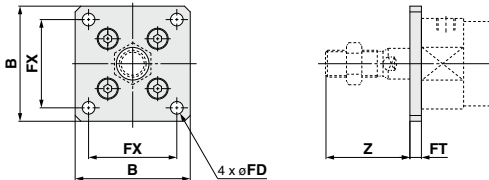
| Bore size | B | LD | LH | LT | LX | LZ | M | X | Y | Z | ZZ |
|-----------|------|------|------|-----|-------|-----|-------|--------|------|--------|----------------|
| 32 | 44 | 7.2 | [25] | [3] | [44] | 60 | [3.5] | [16] | 6 | [53] | [117.5(125.5)] |
| 40 | 53.5 | 7.2 | [30] | [3] | [54] | 75 | [4] | [16.5] | 6.5 | [63.5] | [135(144)] |
| 50 | 69 | [10] | [40] | 4 | [66] | 90 | 5.5 | 21.5 | 11.5 | [75.5] | [157.5(169.5)] |
| 63 | 81 | [12] | [45] | 4 | [82] | 110 | 7 | 21.5 | 11.5 | [75.5] | 159(171) |
| 80 | 99.5 | 12 | [55] | 4 | [100] | 130 | 7 | 28 | 17 | [95] | 190(204) |
| 100 | 125 | [14] | [70] | [6] | [120] | 160 | 8 | [30] | 15 | [95] | 193(207) |

*1 []: Same as the standard type (): Denotes the dimensions for long strokes

*2 Supplied with 4 mounting screws.

Rod flange

The head flange has the same dimensions.



| Bore size | B | FD | FT | FX | Z |
|-----------|-----|-------|-----|-------|------|
| 32 | 50 | [6.6] | 6 | [38] | 34 |
| 40 | 60 | [6.6] | 6 | [46] | 44 |
| 50 | 75 | [9] | [9] | [58] | [49] |
| 63 | 90 | [11] | [9] | [70] | [49] |
| 80 | 100 | [11] | 9 | [82] | 62 |
| 100 | 125 | [14] | 10 | [100] | 61 |

*1 []: Same as the standard type

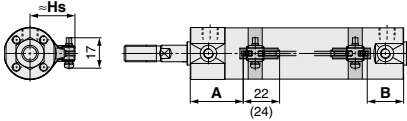
*2 Supplied with 4 mounting screws.

CG1Y Series Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Solid state auto switch

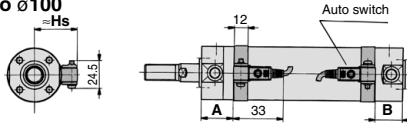
D-M9□
D-M9□W
ø20 to ø63



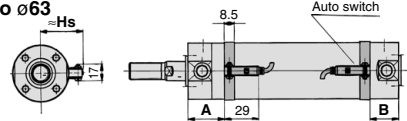
(): Dimension of the D-M9□A

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

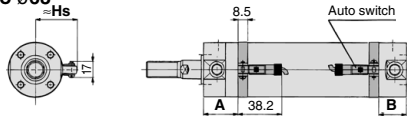
D-G5, K5, G5□W
D-K59W, D-G59F, D-G5NT
ø20 to ø100



D-H7□, H7□W
D-H7NF
ø20 to ø63

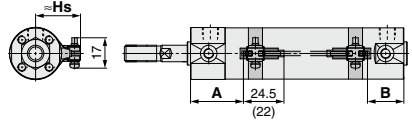


D-H7C
ø20 to ø63



Reed auto switch

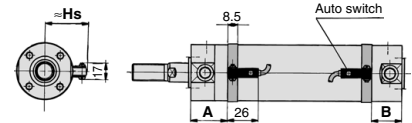
D-A9□
ø20 to ø63



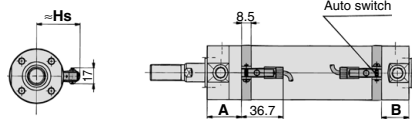
(): Dimension of the D-A96

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

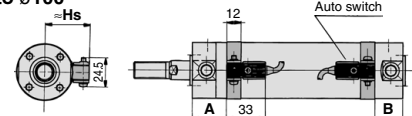
D-C7, C8
ø20 to ø63



D-C73C, C80C
ø20 to ø63



D-B5, B6, B59W
ø20 to ø100



Auto Switch Proper Mounting Position (Detection at stroke end) (mm)

| Auto switch model | D-M9□ | | D-A9□ | | D-H7□W | | D-C7□ | | D-G5□K59 | | D-B5□ | | D-B59W | |
|-------------------|--------|---------|--------|--------|--------|--------|-------|--------|----------|--------|--------|--------|--------|-------|
| | D-M9□V | D-M9□WV | D-A9□V | D-A9□V | D-H7□W | D-H7□W | D-C80 | D-C73C | D-G5□K59 | D-G5□W | D-G59F | D-G5NT | D-G5BA | D-B64 |
| Bore size | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 20 | 33 | 32 | 29 | 28 | 28.5 | 27.5 | 29.5 | 28.5 | 25 | 24 | 23.5 | 22.5 | 26.5 | 23.5 |
| 25 | 32.5 | 32.5 | 28.5 | 28.5 | 28 | 28 | 29 | 29 | 24.5 | 24.5 | 23 | 23 | 26 | 26 |
| 32 | 34 | 33 | 30 | 29 | 29.5 | 28.5 | 30.5 | 29.5 | 26 | 25 | 24.5 | 23.5 | 27.5 | 26.5 |
| 40 | 39 | 36 | 35 | 32 | 34.5 | 31.5 | 35.5 | 32.5 | 31 | 28 | 29.5 | 26.5 | 32.5 | 29.5 |
| 50 | 46 | 44 | 42 | 40 | 41.5 | 39.5 | 42.5 | 40.5 | 38 | 36 | 36.5 | 34.5 | 39.5 | 37.5 |
| 63 | 44.5 | 45.5 | 40.5 | 41.5 | 40 | 41 | 41 | 42 | 36.5 | 37.5 | 35 | 36 | 38 | 39 |
| 80 | — | — | — | — | — | — | — | — | 49.5 | 44.5 | 48 | 43 | 51 | 46 |
| 100 | — | — | — | — | — | — | — | — | 48.5 | 45.5 | 47 | 44 | 50 | 47 |

Auto Switch Mounting Height (mm)

| Auto switch model | D-M9□ (V) | | D-H7□ | | D-C73C | | D-B5/B6 | | D-K59W | |
|-------------------|------------|-------------|--------|--------|--------|--------|---------|--------|--------|-------|
| | D-M9□W (V) | D-M9□AV (V) | D-H7□W | D-H7NF | D-H7BA | D-C73C | D-B59W | D-G5NT | D-G59F | D-H7C |
| Bore size | Hs | | Hs | | Hs | | Hs | | Hs | |
| 20 | 26.5 | | 27 | | 27.5 | | 27.5 | | 27.5 | |
| 25 | 29 | | 29.5 | | 30 | | 30 | | 30 | |
| 32 | 32.5 | | 33 | | 33.5 | | 33.5 | | 33.5 | |
| 40 | 37 | | 37.5 | | 38 | | 38 | | 38 | |
| 50 | 42.5 | | 43 | | 43.5 | | 43.5 | | 43.5 | |
| 63 | 49.5 | | 50 | | 50.5 | | 50.5 | | 50.5 | |
| 80 | — | | — | | 59 | | 59 | | 59 | |
| 100 | — | | — | | 69.5 | | 69.5 | | 69.5 | |

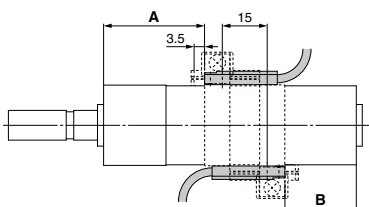
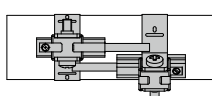
Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Minimum Stroke for Auto Switch Mounting

| Auto switch model | Number of auto switches (mm) | | | | |
|-----------------------------------|---|---------------------------|---------------------------|---|---|
| | With 1 pc. | With 2 pcs. | | With n pcs. (n: Number of auto switches) | |
| | | Different surfaces | Same surface | Different surfaces | Same surface |
| D-M9□ | 5 | 15 <small>Note 1)</small> | 40 <small>Note 1)</small> | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $55 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□W | 10 | 15 <small>Note 1)</small> | 40 <small>Note 1)</small> | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $55 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□A | 10 | 25 | 40 <small>Note 1)</small> | $25 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $60 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-A9□ | 5 | 15 | 30 <small>Note 1)</small> | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $50 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□V | 5 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $35 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-A9□V | 5 | 15 | 25 | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $25 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-M9□WV D-M9□AV | 10 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $35 + 35 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-C7□ D-C80 | 5 | 15 | 50 | $15 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $50 + 45 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-H7□ D-H7□W D-H7NF | 10 | 15 | 60 | $15 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $60 + 45 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-C73C D-C80C | 5 | 15 | 65 | $15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $65 + 50 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-B5□ D-B64 D-G5□ D-K59□ | 5 | 15 | 75 | $15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $75 + 55 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |
| D-B59W | 10 | 20 | 75 | $20 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3)</small> | $75 + 55 (n - 2)$ <small>(n = 2, 3, 4, 5...)</small> |

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting

| Auto switch model | With 2 auto switches | |
|-------------------|---|---|
| | Different surfaces | Same surface |
| |  <p>Correct auto switch mounting position is 3.5 mm from the back face of the switch holder.</p> |  <p>The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.</p> |
| D-M9□ D-M9□W | Less than 20 stroke <small>Note 2)</small> | Less than 55 stroke <small>Note 2)</small> |
| D-M9□A | Less than 20 stroke <small>Note 2)</small> | Less than 60 stroke <small>Note 2)</small> |
| D-A9□ | — | Less than 50 stroke <small>Note 2)</small> |

Note 2) Minimum stroke for auto switch mounting in types other than those mentioned in Note 1.

CG1Y Series

Operating Range

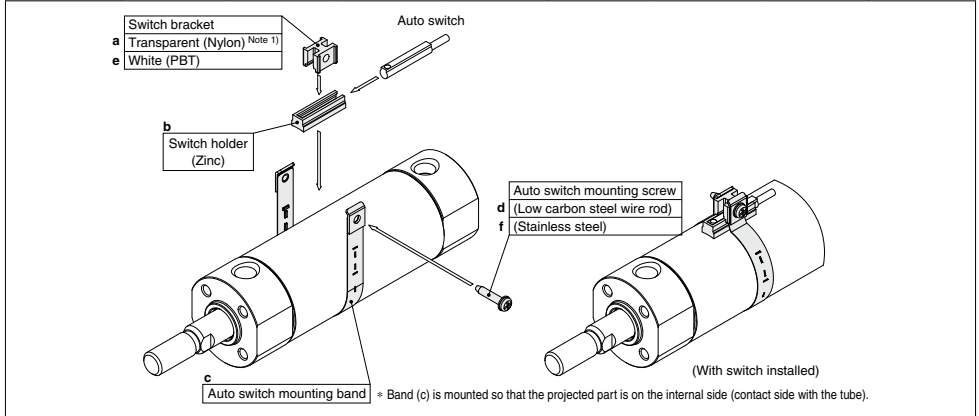
| Auto switch model | Bore size (mm) | | | | | | | |
|------------------------------------|----------------|----|-----|-----|----|-----|----|-----|
| | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| D-M9□(V) D-M9□W(V) D-M9□A(V) | 4.5 | 5 | 4.5 | 5.5 | 5 | 5.5 | — | — |
| D-A9□(V) | 7 | 6 | 8 | 8 | 8 | 9 | — | — |
| D-C7/C80 D-C73C/C80C | 8 | 10 | 9 | 10 | 10 | 11 | — | — |
| D-B5□/B64 | 8 | 10 | 9 | 10 | 10 | 11 | 11 | 11 |
| D-B59W | 13 | 13 | 14 | 14 | 14 | 17 | 16 | 18 |

| Auto switch model | Bore size (mm) | | | | | | | |
|------------------------------------|----------------|-----|-----|----|-----|------|-----|-----|
| | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| D-H7□/H7mW D-H7NF | 4 | 4 | 4.5 | 5 | 6 | 6.5 | — | — |
| D-H7C | 7 | 8.5 | 9 | 10 | 9.5 | 10.5 | — | — |
| D-G5□/G5□W/G59F D-G5BA/K59/K59W | 4 | 4 | 4.5 | 5 | 6 | 6.5 | 6.5 | 7 |
| D-G5NT | 4 | 4 | 4.5 | 5 | 6 | 6.5 | 6.5 | 7 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

| Auto switch model | Bore size (mm) | | | | | | | |
|-----------------------------------|--|--|--|--|--|--|----|-----|
| | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| D-M9□(V) D-M9□W(V) D-A9□(V) | Note 1) BMA3-020 (A set of a, b, c, d) | Note 1) BMA3-025 (A set of a, b, c, d) | Note 1) BMA3-032 (A set of a, b, c, d) | Note 1) BMA3-040 (A set of a, b, c, d) | Note 1) BMA3-050 (A set of a, b, c, d) | Note 1) BMA3-063 (A set of a, b, c, d) | — | — |
| D-M9□A(V) Note 2) | BMA3-020S (A set of b, c, e, f) | BMA3-025S (A set of b, c, e, f) | BMA3-032S (A set of b, c, e, f) | BMA3-040S (A set of b, c, e, f) | BMA3-050S (A set of b, c, e, f) | BMA3-063S (A set of b, c, e, f) | — | — |



| | | | | | | | | |
|--|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------|-----------------------------|
| D-H7□ D-H7□W D-H7NF D-C7□/C80 D-C73C/80C | BMA2-020A (A set of c and d) | BMA2-025A (A set of c and d) | BMA2-032A (A set of c and d) | BMA2-040A (A set of c and d) | BMA2-050A (A set of c and d) | BMA2-063A (A set of c and d) | — | — |
| D-H7BA | BMA2-020AS (A set of c and f) | BMA2-025AS (A set of c and f) | BMA2-032AS (A set of c and f) | BMA2-040AS (A set of c and f) | BMA2-050AS (A set of c and f) | BMA2-063AS (A set of c and f) | — | — |
| D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BA/G59F D-G5NT | BA-01 (A set of c and d) | BA-02 (A set of c and d) | BA-32 (A set of c and d) | BA-04 (A set of c and d) | BA-05 (A set of c and d) | BA-06 (A set of c and d) | BA-08 (A set of c and d) | BA-10 (A set of c and d) |

Note 1) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used.

Please contact SMC regarding other chemicals.

Note 2) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

Band Mounting Brackets Set Part No.

| Set part no. | Contents |
|--------------|---|
| BJ4-1 | · Switch bracket (White/PBT) (e) · Switch holder (b) |
| BJ5-1 | · Switch bracket (Transparent/Nylon) (a) · Switch holder (b) |

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)







BBA3: D-B5/B6/G5/K5 types

Note) Refer to page 1439 for details on the BBA3. When the D-G5BA type auto switch is shipped independently, the BBA3 is attached.

Cylinder Mounting Bracket, by Stroke/Auto Switch Mounting Surfaces

Auto switch mounting surface varies depending on mounting brackets and cylinder strokes. Refer to the table below.

(mm)

| Auto switch model | Basic, Foot, Flange, Clevis | | | Trunnion | | |
|--|---|---|---|---|---|--|
| | With 1 pc. (Rod cover side) | With 2 pcs. (Different surfaces) | With 2 pcs. (Same surface) | With 1 pc. (Rod cover side) | With 2 pcs. (Different surfaces) | With 2 pcs. (Same surface) |
| Auto switch mounting surface | Port surface  | Port surface  | Port surface  |  |  |  |
| Auto switch type | | | | | | |
| D-M9□(V) D-M9□W(V) D-M9□A(V) D-A9□(V) | 10 st or more | 15 to 44 st | 45 st or more | 10 st or more | 15 to 44 st | 45 st or more |
| D-C7/C8 | 10 st or more | 15 to 49 st | 50 st or more | 10 st or more | 15 to 49 st | 50 st or more |
| D-H7□/H7□W D-H7NF | 10 st or more | 15 to 59 st | 60 st or more | 10 st or more | 15 to 59 st | 60 st or more |
| D-C73C/C80C/H7C | 10 st or more | 15 to 64 st | 65 st or more | 10 st or more | 15 to 64 st | 65 st or more |
| D-B5/B6/G5/K5 D-G5□W/K59W D-G59F/G5NT | 10 st or more | 15 to 74 st | 75 st or more | 10 st or more | 15 to 74 st | 75 st or more |
| D-B59W | 15 st or more | 20 to 74 st | 75 st or more | 15 st or more | 20 to 74 st | 75 st or more |

* Trunnion type is not available for ø80 and ø100.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features | Applicable bore size (mm) |
|-------------|------------------|-------------------|---|---------------------------|
| Solid state | D-H7A1/H7A2/H7B | Grommet (In-line) | — | ø20 to ø63 |
| | D-H7NW/H7PW/H7BW | | Diagnostic indication (2-color indicator) | |
| | D-H7BA | | Water resistant (2-color indicator) | |
| | D-G5NT | | With timer | ø20 to ø100 |
| Reed | D-C73/C76 | | — | ø20 to ø63 |
| | D-C80 | | Without indicator light | |
| | D-B53 | | — | ø20 to ø100 |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1360.

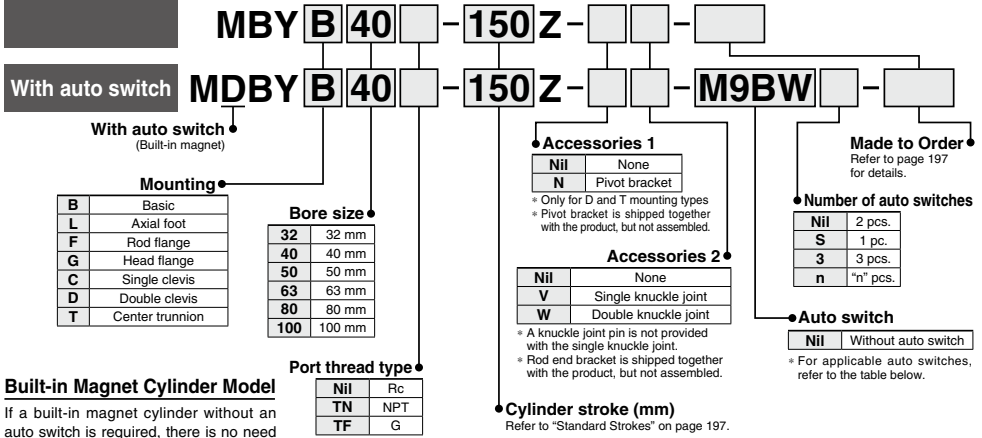
Smooth Cylinder

MBY Series

ø32, ø40, ø50, ø63, ø80, ø100

RoHS

How to Order



* Refer to "Ordering Example of Cylinder Assembly" on page 198.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length (m) | | | | Pre-wired connector | Applicable load | | | |
|--|---|-------------------------------------|-------------------------|-------------------------|--------------|-----------|-------------------|---------------|----------------------|--------------|-------|-------|---------------------|-----------------|------------|-----|------------|
| | | | | | DC | AC | Tie-rod mounting | Band mounting | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | | | | |
| Solid state auto switch | — | Grommet | No | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9N | ● | ● | ○ | ○ | — | IC circuit | | | |
| | | | | 3-wire (PNP) | | | | M9P | ● | ● | ○ | ○ | | | | | |
| | | 2-wire | | M9B | ● | ● | ○ | ○ | — | | | | | | | | |
| | | 3-wire (NPN) | | — | G39 | — | — | — | | — | | | | | | | |
| | Diagnostic indication (2-color indicator) | Terminal conduit | Yes | 2-wire | 24 V | 12 V | — | — | K39 | — | — | — | — | — | | | |
| | | | | 3-wire (NPN) | | | | M9NW | ● | ● | ○ | ○ | | | | | |
| | | 3-wire (PNP) | | M9PW | ● | ● | ○ | ○ | — | IC circuit | | | | | | | |
| | | 2-wire | | M9BW | ● | ● | ○ | ○ | | | | | | | | | |
| | | Water resistant (2-color indicator) | | Grommet | 3-wire (NPN) | M9NA*1 | — | ○ | ○ | ● | ○ | ○ | — | IC circuit | | | |
| | | | | | 3-wire (PNP) | M9PA*1 | — | ○ | ○ | ● | ○ | ○ | | | | | |
| With diagnostic output (2-color indicator) | Grommet | Yes | 2-wire | 24 V | 12 V | — | M9BA*1 | — | ○ | ○ | ○ | ○ | — | | | | |
| | | | 4-wire (NPN) | | | | F59F | — | ● | — | ● | ○ | | ○ | IC circuit | | |
| Magnetic field resistant (2-color indicator) | Terminal conduit | No | 2-wire (Non-polar) | 24 V | — | — | P3DWA | — | ● | — | ○ | ○ | — | | | | |
| | | | 2-wire (NPN equivalent) | | | | P4DW | — | — | ● | ● | ○ | | ○ | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 24 V | 12 V | — | A96 | — | ● | — | — | — | — | IC circuit | | |
| | | | | | | | | 100 V | A93 | — | ● | ● | ● | | | — | |
| | | | | | | | | 100 V or less | A90 | — | ● | — | — | | | — | IC circuit |
| | | | | | | | | 100 V, 200 V | A54 | — | ● | — | ● | | | — | |
| | | Terminal conduit | No | Yes | 2-wire | 24 V | 12 V | — | — | A64 | — | ● | — | — | — | PLC | |
| | | | | | | | | | | — | A33 | — | — | — | | | — |
| | | | | | | | | | | 100 V, 200 V | A34 | — | — | — | | | — |
| DIN terminal | Yes | Grommet | No | 2-wire | 24 V | — | — | A44 | — | ● | — | — | — | Relay, PLC | | | |
| | | | | | | | | — | A59W | — | ● | — | | | — | | |
| Diagnostic indication (2-color indicator) | Grommet | No | 2-wire | 24 V | — | — | — | A59W | — | ● | — | — | — | — | | | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

A water resistant type cylinder is recommended for use in an environment which requires water resistance.

* Lead wire length symbols: 0.5 m.....Nil (Example) M9NW 3 m.....L (Example) M9NWL
1 m.....M (Example) M9NWM 5 m.....Z (Example) M9NZZ

* Solid state auto switches marked with "C" are produced upon receipt of order.

* Since there are other applicable auto switches than listed above, refer to page 210 for details.

* The D-A9□/M9□/P3DWA□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled for the D-A9□/M9□ before shipment.)



Symbol



Minimum Operating Pressure

| | | Unit: MPa | | | | | |
|-------------------------|------|-----------|------|----|----|-----|--|
| Bore size (mm) | 32 | 40 | 50 | 63 | 80 | 100 | |
| Min. operating pressure | 0.02 | | 0.01 | | | | |



Made to Order
[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC7 | Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel |
| -XC14 | Change of trunnion bracket mounting position |
| -XC27 | Double clevis and double knuckle joint pins made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC30 | Rod trunnion |
| -XC65 | Made of stainless steel (Combination of XC7 and XC68) |
| -XC68 | Made of stainless steel (with hard chrome plated piston rod) |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|-----------------------------|
| 32 | MBY32Z-PS | |
| 40 | CA2Y40Z-PS | Rod seal 1 pc. |
| 50 | CA2Y50Z-PS | Piston seal 1 pc. |
| 63 | CA2Y63Z-PS | Cylinder tube gasket 2 pcs. |
| 80 | CA2Y80Z-PS | Grease pack (10 g) 1 pc. |
| 100 | CA2Y100Z-PS | |

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
 GR-L-010 (10 g)
 GR-L-150 (150 g)

Specifications

| Bore size (mm) | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------------------------|---|----|----|----|----|-----|
| Action | Double acting | | | | | |
| Piston speed | 5 to 500 mm/s | | | | | |
| Fluid | Air | | | | | |
| Proof pressure | 1.05 MPa | | | | | |
| Maximum operating pressure | 0.7 MPa | | | | | |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C | | | | | |
| Cushion | None | | | | | |
| Lubrication | Not required (Non-lube) | | | | | |
| Mounting | Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion | | | | | |
| Allowable leakage rate | 0.5 L/min (ANR) | | | | | |

Standard Strokes

| Bore size (mm) | Standard stroke (mm) | Max. manufacturable stroke |
|----------------|--|----------------------------|
| 32 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500 | 1000 |
| 40 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500 | 1000 |
| 50 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600 | 1000 |
| 63 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600 | 1000 |
| 80 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800 | 1000 |
| 100 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800 | 1000 |

Note 1) Intermediate strokes not listed above are also available.

Please consult with SMC for strokes outside the above ranges.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Accessories

For details, refer to page 204.

| Mounting | | Basic | Axial foot | Rod flange | Head flange | Single clevis | Double clevis | Center trunnion |
|----------|---------------------------------|-------|------------|------------|-------------|---------------|---------------|-----------------|
| Standard | Rod end nut | ● | ● | ● | ● | ● | ● | ● |
| | Clevis pin | — | — | — | — | — | ● | — |
| Option | Single knuckle joint | ● | ● | ● | ● | ● | ● | ● |
| | Double knuckle joint (with pin) | ● | ● | ● | ● | ● | ● | ● |
| | Rod boot | ● | ● | ● | ● | ● | ● | ● |

Mounting Brackets/Part No.

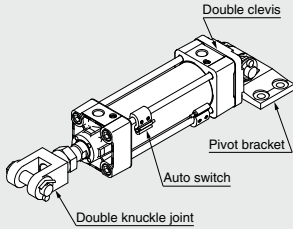
| Bore size (mm) | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------------------------|--------|--------|--------|--------|--------|--------|
| Axial foot ^{Note 1)} | MB-L03 | MB-L04 | MB-L05 | MB-L06 | MB-L08 | MB-L10 |
| Flange | MB-F03 | MB-F04 | MB-F05 | MB-F06 | MB-F08 | MB-F10 |
| Single clevis | MB-C03 | MB-C04 | MB-C05 | MB-C06 | MB-C08 | MB-C10 |
| Double clevis | MB-D03 | MB-D04 | MB-D05 | MB-D06 | MB-D08 | MB-D10 |

Note 1) Order two foots per cylinder.

Note 2) Accessories for each mounting bracket are as follows: Axial foot, Flange, Single clevis: Body mounting bolt, Double clevis: Body mounting bolt, Clevis pin, Flat washers and Split pins. → Refer to page 204 for details.

Ordering Example of Cylinder Assembly

Cylinder model: **MDBYD40-150Z-NW-M9BW**



| | |
|---------------------|----------------------|
| Mounting | D : Double clevis |
| Pivot bracket | N : Yes |
| Rod end bracket W: | Double knuckle joint |
| Auto switch D-M9BW: | 2 pcs. |

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

Weights

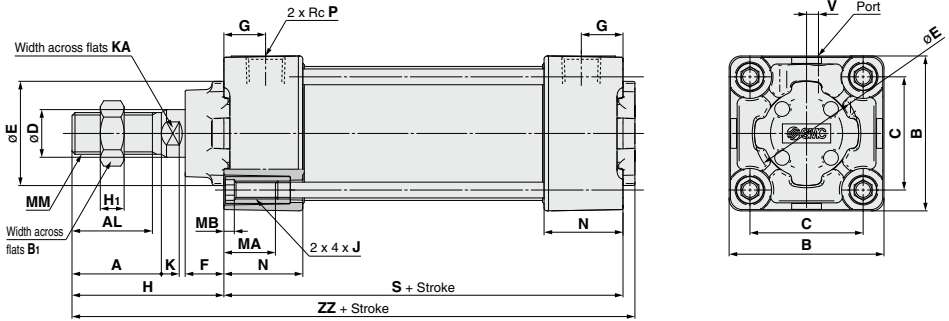
| Bore size (mm) | | 32 | 40 | 50 | 63 | 80 | 100 |
|---------------------------------------|---------------------------------|------|------|------|------|------|------|
| Basic weight | Basic | 0.44 | 0.59 | 1.04 | 1.29 | 2.41 | 3.36 |
| | Axial foot | 0.56 | 0.73 | 1.26 | 1.57 | 2.91 | 4.02 |
| | Flange | 0.73 | 0.96 | 1.49 | 2.08 | 3.86 | 5.19 |
| | Single clevis | 0.69 | 0.82 | 1.38 | 1.92 | 3.52 | 4.94 |
| | Double clevis | 0.7 | 0.86 | 1.47 | 2.08 | 3.81 | 5.21 |
| | Trunnion | 0.73 | 0.95 | 1.52 | 2.09 | 3.96 | 5.05 |
| Additional weight per 50 mm of stroke | All mounting brackets | 0.11 | 0.16 | 0.26 | 0.27 | 0.42 | 0.56 |
| Accessories | Single knuckle joint | 0.15 | 0.23 | 0.26 | 0.26 | 0.60 | 0.83 |
| | Double knuckle joint (with pin) | 0.22 | 0.37 | 0.43 | 0.43 | 0.87 | 1.27 |

Calculation Example **MBYB32-100Z** (Basic, ø32, 100 st)

- Basic weight.....0.44 (Basic, ø32)
 - Additional weight.....0.11/50 stroke
 - Cylinder stroke.....100 stroke
-
- 0.44 + 0.11 x 100/50 = **0.66 kg**

Standard

Basic: MBYB



Dimensions

(mm)

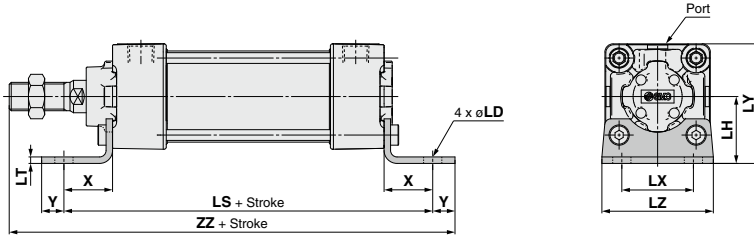
| Bore size (mm) | A | AL | B | B ₁ | C | D | E | F | G | H | H ₁ | J | K | KA | MA | MB | MM | N | P | S | V | ZZ |
|----------------|----|------|-----|----------------|------|----|----|----|------|----|----------------|-----------|----|----|----|----|------------|------|-----|-----|------|-----|
| 32 | 22 | 19.5 | 46 | 17 | 32.5 | 12 | 30 | 13 | 13 | 47 | 6 | M6 x 1 | 6 | 10 | 16 | 4 | M10 x 1.25 | 27 | 1/8 | 84 | 4 | 135 |
| 40 | 30 | 27 | 52 | 22 | 38 | 16 | 35 | 13 | 14 | 51 | 8 | M6 x 1 | 6 | 14 | 16 | 4 | M14 x 1.5 | 27 | 1/4 | 84 | 4 | 139 |
| 50 | 35 | 32 | 65 | 27 | 46.5 | 20 | 40 | 14 | 15.5 | 58 | 11 | M8 x 1.25 | 7 | 18 | 16 | 5 | M18 x 1.5 | 31.5 | 1/4 | 94 | 5 | 156 |
| 63 | 35 | 32 | 75 | 27 | 56.5 | 20 | 45 | 14 | 16.5 | 58 | 11 | M8 x 1.25 | 7 | 18 | 16 | 5 | M18 x 1.5 | 31.5 | 3/8 | 94 | 9 | 156 |
| 80 | 40 | 37 | 95 | 32 | 72 | 25 | 45 | 20 | 19 | 72 | 13 | M10 x 1.5 | 10 | 22 | 16 | 5 | M22 x 1.5 | 38 | 3/8 | 114 | 11.5 | 190 |
| 100 | 40 | 37 | 114 | 41 | 89 | 30 | 55 | 20 | 19 | 72 | 16 | M10 x 1.5 | 10 | 26 | 16 | 5 | M26 x 1.5 | 38 | 1/2 | 114 | 17 | 190 |

MBY Series

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

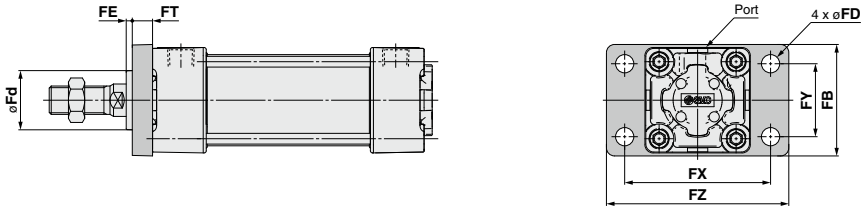
Axial foot: MBYL



Axial Foot (mm)

| Bore size (mm) | LD | LH | LS | LT | LX | LY | LZ | X | Y | ZZ |
|----------------|----|----|-----|-----|----|-------|-----|----|----|-----|
| 32 | 7 | 30 | 128 | 3.2 | 32 | 53 | 50 | 22 | 9 | 162 |
| 40 | 9 | 33 | 132 | 3.2 | 38 | 59 | 55 | 24 | 11 | 170 |
| 50 | 9 | 40 | 148 | 3.2 | 46 | 72.5 | 70 | 27 | 11 | 190 |
| 63 | 12 | 45 | 148 | 3.6 | 56 | 82.5 | 80 | 27 | 14 | 193 |
| 80 | 12 | 55 | 174 | 4.5 | 72 | 102.5 | 100 | 30 | 14 | 230 |
| 100 | 14 | 65 | 178 | 4.5 | 89 | 122 | 120 | 32 | 16 | 234 |

Rod flange: MBYF



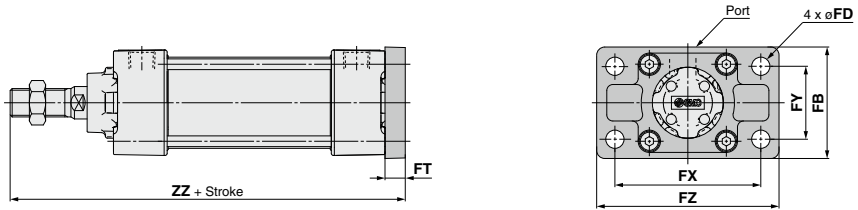
Rod Flange (mm)

| Bore size (mm) | FB | FD | FE | FT | FX | FY | FZ | Fd |
|----------------|-----|----|----|----|-----|----|-----|------|
| 32 | 50 | 7 | 3 | 10 | 64 | 32 | 79 | 24.5 |
| 40 | 55 | 9 | 3 | 10 | 72 | 36 | 90 | 29.5 |
| 50 | 70 | 9 | 2 | 12 | 90 | 45 | 110 | 35.5 |
| 63 | 80 | 9 | 2 | 12 | 100 | 50 | 120 | 38.5 |
| 80 | 100 | 12 | 4 | 16 | 126 | 63 | 153 | 41 |
| 100 | 120 | 14 | 4 | 16 | 150 | 75 | 178 | 46 |

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

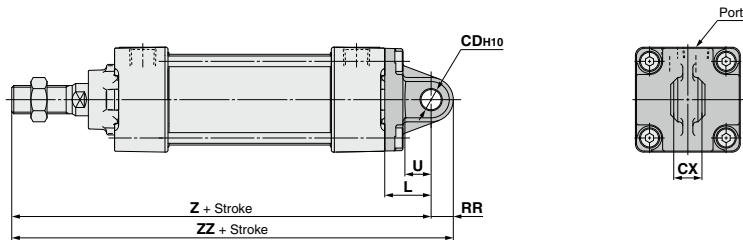
Head flange: MBYG



Head Flange (mm)

| Bore size (mm) | FB | FD | FT | FX | FY | FZ | ZZ |
|----------------|-----|----|----|-----|----|-----|-----|
| 32 | 50 | 7 | 10 | 64 | 32 | 79 | 141 |
| 40 | 55 | 9 | 10 | 72 | 36 | 90 | 145 |
| 50 | 70 | 9 | 12 | 90 | 45 | 110 | 164 |
| 63 | 80 | 9 | 12 | 100 | 50 | 120 | 164 |
| 80 | 100 | 12 | 16 | 126 | 63 | 153 | 202 |
| 100 | 120 | 14 | 16 | 150 | 75 | 178 | 202 |

Single clevis: MBYC



Single Clevis (mm)

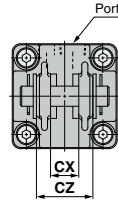
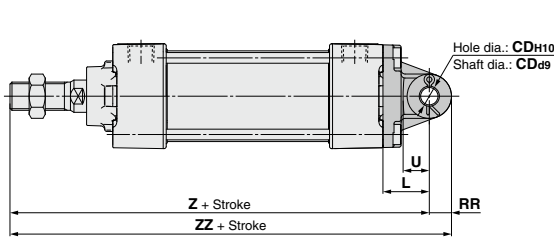
| Bore size (mm) | CDH10 | CX | L | RR | U | Z | ZZ |
|----------------|-----------------------------------|------------------------------------|----|------|----|-----|-------|
| 32 | 10 ^{+0.058} ₀ | 14 ^{-0.1} _{-0.3} | 23 | 10.5 | 13 | 154 | 164.5 |
| 40 | 10 ^{+0.058} ₀ | 14 ^{-0.1} _{-0.3} | 23 | 11 | 13 | 158 | 169 |
| 50 | 14 ^{+0.070} ₀ | 20 ^{-0.1} _{-0.3} | 30 | 15 | 17 | 182 | 197 |
| 63 | 14 ^{+0.070} ₀ | 20 ^{-0.1} _{-0.3} | 30 | 15 | 17 | 182 | 197 |
| 80 | 22 ^{+0.084} ₀ | 30 ^{-0.1} _{-0.3} | 42 | 23 | 26 | 228 | 251 |
| 100 | 22 ^{+0.084} ₀ | 30 ^{-0.1} _{-0.3} | 42 | 23 | 26 | 228 | 251 |

MBY Series

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

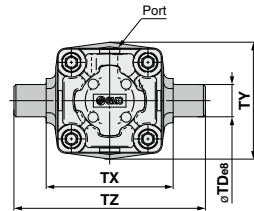
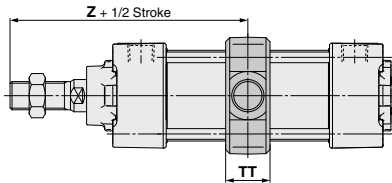
Double clevis: MBYD



Double Clevis (mm)

| Bore size (mm) | CDH10 | CD49 | CX | CZ | L | RR | U | Z | ZZ |
|----------------|-----------------------------------|--|------------------------------------|----|----|------|----|-----|-------|
| 32 | 10 ^{+0.058} ₀ | 10 ^{-0.040} _{-0.076} | 14 ^{+0.3} _{+0.1} | 28 | 23 | 10.5 | 13 | 154 | 164.5 |
| 40 | 10 ^{+0.058} ₀ | 10 ^{-0.040} _{-0.076} | 14 ^{+0.3} _{+0.1} | 28 | 23 | 11 | 13 | 158 | 169 |
| 50 | 14 ^{+0.070} ₀ | 14 ^{-0.050} _{-0.093} | 20 ^{+0.3} _{+0.1} | 40 | 30 | 15 | 17 | 182 | 197 |
| 63 | 14 ^{+0.070} ₀ | 14 ^{-0.050} _{-0.093} | 20 ^{+0.3} _{+0.1} | 40 | 30 | 15 | 17 | 182 | 197 |
| 80 | 22 ^{+0.084} ₀ | 22 ^{-0.065} _{-0.117} | 30 ^{+0.3} _{+0.1} | 60 | 42 | 23 | 26 | 228 | 251 |
| 100 | 22 ^{+0.084} ₀ | 22 ^{-0.065} _{-0.117} | 30 ^{+0.3} _{+0.1} | 60 | 42 | 23 | 26 | 228 | 251 |

Center trunnion: MBYT



Center Trunnion (mm)

| Bore size (mm) | TD _{es} | TT | TX | TY | TZ | Z |
|----------------|--|----|-----|-----|-----|-----|
| 32 | 12 ^{-0.032} _{-0.059} | 17 | 50 | 49 | 74 | 89 |
| 40 | 16 ^{-0.032} _{-0.059} | 22 | 63 | 58 | 95 | 93 |
| 50 | 16 ^{-0.032} _{-0.059} | 22 | 75 | 71 | 107 | 105 |
| 63 | 20 ^{-0.040} _{-0.073} | 28 | 90 | 87 | 130 | 105 |
| 80 | 20 ^{-0.040} _{-0.073} | 34 | 110 | 110 | 150 | 129 |
| 100 | 25 ^{-0.040} _{-0.073} | 40 | 132 | 136 | 182 | 129 |

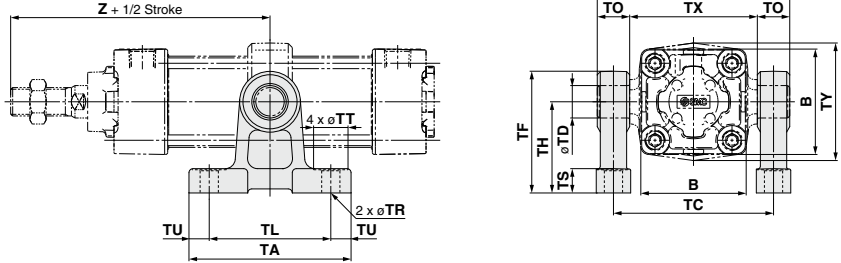
Pivot Bracket/Trunnion and Double Clevis Pivot Bracket

Part No.

| | | | | | | |
|-------------------------------|--------|--------|--------|--------|-------|--------|
| Bore size | MB□32 | MB□40 | MB□50 | MB□63 | MB□80 | MB□100 |
| Description | MB-S03 | MB-S04 | MB-S06 | MB-S10 | | |
| Trunnion pivot bracket (Note) | MB-S03 | MB-S04 | MB-S06 | MB-S10 | | |
| Double clevis pivot bracket | MB-B03 | MB-B05 | MB-B08 | | | |

(Note) Order 2 trunnion pivot brackets per cylinder.

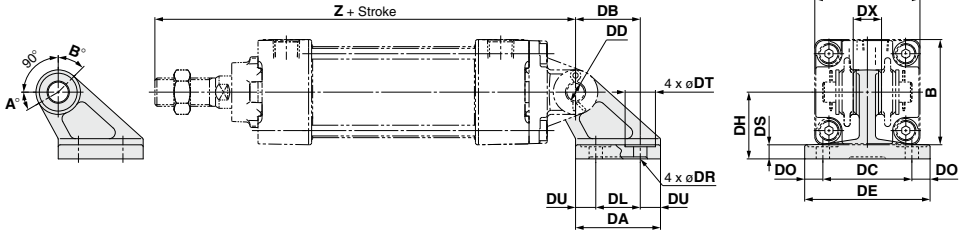
Trunnion pivot bracket



(mm)

| Part no. | Bore size (mm) | B | TA | TL | TU | TC | TX | TE | TO | TR | TT | TS | TH | TF | Z ^{±s} | TD _{H10} |
|----------|----------------|-----|-----|----|-----|-----|-----|-----|----|------|----|----|----|-----|-----------------|-----------------------------------|
| MB-S03 | 32 | 46 | 62 | 45 | 8.5 | 62 | 50 | 74 | 12 | 7 | 13 | 10 | 35 | 47 | 89 | 12 ^{+0.070} ₀ |
| | 40 | 52 | 80 | 60 | 10 | 80 | 63 | 97 | 17 | 9 | 17 | 12 | 45 | 60 | 93 | 16 ^{+0.070} ₀ |
| MB-S04 | 50 | 65 | 80 | 60 | 10 | 92 | 75 | 109 | 17 | 9 | 17 | 12 | 45 | 60 | 105 | 16 ^{+0.070} ₀ |
| | 63 | 75 | 100 | 70 | 15 | 110 | 90 | 130 | 20 | 11 | 22 | 14 | 60 | 80 | 105 | 20 ^{+0.084} ₀ |
| MB-S06 | 80 | 95 | 100 | 70 | 15 | 130 | 110 | 150 | 20 | 11 | 22 | 14 | 60 | 80 | 129 | 20 ^{+0.084} ₀ |
| | 100 | 114 | 120 | 90 | 15 | 158 | 132 | 184 | 26 | 13.5 | 24 | 17 | 75 | 100 | 129 | 25 ^{+0.084} ₀ |

Double clevis pivot bracket



(mm)

| Part no. | Bore size (mm) | B | DA | DB | DL | DU | DC | DX | DE | DO | DR | DT | DS | DH | Z ^{±s} | DD _{H10} |
|----------|----------------|-----|----|----|----|------|----|----|-----|------|-----|----|----|----|-----------------|-----------------------------------|
| MB-B03 | 32 | 46 | 42 | 32 | 22 | 10 | 44 | 14 | 62 | 9 | 6.6 | 15 | 7 | 33 | 154 | 10 ^{+0.058} ₀ |
| | 40 | 52 | 42 | 32 | 22 | 10 | 44 | 14 | 62 | 9 | 6.6 | 15 | 7 | 33 | 158 | 10 ^{+0.058} ₀ |
| MB-B05 | 50 | 65 | 53 | 43 | 30 | 11.5 | 60 | 20 | 81 | 10.5 | 9 | 18 | 8 | 45 | 182 | 14 ^{+0.070} ₀ |
| | 63 | 75 | 53 | 43 | 30 | 11.5 | 60 | 20 | 81 | 10.5 | 9 | 18 | 8 | 45 | 182 | 14 ^{+0.070} ₀ |
| MB-B08 | 80 | 95 | 73 | 64 | 45 | 14 | 86 | 30 | 111 | 12.5 | 11 | 22 | 10 | 65 | 228 | 22 ^{+0.084} ₀ |
| | 100 | 114 | 73 | 64 | 45 | 14 | 86 | 30 | 111 | 12.5 | 11 | 22 | 10 | 65 | 228 | 22 ^{+0.084} ₀ |

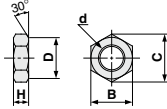
Rotating Angle

| Bore size (mm) | A° | B° | A° + B° + 90° |
|----------------|-----|-----|---------------|
| 32, 40 | 25° | 45° | 160° |
| 50, 63 | 40° | 60° | 190° |
| 80, 100 | 30° | 55° | 175° |

MBY Series

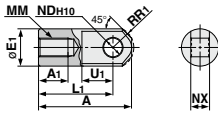
Dimensions of Accessories

Rod end nut
(Standard)



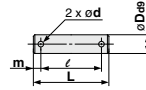
| Part no. | Bore size (mm) | d | H | B | C | D |
|----------|----------------|------------|----|----|------|------|
| NT-03 | 32 | M10 x 1.25 | 6 | 17 | 19.6 | 16.5 |
| NT-04 | 40 | M14 x 1.5 | 8 | 22 | 25.4 | 21 |
| NT-05 | 50, 63 | M18 x 1.5 | 11 | 27 | 31.2 | 26 |
| NT-08 | 80 | M22 x 1.5 | 13 | 32 | 37.0 | 31 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | 47.3 | 39 |

I type
Single knuckle joint



| Part no. | Bore size (mm) | A | A ₁ | E ₁ | L ₁ | MM | R ₁ | U ₁ | NDH10 | NX |
|----------|----------------|----|----------------|----------------|----------------|------------|----------------|----------------|-----------------------------------|--------------------------------------|
| I-03M | 32 | 40 | 14 | 20 | 30 | M10 x 1.25 | 12 | 16 | 10 ^{+0.058} ₀ | 14 ^{+0.10} _{-0.30} |
| I-04M | 40 | 50 | 19 | 22 | 40 | M14 x 1.5 | 12.5 | 19 | 10 ^{+0.058} ₀ | 14 ^{+0.10} _{-0.30} |
| I-05M | 50, 63 | 64 | 24 | 28 | 50 | M18 x 1.5 | 16.5 | 24 | 14 ^{+0.070} ₀ | 20 ^{+0.10} _{-0.30} |
| I-08M | 80 | 80 | 26 | 40 | 60 | M22 x 1.5 | 23.5 | 34 | 22 ^{+0.084} ₀ | 30 ^{+0.10} _{-0.30} |
| I-10M | 100 | 80 | 26 | 40 | 60 | M26 x 1.5 | 23.5 | 34 | 22 ^{+0.084} ₀ | 30 ^{+0.10} _{-0.30} |

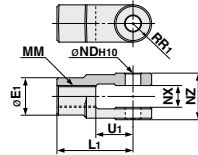
Knuckle joint pin
Clevis pin



| Part no. | Bore size (mm) Clevis (knuckle) | Dø8 | L | l | m | d | Applicable split pin |
|----------|------------------------------------|--|----|----|-----|---|----------------------|
| CD-M03 | 32, 40 | 10 ^{+0.040} _{-0.076} | 44 | 36 | 4 | 3 | ø3 x 18 ℓ |
| CD-M05 | 50, 63 | 14 ^{+0.050} _{-0.093} | 60 | 51 | 4.5 | 4 | ø4 x 25 ℓ |
| CD-M08 | 80, 100 | 22 ^{+0.075} _{-0.117} | 82 | 72 | 5 | 4 | ø4 x 35 ℓ |

Note) Split pins and flat washers are included.

Y type
Double knuckle joint



| Part no. | Bore size (mm) | E ₁ | L ₁ | MM | R ₁ | U ₁ | NDH10 | NX | NZ |
|----------|----------------|----------------|----------------|------------|----------------|----------------|-----------------------------------|--------------------------------------|--------------------------------------|
| Y-03M | 32 | 20 | 30 | M10 x 1.25 | 10 | 16 | 10 ^{+0.058} ₀ | 14 ^{+0.30} _{-0.10} | 28 ^{+0.10} _{-0.30} |
| Y-04M | 40 | 22 | 40 | M14 x 1.5 | 11 | 19 | 10 ^{+0.058} ₀ | 14 ^{+0.30} _{-0.10} | 28 ^{+0.10} _{-0.30} |
| Y-05M | 50, 63 | 28 | 50 | M18 x 1.5 | 14 | 24 | 14 ^{+0.070} ₀ | 20 ^{+0.30} _{-0.10} | 40 ^{+0.10} _{-0.30} |
| Y-08M | 80 | 40 | 65 | M22 x 1.5 | 20 | 34 | 22 ^{+0.084} ₀ | 30 ^{+0.30} _{-0.10} | 60 ^{+0.10} _{-0.30} |
| Y-10M | 100 | 40 | 65 | M26 x 1.5 | 20 | 34 | 22 ^{+0.084} ₀ | 30 ^{+0.30} _{-0.10} | 60 ^{+0.10} _{-0.30} |

Note) A pin, split pins and flat washers are included.

Bracket Combinations

Bracket combination available Refer to the figure below.

| Bracket for cylinder | Bracket for workpiece | | | | |
|----------------------|-----------------------|---------------|----------------------|----------------------|----------------------|
| | Single clevis | Double clevis | Single knuckle joint | Double knuckle joint | Clevis pivot bracket |
| Single clevis | — | ① | — | ② | — |
| Double clevis | ③ | — | ④ | — | ⑨ |
| Single knuckle joint | — | ⑤ | — | ⑥ | — |
| Double knuckle joint | ⑦ | — | ⑧ | — | ⑩ |

| No. | Appearance | No. | Appearance |
|-----|--------------------------------------|-----|---|
| ① | Single clevis + Double clevis | ⑥ | Single knuckle joint + Double knuckle joint |
| ② | Single clevis + Double knuckle joint | ⑦ | Double knuckle joint + Single clevis |
| ③ | Double clevis + Single clevis | ⑧ | Double knuckle joint + Single knuckle joint |
| ④ | Double clevis + Single knuckle joint | ⑨ | Double clevis + Clevis pivot bracket |
| ⑤ | Single knuckle joint + Double clevis | ⑩ | Double knuckle joint + Clevis pivot bracket |

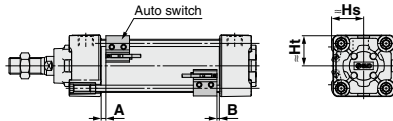
MBY Series

Auto Switch Mounting

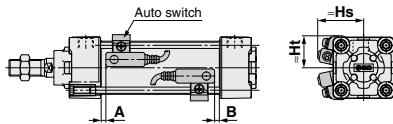
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

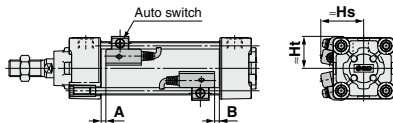
- D-M9□/M9□V
- D-M9□W/M9□WV
- D-M9□A/M9□AV
- D-A9□/A9□V
- D-Z7□/Z80
- D-Y59□/Y69□/Y7P/Y7PV
- D-Y7□W/Y7□WV/Y7BA



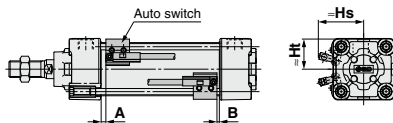
- D-A5□/A6□
- D-A59W



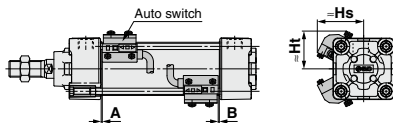
- D-F5□/J59
- D-F5□W/J59W/F5BA
- D-F59F/F5NT



- D-P3DWA

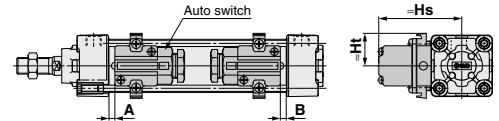


- D-P4DW

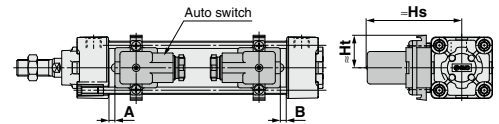


<Band mounting>

- D-A3□/G39/K39



- D-A44



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | | D-A9□ D-A9□V | | D-A5□ D-A6□ | | D-A59W | | D-F5□ D-J59 D-F59F | | D-F5NT | | D-A3□ D-A44 D-G39 D-K39 | | D-Z7□ D-Z8□ D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7H D-Y7□W D-Y7□WV | | D-P3DWA | | D-P4DW | |
|-------------------|---|------|-----------------|-----|----------------|-----|--------|-----|--------------------------|-----|--------|------|----------------------------------|-----|---|-----|---------|-----|--------|-----|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 32 | 10 | 8 | 6 | 4 | 0 | 0 | 4 | 2 | 6.5 | 4.5 | 11.5 | 9.5 | 0 | 0 | 3.5 | 1.5 | 5.5 | 3.5 | 3 | 1 |
| 40 | 9 | 9 | 5 | 5 | 0 | 0 | 3 | 3 | 5.5 | 5.5 | 10.5 | 10.5 | 0 | 0 | 2.5 | 2.5 | 4.5 | 4.5 | 2 | 2 |
| 50 | 10 | 9 | 6 | 5 | 0 | 0 | 4 | 3 | 6.5 | 5.5 | 11.5 | 10.5 | 0 | 0 | 3.5 | 2.5 | 5.5 | 4.5 | 3 | 2 |
| 63 | 10 | 9 | 6 | 5 | 0 | 0 | 4 | 3 | 6.5 | 5.5 | 11.5 | 10.5 | 0 | 0 | 3.5 | 2.5 | 5.5 | 4.5 | 3 | 2 |
| 80 | 14.5 | 11.5 | 10.5 | 7.5 | 4.5 | 1.5 | 8.5 | 5.5 | 11 | 8 | 16 | 13 | 4.5 | 1.5 | 8 | 5 | 10 | 7 | 7.5 | 4.5 |
| 100 | 14 | 12 | 10 | 8 | 4 | 2 | 8 | 6 | 10.5 | 8.5 | 15.5 | 13.5 | 4 | 2 | 7.5 | 5.5 | 9.5 | 7.5 | 7 | 5 |

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Proper Mounting Height

(mm)

| Auto switch model | D-M9□ D-M9□W D-M9□A D-A9□ | | D-M9□V D-M9□WV D-M9□AV | | D-A9□V | | D-A5□ D-A6□ D-A59W | | D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA D-F5NT | | D-A3□ D-G39 D-K39 | | D-A44 | | D-Z7□ D-Z8□ D-Y59□ D-Y7P D-Y7□W D-Y7BA | | D-Y69□ D-Y7PV D-Y7□WV | | D-P3DWA | | D-P4DW | |
|-------------------|------------------------------------|------|------------------------------|------|--------|------|--------------------------|------|--|------|-------------------------|------|-------|------|---|------|-----------------------------|------|---------|------|--------|------|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 32 | 24.5 | 23 | 30.5 | 23 | 27.5 | 23 | 35 | 24.5 | 32.5 | 25 | 67 | 27.5 | 77 | 27.5 | 25.5 | 23 | 26.5 | 23 | 38 | 31 | 38 | 31 |
| 40 | 28.5 | 25.5 | 34 | 25.5 | 31.5 | 25.5 | 38.5 | 27.5 | 36.5 | 27.5 | 71.5 | 27.5 | 81.5 | 27.5 | 29.5 | 26 | 30 | 26 | 39 | 25.5 | 42 | 33 |
| 50 | 33.5 | 31 | 38.5 | 31 | 36 | 31 | 43.5 | 34.5 | 41 | 34 | 77 | — | 87 | — | 33.5 | 31 | 34.5 | 31 | 43 | 31 | 46.5 | 39 |
| 63 | 38.5 | 36 | 43 | 36 | 40.5 | 36 | 48.5 | 39.5 | 46 | 39 | 83.5 | — | 93.5 | — | 39 | 36 | 40 | 36 | 48 | 36 | 51.5 | 44 |
| 80 | 46.5 | 45 | 52 | 45 | 49 | 45 | 55 | 46.5 | 52.5 | 46.5 | 92.5 | — | 103 | — | 47.5 | 45 | 48.5 | 45 | 56.5 | 45 | 58 | 51.5 |
| 100 | 54 | 53.5 | 59.5 | 53.5 | 57 | 53.5 | 62 | 55 | 59.5 | 55 | 103 | — | 113.5 | — | 55.5 | 53.5 | 56.5 | 53.5 | 64.5 | 53.5 | 65.5 | 60.5 |

Operating Range

(mm)

| Auto switch model | Bore size | | | | | |
|---|-----------|-----|-----|-----|-----|------|
| | 32 | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 4 | 4.5 | 5 | 6 | 6 | 6 |
| D-A9□/A9□V | 7 | 7.5 | 8.5 | 9.5 | 9.5 | 10.5 |
| D-Z7□/Z8□ | 7.5 | 8.5 | 7.5 | 9.5 | 9.5 | 10.5 |
| D-A5□/A6□ | 9 | 9 | 10 | 11 | 11 | 11 |
| D-A59W | 13 | 13 | 13 | 14 | 14 | 15 |
| D-A3□/A44 | 9 | 9 | 10 | 11 | 11 | 11 |
| D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA | 5.5 | 5.5 | 7 | 7.5 | 6.5 | 5.5 |
| D-F5□/J59 D-F5□W/J59W D-F5BA/F5NT D-F59F | 3.5 | 4 | 4 | 4.5 | 4.5 | 4.5 |
| D-G39/K39 | 9 | 9 | 9 | 10 | 10 | 11 |
| D-P3DWA | 3 | 4.5 | 4.5 | 5 | 5 | 5.5 |
| D-P4DW | 4 | 4 | 4 | 4.5 | 4 | 4.5 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Minimum Stroke for Auto Switch Mounting/Mounting Brackets other than Center Trunnion

| | | n: Number of auto switches (mm) | |
|--|---|--|--|
| Auto switch model | Number of auto switches mounted | Mounting brackets other than center trunnion | |
| | | ø32, ø40, ø50, ø63 | ø80, ø100 |
| D-M9□ D-M9□W | 2 (Different surfaces, same surface) 1 | 15 | |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-M9□V D-M9□WV | 2 (Different surfaces, same surface) 1 | 10 | |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-M9□A | 2 (Different surfaces, same surface) 1 | 15 | |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-M9□AV | 2 (Different surfaces, same surface) 1 | 15 | |
| | n | $15 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-A9□ | 2 (Different surfaces, same surface) 1 | 15 | |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-A9□V | 2 (Different surfaces, same surface) 1 | 10 | |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |
| D-A3□ D-G39 D-K39 | 2 (Different surfaces) | 35 | |
| | 2 (Same surface) | 100 | |
| | n (Different surfaces) | $35 + 30(n-2)$ (n = 2, 3, 4...) | |
| | n (Same surface) | $100 + 100(n-2)$ (n = 2, 3, 4...) | |
| | 1 | 10 | |
| D-A44 | 2 (Different surfaces) | 35 | |
| | 2 (Same surface) | 55 | |
| | n (Different surfaces) | $35 + 30(n-2)$ (n = 2, 3, 4...) | |
| | n (Same surface) | $55 + 50(n-2)$ (n = 2, 3, 4...) | |
| | 1 | 10 | |
| D-A5□ D-A6□ | 2 (Different surfaces, same surface) 1 | 15 | 20 |
| | n (Different surfaces) | $15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | $20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) |
| D-A59W | 2 (Different surfaces, same surface) | 20 | 25 |
| | n (Same surface) | $20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | $25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) |
| | 1 | 15 | 25 |
| D-F5□ D-J5□ D-F5□W D-J59W D-F5BA D-F59F | 2 (Different surfaces, same surface) | 15 | 25 |
| | n (Same surface) | $15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | $25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) |
| | 1 | 10 | 25 |
| D-F5NT | 2 (Different surfaces, same surface) | 15 | 25 |
| | n (Same surface) | $15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | $25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) |
| | 1 | 10 | 25 |
| D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W | 2 (Different surfaces, same surface) 1 | 15 | |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1) | |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Mounting Brackets other than Center Trunnion

n: Number of auto switches (mm)

| Auto switch model | Number of auto switches mounted | Mounting brackets other than center trunnion | |
|---|--------------------------------------|---|--|
| | | ø32, ø40, ø50, ø63, ø80, ø100 | |
| D-Y69 D-Y7PV D-Y7 WV | 2 (Different surfaces, same surface) | 10 | |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| D-Y7BA | 2 (Different surfaces, same surface) | 20 | |
| | n | $20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| D-P3DWA | 2 (Different surfaces, same surface) | 15 | |
| | n | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| D-P4DW | 2 (Different surfaces, same surface) | 15 | |
| | n | $15 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Center Trunnion

n: Number of auto switches (mm)

| Auto switch model | Number of auto switches mounted | Center trunnion | | | | | |
|---------------------------------|--------------------------------------|---|---|-----|---|---|--|
| | | ø32 | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-M9 D-M9 W | 2 (Different surfaces, same surface) | 75 | 80 | | 85 | 90 | 95 |
| | n | $75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-M9 V D-M9 WV | 2 (Different surfaces, same surface) | 50 | 55 | | 60 | 65 | 70 |
| | n | $50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-M9 A | 2 (Different surfaces, same surface) | 80 | 85 | | 90 | 95 | 100 |
| | n | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-M9 AV | 2 (Different surfaces, same surface) | 55 | 60 | | 65 | 70 | 75 |
| | n | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-A9 | 2 (Different surfaces, same surface) | 70 | 75 | | 80 | 85 | 95 |
| | n | $70 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-A9 V | 2 (Different surfaces, same surface) | 45 | 50 | | 55 | 60 | 70 |
| | n | $45 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Center Trunnion

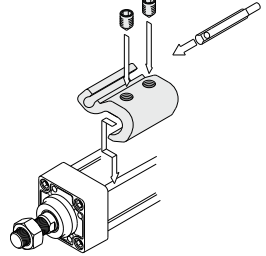
| | | n: Number of auto switches (mm) | | | | | | | | | |
|--|--------------------------------------|---|--|---|--|--|--|--|--|--|--|
| Auto switch model | Number of auto switches mounted | Center trunnion | | | | | | | | | |
| | | ø32 | ø40 | ø50 | ø63 | ø80 | ø100 | | | | |
| D-A3□ D-G39 D-K39 | 2 (Different surfaces) | 60 | | 65 | | 75 | | 80 | | 85 | |
| | 2 (Same surface) | 90 | | 95 | | 100 | | 105 | | 110 | |
| | n (Different surfaces) | $60 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $65 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $75 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $80 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $85 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | |
| | n (Same surface) | $90 + 100(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $95 + 100(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $100 + 100(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $105 + 100(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $110 + 100(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | |
| | 1 | 60 | | 65 | | 75 | | 80 | | 85 | |
| D-A44 | 2 (Different surfaces) | 70 | | 75 | | 80 | | 85 | | | |
| | 2 (Same surface) | | | | | | | | | | |
| | n (Different surfaces) | $70 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $75 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $80 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $85 + 30(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | | |
| | n (Same surface) | $70 + 50(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $75 + 50(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $80 + 50(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | $85 + 50(n-2)$ <small>(n = 2, 4, 6, 8...)</small> Note 1) | | | |
| | 1 | 70 | | 75 | | 80 | | 85 | | | |
| D-A5□ D-A6□ | 2 (Different surfaces, same surface) | | 60 | | 80 | | 105 | | 110 | | 115 |
| | 1 | | | | | | | | | | |
| D-A59W | n (Same surface) | | $60 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $80 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $105 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $110 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $115 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 60 | | 70 | | 85 | | 110 | | 115 |
| D-F5□/J59 D-F5□W D-J59W D-F5BA D-F59F | 2 (Different surfaces, same surface) | | 90 | | 95 | | 110 | | 115 | | 120 |
| | n (Same surface) | | $90 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $95 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $110 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $115 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $120 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 90 | | 95 | | 110 | | 115 | | 120 |
| | n (Same surface) | | $90 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $95 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $110 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $115 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $120 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| D-F5NT | 2 (Different surfaces, same surface) | | 100 | | 105 | | 120 | | 125 | | 130 |
| | n (Same surface) | | $100 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $105 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $120 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $125 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $130 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 100 | | 105 | | 120 | | 125 | | 130 |
| | n (Same surface) | | $100 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $105 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $120 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $125 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $130 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W | 2 (Different surfaces, same surface) | | 80 | | 85 | | 90 | | 95 | | 100 |
| | 1 | | | | | | | | | | |
| | n | | $80 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $85 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $90 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $95 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $100 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 80 | | 85 | | 90 | | 95 | | 100 |
| D-Y69□ D-Y7PV D-Y7□WV | 2 (Different surfaces, same surface) | | 60 | | 65 | | 70 | | 75 | | 85 |
| | 1 | | | | | | | | | | |
| | n | | $60 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $65 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $70 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $75 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $85 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 60 | | 65 | | 70 | | 75 | | 85 |
| D-Y7BA | 2 (Different surfaces, same surface) | | 85 | | 90 | | 100 | | 105 | | 110 |
| | 1 | | | | | | | | | | |
| | n | | $85 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $90 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $100 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $105 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $110 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) |
| | 1 | | 85 | | 90 | | 100 | | 105 | | 110 |
| D-P3DWA | 2 (Different surfaces, same surface) | | 80 | | 85 | | 90 | | 95 | | |
| | 1 | | | | | | | | | | |
| | n | | $80 + 50 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $85 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $90 + 45 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $95 + 50 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | |
| | 1 | | 80 | | 85 | | 90 | | 95 | | |
| D-P4DW | 2 (Different surfaces, same surface) | | 120 | | 130 | | 140 | | | | |
| | 1 | | | | | | | | | | |
| | n | | $120 + 65 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $130 + 65 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | $140 + 65 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)</small> Note 2) | | | | |
| | 1 | | 120 | | 130 | | 140 | | | | |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
 Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Auto Switch Mounting Brackets/Part No.

| Auto switch model | Bore size (mm) | | | | | |
|---|----------------|-----------|-----------|-----------|-----------|-----------|
| | ø32 | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-M9□W/M9□WV D-M9□A/M9□AV D-M9□/M9□V D-A9□/A9□V | BMB5-032 | BMB5-032 | BA7-040 | BA7-040 | BA7-063 | BA7-063 |
| D-A3□/A44 D-G39/K39 | BMB2-032 | BMB2-040 | BMB1-050 | BMB1-063 | BMB1-080 | BMB1-100 |
| D-A5□/A6□/A59W D-F5□/J59 D-F5□W/J59W D-F59F/F5BA D-F5NT | BT-03 | BT-03 | BT-05 | BT-05 | BT-06 | BT-06 |
| D-P3DWA | BA10-032S | BA10-040S | BA10-050S | BA10-050S | BA10-063S | BA10-063S |
| D-P4DW | BMB3T-040 | BMB3T-040 | BMB3T-050 | BMB3T-050 | BMB3T-080 | BMB3T-080 |
| D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA | BMB4-032 | BMB4-032 | BMB4-050 | BMB4-050 | BA4-063 | BA4-063 |

The figure shows the mounting example for the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V).



[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

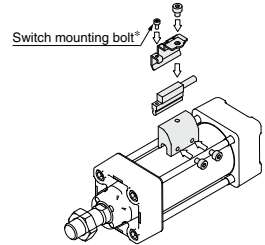
BBA1: For D-A5/A6/F5/J5 types

Note 1) Refer to page 1447 for details on the BBA1.

The above stainless steel screws are used when a cylinder is shipped with the D-F5BA auto switch. When only the auto switch is shipped independently, the BBA1 is attached.

Note 2) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BMB5-032, BA7-□□□, BMB4-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6 L stainless steel set screws included in the BBA1.

<Mounting example for ø32, D-P3DWA>



* The switch mounting bolt is supplied with the switch.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features |
|-------------|---------------------|-------------------------|--|
| Reed | D-A93V/A96V | Grommet (Perpendicular) | — |
| | D-A90V | | Without indicator light |
| | D-B35 | Grommet (In-line) | — |
| | D-A53/A56/Z73/Z76 | | Without indicator light |
| | D-A67/Z80 | | Without indicator light |
| Solid state | D-M9NV/M9PV/M9BV | Grommet (Perpendicular) | — |
| | D-Y69A/Y69B/Y7PV | | Diagnostic indication (2-color indicator) |
| | D-M9NWV/M9PWW/M9BWW | | Water resistant (2-color indicator) |
| | D-Y7NWV/Y7PWW/Y7BWW | | Magnetic field resistant (2-color indicator) |
| | D-M9NAV/M9PAV/M9BAV | | — |
| | D-P4DW | | — |
| | D-F59/F5P/J59 | Grommet (In-line) | — |
| | D-Y59A/Y59B/Y7P | | Diagnostic indication (2-color indicator) |
| | D-Y7H | | Water resistant (2-color indicator) |
| | D-F59W/F5PW/J59W | | With timer |
| | D-Y7NW/Y7PW/Y7BW | | Magnetic field resistant (2-color indicator) |
| | D-F5BA/Y7BA | | — |
| | D-F5NT | | — |
| | D-P5DW | | — |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1360 and 1362.

Smooth Cylinder

CA2Y Series

ø40, ø50, ø63, ø80, ø100



How to Order

CA2Y B 40 - 150 Z -

With auto switch CDA2Y B 40 - 150 Z - M9BW

With auto switch (Built-in magnet)

Mounting

| | |
|---|-----------------|
| B | Basic |
| L | Axial foot |
| F | Rod flange |
| G | Head flange |
| C | Single clevis |
| D | Double clevis |
| T | Center trunnion |

Bore size

| | |
|-----|--------|
| 40 | 40 mm |
| 50 | 50 mm |
| 63 | 63 mm |
| 80 | 80 mm |
| 100 | 100 mm |

Port thread type

| | |
|-----|-----|
| Nil | Rc |
| TN | NPT |
| TF | G |

Accessories 1

| | |
|-----|---------------|
| Nil | No bracket |
| N | Pivot bracket |

* Only for D and T mounting types
* Pivot bracket is shipped together with the product, but not assembled.

Accessories 2

| | |
|-----|----------------------|
| Nil | No bracket |
| V | Single knuckle joint |
| W | Double knuckle joint |

* A knuckle joint pin is not provided with the single knuckle joint.
* Rod end bracket is shipped together with the product, but not assembled.

Made to Order
Refer to page 212 for details.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| 3 | 3 pcs. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------|
| Nil | Without auto switch |
|-----|---------------------|

* For applicable auto switches, refer to the table below.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDA2YB40-100Z

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 212.

* Refer to "Ordering Example of Cylinder Assembly" on page 213.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | | Auto switch model | | Lead wire length (m) | | | | | Pre-wired connector | Applicable load | |
|--|---|-------------------------------------|-----------------|---|--------------|------------------|--------------|-------------------|---------------|----------------------|-------|-------|-------|-----|---------------------|-----------------|------------|
| | | | | | DC | AC | | Tie-rod mounting | Band mounting | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | | | |
| Solid state auto switch | — | Grommet | No | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9N | — | ● | ● | ● | ○ | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | | M9P | — | ● | ● | ● | ○ | ○ | | | |
| | | | | 2-wire | M9B | — | ● | ● | ● | ○ | ○ | | | | | | |
| | | Terminal conduit | | 3-wire (NPN) | 12 V | — | G39C | G39 | — | — | — | — | — | — | | — | — |
| | | | | 2-wire | | | K39C | K39 | — | — | — | — | — | — | | — | |
| | | | | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NW | — | ● | ● | ● | ○ | ○ | | IC circuit | |
| | 3-wire (PNP) | M9PW | — | ● | | | | ● | ● | ○ | ○ | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | No | 2-wire | 24 V | 12 V | — | M9B | — | ● | ● | ● | ○ | ○ | — | |
| | | | | | 3-wire (NPN) | | | | M9NA*1 | — | ○ | ○ | ○ | ○ | ○ | | IC circuit |
| | | | | | 3-wire (PNP) | M9PA*1 | — | ○ | ○ | ○ | ○ | ○ | — | | | | |
| | | 2-wire | | M9A*1 | — | ○ | ○ | ○ | ○ | ○ | — | | | | | | |
| | | Water resistant (2-color indicator) | | Grommet | Yes | No | 4-wire (NPN) | 24 V | 5 V, 12 V | — | | F59F | G59F | ● | ● | ● | ○ |
| 2-wire (Non-polar) | | | | | | | P3DWA | | | | — | ● | ● | ● | ○ | ○ | |
| With diagnostic output (2-color indicator) | P4DW | | — | | | | ● | ● | ● | ○ | ○ | — | | | | | |
| Magnetic field resistant (2-color indicator) | Grommet | Yes | No | 3-wire (NPN equivalent) | | 24 V | 12 V | — | A96 | — | ● | | ● | ● | ○ | IC circuit | |
| | | | | 2-wire | | | | | A93 | — | ● | ● | ● | ○ | — | | |
| | | | | Diagnostic indication (2-color indicator) | | Terminal conduit | Yes | No | 2-wire | 24 V | 12 V | — | 100 V | A90 | | — | ● |
| 100 V or less | A54 | | B54 | | ● | | | | | | | | ● | ● | ○ | — | |
| 100 V, 200 V | A64 | | B64 | | ● | | | | | ● | ● | ○ | — | | | | |
| 200 V or less | A33C | | A33 | — | — | — | | — | — | | | | | | | | |
| 100 V, 200 V | A34C | A34 | — | — | — | — | | — | | | | | | | | | |
| — | A44C | A44 | — | — | — | — | | | — | | | | | | | | |
| — | A59W | B59W | ● | ● | ● | ○ | ○ | Relay, PLC | | | | | | | | | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NLW
5 m..... Z (Example) M9NZ

* Solid state auto switches marked with "○" are produced upon receipt of order.

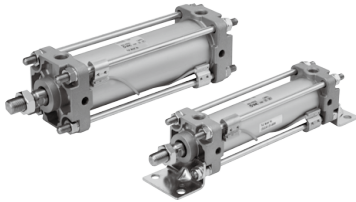
* Since there are other applicable auto switches then listed above, refer to page 224 for details.

* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* The D-A9□M9□□/P3DWA□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled for the D-A9□M9□□ before shipment.)

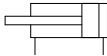


CA2Y Series



Symbol

Without cushion



Made to Order
[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC7 | Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel |
| -XC14 | Change of trunnion bracket mounting position |
| -XC15 | Change of tie-rod length |
| -XC27 | Double clevis and double knuckle joint pins made of stainless steel |
| -XC28 | Compact flange made of SS400 |
| -XC29 | Double knuckle joint with spring pin |
| -XC30 | Rod trunnion |
| -XC65 | Made of stainless steel (Combination of XC7 and XC68) |
| -XC68 | Made of stainless steel (with hard chrome plated piston rod) |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|-----------------------------|
| 40 | CA2Y40Z-PS | Rod seal 1 pc. |
| 50 | CA2Y50Z-PS | Piston seal 1 pc. |
| 63 | CA2Y63Z-PS | Cylinder tube gasket 2 pcs. |
| 80 | CA2Y80Z-PS | Grease pack (10 g) 1 pc. |
| 100 | CA2Y100Z-PS | |

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
 GR-L-010 (10 g)
 GR-L-150 (150 g)

Specifications

| Bore size (mm) | 40 | 50 | 63 | 80 | 100 |
|--------------------------------------|---|----|----|----|-----|
| Action | Double acting | | | | |
| Piston speed | 5 to 500 mm/s | | | | |
| Fluid | Air | | | | |
| Proof pressure | 1.05 MPa | | | | |
| Maximum operating pressure | 0.7 MPa | | | | |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C | | | | |
| Cushion | None | | | | |
| Lubrication | Not required (Non-lube) | | | | |
| Mounting | Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion | | | | |
| Allowable leakage rate | 0.5 L/min (ANR) | | | | |

Minimum Operating Pressure

| Unit: MPa | | | | | |
|----------------------------|------|------|----|----|-----|
| Bore size (mm) | 40 | 50 | 63 | 80 | 100 |
| Minimum operating pressure | 0.02 | 0.01 | | | |

Standard Strokes

| Bore size (mm) | Standard stroke (mm) | Max. manufacturable stroke (mm) |
|----------------|---|---------------------------------|
| 40 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500 | 1000 |
| 50, 63 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600 | 1000 |
| 80, 100 | 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700 | 1000 |

Note 1) Intermediate strokes not listed above are also available.

Please consult with SMC for strokes outside the above ranges.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

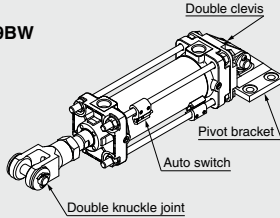
Accessories

For details, refer to page 219.

| Mounting | | Basic | Foot | Rod flange | Head flange | Single clevis | Double clevis | Center trunnion |
|----------|---------------------------------|-------|------|------------|-------------|---------------|---------------|-----------------|
| Standard | Rod end nut | ● | ● | ● | ● | ● | ● | ● |
| | Clevis pin | — | — | — | — | — | ● | — |
| Option | Single knuckle joint | ● | ● | ● | ● | ● | ● | ● |
| | Double knuckle joint (with pin) | ● | ● | ● | ● | ● | ● | ● |

Ordering Example of Cylinder Assembly

Cylinder model:
CDA2YD40-150Z-NW-M9BW



Mounting D: Double clevis
Pivot bracket N: Yes
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

Weights/Aluminum Tube

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 |
|---------------------------------------|---------------------------------|------|------|------|------|------|
| Basic weight | Basic | 0.73 | 1.06 | 1.53 | 2.73 | 3.71 |
| | Axial foot | 0.91 | 1.25 | 1.83 | 3.40 | 4.64 |
| | Flange | 1.09 | 1.48 | 2.28 | 4.18 | 5.57 |
| | Single clevis | 0.95 | 1.37 | 2.12 | 3.84 | 5.43 |
| | Double clevis | 0.99 | 1.46 | 2.28 | 4.13 | 5.95 |
| | Trunnion | 1.08 | 1.51 | 2.29 | 4.28 | 5.93 |
| Additional weight per 50 mm of stroke | All mounting brackets | 0.20 | 0.25 | 0.31 | 0.46 | 0.58 |
| Accessories | Single knuckle joint | 0.23 | 0.26 | 0.26 | 0.60 | 0.83 |
| | Double knuckle joint (with pin) | 0.37 | 0.43 | 0.43 | 0.87 | 1.27 |

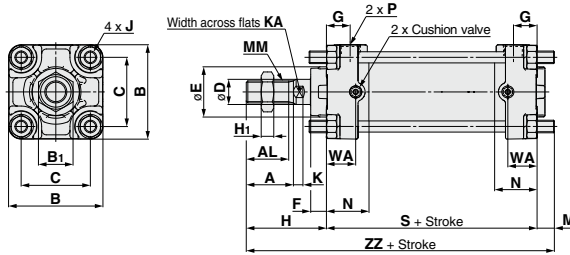
Calculation (Example) **CA2YL40-100Z** (Axial foot, ø40, 100 st)

- Basic weight.....0.91kg
- Additional weight.....0.20/50 stroke
- Cylinder stroke.....100 stroke

$$\frac{0.91 + 0.20 \times 100/50}{1} = 1.31 \text{ kg}$$

CA2Y Series

Basic: CA2YB

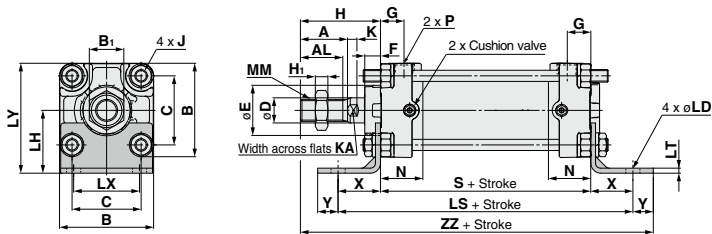


(mm)

| Bore size (mm) | A | AL | B | B ₁ | C | D | E | F | G | H | H ₁ | J | K | KA |
|----------------|----|----|-----|----------------|----|----|----|----|----|----|----------------|------------|----|----|
| 40 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 15 | 51 | 8 | M8 x 1.25 | 6 | 14 |
| 50 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 17 | 58 | 11 | M8 x 1.25 | 7 | 18 |
| 63 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 17 | 58 | 11 | M10 x 1.25 | 7 | 18 |
| 80 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 21 | 71 | 13 | M12 x 1.75 | 10 | 22 |
| 100 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 21 | 72 | 16 | M12 x 1.75 | 10 | 26 |

| Bore size (mm) | M | MM | N | P | S | WA | ZZ |
|----------------|----|-----------|----|-----|-----|------|-----|
| 40 | 11 | M14 x 1.5 | 27 | 1/4 | 84 | 18.5 | 146 |
| 50 | 11 | M18 x 1.5 | 30 | 3/8 | 90 | 18.5 | 159 |
| 63 | 14 | M18 x 1.5 | 31 | 3/8 | 98 | 23 | 170 |
| 80 | 17 | M22 x 1.5 | 37 | 1/2 | 116 | 28.5 | 204 |
| 100 | 17 | M26 x 1.5 | 40 | 1/2 | 126 | 28.5 | 215 |

Axial Foot: CA2YL

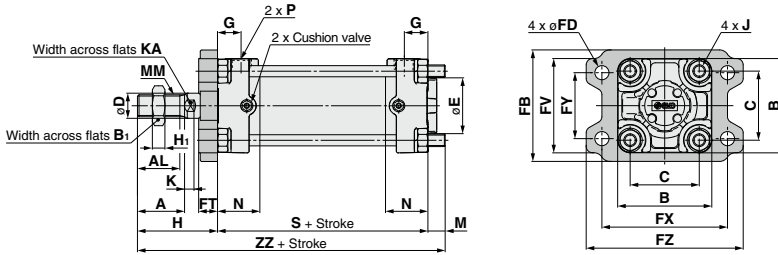


(mm)

| Bore size (mm) | A | AL | B | B ₁ | C | D | E | F | G | H | H ₁ | J | K | KA | LD | LH | LS | LT |
|----------------|----|----|-----|----------------|----|----|----|----|----|----|----------------|------------|----|----|------|----|-----|-----|
| 40 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 15 | 51 | 8 | M8 x 1.25 | 6 | 14 | 9 | 40 | 138 | 3.2 |
| 50 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 17 | 58 | 11 | M8 x 1.25 | 7 | 18 | 9 | 45 | 144 | 3.2 |
| 63 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 17 | 58 | 11 | M10 x 1.25 | 7 | 18 | 11.5 | 50 | 166 | 3.2 |
| 80 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 21 | 71 | 13 | M12 x 1.75 | 10 | 22 | 13.5 | 65 | 204 | 4.5 |
| 100 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 21 | 72 | 16 | M12 x 1.75 | 10 | 26 | 13.5 | 75 | 212 | 6 |

| Bore size (mm) | LX | LY | MM | N | P | S | X | Y | ZZ |
|----------------|----|-----|-----------|----|-----|-----|----|----|-----|
| 40 | 42 | 70 | M14 x 1.5 | 27 | 1/4 | 84 | 27 | 13 | 175 |
| 50 | 50 | 80 | M18 x 1.5 | 30 | 3/8 | 90 | 27 | 13 | 188 |
| 63 | 59 | 93 | M18 x 1.5 | 31 | 3/8 | 98 | 34 | 16 | 206 |
| 80 | 76 | 116 | M22 x 1.5 | 37 | 1/2 | 116 | 44 | 16 | 247 |
| 100 | 92 | 133 | M26 x 1.5 | 40 | 1/2 | 126 | 43 | 17 | 258 |

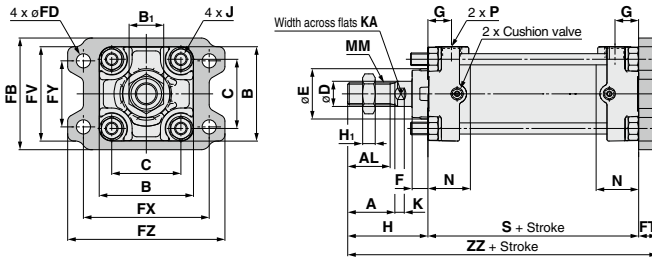
Rod Flange: CA2YF



| Bore size (mm) | A | AL | B | B ₁ | C | D | E | FB | FD | FT | FV | FX | FY | FZ | G | H | H ₁ | J | K |
|----------------|----|----|-----|----------------|----|----|----|-----|------|----|-----|-----|----|-----|----|----|----------------|------------|----|
| 40 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 71 | 9 | 12 | 60 | 80 | 42 | 100 | 15 | 51 | 8 | M8 x 1.25 | 6 |
| 50 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 81 | 9 | 12 | 70 | 90 | 50 | 110 | 17 | 58 | 11 | M8 x 1.25 | 7 |
| 63 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 101 | 11.5 | 15 | 86 | 105 | 59 | 130 | 17 | 58 | 11 | M10 x 1.25 | 7 |
| 80 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 119 | 13.5 | 18 | 102 | 130 | 76 | 160 | 21 | 71 | 13 | M12 x 1.75 | 10 |
| 100 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 133 | 13.5 | 18 | 116 | 150 | 92 | 180 | 21 | 72 | 16 | M12 x 1.75 | 10 |

| Bore size (mm) | KA | M | MM | N | P | S | ZZ |
|----------------|----|----|-----------|----|-----|-----|-----|
| 40 | 14 | 11 | M14 x 1.5 | 27 | 1/4 | 84 | 146 |
| 50 | 18 | 11 | M18 x 1.5 | 30 | 3/8 | 90 | 159 |
| 63 | 18 | 14 | M18 x 1.5 | 31 | 3/8 | 98 | 170 |
| 80 | 22 | 17 | M22 x 1.5 | 37 | 1/2 | 116 | 204 |
| 100 | 26 | 17 | M26 x 1.5 | 40 | 1/2 | 126 | 215 |

Head Flange: CA2YG

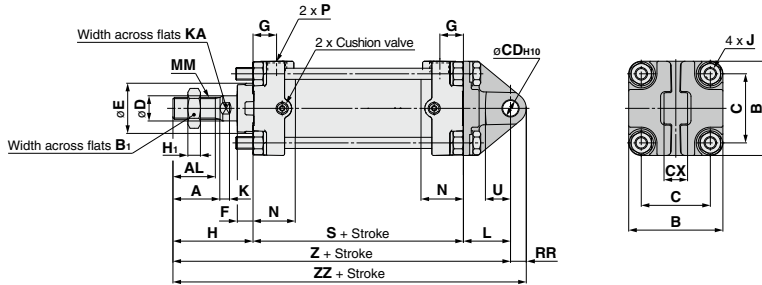


| Bore size (mm) | A | AL | B | B ₁ | C | D | E | F | FB | FD | FT | FV | FX | FY | FZ | G | H | H ₁ |
|----------------|----|----|-----|----------------|----|----|----|----|-----|------|----|-----|-----|----|-----|----|----|----------------|
| 40 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 71 | 9 | 12 | 60 | 80 | 42 | 100 | 15 | 51 | 8 |
| 50 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 81 | 9 | 12 | 70 | 90 | 50 | 110 | 17 | 58 | 11 |
| 63 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 101 | 11.5 | 15 | 86 | 105 | 59 | 130 | 17 | 58 | 11 |
| 80 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 119 | 13.5 | 18 | 102 | 130 | 76 | 160 | 21 | 71 | 13 |
| 100 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 133 | 13.5 | 18 | 116 | 150 | 92 | 180 | 21 | 72 | 16 |

| Bore size (mm) | J | K | KA | MM | N | P | S | ZZ |
|----------------|------------|----|----|-----------|----|-----|-----|-----|
| 40 | M8 x 1.25 | 6 | 14 | M14 x 1.5 | 27 | 1/4 | 84 | 147 |
| 50 | M8 x 1.25 | 7 | 18 | M18 x 1.5 | 30 | 3/8 | 90 | 160 |
| 63 | M10 x 1.25 | 7 | 18 | M18 x 1.5 | 31 | 3/8 | 98 | 171 |
| 80 | M12 x 1.75 | 10 | 22 | M22 x 1.5 | 37 | 1/2 | 116 | 205 |
| 100 | M12 x 1.75 | 10 | 26 | M26 x 1.5 | 40 | 1/2 | 126 | 216 |

CA2Y Series

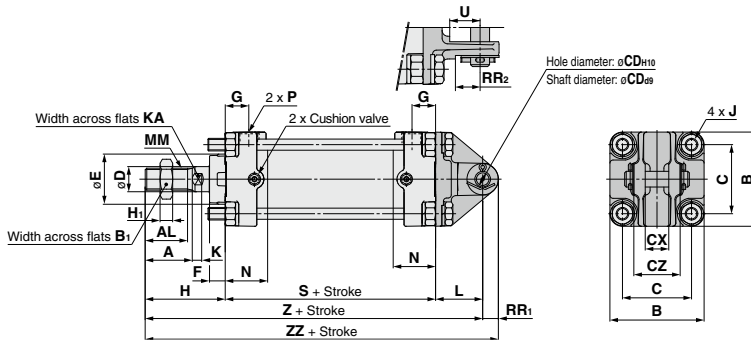
Single Clevis: CA2YC



| Bore size (mm) | A | AL | B | B ₁ | C | CDH ₁₀ | CX | D | E | F | G | H | H ₁ | J | K | KA |
|----------------|----|----|-----|----------------|----|-----------------------------------|--------------------------------------|----|----|----|----|----|----------------|------------|----|----|
| 40 | 30 | 27 | 60 | 22 | 44 | 10 ^{+0.058} ₀ | 15 ^{+0.1} _{-0.3} | 16 | 32 | 10 | 15 | 51 | 8 | M8 x 1.25 | 6 | 14 |
| 50 | 35 | 32 | 70 | 27 | 52 | 12 ^{+0.070} ₀ | 18 ^{+0.1} _{-0.3} | 20 | 40 | 10 | 17 | 58 | 11 | M8 x 1.25 | 7 | 18 |
| 63 | 35 | 32 | 85 | 27 | 64 | 16 ^{+0.070} ₀ | 25 ^{+0.1} _{-0.3} | 20 | 40 | 10 | 17 | 58 | 11 | M10 x 1.25 | 7 | 18 |
| 80 | 40 | 37 | 102 | 32 | 78 | 20 ^{+0.084} ₀ | 31.5 ^{+0.1} _{-0.3} | 25 | 52 | 14 | 21 | 71 | 13 | M12 x 1.75 | 10 | 22 |
| 100 | 40 | 37 | 116 | 41 | 92 | 25 ^{+0.084} ₀ | 35.5 ^{+0.1} _{-0.3} | 30 | 52 | 14 | 21 | 72 | 16 | M12 x 1.75 | 10 | 26 |

| Bore size (mm) | L | MM | N | P | RR | S | U | Z | ZZ |
|----------------|----|-----------|----|-----|----|-----|----|-----|-----|
| 40 | 30 | M14 x 1.5 | 27 | 1/4 | 10 | 84 | 16 | 165 | 175 |
| 50 | 35 | M18 x 1.5 | 30 | 3/8 | 12 | 90 | 19 | 183 | 195 |
| 63 | 40 | M18 x 1.5 | 31 | 3/8 | 16 | 98 | 23 | 196 | 212 |
| 80 | 48 | M22 x 1.5 | 37 | 1/2 | 20 | 116 | 28 | 235 | 255 |
| 100 | 58 | M26 x 1.5 | 40 | 1/2 | 25 | 126 | 36 | 256 | 281 |

Double Clevis: CA2YD



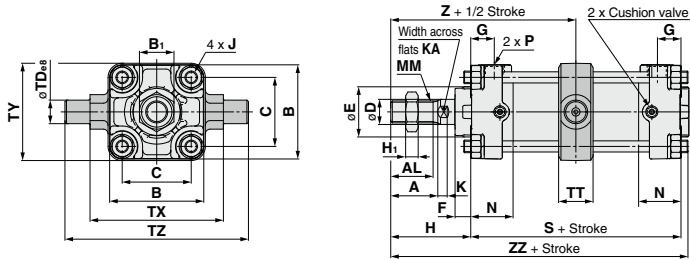
* A pin and retaining rings are shipped together with double clevis and/or double knuckle joint.

| Bore size (mm) | A | AL | B | B ₁ | C | CDH ₁₀ | CX | CZ | D | E | F | G | H | H ₁ | J | K | KA |
|----------------|----|----|-----|----------------|----|-----------------------------------|--------------------------------------|------|----|----|----|----|----|----------------|------------|----|----|
| 40 | 30 | 27 | 60 | 22 | 44 | 10 ^{+0.058} ₀ | 15 ^{+0.3} _{-0.1} | 29.5 | 16 | 32 | 10 | 15 | 51 | 8 | M8 x 1.25 | 6 | 14 |
| 50 | 35 | 32 | 70 | 27 | 52 | 12 ^{+0.070} ₀ | 18 ^{+0.3} _{-0.1} | 38 | 20 | 40 | 10 | 17 | 58 | 11 | M8 x 1.25 | 7 | 18 |
| 63 | 35 | 32 | 85 | 27 | 64 | 16 ^{+0.070} ₀ | 25 ^{+0.3} _{-0.1} | 49 | 20 | 40 | 10 | 17 | 58 | 11 | M10 x 1.25 | 7 | 18 |
| 80 | 40 | 37 | 102 | 32 | 78 | 20 ^{+0.084} ₀ | 31.5 ^{+0.3} _{-0.1} | 61 | 25 | 52 | 14 | 21 | 71 | 13 | M12 x 1.75 | 10 | 22 |
| 100 | 40 | 37 | 116 | 41 | 92 | 25 ^{+0.084} ₀ | 35.5 ^{+0.3} _{-0.1} | 64 | 30 | 52 | 14 | 21 | 72 | 16 | M12 x 1.75 | 10 | 26 |

| Bore size (mm) | L | MM | N | P | RR ₁ | RR ₂ | S | U | Z | ZZ |
|----------------|----|-----------|----|-----|-----------------|-----------------|-----|----|-----|-----|
| 40 | 30 | M14 x 1.5 | 27 | 1/4 | 10 | 16 | 84 | 16 | 165 | 175 |
| 50 | 35 | M18 x 1.5 | 30 | 3/8 | 12 | 19 | 90 | 19 | 183 | 195 |
| 63 | 40 | M18 x 1.5 | 31 | 3/8 | 16 | 23 | 98 | 23 | 196 | 212 |
| 80 | 48 | M22 x 1.5 | 37 | 1/2 | 20 | 28 | 116 | 28 | 235 | 255 |
| 100 | 58 | M26 x 1.5 | 40 | 1/2 | 25 | 23.5 | 126 | 36 | 256 | 281 |

* A clevis pin, flat washers and split pins are included.

Center Trunnion: CA2YT



| Bore size (mm) | A | AL | B | B ₁ | C | D | E | F | G | H | H ₁ | J | K | KA | MM | N | P |
|----------------|----|----|-----|----------------|----|----|----|----|----|----|----------------|------------|----|----|-----------|----|-----|
| 40 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 15 | 51 | 8 | M8 x 1.25 | 6 | 14 | M14 x 1.5 | 27 | 1/4 |
| 50 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 17 | 58 | 11 | M8 x 1.25 | 7 | 18 | M18 x 1.5 | 30 | 3/8 |
| 63 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 17 | 58 | 11 | M10 x 1.25 | 7 | 18 | M18 x 1.5 | 31 | 3/8 |
| 80 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 21 | 71 | 13 | M12 x 1.75 | 10 | 22 | M22 x 1.5 | 37 | 1/2 |
| 100 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 21 | 72 | 16 | M12 x 1.75 | 10 | 26 | M26 x 1.5 | 40 | 1/2 |

| Bore size (mm) | S | TDø8 | TT | TX | TY | TZ | Z | ZZ |
|----------------|-----|--|----|-----|-----|-----|-----|-----|
| 40 | 84 | 15 ^{+0.032} _{-0.059} | 22 | 85 | 62 | 117 | 93 | 140 |
| 50 | 90 | 15 ^{+0.032} _{-0.059} | 22 | 95 | 74 | 127 | 103 | 154 |
| 63 | 98 | 18 ^{+0.032} _{-0.059} | 28 | 110 | 90 | 148 | 107 | 162 |
| 80 | 116 | 25 ^{+0.040} _{-0.073} | 34 | 140 | 110 | 192 | 129 | 194 |
| 100 | 126 | 25 ^{+0.040} _{-0.073} | 40 | 162 | 130 | 214 | 135 | 206 |

* Do not disassemble the trunnion type. (Refer to the standard type.)

CA2Y Series

Trunnion and Double Clevis Pivot Bracket

- Strength is the same as cylinder brackets.

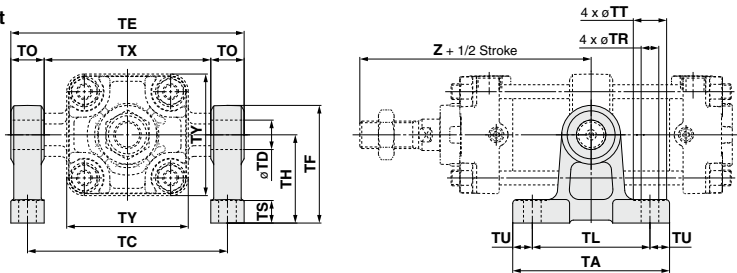
Type

| Bore size | CA2□40 | CA2□50 | CA2□63 | CA2□80 | CA2□100 |
|-----------------------------|---------|---------|---------|---------|---------|
| Description | CA2-S04 | | CA2-S06 | MB-S10 | |
| Trunnion pivot bracket | CA2-S04 | | CA2-S06 | MB-S10 | |
| Double clevis pivot bracket | CA2-B04 | CA2-B05 | CA2-B06 | CA2-B08 | CA2-B10 |

* Order 2 trunnion pivot brackets per cylinder.

Trunnion pivot bracket

Material: Cast iron

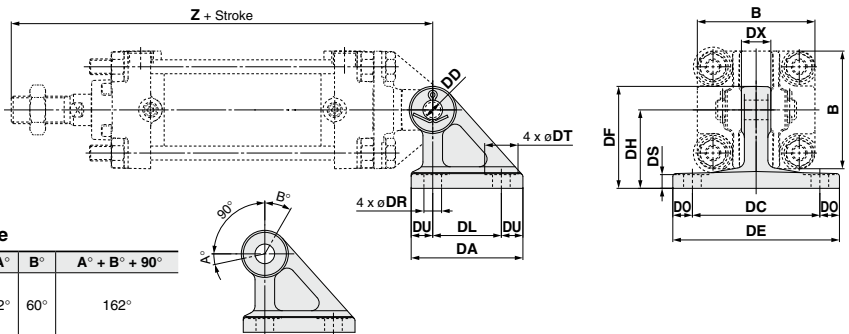


(mm)

| Part no. | Bore size (mm) | TA | TL | TU | TC | TX | TE | TO | TR | TT | TS | TH | TF | TY | Z | TD-H10 (Hole) |
|----------|----------------|-----|----|----|-----|-----|-----|----|------|----|----|----|-----|-----|-----|-----------------------------------|
| CA2-S04 | 40 | 80 | 60 | 10 | 102 | 85 | 119 | 17 | 9 | 17 | 12 | 45 | 60 | 62 | 93 | 15 ^{+0.070} ₀ |
| | 50 | 80 | 60 | 10 | 112 | 95 | 129 | 17 | 9 | 17 | 12 | 45 | 60 | 74 | 103 | 15 ^{+0.070} ₀ |
| CA2-S06 | 63 | 100 | 70 | 15 | 130 | 110 | 150 | 20 | 11 | 22 | 14 | 55 | 73 | 90 | 107 | 18 ^{+0.070} ₀ |
| | 80 | 120 | 90 | 15 | 166 | 140 | 192 | 26 | 13.5 | 24 | 17 | 75 | 100 | 110 | 129 | 25 ^{+0.084} ₀ |
| MB-S10 | 100 | 120 | 90 | 15 | 188 | 162 | 214 | 26 | 13.5 | 24 | 17 | 75 | 100 | 130 | 135 | 25 ^{+0.084} ₀ |

Double clevis pivot bracket

Material: Cast iron



Rotating Angle

| Bore size (mm) | A° | B° | A° + B° + 90° |
|----------------|-----|-----|---------------|
| 40 to 100 | 12° | 60° | 162° |

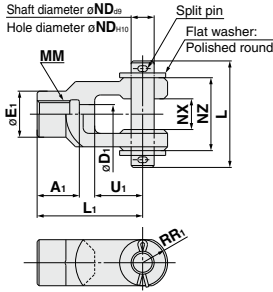
(mm)

| Part no. | Bore size (mm) | DA | DL | DU | DC | DX | DE | DO | DR | DT | DS | DH | DF | B | Z | DDH10 (Hole) |
|----------|----------------|----|----|------|-----|------|-----|------|------|----|----|----|----|-----|-----|-----------------------------------|
| CA2-B04 | 40 | 57 | 35 | 11 | 65 | 15 | 85 | 10 | 9 | 17 | 8 | 40 | 52 | 60 | 165 | 10 ^{+0.058} ₀ |
| CA2-B05 | 50 | 57 | 35 | 11 | 65 | 18 | 85 | 10 | 9 | 17 | 8 | 40 | 52 | 70 | 183 | 12 ^{+0.070} ₀ |
| CA2-B06 | 63 | 67 | 40 | 13.5 | 80 | 25 | 105 | 12.5 | 11 | 22 | 10 | 50 | 66 | 85 | 196 | 16 ^{+0.070} ₀ |
| CA2-B08 | 80 | 93 | 60 | 16.5 | 100 | 31.5 | 130 | 15 | 13.5 | 24 | 12 | 65 | 90 | 102 | 235 | 20 ^{+0.084} ₀ |
| CA2-B10 | 100 | 93 | 60 | 16.5 | 100 | 35.5 | 130 | 15 | 13.5 | 24 | 12 | 65 | 90 | 116 | 256 | 25 ^{+0.084} ₀ |

CA2Y Series

Dimensions of Accessories

Y Type Double Knuckle Joint

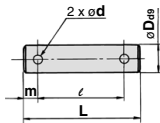


Material: Cast iron (mm)

| Part no. | Applicable bore size (mm) | Bore size | | | | MM | RR ₁ | U ₁ | ND | NX | NZ | L | Split pin size | Flat washer size |
|----------|---------------------------|----------------|----------------|----------------|----------------|-----------|-----------------|----------------|----|------------------------------------|----|------|----------------|-------------------|
| | | A ₁ | E ₁ | D ₁ | L ₁ | | | | | | | | | |
| Y-04D | 40 | 22 | 24 | 10 | 55 | M14 x 1.5 | 13 | 25 | 12 | 16 ^{+0.3} _{-0.1} | 38 | 55.5 | ø3 x 18 ℓ | Polished round 12 |
| Y-05D | 50, 63 | 27 | 28 | 14 | 60 | M18 x 1.5 | 15 | 27 | 12 | 16 ^{+0.3} _{-0.1} | 38 | 55.5 | ø3 x 18 ℓ | Polished round 12 |
| Y-08D | 80 | 37 | 36 | 18 | 71 | M22 x 1.5 | 19 | 28 | 18 | 28 ^{+0.3} _{-0.1} | 55 | 76.5 | ø4 x 25 ℓ | Polished round 18 |
| Y-10D | 100 | 37 | 40 | 21 | 83 | M26 x 1.5 | 21 | 38 | 20 | 30 ^{+0.3} _{-0.1} | 61 | 83 | ø4 x 30 ℓ | Polished round 20 |

* A knuckle pin, split pins and flat washers are included.

Clevis Pin/Knuckle Pin

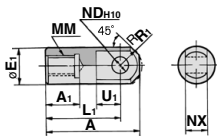


Material: Carbon steel (mm)

| Part no. | Applicable bore size | | Dd9 | L | ℓ | m | d Drill through | Included split pin | Included flat washer |
|----------|----------------------|------------|--|------|------|---|-----------------|--------------------|----------------------|
| | Clevis | Knuckle | | | | | | | |
| CDP-2A | 40 | — | 10 ^{-0.040} _{-0.076} | 46 | 38 | 4 | 3 | ø3 x 18 ℓ | Polished round 10 |
| CDP-3A | 50 | 40, 50, 63 | 12 ^{-0.050} _{-0.099} | 55.5 | 47.5 | 4 | 3 | ø3 x 18 ℓ | Polished round 12 |
| CDP-4A | 63 | — | 16 ^{-0.050} _{-0.093} | 71 | 61 | 5 | 4 | ø4 x 25 ℓ | Polished round 16 |
| CDP-5A | — | 80 | 18 ^{-0.050} _{-0.099} | 76.5 | 66.5 | 5 | 4 | ø4 x 25 ℓ | Polished round 18 |
| CDP-6A | 80 | 100 | 20 ^{-0.065} _{-0.117} | 83 | 73 | 5 | 4 | ø4 x 30 ℓ | Polished round 20 |
| CDP-7A | 100 | — | 25 ^{-0.065} _{-0.117} | 88 | 78 | 5 | 4 | ø4 x 36 ℓ | Polished round 24 |

* Split pins and flat washers are included.

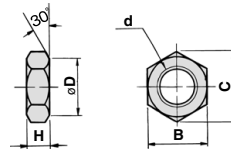
I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

| Part no. | Applicable bore size (mm) | Bore size | | | | MM | R ₁ | U ₁ | ND ^{#10} | NX |
|----------|---------------------------|-----------|----------------|----------------|----------------|-----------|----------------|----------------|--------------------------------------|------------------------------------|
| | | A | A ₁ | E ₁ | L ₁ | | | | | |
| I-04A | 40 | 69 | 22 | 24 | 55 | M14 x 1.5 | 15.5 | 20 | 12 ^{+0.070} _{-0.3} | 16 ^{-0.1} _{-0.3} |
| I-05A | 50, 63 | 74 | 27 | 28 | 60 | M18 x 1.5 | 15.5 | 20 | 12 ^{+0.070} _{-0.3} | 16 ^{-0.1} _{-0.3} |
| I-08A | 80 | 91 | 37 | 36 | 71 | M22 x 1.5 | 22.5 | 26 | 18 ^{+0.070} _{-0.3} | 28 ^{-0.1} _{-0.3} |
| I-10A | 100 | 105 | 37 | 40 | 83 | M26 x 1.5 | 24.5 | 28 | 20 ^{+0.084} _{-0.3} | 30 ^{-0.1} _{-0.3} |

Rod End Nut (Standard)



Material: Rolled steel (mm)

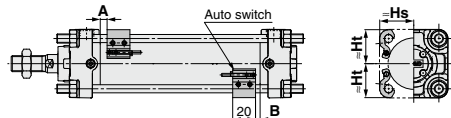
| Part no. | Applicable bore size (mm) | d | H | Bore size | | |
|----------|---------------------------|-----------|----|-----------|------|----|
| | | | | B | C | D |
| NT-04 | 40 | M14 x 1.5 | 8 | 22 | 25.4 | 21 |
| NT-05 | 50, 63 | M18 x 1.5 | 11 | 27 | 31.2 | 26 |
| NT-08 | 80 | M22 x 1.5 | 13 | 32 | 37.0 | 31 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | 47.3 | 39 |

CA2Y Series Auto Switch Mounting

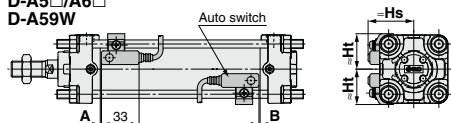
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

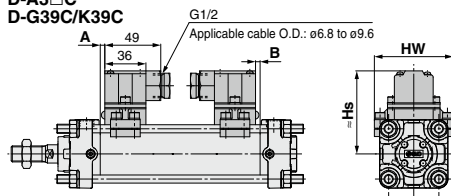
D-M9□/M9□V D-Z7□/Z80
 D-M9□W/M9□WV D-Y59□/Y69□/Y7P/Y7PV
 D-M9□A/M9□AV D-Y7□W/Y7□WV
 D-A9□/A9□V D-Y7BA



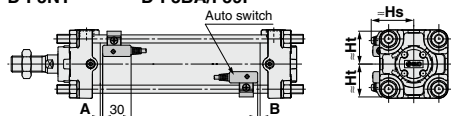
D-A5□/A6□
 D-A59W



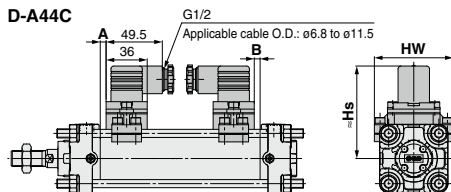
D-A3□C
 D-G39C/K39C



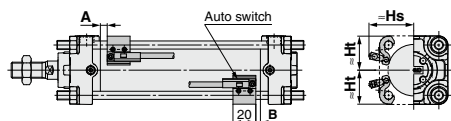
D-F5□/J59 D-F5□W/J59W
 D-F5NT D-F5BA/F59F



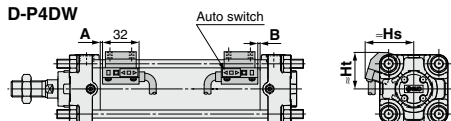
D-A44C



D-P3DWA

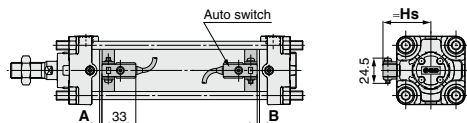


D-P4DW

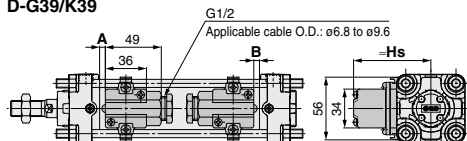


<Band mounting>

D-B5□/B64/B59W

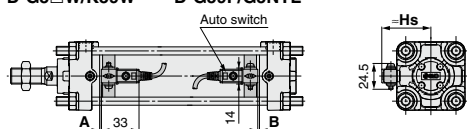


D-A3□
 D-G39/K39

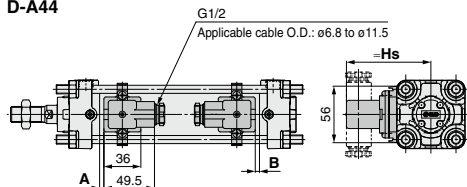


D-G5□/K59
 D-G5□W/K59W

D-G5BAL
 D-G59F/G5NTL



D-A44



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-M9□ D-M9□V D-M9□W D-M9□A D-M9□AV | | D-A9□ D-A9□V | | D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7BA D-Z7□ D-Z80 D-B59W | | D-P3DWA | | D-P4DW | | D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA | | D-A59W | | | D-F5NT | | D-G39 D-G39C D-K39 D-K39C D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C | | D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F | | D-B5□ D-B64 | |
|-------------------|--|------|-----------------|-----|---|-----|---------|------|--------|-----|--|------|--------|-----|------|--------|-----|--|-----|--|-----|----------------|--|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | |
| 40 | 9 | 9 | 5 | 5 | 2.5 | 2.5 | 4.5 | 4.5 | 2 | 2 | 5.5 | 5.5 | 3 | 3 | 10.5 | 10.5 | 0 | 0 | 1 | 1 | 0 | 0 | |
| 50 | 9.5 | 8.5 | 5.5 | 4.5 | 3 | 2 | 5 | 4 | 2.5 | 1.5 | 6 | 5 | 3.5 | 2.5 | 11 | 10 | 0 | 0 | 1.5 | 0.5 | 0 | 0 | |
| 63 | 12.5 | 11.5 | 8.5 | 7.5 | 6 | 5 | 8 | 7 | 5.5 | 4.5 | 9 | 8 | 6.5 | 5.5 | 14 | 13 | 2.5 | 1.5 | 4.5 | 3.5 | 3 | 2 | |
| 80 | 16.5 | 13.5 | 12.5 | 9.5 | 10 | 7 | 12 | 9 | 9.5 | 6.5 | 13 | 10 | 10.5 | 7.5 | 18 | 15 | 6.5 | 3.5 | 8.5 | 5.5 | 7 | 4 | |
| 100 | 18 | 16 | 14 | 12 | 11.5 | 9.5 | 13.5 | 11.5 | 11 | 9 | 14.5 | 12.5 | 12 | 10 | 19.5 | 17.5 | 8 | 6 | 10 | 8 | 8.5 | 6.5 | |

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

(mm)

| Auto switch model | D-M9□ D-M9□V D-M9□W D-M9□A D-A9□ | | D-M9□V D-M9□W D-M9□AV | | D-A9□V | | D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7PV D-Y7BA D-Y7□W | | D-Y69□ D-Y7P D-Y7□W | | D-P3DWA | | D-P4DW | | D-B5□ D-B64 D-B59W D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F | | D-A3□ D-G39 D-K39 | | D-A44 | | D-A5□ D-A6□ D-A59W | | D-F5□ D-J59 D-F5□W D-F5BA D-F5NT | | D-A3□C D-G39C D-K39C | | D-A44C | |
|-------------------|--|----|-----------------------------|----|--------|----|---|------|---------------------------|------|---------|------|--------|------|--|-------|-------------------------|------|-------|------|--------------------------|-----|--|-----|----------------------------|----|--------|----|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Hs | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 40 | 30 | 30 | 34 | 30 | 31 | 30 | 30 | 30 | 30 | 37.5 | 35 | 42.5 | 33 | 37 | 71.5 | 81.5 | 81.5 | 38.5 | 31.5 | 38 | 31.5 | 73 | 69 | 81 | 69 | | | |
| 50 | 34 | 34 | 38 | 34 | 35 | 34 | 34 | 34 | 34 | 41.5 | 39 | 46.5 | 37.5 | 42 | 76.5 | 86.5 | 42 | 35.5 | 42 | 35.5 | 78.5 | 77 | 86.5 | 77 | | | | |
| 63 | 41 | 41 | 44 | 41 | 41.5 | 41 | 41 | 41 | 41 | 50 | 41 | 52 | 43 | 49 | 83.5 | 93.5 | 46.5 | 43 | 47 | 43 | 85.5 | 91 | 93.5 | 91 | | | | |
| 80 | 49.5 | 49 | 52.5 | 49 | 50 | 49 | 49.5 | 49 | 49.5 | 58 | 49 | 58.5 | 51.5 | 57.5 | 92 | 102 | 53.5 | 51 | 53.5 | 51 | 94 | 107 | 102 | 107 | | | | |
| 100 | 56.5 | 56 | 61 | 56 | 58.5 | 56 | 56.5 | 55.5 | 57.5 | 66 | 56 | 66 | 58.5 | 68 | 102.5 | 112.5 | 61.5 | 57.5 | 61 | 57.5 | 104 | 121 | 112 | 121 | | | | |

Operating Range

(mm)

| Auto switch model | Bore size | | | | |
|--|-----------|-----|-----|-----|------|
| | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 4.5 | 5 | 5.5 | 5 | 6 |
| D-A9□/A9□V | 7.5 | 8.5 | 9.5 | 9.5 | 10.5 |
| D-Z7□/Z80 | 8.5 | 7.5 | 9.5 | 9.5 | 10.5 |
| D-A3□/A44 D-A3□C/A44C | 9 | 10 | 11 | 11 | 11 |
| D-A5□/A6□ | | | | | |
| D-B5□/B64 | | | | | |
| D-A59W | 13 | 13 | 14 | 14 | 15 |
| D-B59W | 14 | 14 | 17 | 16 | 18 |

| Auto switch model | Bore size | | | | |
|---|-----------|-----|-----|-----|-----|
| | 40 | 50 | 63 | 80 | 100 |
| D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA | 8 | 7 | 5.5 | 6.5 | 6.5 |
| D-F5□/J59/F5□W D-J59W/F59F D-F5NT/F59F | 4 | 4 | 4.5 | 4.5 | 4.5 |
| D-G5□/K59/G5□W D-K59W/G5BA D-G5NT/G59F | 5 | 6 | 6.5 | 6.5 | 7 |
| D-G39/K39 D-G39C/K39C | 9 | 9 | 10 | 10 | 11 |
| D-P3DWA | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 |
| D-P4DW | 4 | 4 | 4.5 | 4 | 4.5 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Minimum Stroke for Auto Switch Mounting

| | | n: Number of auto switches (mm) | | | | | |
|--|---|---|--|---|--|--|--|
| Auto switch model | Number of auto switches mounted | Mounting brackets other than center trunnion | Center trunnion | | | | |
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-M9□ D-M9□W | 2 (Different surfaces and same surface) 1 | 15 | 80 | | 85 | 90 | 95 |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-M9□V D-M9□WV | 2 (Different surfaces and same surface) 1 | 10 | 55 | | 60 | 65 | 70 |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-M9□A | 2 (Different surfaces and same surface) 1 | 15 | 80 | | 85 | 95 | 100 |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-M9□AV | 2 (Different surfaces and same surface) 1 | 10 | 60 | | 65 | 70 | 75 |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-A9□ | 2 (Different surfaces and same surface) 1 | 15 | 75 | | 80 | 85 | 90 |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-A9□V | 2 (Different surfaces and same surface) 1 | 10 | 50 | | 55 | 60 | 65 |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-A5□/A6 D-F5□/J5 D-F5□W/J59W D-F5BA/F59F | 2 (Different surfaces and same surface) 1 | 15 | 90 | | 100 | 110 | 120 |
| | n (Same surface) | $15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-A59W | 2 (Different surfaces and same surface) 1 | 20 | 90 | | 100 | 110 | 120 |
| | n (Same surface) | $20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| | 1 | 15 | 90 | | 100 | 110 | 120 |
| D-F5NT | 2 (Different surfaces and same surface) 1 | 25 | 110 | | 120 | 130 | 140 |
| | n (Same surface) | $25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) |
| D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G5BA D-G59F D-G5NT | 2 | Different surfaces | 15 | 90 | 100 | 110 | 110 |
| | | Same surface | 75 | | | | |
| | n | Different surfaces | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | |
| | | Same surface | $75 + 50 (n-2)$ (n = 2, 3, 4...) | $90 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | $100 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | $110 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | |
| | 1 | 10 | 90 | 100 | 110 | | |
| D-B59W | 2 | Different surfaces | 20 | 90 | 100 | 110 | 110 |
| | | Same surface | 75 | | | | |
| | n | Different surfaces | $20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1) | $90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | $110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2) | |
| | Same surface | $75 + 50 (n-2)$ (n = 2, 3, 4...) | $90 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | $100 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | $110 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1) | | |
| 1 | 15 | 90 | 100 | 110 | | | |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
 Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting

| | | n: Number of auto switches (mm) | | | | | |
|-----------------------------------|---|---|--|--|--|--|--|
| Auto switch model | Number of auto switches mounted | Mounting brackets other than center trunnion | Center trunnion | | | | |
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-A3□ D-G39 D-K39 | 2 | Different surfaces | 35 | 75 | 80 | 90 | |
| | | Same surface | 100 | 100 | 100 | 100 | |
| | n | Different surfaces | $35 + 30(n - 2)$ (n = 2, 3, 4...) | $75 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $100 + 100(n - 2)$ (n = 2, 3, 4...) | | $100 + 100(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | | |
| | 1 | 10 | 75 | 80 | 90 | | |
| D-A44 | 2 | Different surfaces | 35 | 75 | 80 | 90 | |
| | | Same surface | 55 | | | | |
| | n | Different surfaces | $35 + 30(n - 2)$ (n = 2, 3, 4...) | $75 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $55 + 50(n - 2)$ (n = 2, 3, 4...) | $75 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | 1 | 10 | 75 | 80 | 90 | | |
| D-A3□C D-G39C D-K39C | 2 | Different surfaces | 20 | 75 | 80 | 90 | |
| | | Same surface | 100 | 100 | 100 | 100 | |
| | n | Different surfaces | $20 + 35(n - 2)$ (n = 2, 3, 4...) | $75 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $100 + 100(n - 2)$ (n = 2, 3, 4, 5...) | | $100 + 100(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | | |
| | 1 | 10 | 75 | 80 | 90 | | |
| D-A44C | 2 | Different surfaces | 20 | 75 | 80 | 90 | |
| | | Same surface | 55 | | | | |
| | n | Different surfaces | $20 + 35(n - 2)$ (n = 2, 3, 4...) | $75 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $55 + 50(n - 2)$ (n = 2, 3, 4...) | $75 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | 1 | 10 | 75 | 80 | 90 | | |
| D-Z7□/Z80 D-Y59□/Y7P D-Y7□W | 2 (Different surfaces and same surface) 1 | 15 | 80 | 85 | 90 | 95 | 105 |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-Y69□/Y7PV D-Y7□WV | 2 (Different surfaces and same surface) 1 | 10 | 65 | 75 | 80 | 90 | |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-Y7BA | 2 (Different surfaces and same surface) 1 | 20 | 95 | 100 | 105 | 110 | |
| | n | $20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $95 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $100 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $105 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $110 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-P3DWA | 2 (Different surfaces and same surface) 1 | 15 | | 85 | | | |
| | n | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | | $85 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | | |
| D-P4DW | 2 (Different surfaces and same surface) 1 | 15 | 120 | 130 | 140 | | |
| | n | $15 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $120 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $130 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $140 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | | |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

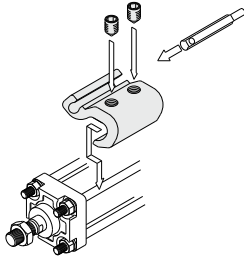
Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

CA2Y Series

Auto Switch Mounting Brackets/Part No.

<Tie-rod mounting>

| Auto switch model | Bore size (mm) | | | | |
|--|----------------|----------|-----------|-----------|-----------|
| | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V | BA7-040 | BA7-040 | BA7-063 | BA7-080 | BA7-080 |
| D-A5□/A6□ D-A59W D-F5□/J59 D-F5□W/J59W D-F59F/F5NT | BT-04 | BT-04 | BT-06 | BT-08 | BT-08 |
| D-A3□C/A44C D-G39C/K39C | BA3-040 | BA3-050 | BA3-063 | BA3-080 | BA3-100 |
| D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA | BA4-040 | BA4-040 | BA4-063 | BA4-080 | BA4-080 |
| D-P3DWA | BK7-040S | BK7-040S | BA10-063S | BA10-080S | BA10-080S |
| D-P4DW | BAP2-040 | BAP2-040 | BAP2-063 | BAP2-080 | BAP2-080 |



* The figure shows the mounting example for the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types.

<Band mounting>

| Auto switch model | Bore size (mm) | | | | |
|---|----------------|---------|----------|----------|----------|
| | 40 | 50 | 63 | 80 | 100 |
| D-A3□/A44 D-G39/K39 | BDS-04M | BDS-05M | BMB1-063 | BMB1-080 | BMB1-100 |
| D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT | BH2-040 | BA5-050 | BAF-06 | BAF-08 | BAF-10 |

Note 1) The auto switch mounting bracket is included in the D-A3□C/A44C/G39C/K39C types. Specify the part number as follows depending on the cylinder size when ordering.
(Example) ø40: D-A3□C-4, ø50: D-A3□C-5, ø63: D-A3□C-6, ø80: D-A3□C-8, ø100: D-A3□C-10

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is also available. Use it in accordance with the operating environment.

(Since the auto switch mounting bracket is not included, order it separately.)

- BBA1: For D-A5/A6/F5/J5 types
- BBA3: For D-B5/B6/G5/K5 types
- Note 2) Refer to pages 1439 and 1447 for details on the BBA1 and BBA3. The above stainless steel screws are used when a cylinder is shipped with D-F5BA or G5BA auto switches. When only an auto switch is shipped independently, the BBA1 or BBA3 is attached.
- Note 3) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BA7-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6L stainless steel set screws included in the BBA1.
- Note 4) There is a difference in the cylinder tube thickness depending on the cylinder model. When a band mounting type is used as an applicable auto switch and a cylinder model is changed, use caution.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features |
|-------------|-----------------------|-------------------------|---|
| Reed | D-A93V/A96V | Grommet (Perpendicular) | — |
| | D-A90V | | Without indicator light |
| | D-A53/A56/B53/Z73/Z76 | Grommet (In-line) | — |
| | D-A67/Z80 | | Without indicator light |
| Solid state | D-M9NV/M9PV/M9BV | Grommet (Perpendicular) | — |
| | D-Y69A/Y69B/Y7PV | | — |
| | D-M9NWV/M9PWV/M9BWW | | Diagnostic indication (2-color indicator) |
| | D-Y7NWV/Y7PWV/Y7BWW | | Water resistant (2-color) |
| | D-M9NAV/M9PAV/M9BAV | | — |
| | D-Y59A/Y59B/Y7P | | — |
| | D-F59/F5P/J59 | Grommet (In-line) | — |
| | D-Y7NW/Y7PW/Y7BW | | Diagnostic indication (2-color indicator) |
| | D-F59W/F5PW/J59W | | Water resistant (2-color) |
| | D-F5BA/Y7BA | | With timer |
| | D-F5NT/G5NT | | Magnetic field resistant (2-color) |
| | D-P5DW | | — |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1360 and 1362.

Smooth Cylinder

CS2Y Series

∅125, ∅140, ∅160

How to Order

CS2Y L 160 - **300** -

With auto switch **CDS2Y L 160** - **300** - **M9BW** -

With auto switch (Built-in magnet)

Smooth cylinder

Mounting

| | |
|---|-----------------|
| B | Basic |
| L | Foot |
| F | Rod flange |
| G | Head flange |
| C | Single clevis |
| D | Double clevis |
| T | Center trunnion |

Bore size

| | |
|-----|--------|
| 125 | 125 mm |
| 140 | 140 mm |
| 160 | 160 mm |

Port thread type

| | |
|-----|-----|
| Nil | Rc |
| TN | NPT |
| TF | G |

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| 3 | 3 pcs. |
| n | "n" pcs. |

Made to Order
Refer to page 226 for details.

Auto switch

| | |
|-----|---------------------|
| Nil | Without auto switch |
|-----|---------------------|

* For applicable auto switches, refer to the table below.

Suffix for cylinder

| | | |
|----------------------|-----|--------------------------|
| Rod boot | J | Nylon tarpaulin |
| | K | Heat resistant tarpaulin |
| With/without cushion | A | With double-side cushion |
| | R | With rod cushion |
| | H | With head cushion |
| | Nil | Without cushion |

* When more than one symbol is specified, indicate them in alphabetical order.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDS2YL125-200

Cylinder stroke (mm)
Refer to "Maximum Strokes" on page 226.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length (m) | | | | Pre-wired connector | Applicable load | | | | | | | | | | |
|---|---|------------------|--------------------|-------------------------|--------------|-----------|-------------------|---------------|----------------------|-------|-------|---------|---------------------|-----------------|------------|---|---|------|---|---|---|---|---|---|
| | | | | | DC | AC | Tie-rod mounting | Band mounting | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | | | | | | | | | | | |
| Solid state auto switch | — | Grommet | — | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9N | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | | | | | | | | | |
| | | | | 3-wire (PNP) | | | | M9P | ● | ● | ● | ○ | ○ | | | | | | | | | | | |
| | | 2-wire | M9B | ● | | | | ● | ● | ○ | ○ | | | | | | | | | | | | | |
| | | — | G39 | — | | | | — | — | — | — | | | | | | | | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NW | ● | ● | ● | ○ | ○ | IC circuit | | | | | | | | | | |
| | | | | 3-wire (PNP) | | | | M9PW | ● | ● | ● | ○ | ○ | | | | | | | | | | | |
| | Water resistant (2-color indicator) | Grommet | — | 2-wire | 24 V | 5 V, 12 V | — | M9B | ● | ● | ● | ○ | ○ | — | | | | | | | | | | |
| | | | | 3-wire (NPN) | | | | M9NA*1 | — | ○ | ○ | ● | ○ | | | ○ | | | | | | | | |
| | | | | 3-wire (PNP) | | | | M9PA*1 | — | ○ | ○ | ● | ○ | | | ○ | | | | | | | | |
| | | | | 2-wire | | | | M9BA*1 | — | ○ | ○ | ● | ○ | | | ○ | | | | | | | | |
| Diagnostic indication (2-color indicator) | Grommet | — | 4-wire (NPN) | 24 V | 5 V, 12 V | — | F59F | ● | — | ● | ○ | ○ | IC circuit | | | | | | | | | | | |
| | | | 2-wire (Non-polar) | | | | P3DWA | — | ● | — | ● | ○ | | ○ | | | | | | | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 24 V | 12 V | — | A96 | ● | — | ● | — | — | IC circuit | Relay, PLC | | | | | | | | | |
| | | | | | | | | A93 | ● | ● | ● | — | — | | | | | | | | | | | |
| | | | | | | | | A90 | — | — | ● | — | — | | | | | | | | | | | |
| | | | | | | | | A54 | — | ● | — | ● | — | | | | | | | | | | | |
| | | | | | | | | A64 | — | ● | — | ● | — | | | | | | | | | | | |
| | | Terminal conduit | — | No | | | | 2-wire | 24 V | 12 V | — | A33 | — | — | | — | — | — | — | | | | | |
| | | | | | | | | | | | | A34 | — | — | | — | — | — | | | | | | |
| | | DIN terminal | — | Yes | | | | 2-wire | 24 V | 12 V | — | A44 | — | — | | — | — | — | — | | | | | |
| | | | | | | | | | | | | Grommet | — | — | | — | — | A59W | | — | ● | — | — | — |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Please consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW 3 m L (Example) M9NWL 1 m M (Example) M9NWM 5 m Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.

* Since there are other applicable auto switches than listed, refer to page 236 for details.

* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* The D-A9□/M9□/M9□/W/M9□/A/P3DWA□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

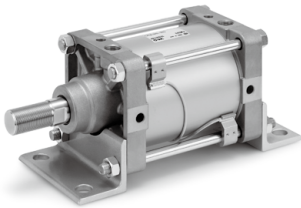
CS2Y Series

Designed with a low sliding resistance of the piston, this air cylinder is ideal for applications such as contact pressure control, which requires smooth movements at low pressure.

Low sliding resistance

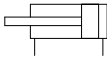
Min. operating pressure — 0.005 MPa

Auto switch mounting is possible.



Symbol

Double acting/Without cushion



Made to Order

[Click here for details](#)

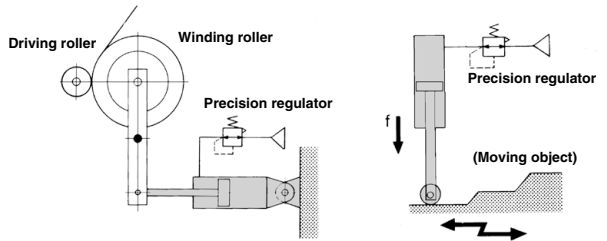
| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC3 | Special port position |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC10 | Dual stroke cylinder/Double rod type |
| -XC14 | Change of trunnion bracket mounting position |
| -XC15 | Change of tie-rod length |
| -XC26 | With split pins for double clevis pin/double knuckle joint pin and flat washers |
| -XC27 | Double clevis and double knuckle pins made of stainless steel |
| -XC30 | Rod side trunnion |
| -XC68 | Made of stainless steel (with hard chrome plated piston rod) |
| -XC86 | With rod end bracket |

Refer to pages 234 to 236 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Application Example

Low friction cylinder is used in combination with precision regulator (IR series).



Specifications

| Bore size (mm) | 125 | 140 | 160 |
|--------------------------------------|---|-----|-----|
| Action | Double acting, Single rod | | |
| Direction of low friction | Both directions | | |
| Fluid | Air | | |
| Proof pressure | 1.05 MPa | | |
| Maximum operating pressure | 0.7 MPa | | |
| Ambient and fluid temperature | Without auto switch: 0°C to 70°C With auto switch: 0°C to 60°C (No freezing) | | |
| Allowable leakage | Less than 0.5 L/min (ANR) | | |
| Cushion | Without cushion* (manufacturable with cushion) | | |
| Lubrication | Not required (Non-lube) | | |
| Mounting | Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion | | |

* If an air cushion is not used, set the energy at the stroke end to 0.36J (ø125, ø140) or less, 0.3J (ø160) or less.

Minimum Operating Pressure

| Bore size (mm) | 125 | 140 | 160 |
|----------------------------|------------|-----|-----|
| Minimum operating pressure | 0.005 MPa* | | |

Unit: MPa

* If a cushion is used, this value will not include the operating pressure within the cushion stroke.

Maximum Strokes

| Mounting bracket Bore size (mm) | (mm) | |
|------------------------------------|---|------------------|
| | Basic, Head flange, Single clevis, Double clevis, Center trunnion | Foot, Rod flange |
| 125 | 1000 or less | 1600 or less |
| 140 | 1000 or less | 1600 or less |
| 160 | 1200 or less | 1600 or less |

Accessories

For details, refer to page 233.

| Mounting | | Basic | Foot | Rod flange | Head flange | Single clevis | Double clevis | Center trunnion |
|----------|--|-------|------|------------|-------------|---------------|---------------|-----------------|
| Standard | Clevis pin | — | — | — | — | — | ● | — |
| Option | Rod end nut | ● | ● | ● | ● | ● | ● | ● |
| | Single knuckle joint | ● | ● | ● | ● | ● | ● | ● |
| | Double knuckle joint (with knuckle pin, split pin) | ● | ● | ● | ● | ● | ● | ● |
| | Rod boot | ● | ● | ● | ● | ● | ● | ● |

Mounting Brackets/Part No.

| Bore size (mm) | 125 | 140 | 160 |
|-----------------|---------|---------|---------|
| Foot* | CS2-L12 | CS2-L14 | CS2-L16 |
| Flange | CS2-F12 | CS2-F14 | CS2-F16 |
| Single clevis | CS2-C12 | CS2-C14 | CS2-C16 |
| Double clevis** | CS2-D12 | CS2-D14 | CS2-D16 |

* Order two foot brackets per cylinder.

** When ordering the double clevis type, the clevis pin and 2 split pins are included as accessories.

Weights

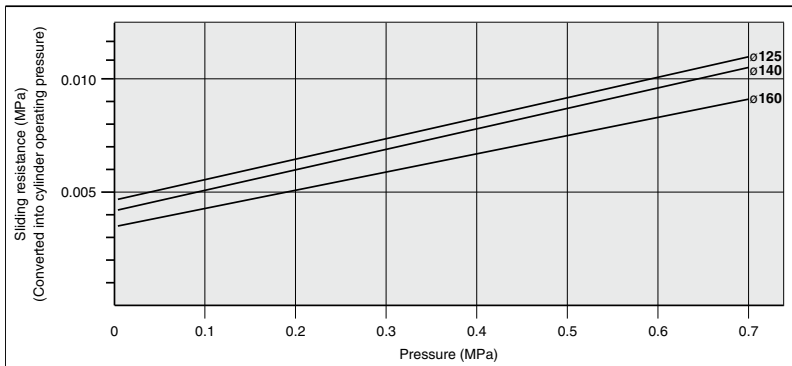
| Bore size (mm) | | 125 | 140 | 160 |
|--|--|------|-------|-------|
| Basic weight | Basic | 5.46 | 6.50 | 9.07 |
| | Foot | 7.49 | 9.50 | 12.45 |
| | Rod flange | 8.51 | 12.03 | 15.80 |
| | Head flange | 8.51 | 12.03 | 15.80 |
| | Single clevis | 8.53 | 10.79 | 14.56 |
| | Double clevis | 8.99 | 11.54 | 15.41 |
| | Trunnion | 9.59 | 12.23 | 15.47 |
| Additional weight with magnet (With built-in magnet and auto switch) | | 0.07 | 0.07 | 0.08 |
| Additional weight per 100 mm of stroke | | 1.55 | 1.67 | 2.23 |
| Accessories | Single knuckle | 0.91 | 1.16 | 1.56 |
| | Double knuckle (With Knuckle pin, Split pin) | 1.37 | 1.81 | 2.48 |
| | Rod end nut | 0.16 | 0.16 | 0.23 |

Calculation: (Example) **CS2Y160-500**

- Basic weight.....12.45 (kg)
- Additional weight.....2.23 (kg/100 mm)
- Cylinder stroke.....500 (mm)

$$12.45 + 2.23 \times 500/100 = \mathbf{23.60 \text{ kg}}$$

Sliding Resistance



Rod Boot Material

| Symbol | Material | Max. ambient temperature |
|--------|--------------------------|--------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C* |

* Maximum ambient temperature for the rod boot itself.

Replacement Parts: Seal kit.

| Bore size (mm) | Kit no. | Content |
|----------------|--------------|--------------------------|
| 125 | CS2Y125A-PS | Without cushion |
| | | · Rod seal 1 pc. |
| 140 | CS2Y140A-PS | · Piston seal 1 pc. |
| | | · Tube gasket 2 pcs. |
| 160 | CS2Y160A-PS | · Tube gasket 2 pcs. |
| | | · Tube gasket 2 pcs. |
| 125 | CS2Y125AA-PS | With single-side cushion |
| | | · Rod seal 1 pc. |
| 140 | CS2Y140AA-PS | · Cushion seal 2 pcs. |
| | | · Piston seal 1 pc. |
| 160 | CS2Y160AA-PS | · Tube gasket 2 pcs. |
| | | · Tube gasket 2 pcs. |
| 125 | CS2Y125AR-PS | With single-side cushion |
| | | · Rod seal 1 pc. |
| 140 | CS2Y140AR-PS | · Cushion seal 1 pc. |
| | | · Piston seal 1 pc. |
| 160 | CS2Y160AR-PS | · Tube gasket 2 pcs. |
| | | · Tube gasket 2 pcs. |

* Seal kit does not include a grease pack.

Order with the following part number when only the grease pack is needed.

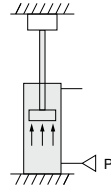
Grease pack part number: GR-L-005 (5 g), GR-L-010 (10 g), GR-L-150 (150 g)

Relationship between Cylinder Size and Maximum Stroke

The below table shows the applicable maximum stroke (in cm units), found by calculation assuming the case where the force generated by the cylinder itself acts as buckling force on the piston rod, or piston rod and cylinder tube.

Therefore, it is possible to find the applicable maximum stroke for each cylinder size using the relationship between the size of the operating pressure and the cylinder support type, regardless of the load ratio.

[Reference] If it is stopped with the external stopper on the cylinder extension side, even with a light load, the maximum generated force of the cylinder will act on the cylinder itself.

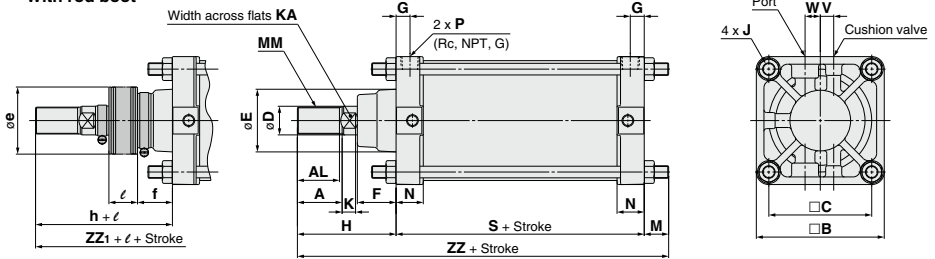


| Mounting | | | Operating pressure (MPa) | Applicable maximum stroke according to buckling strength (cm) | | | |
|--|----------------------|---------------------------|--------------------------|---|-----|-----|-----|
| Support bracket nominal symbol and schematic diagram | | Nominal symbol | | 125 | 140 | 160 | |
| Foot: L | Rod flange: F | Head flange: G | 0.3 | 103 | 92 | 113 | |
| | | | L, F | 0.5 | 79 | 70 | 86 |
| | | | | 0.7 | 66 | 58 | 72 |
| | | | G | 0.3 | 45 | 38 | 47 |
| | | | 0.5 | 33 | 27 | 34 | |
| | | | 0.7 | 26 | 22 | 27 | |
| Clevis: C, D | | Center trunnion: T | 0.3 | 96 | 83 | 106 | |
| | | | C, D | 0.5 | 71 | 61 | 76 |
| | | | | 0.7 | 59 | 50 | 62 |
| | | | T | 0.3 | 135 | 119 | 147 |
| | | | 0.5 | 101 | 89 | 111 | |
| | | | 0.7 | 84 | 74 | 91 | |
| Foot: L | Rod flange: F | Head flange: G | 0.3 | 301 | 267 | 330 | |
| | | | L, F | 0.5 | 231 | 207 | 253 |
| | | | | 0.7 | 193 | 172 | 212 |
| | | | G | 0.3 | 144 | 126 | 156 |
| | | | 0.5 | 109 | 94 | 118 | |
| | | | 0.7 | 90 | 78 | 97 | |
| Foot: L | Rod flange: F | Head flange: G | 0.3 | 433 | 386 | 476 | |
| | | | L, F | 0.5 | 334 | 297 | 367 |
| | | | | 0.7 | 281 | 250 | 309 |
| | | | G | 0.3 | 210 | 185 | 229 |
| | | | 0.5 | 160 | 141 | 175 | |
| | | | 0.7 | 134 | 117 | 129 | |

Dimensions

Basic: CS2YB

With rod boot



| Bore size (mm) | A | AL | □B | □C | D | E | F | G | J | V | W | K | KA | M | MM |
|----------------|----|----|-----|-----|----|------|----|----|-----------|----|----|----|----|------|-----------|
| 125 | 50 | 47 | 143 | 115 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 27 | M30 x 1.5 |
| 140 | 50 | 47 | 157 | 128 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 27 | M30 x 1.5 |
| 160 | 56 | 53 | 177 | 144 | 38 | 78.5 | 42 | 18 | M16 x 1.5 | 15 | 20 | 17 | 34 | 30.5 | M36 x 1.5 |

(mm)

| Bore size (mm) | N | P | S | Without rod boot | | With rod boot | | | | |
|----------------|------|-----|-----|------------------|-------|---------------|----|-----|------------|-----------------|
| | | | | H | ZZ | e | f | h | ℓ | ZZ ₁ |
| 125 | 30.5 | 1/2 | 98 | 110 | 235 | 75 | 40 | 133 | 1/5 Stroke | 258 |
| 140 | 30.5 | 1/2 | 98 | 110 | 235 | 75 | 40 | 133 | 1/5 Stroke | 258 |
| 160 | 34.5 | 3/4 | 106 | 120 | 256.5 | 75 | 40 | 141 | 1/5 Stroke | 277.5 |

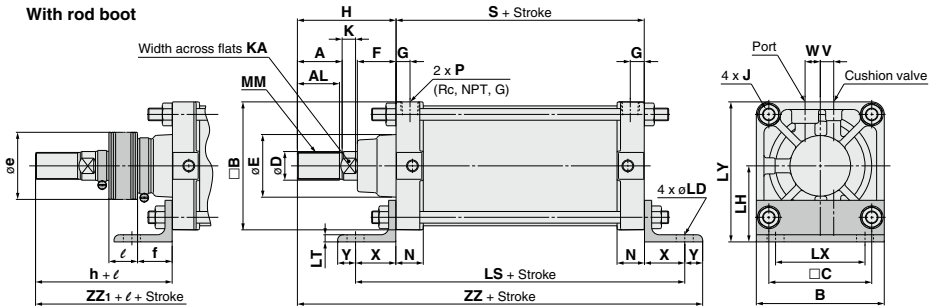
* The minimum stroke with rod boot is 30 mm or more.

** For auto switch mounting position and its mounting height, refer to page 234.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

Foot: CS2YL

With rod boot



| Bore size (mm) | A | AL | □B | B | □C | D | E | F | G | J | V | W | K | KA | LD | LH | LS |
|----------------|----|----|-----|-----|-----|----|------|----|----|-----------|----|----|----|----|----|-----|-----|
| 125 | 50 | 47 | 143 | 143 | 115 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 19 | 85 | 188 |
| 140 | 50 | 47 | 157 | 157 | 128 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 19 | 100 | 188 |
| 160 | 56 | 53 | 177 | 177 | 144 | 38 | 78.5 | 42 | 18 | M16 x 1.5 | 15 | 20 | 17 | 34 | 19 | 106 | 206 |

(mm)

| Bore size (mm) | LT | LX | LY | MM | N | P | S | X | Y | Without rod boot | | With rod boot | | | | |
|----------------|----|-----|-------|-----------|------|-----|-----|----|----|------------------|-----|---------------|----|-----|------------|-----------------|
| | | | | | | | | | | H | ZZ | e | f | h | ℓ | ZZ ₁ |
| 125 | 8 | 100 | 156.5 | M30 x 1.5 | 30.5 | 1/2 | 98 | 45 | 20 | 110 | 273 | 75 | 40 | 133 | 1/5 Stroke | 296 |
| 140 | 9 | 112 | 178.5 | M30 x 1.5 | 30.5 | 1/2 | 98 | 45 | 30 | 110 | 283 | 75 | 40 | 133 | 1/5 Stroke | 306 |
| 160 | 9 | 118 | 194.5 | M36 x 1.5 | 34.5 | 3/4 | 106 | 50 | 25 | 120 | 301 | 75 | 40 | 141 | 1/5 Stroke | 322 |

* The minimum stroke with rod boot is 30 mm or more.

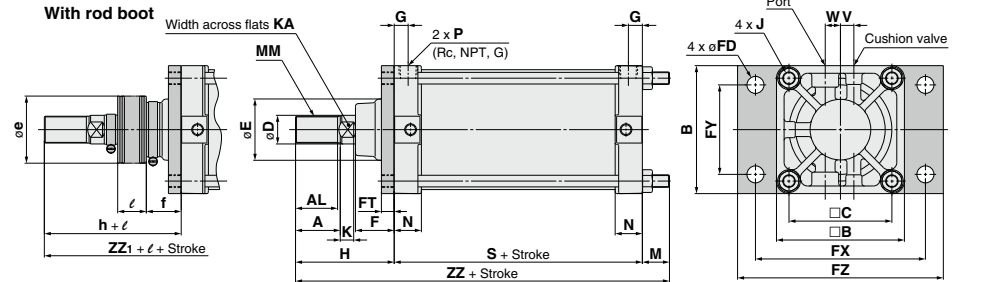
** For auto switch mounting position and its mounting height, refer to page 234.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

CS2Y Series

Dimensions

Rod flange: CS2YF

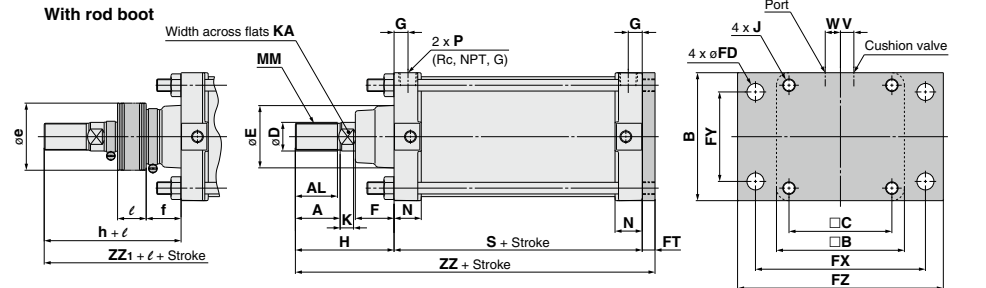


| Bore size (mm) | A | AL | □B | B | □C | D | E | F | FD | FT | FX | FY | FZ | G | J | V |
|----------------|----|----|-----|-----|-----|----|------|----|----|----|-----|-----|-----|----|-----------|----|
| 125 | 50 | 47 | 143 | 145 | 115 | 32 | 71 | 43 | 19 | 14 | 190 | 100 | 230 | 15 | M14 x 1.5 | 15 |
| 140 | 50 | 47 | 157 | 160 | 128 | 32 | 71 | 43 | 19 | 20 | 212 | 112 | 255 | 15 | M14 x 1.5 | 15 |
| 160 | 56 | 53 | 177 | 180 | 144 | 38 | 78.5 | 42 | 19 | 20 | 236 | 118 | 275 | 18 | M16 x 1.5 | 15 |

| Bore size (mm) | W | K | KA | M | MM | N | P | S | Without rod boot | | With rod boot | | | | |
|----------------|----|----|----|----|-----------|------|-----|-----|------------------|-----|---------------|----|-----|------------|-----------------|
| | | | | | | | | | H | ZZ | e | f | h | ℓ | ZZ ₁ |
| 125 | 17 | 15 | 27 | 13 | M30 x 1.5 | 30.5 | 1/2 | 98 | 110 | 221 | 75 | 40 | 133 | 1/5 Stroke | 244 |
| 140 | 17 | 15 | 27 | 13 | M30 x 1.5 | 30.5 | 1/2 | 98 | 110 | 221 | 75 | 40 | 133 | 1/5 Stroke | 244 |
| 160 | 20 | 17 | 34 | 15 | M36 x 1.5 | 34.5 | 3/4 | 106 | 120 | 241 | 75 | 40 | 141 | 1/5 Stroke | 262 |

- * The minimum stroke with rod boot is 30 mm or more.
- ** For auto switch mounting position and its mounting height, refer to page 234.
- *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

Head flange: CS2YG



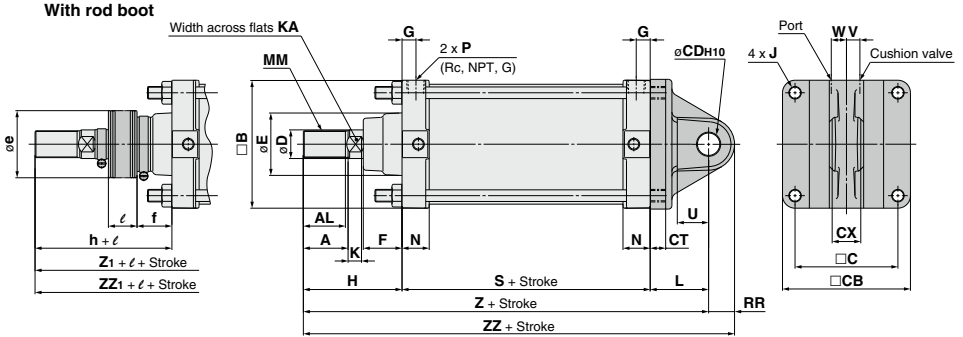
| Bore size (mm) | A | AL | □B | B | □C | D | E | F | FD | FT | FX | FY | FZ | G | J | V |
|----------------|----|----|-----|-----|-----|----|------|----|----|----|-----|-----|-----|----|-----------|----|
| 125 | 50 | 47 | 143 | 145 | 115 | 32 | 71 | 43 | 19 | 14 | 190 | 100 | 230 | 15 | M14 x 1.5 | 15 |
| 140 | 50 | 47 | 157 | 160 | 128 | 32 | 71 | 43 | 19 | 20 | 212 | 112 | 255 | 15 | M14 x 1.5 | 15 |
| 160 | 56 | 53 | 177 | 180 | 144 | 38 | 78.5 | 42 | 19 | 20 | 236 | 118 | 275 | 18 | M16 x 1.5 | 15 |

| Bore size (mm) | W | K | KA | MM | N | P | S | Without rod boot | | With rod boot | | | | |
|----------------|----|----|----|-----------|------|-----|-----|------------------|-----|---------------|----|-----|------------|-----------------|
| | | | | | | | | H | ZZ | e | f | h | ℓ | ZZ ₁ |
| 125 | 17 | 15 | 27 | M30 x 1.5 | 30.5 | 1/2 | 98 | 110 | 222 | 75 | 40 | 133 | 1/5 Stroke | 245 |
| 140 | 17 | 15 | 27 | M30 x 1.5 | 30.5 | 1/2 | 98 | 110 | 228 | 75 | 40 | 133 | 1/5 Stroke | 251 |
| 160 | 20 | 17 | 34 | M36 x 1.5 | 34.5 | 3/4 | 106 | 120 | 246 | 75 | 40 | 141 | 1/5 Stroke | 267 |

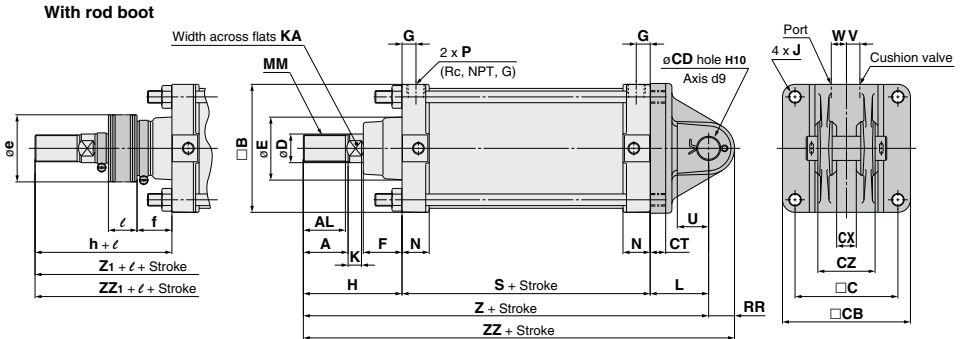
- * The minimum stroke with rod boot is 30 mm or more.
- ** For auto switch mounting position and its mounting height, refer to page 234.
- *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

Dimensions

Single clevis: CS2YC



Double clevis: CS2YD



| Bore size (mm) | A | AL | $\square B$ | $\square C$ | $\square CB$ | CDH10 | CT | Single clevis | | | D | E | F | G | J | V | W |
|----------------|----|----|-------------|-------------|--------------|-----------------|----|--------------------|--------------------|--------------------|----|------|----|----|-----------|----|----|
| | | | | | | | | CX | CX | CZ | | | | | | | |
| 125 | 50 | 47 | 143 | 115 | 145 | $25^{+0.064}_0$ | 17 | $32^{+0.1}_{-0.3}$ | $32^{+0.3}_{-0.1}$ | $64^{+0.2}_{-0.2}$ | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 |
| 140 | 50 | 47 | 157 | 128 | 160 | $28^{+0.084}_0$ | 17 | $36^{+0.1}_{-0.3}$ | $36^{+0.3}_{-0.1}$ | $72^{+0.2}_{-0.2}$ | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 |
| 160 | 56 | 53 | 177 | 144 | 180 | $32^{+0.100}_0$ | 20 | $40^{+0.1}_{-0.3}$ | $40^{+0.3}_{-0.1}$ | $80^{+0.2}_{-0.2}$ | 38 | 78.5 | 42 | 18 | M16 x 1.5 | 15 | 20 |

| Bore size (mm) | K | KA | L | MM | N | P | S | U | RR | Without rod boot | | | With rod boot | | | | | |
|----------------|----|----|----|-----------|------|-----|-----|----|----|------------------|-----|-----|---------------|----|-----|------------|-----|-----|
| | | | | | | | | | | H | Z | ZZ | e | f | h | ℓ | Z1 | ZZ1 |
| 125 | 15 | 27 | 65 | M30 x 1.5 | 30.5 | 1/2 | 98 | 35 | 29 | 110 | 273 | 302 | 75 | 40 | 133 | 1/5 Stroke | 296 | 325 |
| 140 | 15 | 27 | 75 | M30 x 1.5 | 30.5 | 1/2 | 98 | 40 | 32 | 110 | 283 | 315 | 75 | 40 | 133 | 1/5 Stroke | 306 | 338 |
| 160 | 17 | 34 | 80 | M36 x 1.5 | 34.5 | 3/4 | 106 | 45 | 36 | 120 | 306 | 342 | 75 | 40 | 141 | 1/5 Stroke | 327 | 363 |

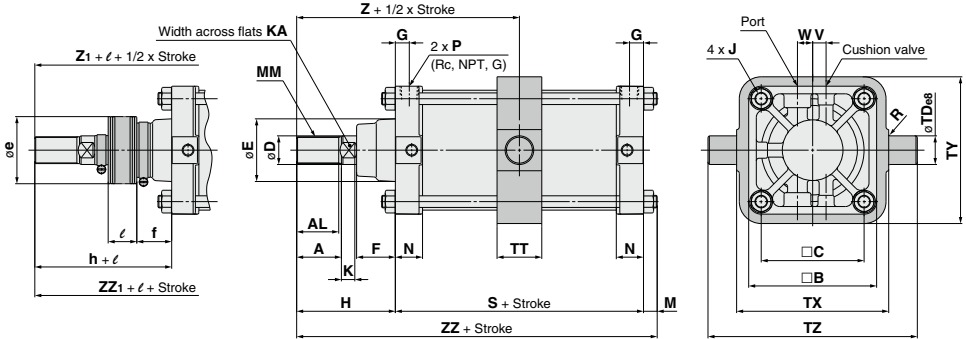
* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 234.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

CS2Y Series

Dimensions

Center trunnion: CS2YT

With rod boot



(mm)

| Bore size (mm) | A | AL | □B | □C | D | E | F | G | J | V | W | K | KA | M | MM | N |
|----------------|----|----|-----|-----|----|------|----|----|-----------|----|----|----|----|----|-----------|------|
| 125 | 50 | 47 | 143 | 115 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 13 | M30 x 1.5 | 30.5 |
| 140 | 50 | 47 | 157 | 128 | 32 | 71 | 43 | 15 | M14 x 1.5 | 15 | 17 | 15 | 27 | 13 | M30 x 1.5 | 30.5 |
| 160 | 56 | 53 | 177 | 144 | 38 | 78.5 | 42 | 18 | M16 x 1.5 | 15 | 20 | 17 | 34 | 15 | M36 x 1.5 | 34.5 |

(mm)

| Bore size (mm) | P | R | S | TDø8 | TT | TX | TY | TZ | Without rod boot | | | With rod boot | | | | | |
|----------------|-----|-----|-----|--|----|-----|-----|-----|------------------|-----|-----|---------------|----|-----|------------|----------------|-----------------|
| | | | | | | | | | H | Z | ZZ | e | f | h | ℓ | Z ₁ | ZZ ₁ |
| 125 | 1/2 | 1 | 98 | 32 ^{+0.050} _{-0.059} | 50 | 170 | 164 | 234 | 110 | 159 | 221 | 75 | 40 | 133 | 1/5 Stroke | 182 | 244 |
| 140 | 1/2 | 1.5 | 98 | 36 ^{+0.050} _{-0.059} | 55 | 190 | 184 | 262 | 110 | 159 | 221 | 75 | 40 | 133 | 1/5 Stroke | 182 | 244 |
| 160 | 3/4 | 1.5 | 106 | 40 ^{+0.050} _{-0.059} | 60 | 212 | 204 | 292 | 120 | 173 | 241 | 75 | 40 | 141 | 1/5 Stroke | 194 | 262 |

* The minimum stroke with rod boot is 30 mm or more for ø125, ø140 and 35 mm or more for ø160.

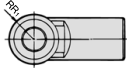
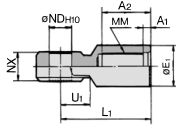
** For auto switch mounting position and its mounting height, refer to page 234.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 235.

CS2Y Series

Dimensions of Accessories

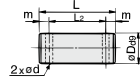
I Type Single Knuckle Joint*



Material: Cast iron
(mm)

| Part no. | Applicable bore size (mm) | A1 | A2 | E1 | L1 | MM | ND _{H10} | NX | RR1 | U1 |
|----------|---------------------------|----|----|----|-----|-----------|-----------------------------------|------------------------------------|-----|----|
| I-12A | 125 | 8 | 54 | 46 | 100 | M30 x 1.5 | 25 ^{+0.084} ₀ | 32 ^{-0.1} _{-0.3} | 27 | 33 |
| I-14A | 140 | 8 | 54 | 48 | 105 | M30 x 1.5 | 28 ^{+0.084} ₀ | 36 ^{-0.1} _{-0.3} | 30 | 39 |
| I-16A | 160 | 8 | 60 | 55 | 110 | M36 x 1.5 | 32 ^{+0.1} ₀ | 40 ^{-0.1} _{-0.3} | 34 | 39 |

Knuckle Pin/Clevis Pin

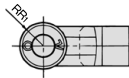
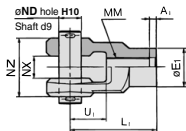


Material: Carbon steel
(mm)

| Part no. | Applicable bore size (mm) | D _{ø9} | L | L ₂ | m | d | Applicable split pin |
|----------|---------------------------|--|------|----------------|---|---|----------------------|
| IY-12 | 125 | 25 ^{-0.065} _{-0.117} | 79.5 | 69.5 | 5 | 4 | ø4 x 40 |
| IY-14 | 140 | 28 ^{-0.065} _{-0.117} | 86.5 | 76.5 | 5 | 4 | ø4 x 40 |
| IY-16 | 160 | 32 ^{-0.080} _{-0.142} | 94.5 | 84.5 | 5 | 4 | ø4 x 40 |

* Split pins are included.

Y Type Double Knuckle Joint*



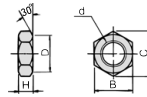
Material: Cast iron
(mm)

| Part no. | Applicable bore size (mm) | A1 | E1 | L1 | MM | ND _{H10} | NX | NZ | RR1 | U1 |
|----------|---------------------------|----|----|-----|-----------|-----------------------------------|------------------------------------|------------------------------------|-----|----|
| Y-12A | 125 | 8 | 46 | 100 | M30 x 1.5 | 25 ^{+0.084} ₀ | 32 ^{+0.3} _{-0.1} | 64 ^{-0.1} _{-0.3} | 27 | 42 |
| Y-14A | 140 | 8 | 48 | 105 | M30 x 1.5 | 28 ^{+0.084} ₀ | 36 ^{+0.3} _{-0.1} | 72 ^{-0.1} _{-0.3} | 30 | 47 |
| Y-16A | 160 | 8 | 55 | 110 | M36 x 1.5 | 32 ^{+0.1} ₀ | 40 ^{+0.3} _{-0.1} | 80 ^{-0.1} _{-0.3} | 34 | 46 |

- * Use a single knuckle joint or a double knuckle joint individually. (Screw it entirely over the rod end threads and tighten it.)
- * Extend the dimensions of A, H, when using a single/double knuckle joint together with a rod end nut. (To extend dimensions A, H, refer to the below table, and specify the product as made-to-order -XA0.)
- * A pin and split pins are included with the double knuckled joint.

● "Made to Order" with rod end bracket (-XC86) is available when ordering cylinders and accessories together. Refer to page 1621 for details.

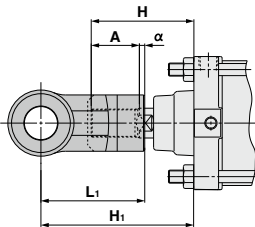
Rod End Nut



Material: Rolled steel
(mm)

| Part no. | Applicable bore size (mm) | d | H | B | C | D |
|----------|---------------------------|-----------|----|----|------|----|
| NT-12 | 125, 140 | M30 x 1.5 | 18 | 46 | 53.1 | 44 |
| NT-16 | 160 | M36 x 1.5 | 21 | 55 | 63.5 | 53 |

Single/Double Knuckle Joint



(mm)

| Bore size (mm) | Symbol | H | A | α | L1 | H1 | Applicable knuckle joint part number | |
|----------------|--------|-----|----|-----|-----|-------|--------------------------------------|-----------------------|
| | | | | | | | I type single knuckle | Y type double knuckle |
| 125 | | 110 | 50 | 3.5 | 100 | 156.5 | I-12A | Y-12A |
| 140 | | 110 | 50 | 3.5 | 105 | 161.5 | I-14A | Y-14A |
| 160 | | 120 | 56 | 3.5 | 110 | 170.5 | I-16A | Y-16A |

A, H Dimensions when Mounting a Single/Double Knuckle Joint together with a Rod End Nut

| Bore size (mm) | A | H |
|----------------|----|-----|
| 125 | 65 | 125 |
| 140 | 65 | 125 |
| 160 | 76 | 140 |

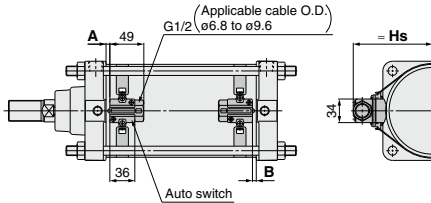
CS2Y Series

Auto Switch Mounting

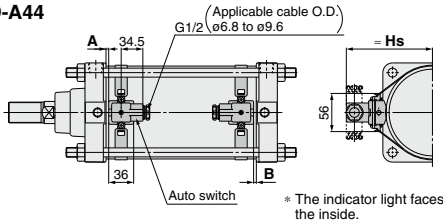
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-A3□
D-G3/K3

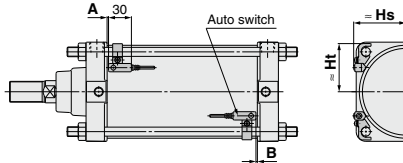


D-A44



* The indicator light faces the inside.

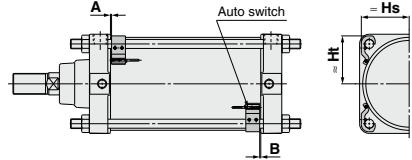
D-F5□/J59/D-F5NT
D-F5BA/F59F
D-F5□W/J59W



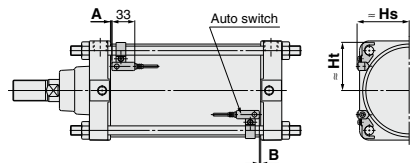
<Tie-rod mounting>

D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V

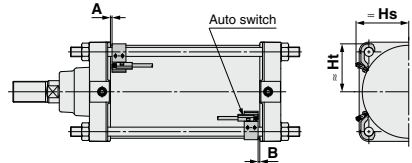
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BA



D-A5□/A6□



D-P3DWA



Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | | D-A9□ D-A9□V | | D-Z7□/Z80 D-Y5□/Y6□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BA | | D-A5□ D-A6□ D-A3□ D-A44 D-G39 D-K39 | | D-A59W | | D-F5□W D-J59W D-F5BA D-F5□ D-J59 D-F59F | | D-F5NT | | D-P3DWA | |
|-------------------|---|----|-----------------|---|---|-----|--|---|--------|---|--|-----|--------|------|---------|-----|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 125 | 13 | 12 | 9 | 8 | 6.5 | 5.5 | 3 | 2 | 7 | 6 | 9.5 | 8.5 | 14.5 | 13.5 | 8.5 | 7.5 |
| 140 | 13 | 12 | 9 | 8 | 6.5 | 5.5 | 3 | 2 | 7 | 6 | 9.5 | 8.5 | 14.5 | 13.5 | 8.5 | 7.5 |
| 160 | 13 | 12 | 9 | 8 | 6.5 | 5.5 | 3 | 2 | 7 | 6 | 9.5 | 8.5 | 14.5 | 13.5 | 8.5 | 7.5 |

* Provided as guidelines for auto switch proper mounting position (detection at stroke end).
Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

| Auto switch model | D-M9□ D-M9□W D-M9□A D-A9□ D-A9□V | | D-M9□V D-M9□WV D-M9□AV | | D-Z7□/Z80 D-Y5□/Y6□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA | | D-A3□ D-G39 D-K39 | | D-A44 | | D-A5□ D-A6□ D-A59W | | D-F5□ D-J59 D-F5□W D-J59W D-F5BA D-F59F D-F5NT | | D-P3DWA | |
|-------------------|--|------|------------------------------|------|--|------|-------------------------|-------|-------|------|--------------------------|------|--|----|---------|------|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 125 | 69 | 69.5 | 71.5 | 69.5 | 69 | 69.5 | 116 | 116 | 126 | 75.5 | 69.5 | 74.5 | 70 | 76 | 69 | 69.5 |
| 140 | 76 | 76 | 77.5 | 76 | 76 | 76 | 124 | 124 | 134 | 81 | 76.5 | 80 | 76.5 | 82 | 76 | |
| 160 | 85 | 85 | 86 | 85 | 85 | 85 | 134.5 | 134.5 | 144.5 | 89 | 87.5 | 88 | 87.5 | 91 | 85 | |

Minimum Stroke for Auto Switch Mounting

| Auto switch model | Number of auto switches | Mounting brackets other than center trunnion | Center trunnion | | |
|--|--|---|--|--|--|
| | | | ø125 | ø140 | ø160 |
| | | | n: Number of auto switches (mm) | | |
| D-M9□ D-M9□W | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 15 | 105 | 110 | 115 |
| | With n pcs. | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-M9□V D-M9□WV | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 10 | 80 | 85 | 90 |
| | With n pcs. | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-M9□A | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 20 | 115 | 120 | |
| | With n pcs. | $20 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $120 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-M9□AV | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 15 | 90 | 95 | |
| | With n pcs. | $15 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-A9□ | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 15 | 100 | 105 | 110 |
| | With n pcs. | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-A9□V | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 10 | 75 | 80 | 85 |
| | With n pcs. | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-A5□/A6□ D-A59W D-F5□/J59 D-F5□W D-J59W D-F5BA D-F59F | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 25 | 125 | 135 | |
| | With n pcs. (Same surface) | $25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $125 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $135 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-F5NT | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 35 | 145 | 155 | |
| | With n pcs. (Same surface) | $35 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $145 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $155 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | |
| D-A3□ D-G39 D-K39 | With 2 pcs. | Different surfaces | 35 | 110 | |
| | | Same surface | 100 | 110 | |
| | With n pcs. | Different surfaces | $35 + 30(n-2)$ | $110 + 30(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| Same surface | | $100 + 100(n-2)$ | $110 + 100(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | | |
| D-A44 | With 2 pcs. | With 1 pc. | 15 | 110 | |
| | | Different surfaces | 35 | 110 | |
| | | Same surface | 55 | 110 | |
| | With n pcs. | Different surfaces | $35 + 30(n-2)$ | $110 + 30(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $55 + 55(n-2)$ | $110 + 50(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| With 1 pc. | 15 | 110 | | | |
| D-Z7□ D-Z80 D-Y9□ D-Y7P D-Y7□W | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 15 | 105 | 110 | 115 |
| | With n pcs. | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-Y69□ D-Y7P D-Y7□WV | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 10 | 90 | 95 | 100 |
| | With n pcs. | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $95 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $100 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-Y7BA | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 20 | 115 | 120 | 125 |
| | With n pcs. | $20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $115 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $120 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $125 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |
| D-P3DWA | With 2 pcs. (Different surfaces, Same surface), With 1 pc. | 20 | 105 | 110 | 115 |
| | With n pcs. | $20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)} | $105 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} | $115 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)} |

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Operating Range

| Auto switch model | Bore size (mm) | | |
|---|----------------|------|------|
| | 125 | 140 | 160 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 6 | 6.5 | 6.5 |
| D-A9□/A9□V | 12 | 12.5 | 11.5 |
| D-Z7□/Z80 | 14 | 14.5 | 13 |
| D-A3□/A44 D-A5□/A6□ | 10 | 10 | 10 |
| D-A59W | 17 | 17 | 17 |
| D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA | 12 | 13 | 7 |
| D-F5□/J59/F5□W D-J59W/F5BA D-F5NT/F59F | 5 | 5 | 5.5 |
| D-G39/K39 | 11 | 11 | 10 |
| D-P3DWA | 7 | 7 | 7 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

| Auto switch model | Bore size (mm) | | |
|--|----------------|----------|----------|
| | ø125 | ø140 | ø160 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V | BS5-125 | BS5-125 | BS5-160 |
| D-A5□/A6□ D-A59W D-F5□/J59 D-F5NT D-F5□W/J59W D-F5BA/F59F | BT-12 | BT-12 | BT-16 |
| D-A3□/A44 D-G39/K39 | BS1-125 | BS1-140 | BS1-160 |
| D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA | BS4-125 | BS4-125 | BS4-160 |
| D-P3DWA | BS7-125S | BS7-125S | BS7-160S |

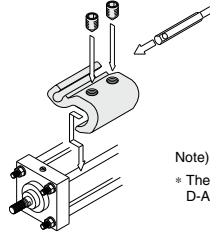
[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

BBA1: For D-A5/A6/F5/J5 types

The above stainless steel screws are used when a cylinder is shipped with the D-F5BA auto switch. When only the auto switch is shipped independently, the BBA1 is attached.

Note) When using the D-M9□A/M9□AV or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BS5-□□□, BS4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 8L stainless steel set screws included in the BBA1.



Note) Refer to page 1447. for details on the BBA1.

* The figure shows the mounting example for the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types.

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features | | |
|---------------------|-------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------|
| Reed | D-A90V | Grommet (Perpendicular) | Without indicator light | | |
| | D-A93V/A96V | | Grommet (In-line) | — | |
| | D-Z73/Z76 | | | Without indicator light | |
| | D-A53/A56 | 2-color indicator | | | |
| | D-A67 | | Water resistant (2-color indicator) | | |
| | D-Z80 | | With timer | | |
| Solid state | D-F59/F5P/J59 | Grommet (In-line) | — | | |
| | D-Y59A/Y59B/Y7P | | 2-color indicator | | |
| | D-F59W/F5PW/J59W | | | Water resistant (2-color indicator) | |
| | D-Y7NW/Y7PW/Y7BW | | | | With timer |
| | D-F5BA/Y7BA | | | | |
| | D-F5NT | 2-color indicator | | | |
| | D-M9NV/M9PV/M9BV | | Water resistant (2-color indicator) | | |
| | D-Y69A/Y69B/Y7PV | | | Grommet (Perpendicular) | |
| | D-M9NWV/M9PWV/M9BWW | | | | 2-color indicator |
| | D-Y7NWV/Y7PWV/Y7BWW | | | | |
| D-M9NAV/M9PAV/M9BAV | Grommet (Perpendicular) | | | | |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1360 and 1362.



CS2Y Series Specific Product Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

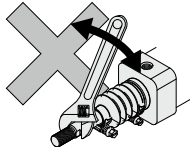
Operating Precautions

⚠ Warning

- 1. Do not use the cylinder as a shock absorber.**
Using the cylinder as a shock absorber may cause damage.
- 2. Do not open the cushion valve beyond the stopper.**
As a retaining mechanism for the cushion valve, retaining ring is installed, and the cushion valve should not be opened beyond that point.
If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.
To adjust the cushion valve, use the JIS B 4648 hexagon wrench key 4 (width across flats of cushion valve: 4).
- 3. Use the air cushion at the end of cylinder stroke.**

⚠ Caution

- 1. Do not use a pneumatic type as an air-hydro cylinder. It can cause oil leak.**
- 2. Do not rotate the piston rod when the rod boot is fixed.**
Before rotating the piston rod, loosen the band to avoid twisting the rod boot.
- 3. Install the rod boot with the breathing hole facing downwards or in a direction suitable to prevent dust, moisture etc. from entering easily into the rod boot.**



- 4. Regarding the installation of a knuckle joint**
Please contact SMC if a knuckle joint must be installed on the piston rod by using the rod end nut.
- 5. Regarding the screw-in of fittings when piping**
When ports and fittings are screwed in, tighten them with the proper tightening torque below.

| Bore size [mm] | Connecting thread nominal size | Proper tightening torque N·m |
|----------------|--------------------------------|------------------------------|
| 125, 140 | 1/2 | 28 to 30 |
| 160 | 3/4 | |

- 6. Do not deform cushion rings when removing and assembling.**
Cushion rings are press molded products. If a cushion ring bumps with something when removing and assembling, the air cushion may not function properly due to cushion ring deformation.
- 7. Do not place tape or other objects onto the painted surface of the unit.**
The paint of the CS cylinder is dried naturally, so it may peel off if tape or another object is placed onto it.

Disassembly/Replacement

⚠ Caution

- 1. Do not replace the bushing.**
As the bushing is press-fit, replace the cover assembly when the bushing must be replaced.
- 2. When a seal is replaced, apply grease to the new seal before it is assembled.**
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.
- 3. Do not disassemble the trunnion type cylinder because the mounting precision is required.**
The trunnion type cylinder may lose dimensional accuracy and malfunction when it is disassembled and reassembled because the axial center of the trunnion and that of the cylinder will not be aligned easily.

Smooth Cylinder

CQSY Series

ø12, ø16, ø20, ø25

How to Order

CQSY B 20 - 30 D C

With auto switch CDQSY B 20 - 30 D C - M9BW

With auto switch (Built-in magnet)

Mounting

| | |
|-----------|--|
| B | Through-hole/Both ends tapped (Standard) |
| L | Foot (Note) |
| LC | Compact foot |
| F | Rod flange |
| G | Head flange |
| D | Double clevis |

* Mounting bracket is shipped together with the product, (but not assembled).

Bore size

| | |
|-----------|-------|
| 12 | 12 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 239.

Action

| | |
|----------|---------------|
| D | Double acting |
|----------|---------------|

Body option

| | |
|------------|-----------------------|
| Nil | Standard |
| F | With boss on head end |

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------|
| Nil | Without auto switch |
|------------|---------------------|

* For applicable auto switches, refer to the table below.

Rod end thread

| | |
|------------|---------------------------|
| Nil | Standard (Female rod end) |
| M | Male rod end |

Cushion

| | |
|----------|---------------|
| C | Rubber bumper |
|----------|---------------|

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQSYL25-30DC

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire (m) | | | | Pre-wired connector | Applicable load | | |
|-------------------------|---|------------------|-----------------|-------------------------|--------------|------|-------------------|----------------|---------------|-------|-------|-------|---------------------|-----------------|------------|------------|
| | | | | | DC | AC | Perpendicular | In-line | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | IC circuit | Relay, PLC | |
| Solid state auto switch | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | — | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ○ | ○ | | | | |
| | | | | 2-wire | | | M9BV | M9B | ● | ● | ○ | ○ | | | | |
| | | | | 3-wire (NPN) | | | M9NWW | M9NW | ● | ● | ○ | ○ | | | | |
| | 3-wire (PNP) | | | M9PWW | | | M9PW | ● | ● | ○ | ○ | | | | | |
| | 2-wire | | | M9BWW | | | M9BW | ● | ● | ○ | ○ | | | | | |
| | 3-wire (NPN) | | | M9NAV *1 | | | M9NA *1 | ○ | ○ | ● | ○ | | | | | |
| | 3-wire (PNP) | | | M9PAV *1 | | | M9PA *1 | ○ | ○ | ● | ○ | | | | | |
| 2-wire | M9BAV *1 | M9BA *1 | ○ | ○ | ○ | ○ | | | | | | | | | | |
| 2-wire (Non-polar) | — | P3DWA **2 | ● | — | ● | ● | ○ | | | | | | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 24 V | 12 V | A96V | A96 | ● | — | ● | — | — | IC circuit | — | |
| | | | | No | | | 100 V | A93V *2 | A93 | ● | ● | ● | — | — | — | Relay, PLC |
| | | | | | | | 100 V or less | A90V | A90 | ● | — | ● | — | — | — | IC circuit |
| | | | | | | | — | — | — | — | — | — | — | — | — | — |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
 1 m M (Example) M9NWM
 3 m L (Example) M9NWL
 5 m Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.
 ** The D-P3DW□ is only compatible with ø25. It is mounted away from the port side to avoid interference with fittings.

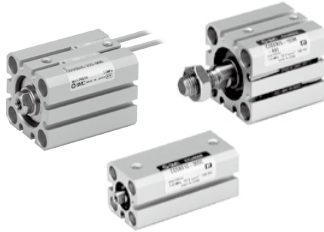
* Since there are other applicable auto switches than listed, refer to page 245 for details.

* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* Auto switches are shipped together, (but not assembled).

Note) The D-A9□V/M9□V/M9□WV/M9□AV auto switches may not be mounted on the port side depending on the cylinder stroke or the fitting size of piping.

Specifications

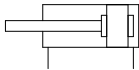


| Bore size (mm) | 12 | 16 | 20 | 25 |
|-------------------------------|---|----|----|----|
| Type | Pneumatic (Non-lube) | | | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.05 MPa | | | |
| Maximum operating pressure | 0.7 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing) | | | |
| Cushion | Rubber bumper | | | |
| Rod end thread | Female thread | | | |
| Stroke length tolerance | +1.0 mm (Note) 0 | | | |
| Piston speed | 5 to 500 mm/s | | | |
| Allowable leakage rate | 0.5 L/min (ANR) or less | | | |

Note) Stroke length tolerance does not include the amount of bumper change.

Symbol

Rubber bumper



Minimum Operating Pressure

Unit: MPa

| Bore size (mm) | 12 | 16 | 20 | 25 |
|----------------------------|------|----|------|----|
| Minimum operating pressure | 0.03 | | 0.02 | |

Standard Strokes

| Bore size (mm) | Standard stroke (mm) |
|----------------|---------------------------------------|
| 12, 16 | 5, 10, 15, 20, 25, 30 |
| 20, 25 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 |

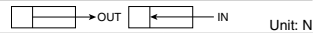
Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-----------|---|
| 12 | CQSY12-PS | Piston seal 1 pc. Rod seal 1 pc. |
| 16 | CQSY16-PS | Tube gasket 1 pc. Grease pack (10 g) 1 pc. |
| 20 | CQSY20-PS | |
| 25 | CQSY25-PS | |

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Theoretical Output



| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm ²) | Operating pressure (MPa) | | |
|----------------|---------------|---------------------|--------------------------------|--------------------------|-----|-----|
| | | | | 0.3 | 0.5 | 0.7 |
| 12 | 6 | IN | 84.8 | 25 | 42 | 59 |
| | | OUT | 113 | 34 | 57 | 79 |
| 16 | 8 | IN | 151 | 45 | 75 | 106 |
| | | OUT | 201 | 60 | 101 | 141 |
| 20 | 10 | IN | 236 | 71 | 118 | 165 |
| | | OUT | 314 | 94 | 157 | 220 |
| 25 | 12 | IN | 378 | 113 | 189 | 264 |
| | | OUT | 491 | 147 | 245 | 344 |

Accessory

* For details about the single knuckle joint, double knuckle joint, knuckle pin, and rod end nut, refer to page 257.

Intermediate Stroke

| | | | |
|-----------------|--|---|-------------------|
| Method | Installation of spacer on standard stroke body. | | |
| Model no. | Refer to page 238 for standard model no. | | |
| Standard stroke | Method | Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders. | |
| | Stroke range | Bore size (mm) | Stroke range (mm) |
| | | 12, 16 | 1 to 29 |
| 20, 25 | 1 to 49 | | |
| Example | Part no.: CQSYB25-47DC CQSYB25-50DC with 3 mm width spacer inside. B dimension is 77.5 mm. Calculation: $\phi 25$, B dimension 27.5 mm (without auto switch) 27.5 (B dimension) + 50 (st) = 77.5 (mm) | | |

CQSY Series

Weights/Without Auto Switch (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 37 | 43 | 50 | 57 | 63 | 70 | — | — | — | — |
| 16 | 49 | 57 | 66 | 74 | 83 | 92 | — | — | — | — |
| 20 | 75 | 88 | 101 | 114 | 127 | 140 | 153 | 165 | 178 | 191 |
| 25 | 109 | 125 | 140 | 156 | 172 | 188 | 204 | 220 | 236 | 252 |

Weights/With Auto Switch (Built-in magnet) (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 45 | 51 | 58 | 65 | 71 | 78 | — | — | — | — |
| 16 | 59 | 67 | 76 | 85 | 94 | 103 | — | — | — | — |
| 20 | 106 | 119 | 132 | 145 | 157 | 170 | 183 | 195 | 208 | 221 |
| 25 | 151 | 167 | 183 | 199 | 215 | 231 | 246 | 262 | 278 | 294 |

Additional Weights (g)

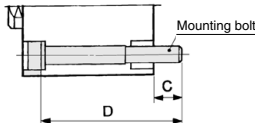
| Bore size (mm) | | 12 | 16 | 20 | 25 |
|--|-------------|-----|-----|-----|-----|
| Male rod end | Male thread | 1.5 | 3 | 6 | 12 |
| | Nut | 1 | 2 | 4 | 8 |
| With boss on head end | | 0.7 | 1.3 | 2 | 3 |
| Foot (Including mounting bolt) | | 55 | 65 | 159 | 181 |
| Compact foot (Including mounting bolt) | | 32 | 40 | 97 | 116 |
| Rod flange (Including mounting bolt) | | 58 | 70 | 143 | 180 |
| Head flange (Including mounting bolt) | | 56 | 66 | 137 | 171 |
| Double clevis (Including pin, retaining ring, mounting bolt) | | 34 | 40 | 92 | 127 |

Mounting Bolt for CQSYB without Auto Switch

Mounting method: Mounting bolt for through-hole mounting type of the CQSYB is available as an option.

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example CQ-M3X30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

| Cylinder model | C | D | Mounting bolt part no. |
|--------------------|-----|----|------------------------|
| CQSYB12-5DC | | 30 | CQ-M3X30L |
| -10DC | 6.5 | 35 | X35L |
| -15DC | | 40 | X40L |
| -20DC | | 45 | X45L |
| -25DC | | 50 | X50L |
| -30DC | | 55 | X55L |
| CQSYB16-5DC | | 30 | CQ-M3X30L |
| -10DC | 6.5 | 35 | X35L |
| -15DC | | 40 | X40L |
| -20DC | | 45 | X45L |
| -25DC | | 50 | X50L |
| -30DC | | 55 | X55L |
| CQSYB20-5DC | | 30 | CQ-M5X30L |
| -10DC | 6.5 | 35 | X35L |
| -15DC | | 40 | X40L |
| -20DC | | 45 | X45L |

| Cylinder model | C | D | Mounting bolt part no. |
|---------------------|-----|----|------------------------|
| CQSYB20-25DC | | 50 | CQ-M5X50L |
| -30DC | 6.5 | 55 | X55L |
| -35DC | | 60 | X60L |
| -40DC | | 65 | X65L |
| -45DC | | 70 | X70L |
| -50DC | | 75 | X75L |
| CQSYB25-5DC | | 35 | CQ-M5X35L |
| -10DC | 8.5 | 40 | X40L |
| -15DC | | 45 | X45L |
| -20DC | | 50 | X50L |
| -25DC | | 55 | X55L |
| -30DC | | 60 | X60L |
| -35DC | | 65 | X65L |
| -40DC | | 70 | X70L |
| -45DC | | 75 | X75L |
| -50DC | | 80 | X80L |

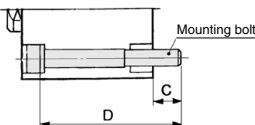
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSYB with Auto Switch

Mounting method: Mounting bolt for through-hole mounting type of the CDQSYB is available as an option.

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example CQ-M3X35L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

| Cylinder model | C | D | Mounting bolt part no. |
|---------------------|-----|----|------------------------|
| CDQSYB12-5DC | | 35 | CQ-M3X35L |
| -10DC | 6.5 | 40 | X40L |
| -15DC | | 45 | X45L |
| -20DC | | 50 | X50L |
| -25DC | | 55 | X55L |
| -30DC | | 60 | X60L |
| CDQSYB16-5DC | | 35 | CQ-M3X35L |
| -10DC | 6.5 | 40 | X40L |
| -15DC | | 45 | X45L |
| -20DC | | 50 | X50L |
| -25DC | | 55 | X55L |
| -30DC | | 60 | X60L |
| CDQSYB20-5DC | | 40 | CQ-M5X40L |
| -10DC | 6.5 | 45 | X45L |
| -15DC | | 50 | X50L |
| -20DC | | 55 | X55L |

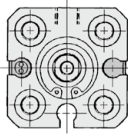
| Cylinder model | C | D | Mounting bolt part no. |
|----------------------|-----|----|------------------------|
| CDQSYB20-25DC | | 60 | CQ-M5X60L |
| -30DC | 6.5 | 65 | X65L |
| -35DC | | 70 | X70L |
| -40DC | | 75 | X75L |
| -45DC | | 80 | X80L |
| -50DC | | 85 | X85L |
| CDQSYB25-5DC | | 45 | CQ-M5X45L |
| -10DC | 8.5 | 50 | X50L |
| -15DC | | 55 | X55L |
| -20DC | | 60 | X60L |
| -25DC | | 65 | X65L |
| -30DC | | 70 | X70L |
| -35DC | | 75 | X75L |
| -40DC | | 80 | X80L |
| -45DC | | 85 | X85L |
| -50DC | | 90 | X90L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

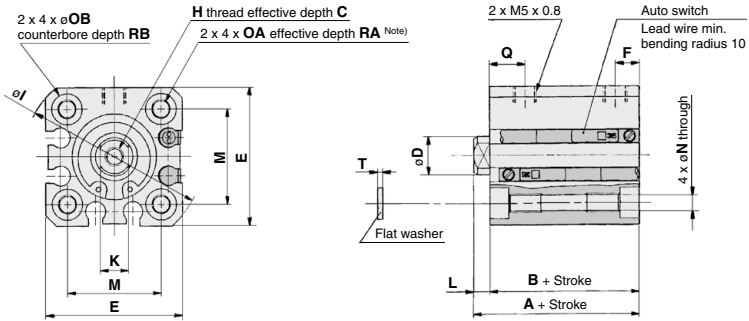
Dimensions: $\phi 12$ to $\phi 25$

Standard (Through-hole/Both ends tapped): CQSYB/CDQSYB

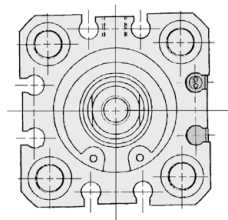
$\phi 12$



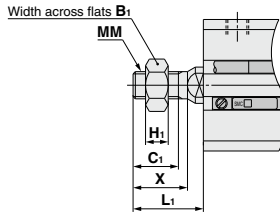
$\phi 16$



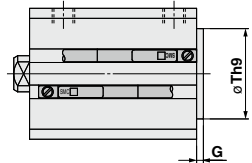
$\phi 20, \phi 25$



Male rod end



With boss on head end



Male Rod End

| Bore size (mm) | B ₁ | C ₁ | H ₁ | L ₁ | MM | X |
|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12 | 8 | 9 | 4 | 14 | M5 x 0.8 | 10.5 |
| 16 | 10 | 10 | 5 | 15.5 | M6 x 1.0 | 12 |
| 20 | 13 | 12 | 5 | 18.5 | M8 x 1.25 | 14 |
| 25 | 17 | 15 | 6 | 22.5 | M10 x 1.25 | 17.5 |

With Boss on Head End (mm)

| Bore size (mm) | G | Th9 |
|----------------|-----|---------------------|
| 12 | 1.5 | 15 _{0.043} |
| 16 | 1.5 | 20 _{0.052} |
| 20 | 2 | 13 _{0.043} |
| 25 | 2 | 15 _{0.043} |

Note) The product with boss on head end is applicable to only the standard stroke.

Standard

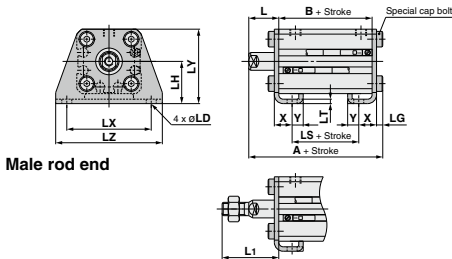
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | C | D | E | F | H | I | K | L | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|------|------------------|------|----|----|----|-----|----------|----|----|-----|------|-----|----------|-----|-----|----|----|-----|
| | | A | B | A | B | | | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 6 | 6 | 25 | 5 | M3 x 0.5 | 32 | 5 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 16 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 8 | 8 | 29 | 5 | M4 x 0.7 | 38 | 6 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 20 | 5 to 50 | 29 | 24.5 | 39 | 34.5 | 7 | 10 | 36 | 5.5 | M5 x 0.8 | 47 | 8 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 8 | 10 | 7 | 1 |
| 25 | 5 to 50 | 32.5 | 27.5 | 42.5 | 37.5 | 12 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 |

Note) Threaded through-hole is used for the standard of $\phi 20$ with 5 to 10 mm strokes and $\phi 25$ with a 5 mm stroke.

CQSY Series

Dimensions: $\phi 12$ to $\phi 25$

Foot: CQSYL/CDQSYL



Male rod end

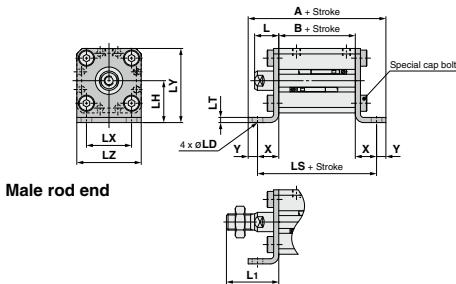
Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 |
| 16 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 |
| 20 | 5 to 50 | 46.2 | 24.5 | 12.5 | 56.2 | 34.5 | 22.5 |
| 25 | 5 to 50 | 49.7 | 27.5 | 12.5 | 59.7 | 37.5 | 22.5 |

| Bore size (mm) | L | L ₁ | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|-----|----|-----|----|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQSYLC/CDQSYLC



Male rod end

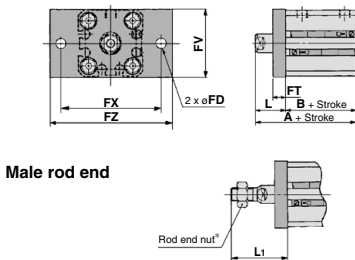
Compact Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 49.6 | 22 | 40.6 | 54.6 | 27 | 45.6 |
| 16 | 5 to 30 | 50.6 | 22 | 40.6 | 55.6 | 27 | 45.6 |
| 20 | 5 to 50 | 62.5 | 24.5 | 50.9 | 72.5 | 34.5 | 60.9 |
| 25 | 5 to 50 | 65.5 | 27.5 | 53.9 | 75.5 | 37.5 | 63.9 |

| Bore size (mm) | L | L ₁ | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|----|-----|------|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQSYF/CDQSYF



Male rod end

Rod Flange

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | |
|----------------|-------------------|---------------------|------|------------------|------|
| | | A | B | A | B |
| 12 | 5 to 30 | 35.5 | 22 | 40.5 | 27 |
| 16 | 5 to 30 | 35.5 | 22 | 40.5 | 27 |
| 20 | 5 to 50 | 39 | 24.5 | 49 | 34.5 |
| 25 | 5 to 50 | 42.5 | 27.5 | 52.5 | 37.5 |

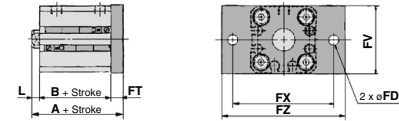
| Bore size (mm) | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-----|-----|----|----|----|------|----------------|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

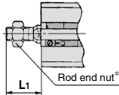
* For details about the rod end nut and accessory brackets, refer to page 257.

Dimensions: $\varnothing 12$ to $\varnothing 25$

Head flange: CQSYG/CDQSYG



Male rod end



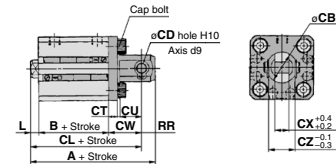
Head Flange

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | |
|----------------|-------------------|---------------------|------|------------------|------|
| | | A | B | A | B |
| 12 | 5 to 30 | 31 | 22 | 36 | 27 |
| 16 | 5 to 30 | 31 | 22 | 36 | 27 |
| 20 | 5 to 50 | 37 | 24.5 | 47 | 34.5 |
| 25 | 5 to 50 | 40.5 | 27.5 | 50.5 | 37.5 |

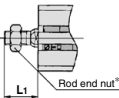
| Bore size (mm) | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-----|-----|----|----|----|-----|----------------|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 | 3.5 | 14 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 | 3.5 | 15.5 |
| 20 | 6.6 | 8 | 39 | 48 | 60 | 4.5 | 18.5 |
| 25 | 6.6 | 8 | 42 | 52 | 64 | 5 | 22.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

Double clevis: CQSYD/CDQSYD



Male rod end



Double Clevis

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | CL | A | B | CL |
| 12 | 5 to 30 | 45.5 | 22 | 39.5 | 50.5 | 27 | 44.5 |
| 16 | 5 to 30 | 46.5 | 22 | 40.5 | 51.5 | 27 | 45.5 |
| 20 | 5 to 50 | 56 | 24.5 | 47 | 66 | 34.5 | 57 |
| 25 | 5 to 50 | 62.5 | 27.5 | 52.5 | 72.5 | 37.5 | 62.5 |

| Bore size (mm) | CB | CD | CT | CU | CW | CX | CZ | L | L ₁ | RR |
|----------------|----|----|----|----|----|-----|----|-----|----------------|----|
| 12 | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 3.5 | 14 | 6 |
| 16 | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 3.5 | 15.5 | 6 |
| 20 | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 4.5 | 18.5 | 9 |
| 25 | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 5 | 22.5 | 10 |

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plating

* For details about the rod end nut and accessory brackets, refer to page 257.

CQSY Series

Simple Joint (CQSY): $\phi 12$ to $\phi 25$

Joint/Mounting Bracket (Type A/B) Part Nos.

| Bore size [mm] | Joint | Type A mounting bracket | Type B mounting bracket |
|----------------|--------|-------------------------|-------------------------|
| 12 | YU-012 | YA-012 | YB-012 |
| 16 | YU-016 | YA-016 | YB-016 |
| 20 | YU-020 | YA-020 | YB-020 |
| 25 | YU-025 | YA-025 | YB-025 |

<Ordering>

Joints are not included with type A or B mounting brackets. Order them separately.

(Example)

Bore size $\phi 12$

Part no.

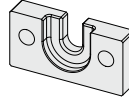
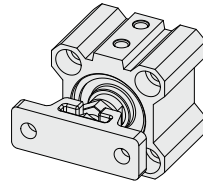
● Type A mounting bracket.....YA-012

● Joint.....YU-012

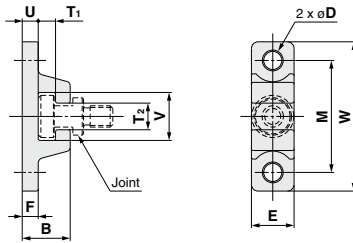
Allowable Eccentricity

[mm]

| Bore size [mm] | 12 | 16 | 20 | 25 |
|--------------------------|-----------|----|----|----|
| Eccentricity tolerance | ± 0.5 | | | |
| Axial direction backlash | 0.5 | | | |



Type A Mounting Bracket

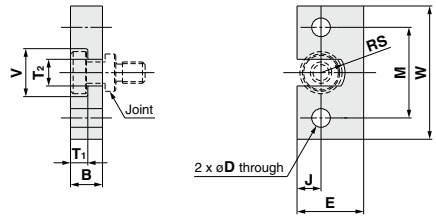


Material: Chromium molybdenum steel (Nickel plating)
[mm]

| Bore size [mm] | Part no. | B | D | E | F | M | T ₁ | T ₂ |
|----------------|----------|------|-----|----|---|----|----------------|----------------|
| 12 | YA-012 | 8 | 3.5 | 10 | 3 | 20 | 2.5 | 4 |
| 16 | YA-016 | 8 | 3.5 | 10 | 3 | 24 | 2.5 | 5 |
| 20 | YA-020 | 12 | 4.5 | 13 | 5 | 30 | 3.5 | 6 |
| 25 | YA-025 | 12.5 | 5.5 | 15 | 5 | 33 | 3.5 | 7 |

| Bore size [mm] | Part no. | U | V | W | Weight [g] |
|----------------|----------|---|------|----|------------|
| 12 | YA-012 | 3 | 8.5 | 30 | 9 |
| 16 | YA-016 | 3 | 11 | 34 | 11 |
| 20 | YA-020 | 5 | 13.5 | 42 | 27 |
| 25 | YA-025 | 5 | 16.5 | 45 | 34 |

Type B Mounting Bracket

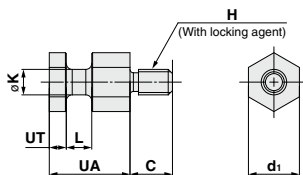


Material: Stainless steel
[mm]

| Bore size [mm] | Part no. | B | D | E | J | M | T ₁ |
|----------------|----------|-----|-----|----|---|------|----------------|
| 12 | YB-012 | 5 | 3.5 | 14 | 5 | 17 | 2.5 |
| 16 | YB-016 | 5 | 3.5 | 16 | 6 | 20 | 2.5 |
| 20 | YB-020 | 7 | 4.5 | 18 | 7 | 25.5 | 3.5 |
| 25 | YB-025 | 7.5 | 5.5 | 20 | 8 | 28 | 3.5 |

| Bore size [mm] | Part no. | T ₂ | V | W | RS | Weight [g] |
|----------------|----------|----------------|------|----|-----|------------|
| 12 | YB-012 | 4 | 8.6 | 25 | 2 | 11 |
| 16 | YB-016 | 5 | 11 | 29 | 2.5 | 15 |
| 20 | YB-020 | 6 | 13.6 | 36 | 3 | 28 |
| 25 | YB-025 | 7 | 16.6 | 40 | 3.5 | 36 |

Joint



Material: Chromium molybdenum steel (Nickel plating)
[mm]

| Bore size [mm] | Part no. | UA | C | d ₁ | H | K | L | UT | Weight [g] |
|----------------|----------|------|----|----------------|----------|---|-----|----|------------|
| 12 | YU-012 | 9.5 | 5 | 6 | M3 x 0.5 | 3 | 3 | 2 | 2 |
| 16 | YU-016 | 9.5 | 7 | 8 | M4 x 0.7 | 4 | 3 | 2 | 4 |
| 20 | YU-020 | 11.5 | 6 | 10 | M5 x 0.8 | 5 | 4 | 3 | 7 |
| 25 | YU-025 | 12 | 11 | 12 | M6 x 1.0 | 6 | 4.5 | 3 | 11 |

CQSY Series Auto Switch Mounting

Minimum Stroke for Auto Switch Mounting

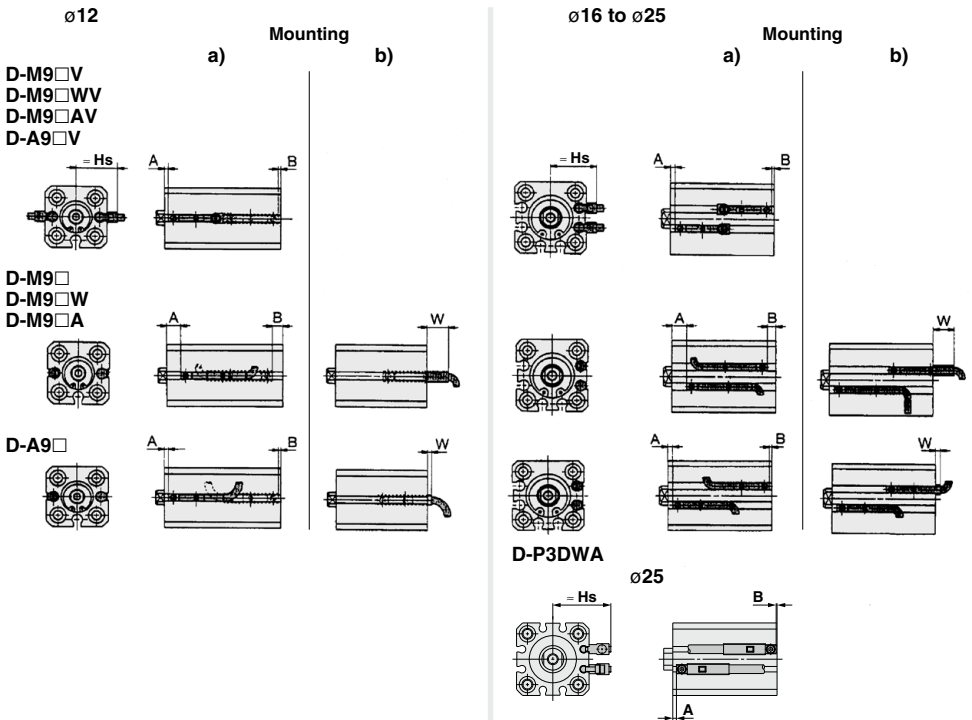
| (mm) | | | | | | | |
|-------------------------|--------|--------|--------------------|--------|------------------|--------|--------------------------------|
| Number of auto switches | D-M9□V | D-A9□V | D-M9□WV D-M9□AV | D-A9□ | D-M9□W D-M9□A | D-M9□ | D-P3DWA <small>Note 1)</small> |
| With 1 pc. | 5 | 5 | 10 | 10 (5) | 15 (10) | 15 (5) | 15 |
| With 2 pcs. | 5 | 10 | 10 | 10 | 15 (10) | 15 (5) | 15 |

Note 1) ø25 is only applicable for the D-P3DWA□.

Note 2) The dimensions stated in () shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure on the right.)
Order auto switches separately.



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height



Auto Switch Proper Mounting Position

| Auto switch model | D-M9□/M9□W | | | D-M9□V/M9□WV M9□AV | | | D-M9□A | | | D-A9□ | | | D-A9□V | | | D-P3DWA | | |
|-------------------|------------|------|------|-----------------------|------|------|--------|------|-----|-------|-----|-----------|--------|-----|------|---------|---|----|
| | A | B | W | A | B | Hs | A | B | W | A | B | W | A | B | Hs | A | B | Hs |
| Bore size 12 | 10 | 5 | 5 | 10 | 5 | 19.5 | 10 | 5 | 7 | 6 | 1 | 1 [3.5] | 6 | 1 | 17 | — | — | — |
| 16 | 9.5 | 5.5 | 4.5 | 9.5 | 5.5 | 21.5 | 9.5 | 5.5 | 6.5 | 5.5 | 1.5 | 0.5 [3] | 5.5 | 1.5 | 19 | — | — | — |
| 20 | 13 | 9.5 | 0.5 | 13 | 9.5 | 25 | 13 | 9.5 | 2.5 | 9 | 5.5 | -3.5 [-1] | 9 | 5.5 | 22.5 | — | — | — |
| 25 | 14 | 11.5 | -1.5 | 14 | 11.5 | 27 | 14 | 11.5 | 0.5 | 10 | 7.5 | -5.5 [-3] | 10 | 7.5 | 24.5 | 9.5 | 7 | 33 |

Note 1) []: Denotes the dimensions of the D-A9□.

Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.

Note 3) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the switch on the head, refer to installation state "b)".

Note 4) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

| Auto switch model | Bore size (mm) | | | |
|--|----------------|-----|-----|-----|
| | 12 | 16 | 20 | 25 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 3 | 3.5 | 5.5 | 4.5 |
| D-A9□/A9□V | 6 | 7.5 | 10 | 10 |
| D-P3DWA | — | — | — | 6 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately $\pm 30\%$ dispersion) and may change substantially depending on the ambient environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

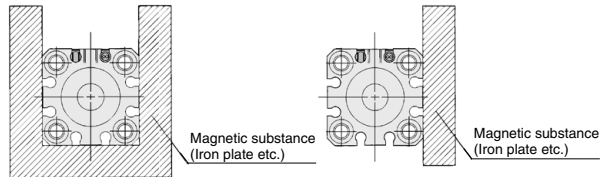
- * With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.
- * Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1360.

⚠ Precautions

Be sure to read this before handling the products.

Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

- If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the figure on the right (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, please consult with SMC for this type of application.



Smooth Cylinder

CQ2Y Series

∅32, ∅40, ∅50, ∅63, ∅80, ∅100

How to Order

CQ2Y B 32 - 30 D C Z

With auto switch **CDQ2Y B 32 - 30 D C Z - M9BW**

Mounting

| | |
|-----------|-------------------------|
| B | Through-hole (Standard) |
| A | Both ends tapped |
| L | Foot (Note) |
| LC | Compact foot |
| F | Rod flange |
| G | Head flange |
| D | Double clevis |

Bore size

| | |
|------------|--------|
| 32 | 32 mm |
| 40 | 40 mm |
| 50 | 50 mm |
| 63 | 63 mm |
| 80 | 80 mm |
| 100 | 100 mm |

Thread type

| | |
|------------|-----|
| Nil | Rc |
| TN | NPT |
| TF | G |

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 247.

Action

| | |
|----------|---------------|
| D | Double acting |
|----------|---------------|

Body option 1

| | |
|------------|-----------------------|
| Nil | Standard |
| F | With boss on head end |

Auto switch

| | |
|------------|---------------------|
| Nil | Without auto switch |
|------------|---------------------|

* For applicable auto switches, refer to the table below.

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch mounting groove

| | |
|----------|------------|
| Z | 4 surfaces |
|----------|------------|

Body option 2

| | |
|------------|---------------------------|
| Nil | Standard (Female rod end) |
| M | Male rod end |

Cushion

| | |
|----------|---------------|
| C | Rubber bumper |
|----------|---------------|

* Mounting bracket is shipped together with the product, (but not assembled).

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2YL40-50DCZ

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire (m) | | | | | Pre-wired connector | Applicable load | | | | | |
|--|---|------------------|-------------------------|-----------------|--------------|----------------------------|---------------------------|--------------|---------------------------|------------|----------------------------|---------------------------|------------|---------------------|-----------------|------------|---|------------|---|------------|
| | | | | | DC | AC | Perpendicular | In-line | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | None (N) | | | | | | | |
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | — | M9NV | M9N | ● | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ○ | — | ○ | | | | | | | |
| | | | | 2-wire | | | M9BV | M9B | ● | ● | ● | ○ | — | ○ | | | | | | |
| | | | | 3-wire (NPN) | | | M9NW | M9W | ● | ● | ● | ○ | — | ○ | | | | | | |
| | Diagnostic indication (2-color indicator) | | | Grommet | | | Yes | 3-wire (PNP) | 24 V | — | M9PW | M9PW | ● | ● | | ○ | — | ○ | ○ | IC circuit |
| | | | | | | | | 2-wire | | | M9BW | M9BW | ● | ● | | ● | ○ | — | ○ | |
| | | | | | | | | 3-wire (NPN) | | | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | | ● | ○ | — | ○ | |
| | | | | | | | | 3-wire (PNP) | | | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | | ● | ○ | — | ○ | |
| Water resistant (2-color indicator) | Grommet | Yes | 2-wire | 24 V | — | M9BAV ^{*1} | M9BA ^{*1} | ○ | | | ○ | ● | ○ | — | ○ | IC circuit | | | | |
| | | | 2-wire (NPN) | | | M9BAV ^{*1} | M9BA ^{*1} | ○ | | | ○ | ● | ○ | — | ○ | | | | | |
| | | | 2-wire (Non-polar) | | | — | P3DWA | ○ | | | ○ | ● | ○ | — | ○ | | | | | |
| | | | 3-wire (NPN equivalent) | | | — | A96V | A96 | | | ● | — | ● | — | — | | — | ○ | | |
| Magnetic field resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | | | 24 V | 12 V | 100 V | A93V ^{*2} | A93 | ● | ● | ● | ● | — | | — | Relay, PLC | | |
| | | | 3-wire (PNP) | | | | | | A90V | A90 | ● | ● | ● | ● | — | | — | | | |
| | | | 2-wire | | | | | | — | — | ● | — | ● | — | — | | — | | | |
| — | Grommet | No | 2-wire | | | | | | 24 V | 12 V | 100 V or less | A90V | A90 | ● | — | | ● | | — | — |
| | | | 3-wire (NPN) | — | — | | | | | | | ● | — | ● | — | — | — | | | |
| | | | 3-wire (PNP) | — | — | | | | | | | ● | — | ● | — | — | — | | | |

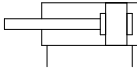
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.
 *2 1 m type lead wire is only applicable to D-A93.
 * Lead wire length symbols: 0.5 m Nil (Example) M9NW
 1 m M (Example) M9NW
 3 m L (Example) M9NL
 5 m Z (Example) M9WZ
 * Solid state auto switches marked with "○" are produced upon receipt of order.
 * Since there are other applicable auto switches than listed, refer to page 262 for details.
 * For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

Specifications



Symbol

Rubber bumper



| Bore size (mm) | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------------------------|---|----|----|----|----|-----|
| Type | Pneumatic (Non-lube) | | | | | |
| Fluid | Air | | | | | |
| Proof pressure | 1.05 MPa | | | | | |
| Maximum operating pressure | 0.7 MPa | | | | | |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C | | | | | |
| Cushion | Rubber bumper (Standard) | | | | | |
| Stroke length tolerance | +1.0 mm (Note) 0 | | | | | |
| Piston speed range | 5 to 500 mm/s | | | | | |
| Allowable leakage rate | 0.5 L/min (ANR) or less | | | | | |

Note) Stroke length tolerance does not include the amount of bumper change.

Minimum Operating Pressure

| Bore size (mm) | Unit: MPa | | | | | |
|----------------------------|-----------|----|------|----|----|-----|
| | 32 | 40 | 50 | 63 | 80 | 100 |
| Minimum operating pressure | 0.02 | | 0.01 | | | |

Standard Strokes

| Bore size (mm) | Standard stroke (mm) |
|-----------------|--|
| 32, 40 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| 50, 63, 80, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|--------------------------|
| 32 | CQ2Y32-PS | |
| 40 | CQ2Y40-PS | Piston seal 1 pc. |
| 50 | CQ2Y50-PS | Rod seal 1 pc. |
| 63 | CQ2Y63-PS | Tube gasket 1 pc. |
| 80 | CQ2Y80-PS | Grease pack (10 g) 1 pc. |
| 100 | CQ2Y100-PS | |

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Accessory

- * For details about the single knuckle joint, double knuckle joint, knuckle pin, and rod end nut, refer to page 257.
- * Stainless steel mounting brackets and accessories are also available. Refer to page 257 for details.

Theoretical Output

| Bore size (mm) | Operating direction | Operating pressure (MPa) | | | Unit: N |
|----------------|---------------------|--------------------------|------|------|---------|
| | | 0.3 | 0.5 | 0.7 | |
| 32 | IN | 181 | 302 | 422 | |
| | OUT | 241 | 402 | 563 | |
| 40 | IN | 317 | 528 | 739 | |
| | OUT | 377 | 628 | 880 | |
| 50 | IN | 495 | 825 | 1155 | |
| | OUT | 589 | 982 | 1374 | |
| 63 | IN | 841 | 1402 | 1962 | |
| | OUT | 935 | 1559 | 2182 | |
| 80 | IN | 1361 | 2268 | 3175 | |
| | OUT | 1508 | 2513 | 3519 | |
| 100 | IN | 2144 | 3574 | 5003 | |
| | OUT | 2356 | 3927 | 5498 | |

Intermediate Stroke

| | | |
|-----------------|---|---|
| Method | Installation of spacer on standard stroke body. | |
| Model no. | Refer to page 246 for standard model no. | |
| Standard stroke | Method | Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders. |
| | Stroke range | Bore size (mm) Stroke range (mm) 32 to 100 1 to 99 |
| Example | Part no.: CQ2YB50-57DCZ CQ2YB50-75DCZ with 18 mm width spacer inside. B dimension is 125.5 mm. Calculation: ø50, B dimension 50.5 mm (without switch) 50.5 (B dimension) + 75 (st) = 125.5 (mm) | |

Weights

Weights/Without Auto Switch

(g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | | | |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| 32 | 134 | 154 | 174 | 193 | 213 | 233 | 252 | 272 | 291 | 311 | 457 | 556 |
| 40 | 211 | 232 | 254 | 275 | 297 | 318 | 340 | 361 | 383 | 404 | 577 | 689 |
| 50 | — | 369 | 402 | 435 | 467 | 500 | 533 | 566 | 598 | 632 | 902 | 1073 |
| 63 | — | 557 | 595 | 633 | 671 | 709 | 747 | 786 | 824 | 862 | 1189 | 1386 |
| 80 | — | 983 | 1043 | 1104 | 1164 | 1224 | 1284 | 1345 | 1405 | 1465 | 1985 | 2281 |
| 100 | — | 1711 | 1792 | 1872 | 1952 | 2033 | 2113 | 2194 | 2274 | 2354 | 3086 | 3494 |

Weights/With Auto Switch (Built-in magnet)

(g)

| Bore size (mm) | Cylinder stroke | | | | | | | | | | | |
|----------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| 32 | 191 | 211 | 230 | 250 | 270 | 289 | 309 | 329 | 348 | 368 | 468 | 567 |
| 40 | 284 | 305 | 327 | 348 | 369 | 391 | 412 | 434 | 455 | 477 | 589 | 701 |
| 50 | — | 480 | 513 | 546 | 579 | 611 | 644 | 677 | 710 | 743 | 915 | 1087 |
| 63 | — | 710 | 748 | 787 | 825 | 863 | 901 | 939 | 977 | 1015 | 1211 | 1408 |
| 80 | — | 1229 | 1289 | 1350 | 1410 | 1470 | 1530 | 1591 | 1651 | 1711 | 2008 | 2305 |
| 100 | — | 2070 | 2150 | 2231 | 2311 | 2391 | 2472 | 2552 | 2633 | 2713 | 3121 | 3529 |

Additional Weights

(g)

| Bore size (mm) | | 32 | 40 | 50 | 63 | 80 | 100 |
|--|-------------|-----------|-----------|-----------|-----------|-----------|------------|
| Both ends tapped | | 6 | 6 | 6 | 19 | 45 | 45 |
| Male rod end | Male thread | 26 | 27 | 53 | 53 | 120 | 175 |
| | Nut | 17 | 17 | 32 | 32 | 49 | 116 |
| With boss on head end | | 5 | 7 | 13 | 25 | 45 | 96 |
| Foot (Including mounting bolt) | | 142 | 154 | 243 | 320 | 690 | 1057 |
| Compact foot (Including mounting bolt) | | 99 | 114 | 177 | 241 | 501 | 770 |
| Rod flange (Including mounting bolt) | | 180 | 214 | 373 | 559 | 1056 | 1365 |
| Head flange (Including mounting bolt) | | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining ring, mounting bolt) | | 151 | 196 | 393 | 554 | 1109 | 1887 |

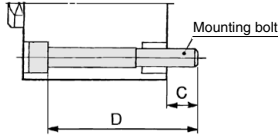
Calculation (Example) **CQ2YD32-20DCMZ**

- Basic weight: CQ2YB32-20DCZ..... 193 g
 - Additional weight: Both ends tapped..... 6 g
 - Male rod end..... 43 g
 - Double clevis 151 g
- Total **393 g**

Mounting Bolt

Mounting method: Mounting bolt for through-hole mounting type of the CQ2YB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5X40L 2 pcs.



Mounting Bolt for CQ2YB without Auto Switch

| Cylinder model | C | D | Mounting bolt part no. |
|----------------------|------|-------|------------------------|
| CQ2YB32- 5DC | 9 | 40 | CQ-M5X40L |
| - 10DC | | 45 | X45L |
| - 15DC | | 50 | X50L |
| - 20DC | | 55 | X55L |
| - 25DC | | 60 | X60L |
| - 30DC | | 65 | X65L |
| - 35DC | | 70 | X70L |
| - 40DC | | 75 | X75L |
| - 45DC | | 80 | X80L |
| - 50DC | | 85 | X85L |
| - 75DC | | 120 | X120L |
| -100DC | 145 | X145L | |
| CQ2YB40- 5DC | 7.5 | 45 | CQ-M5X45L |
| - 10DC | | 50 | X50L |
| - 15DC | | 55 | X55L |
| - 20DC | | 60 | X60L |
| - 25DC | | 65 | X65L |
| - 30DC | | 70 | X70L |
| - 35DC | | 75 | X75L |
| - 40DC | | 80 | X80L |
| - 45DC | | 85 | X85L |
| - 50DC | | 90 | X90L |
| - 75DC | | 125 | X125L |
| -100DC | 150 | X150L | |
| CQ2YB50- 10DC | 12.5 | 55 | CQ-M6X55L |
| - 15DC | | 60 | X60L |
| - 20DC | | 65 | X65L |
| - 25DC | | 70 | X70L |
| - 30DC | | 75 | X75L |
| - 35DC | | 80 | X80L |
| - 40DC | | 85 | X85L |
| - 45DC | | 90 | X90L |
| - 50DC | | 95 | X95L |
| - 75DC | | 130 | X130L |
| -100DC | | 155 | X155L |

| Cylinder model | C | D | Mounting bolt part no. |
|-----------------------|------|-----|------------------------|
| CQ2YB63- 10DC | 14.5 | 60 | CQ-M8X60L |
| - 15DC | | 65 | X65L |
| - 20DC | | 70 | X70L |
| - 25DC | | 75 | X75L |
| - 30DC | | 80 | X80L |
| - 35DC | | 85 | X85L |
| - 40DC | | 90 | X90L |
| - 45DC | | 95 | X95L |
| - 50DC | | 100 | X100L |
| - 75DC | | 135 | X135L |
| -100DC | | 160 | X160L |
| CQ2YB80- 10DC | 15 | 65 | CQ-M10X65L |
| - 15DC | | 70 | X70L |
| - 20DC | | 75 | X75L |
| - 25DC | | 80 | X80L |
| - 30DC | | 85 | X85L |
| - 35DC | | 90 | X90L |
| - 40DC | | 95 | X95L |
| - 45DC | | 100 | X100L |
| - 50DC | | 105 | X105L |
| - 75DC | | 140 | X140L |
| -100DC | | 165 | X165L |
| CQ2YB100- 10DC | 15.5 | 75 | CQ-M10X75L |
| - 15DC | | 80 | X80L |
| - 20DC | | 85 | X85L |
| - 25DC | | 90 | X90L |
| - 30DC | | 95 | X95L |
| - 35DC | | 100 | X100L |
| - 40DC | | 105 | X105L |
| - 45DC | | 110 | X110L |
| - 50DC | | 115 | X115L |
| - 75DC | | 150 | X150L |
| -100DC | | 175 | X175L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

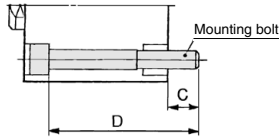
CQ2Y Series

Mounting Bolt

Mounting method: Mounting bolt for through-hole mounting type of the CQ2YB is available as an option.

Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5X40L 2 pcs.



Mounting Bolt for CDQ2YB with Auto Switch (Built-in magnet)

| Cylinder model | C | D | Mounting bolt part no. |
|---------------------|------|-------|------------------------|
| CDQ2YB32- 5 | 9 | 50 | CQ-M5X50L |
| - 10 | | 55 | X55L |
| - 15 | | 60 | X60L |
| - 20 | | 65 | X65L |
| - 25 | | 70 | X70L |
| - 30 | | 75 | X75L |
| - 35 | | 80 | X80L |
| - 40 | | 85 | X85L |
| - 45 | | 90 | X90L |
| - 50 | | 95 | X95L |
| - 75 | | 120 | X120L |
| -100 | 145 | X145L | |
| CDQ2YB40- 5 | 7.5 | 55 | CQ-M5X55L |
| - 10 | | 60 | X60L |
| - 15 | | 65 | X65L |
| - 20 | | 70 | X70L |
| - 25 | | 75 | X75L |
| - 30 | | 80 | X80L |
| - 35 | | 85 | X85L |
| - 40 | | 90 | X90L |
| - 45 | | 95 | X95L |
| - 50 | | 100 | X100L |
| - 75 | | 125 | X125L |
| -100 | 150 | X150L | |
| CDQ2YB50- 10 | 12.5 | 65 | CQ-M6X65L |
| - 15 | | 70 | X70L |
| - 20 | | 75 | X75L |
| - 25 | | 80 | X80L |
| - 30 | | 85 | X85L |
| - 35 | | 90 | X90L |
| - 40 | | 95 | X95L |
| - 45 | | 100 | X100L |
| - 50 | | 105 | X105L |
| - 75 | | 130 | X130L |
| -100 | | 155 | X155L |

| Cylinder model | C | D | Mounting bolt part no. |
|----------------------|------|-----|------------------------|
| CDQ2YB63- 10 | 14.5 | 70 | CQ-M8X70L |
| - 15 | | 75 | X75L |
| - 20 | | 80 | X80L |
| - 25 | | 85 | X85L |
| - 30 | | 90 | X90L |
| - 35 | | 95 | X95L |
| - 40 | | 100 | X100L |
| - 45 | | 105 | X105L |
| - 50 | | 110 | X110L |
| - 75 | | 135 | X135L |
| -100 | | 160 | X160L |
| CDQ2YB80- 10 | 15 | 75 | CQ-M10X75L |
| - 15 | | 80 | X80L |
| - 20 | | 85 | X85L |
| - 25 | | 90 | X90L |
| - 30 | | 95 | X95L |
| - 35 | | 100 | X100L |
| - 40 | | 105 | X105L |
| - 45 | | 110 | X110L |
| - 50 | | 115 | X115L |
| - 75 | | 140 | X140L |
| -100 | | 165 | X165L |
| CDQ2YB100- 10 | 15.5 | 85 | CQ-M10X85L |
| - 15 | | 90 | X90L |
| - 20 | | 95 | X95L |
| - 25 | | 100 | X100L |
| - 30 | | 105 | X105L |
| - 35 | | 110 | X110L |
| - 40 | | 115 | X115L |
| - 45 | | 120 | X120L |
| - 50 | | 125 | X125L |
| - 75 | | 150 | X150L |
| -100 | | 175 | X175L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Bore Size

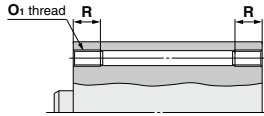
ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Through-hole: CQ2YB/CDQ2YB

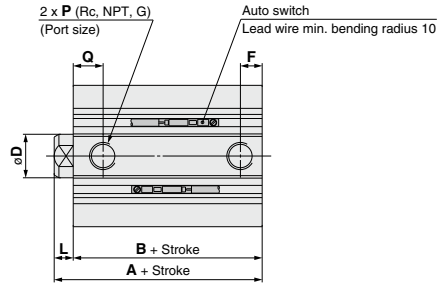
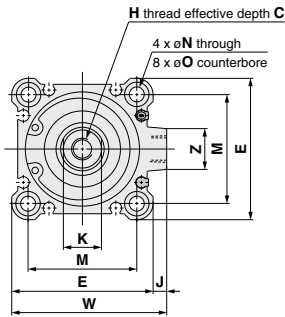
Both ends tapped: CQ2YA/CDQ2YA

CDQ2YA

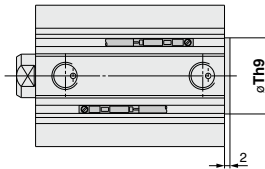


Both Ends Tapped (mm)

| Bore size (mm) | O1 | R |
|----------------|-----------|----|
| 32 | M6 x 1.0 | 10 |
| 40 | M6 x 1.0 | 10 |
| 50 | M8 x 1.25 | 14 |



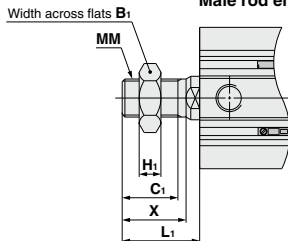
With boss on head end



With Boss on Head End (mm)

| Bore size (mm) | Th9 |
|----------------|-----------------------------------|
| 32 | 21 ⁰ _{-0.052} |
| 40 | 28 ⁰ _{-0.052} |
| 50 | 35 ⁰ _{-0.062} |

Male rod end



Male Rod End

(mm)

| Bore size (mm) | B1 | C1 | H1 | L1 | MM | X |
|----------------|----|------|----|------|-----------|------|
| 32 | 22 | 20.5 | 8 | 28.5 | M14 x 1.5 | 23.5 |
| 40 | 22 | 20.5 | 8 | 28.5 | M14 x 1.5 | 23.5 |
| 50 | 27 | 26 | 11 | 33.5 | M18 x 1.5 | 28.5 |

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | (mm) | | | | | | | | | | | | | | |
|----------------|-------------------|---------------------|---------|------------------|------|------|----|----|------|-----------|-----|-----------|-----|----|-----|------------|-----|-----------|-----|----|
| | | A | B | A | B | C | D | E | F | H | J | K | L | M | N | O | P | Q | W | Z |
| | | 32 | 5 to 50 | 40 | 33 | 50 | 43 | 13 | 16 | 45 | 7.5 | M8 x 1.25 | 4.5 | 14 | 7 | 34 | 5.5 | 9 depth 7 | 1/8 | 10 |
| 40 | 5 to 50 | 46.5 | 39.5 | 56.5 | 49.5 | 13 | 16 | 52 | 7.5 | M8 x 1.25 | 5 | 14 | 7 | 40 | 5.5 | 9 depth 7 | 1/8 | 12.5 | 57 | 14 |
| | 75, 100 | 56.5 | 49.5 | | | | | | | | | | | | | | | | | |
| 50 | 10 to 50 | 48.5 | 40.5 | 58.5 | 50.5 | 15 | 20 | 64 | 10.5 | M10 x 1.5 | 7 | 17 | 8 | 50 | 6.6 | 11 depth 8 | 1/4 | 10.5 | 71 | 19 |
| | 75, 100 | 58.5 | 50.5 | | | | | | | | | | | | | | | | | |

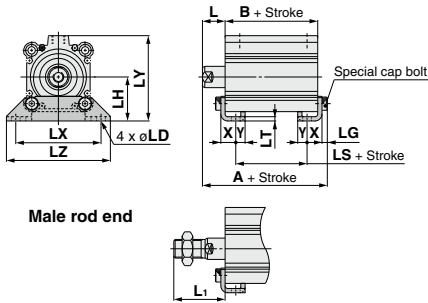
CQ2Y Series

Bore Size

ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Foot: CQ2YL/CDQ2YL



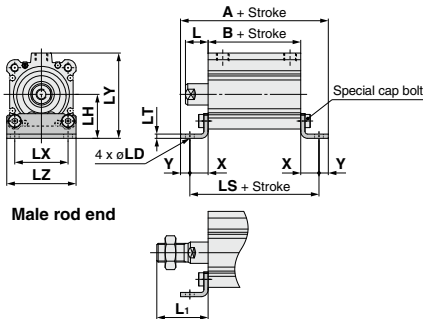
Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----------------|-----|
| | | A | B | LS | A | B | LS | | | |
| 32 | 5 to 50 | 57.2 | 33 | 17 | 67.2 | 43 | 27 | 17 | 38.5 | 6.6 |
| | 75, 100 | 67.2 | 43 | 27 | | | | | | |
| 40 | 5 to 50 | 63.7 | 39.5 | 23.5 | 73.7 | 49.5 | 33.5 | 17 | 38.5 | 6.6 |
| | 75, 100 | 73.7 | 49.5 | 33.5 | | | | | | |
| 50 | 10 to 50 | 66.7 | 40.5 | 17.5 | 76.7 | 50.5 | 27.5 | 18 | 43.5 | 9 |
| | 75, 100 | 76.7 | 50.5 | 27.5 | | | | | | |

| Bore size (mm) | Stroke range (mm) | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|----|----|-----|----|----|----|------|-----|
| 32 | 5 to 50 | 4 | 30 | 3.2 | 57 | 57 | 71 | 11.2 | 5.8 |
| | 75, 100 | | | | | | | | |
| 40 | 5 to 50 | 4 | 33 | 3.2 | 64 | 64 | 78 | 11.2 | 7 |
| | 75, 100 | | | | | | | | |
| 50 | 10 to 50 | 5 | 39 | 3.2 | 79 | 78 | 95 | 14.7 | 8 |
| | 75, 100 | | | | | | | | |

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2YLC/CDQ2YLC



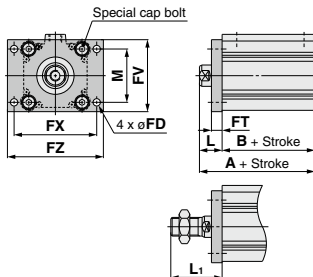
Compact Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----------------|-----|
| | | A | B | LS | A | B | LS | | | |
| 32 | 5 to 50 | 72 | 33 | 60.4 | 82 | 43 | 70.4 | 17 | 38.5 | 6.6 |
| | 75, 100 | 82 | 43 | 70.4 | | | | | | |
| 40 | 5 to 50 | 80.9 | 39.5 | 66.9 | 90.9 | 49.5 | 76.9 | 17 | 38.5 | 6.6 |
| | 75, 100 | 90.9 | 49.5 | 76.9 | | | | | | |
| 50 | 10 to 50 | 89.9 | 40.5 | 73.9 | 99.9 | 50.5 | 83.9 | 18 | 43.5 | 9 |
| | 75, 100 | 99.9 | 50.5 | 83.9 | | | | | | |

| Bore size (mm) | Stroke range (mm) | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|----|-----|----|----|----|------|-----|
| 32 | 5 to 50 | 30 | 3.2 | 34 | 57 | 45 | 13.7 | 5.8 |
| | 75, 100 | | | | | | | |
| 40 | 5 to 50 | 33 | 3.2 | 40 | 64 | 52 | 13.7 | 7 |
| | 75, 100 | | | | | | | |
| 50 | 10 to 50 | 39 | 3.2 | 50 | 78 | 64 | 16.7 | 8 |
| | 75, 100 | | | | | | | |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2YF/CDQ2YF



Rod Flange

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ |
|----------------|-------------------|---------------------|------|------------------|------|-----|----|----|----|----|
| | | A | B | A | B | | | | | |
| 32 | 5 to 50 | 50 | 33 | 60 | 43 | 5.5 | 8 | 48 | 56 | 65 |
| | 75, 100 | 60 | 43 | | | | | | | |
| 40 | 5 to 50 | 56.5 | 39.5 | 66.5 | 49.5 | 5.5 | 8 | 54 | 62 | 72 |
| | 75, 100 | 66.5 | 49.5 | | | | | | | |
| 50 | 10 to 50 | 58.5 | 40.5 | 68.5 | 50.5 | 6.6 | 9 | 67 | 76 | 89 |
| | 75, 100 | 68.5 | 50.5 | | | | | | | |

| Bore size (mm) | Stroke range (mm) | L | L ₁ | M |
|----------------|-------------------|----|----------------|----|
| 32 | 5 to 50 | 17 | 38.5 | 34 |
| | 75, 100 | | | |
| 40 | 5 to 50 | 17 | 38.5 | 40 |
| | 75, 100 | | | |
| 50 | 10 to 50 | 18 | 43.5 | 50 |
| | 75, 100 | | | |

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

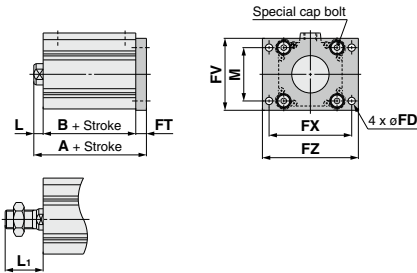
* For details about the rod end nut and accessory brackets, refer to page 257.

Bore Size

ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Head flange: CQ2YG/CDQ2YG



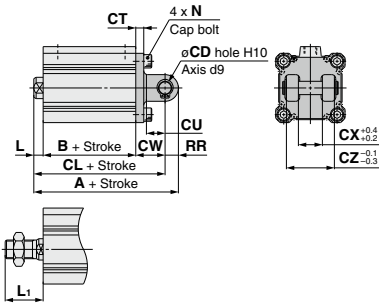
Head Flange

| | | (mm) | | | | |
|----------------|-------------------|---------------------|------------------|--|---|----------------|
| Bore size (mm) | Stroke range (mm) | Without auto switch | With auto switch | | L | L ₁ |
| | | A | A | | | |
| 32 | 5 to 50 | 48 | 58 | | 7 | 28.5 |
| | 75, 100 | 58 | | | | |
| 40 | 5 to 50 | 54.5 | 64.5 | | 7 | 28.5 |
| | 75, 100 | 64.5 | | | | |
| 50 | 10 to 50 | 57.5 | 67.5 | | 8 | 33.5 |
| | 75, 100 | 67.5 | | | | |

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

(* Dimensions except A, L and L₁ are the same as rod flange type.)

Double clevis: CQ2YD/CDQ2YD



Double Clevis

| | | (mm) | | | | | | | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----|----|
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | CD | CT | CU |
| | | A | B | CL | A | B | CL | | | |
| 32 | 5 to 50 | 70 | 33 | 60 | 80 | 43 | 70 | 10 | 5 | 14 |
| | 75, 100 | 80 | 43 | 70 | | | | | | |
| 40 | 5 to 50 | 78.5 | 39.5 | 68.5 | 88.5 | 49.5 | 78.5 | 10 | 6 | 14 |
| | 75, 100 | 88.5 | 49.5 | 78.5 | | | | | | |
| 50 | 10 to 50 | 90.5 | 40.5 | 76.5 | 100.5 | 50.5 | 86.5 | 14 | 7 | 20 |
| | 75, 100 | 100.5 | 50.5 | 86.5 | | | | | | |

Double clevis bracket material: Cast iron
Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 257.
* A double clevis pin and retaining rings are included.

CQ2Y Series

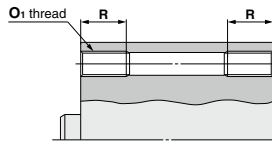
Bore Size

Ø63 to Ø100

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

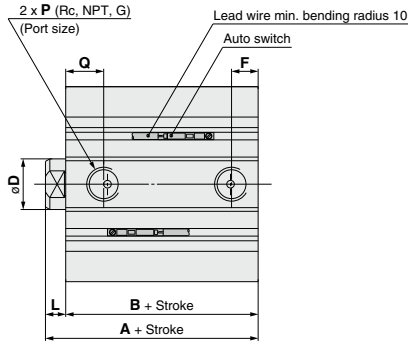
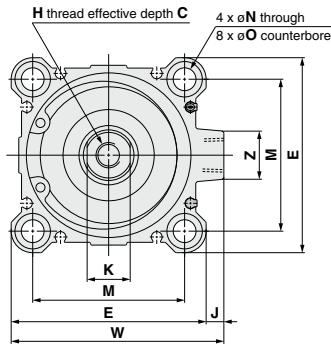
Through-hole: CQ2YB/CDQ2YB

Both ends tapped: CQ2YA/CDQ2YA

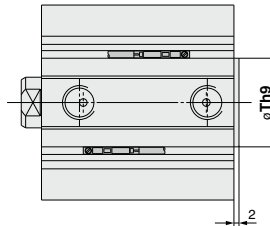


Both Ends Tapped (mm)

| Bore size (mm) | O ₁ | R |
|----------------|----------------|----|
| 63 | M10 x 1.5 | 18 |
| 80 | M12 x 1.75 | 22 |
| 100 | M12 x 1.75 | 22 |



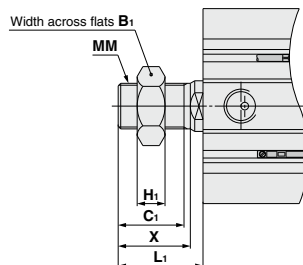
With boss on head end



With Boss on Head End (mm)

| Bore size (mm) | Th9 |
|----------------|----------------------------------|
| 63 | 35 ⁰ _{0.062} |
| 80 | 43 ⁰ _{0.062} |
| 100 | 59 ⁰ _{0.074} |

Male rod end



Male Rod End

| Bore size (mm) | B ₁ | C ₁ | H ₁ | L ₁ | MM | X |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 63 | 27 | 26 | 11 | 33.5 | M18 x 1.5 | 28.5 |
| 80 | 32 | 32.5 | 13 | 43.5 | M22 x 1.5 | 35.5 |
| 100 | 41 | 32.5 | 16 | 43.5 | M26 x 1.5 | 35.5 |

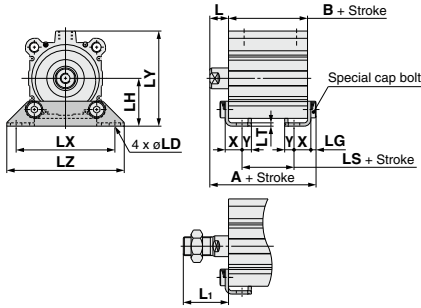
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | C | D | E | F | H | J | K | L | M | N | O | P | Q | W | Z | |
|----------------|-------------------|---------------------|------|------------------|------|----|----|-----|------|-----------|-----|----|----|----|----|------------|------|-----|----|-------|----|
| | | A | B | A | B | | | | | | | | | | | | | | | | |
| 63 | 10 to 50 | 54 | 46 | 64 | 56 | 15 | 20 | 77 | 10.5 | M10 x 1.5 | 7 | 17 | 8 | 60 | 9 | 14 depth | 10.5 | 1/4 | 15 | 84 | 19 |
| | 75, 100 | 64 | 56 | | | | | | | | | | | | | | | | | | |
| 80 | 10 to 50 | 63.5 | 53.5 | 73.5 | 63.5 | 21 | 25 | 98 | 12.5 | M16 x 2.0 | 6 | 22 | 10 | 77 | 11 | 17.5 depth | 13.5 | 3/8 | 16 | 104 | 25 |
| | 75, 100 | 73.5 | 63.5 | | | | | | | | | | | | | | | | | | |
| 100 | 10 to 50 | 75 | 63 | 85 | 73 | 27 | 30 | 117 | 13 | M20 x 2.5 | 6.5 | 27 | 12 | 94 | 11 | 17.5 depth | 13.5 | 3/8 | 23 | 123.5 | 25 |
| | 75, 100 | 85 | 73 | | | | | | | | | | | | | | | | | | |

Bore Size

∅63 to ∅100

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Foot: CQ2YL/CDQ2YL



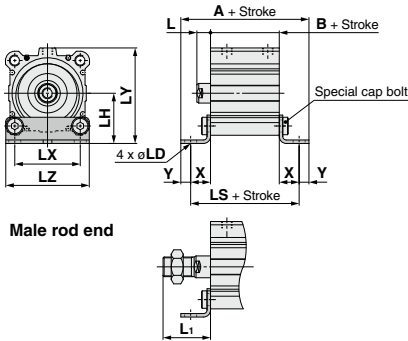
Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----------------|----|
| | | A | B | LS | A | B | LS | | | |
| | | 63 | | | | | | | | |
| 63 | 10 to 50 | 72.2 | 46 | 20 | 82.2 | 56 | 30 | 18 | 43.5 | 11 |
| | 75, 100 | 82.2 | 56 | 30 | | | | | | |
| 80 | 10 to 50 | 85 | 53.5 | 23.5 | 95 | 63.5 | 33.5 | 20 | 53.5 | 13 |
| | 75, 100 | 95 | 63.5 | 33.5 | | | | | | |
| 100 | 10 to 50 | 98 | 63 | 29 | 108 | 73 | 39 | 22 | 53.5 | 13 |
| | 75, 100 | 108 | 73 | 39 | | | | | | |

| Bore size (mm) | Stroke range (mm) | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|----|----|-----|-----|------|-----|------|------|
| 63 | | | | | | | | | |
| 63 | 10 to 50 | 5 | 46 | 3.2 | 95 | 91.5 | 113 | 16.2 | 9 |
| | 75, 100 | | | | | | | | |
| 80 | 10 to 50 | 7 | 59 | 4.5 | 118 | 114 | 140 | 19.5 | 11 |
| | 75, 100 | | | | | | | | |
| 100 | 10 to 50 | 7 | 71 | 6 | 137 | 136 | 162 | 23 | 12.5 |
| | 75, 100 | | | | | | | | |

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2YLC/CDQ2YLC



Male rod end

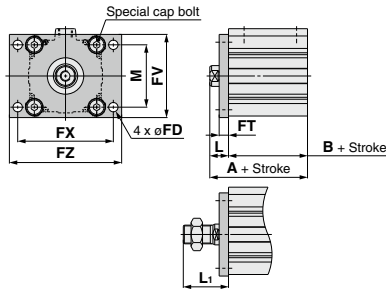
Compact Foot

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD |
|----------------|-------------------|---------------------|------|-------|------------------|------|-------|----|----------------|----|
| | | A | B | LS | A | B | LS | | | |
| | | 63 | | | | | | | | |
| 63 | 10 to 50 | 100.4 | 46 | 82.4 | 110.4 | 56 | 92.4 | 18 | 43.5 | 11 |
| | 75, 100 | 110.4 | 56 | 92.4 | | | | | | |
| 80 | 10 to 50 | 120.5 | 53.5 | 98.5 | 130.5 | 63.5 | 108.5 | 20 | 53.5 | 13 |
| | 75, 100 | 130.5 | 63.5 | 108.5 | | | | | | |
| 100 | 10 to 50 | 136 | 63 | 111 | 146 | 73 | 121 | 22 | 53.5 | 13 |
| | 75, 100 | 146 | 73 | 121 | | | | | | |

| Bore size (mm) | Stroke range (mm) | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|----|-----|----|------|-----|------|------|
| 63 | | | | | | | | |
| 63 | 10 to 50 | 46 | 3.2 | 60 | 91.5 | 77 | 18.2 | 9 |
| | 75, 100 | | | | | | | |
| 80 | 10 to 50 | 59 | 4.5 | 77 | 114 | 98 | 22.5 | 11 |
| | 75, 100 | | | | | | | |
| 100 | 10 to 50 | 71 | 6 | 94 | 136 | 117 | 24 | 12.5 |
| | 75, 100 | | | | | | | |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2YF/CDQ2YF



Rod Flange

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ |
|----------------|-------------------|---------------------|------|------------------|------|----|----|-----|-----|-----|
| | | A | B | A | B | | | | | |
| | | 63 | | | | | | | | |
| 63 | 10 to 50 | 64 | 46 | 74 | 56 | 9 | 9 | 80 | 92 | 108 |
| | 75, 100 | 74 | 56 | | | | | | | |
| 80 | 10 to 50 | 73.5 | 53.5 | 83.5 | 63.5 | 11 | 11 | 99 | 116 | 134 |
| | 75, 100 | 83.5 | 63.5 | | | | | | | |
| 100 | 10 to 50 | 85 | 63 | 95 | 73 | 11 | 11 | 117 | 136 | 154 |
| | 75, 100 | 95 | 73 | | | | | | | |

| Bore size (mm) | Stroke range (mm) | L | L ₁ | M |
|----------------|-------------------|----|----------------|----|
| 63 | | | | |
| 63 | 10 to 50 | 18 | 43.5 | 60 |
| | 75, 100 | | | |
| 80 | 10 to 50 | 20 | 53.5 | 77 |
| | 75, 100 | | | |
| 100 | 10 to 50 | 22 | 53.5 | 94 |
| | 75, 100 | | | |

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

* For details about the rod end nut and accessory brackets, refer to page 257.

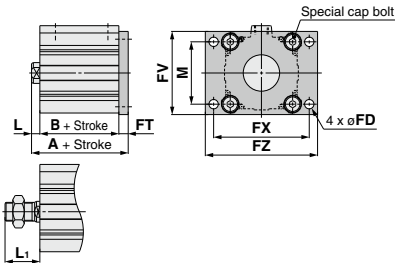
CQ2Y Series

Bore Size

∅63 to ∅100

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Head flange: CQ2YG/CDQ2YG



Head Flange

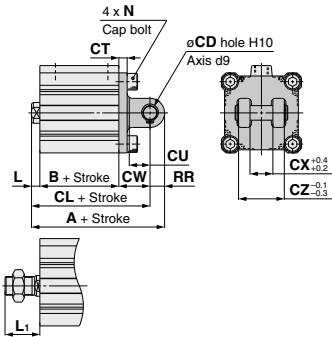
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | L | L ₁ |
|----------------|-------------------|---------------------|---|------------------|---|----|----------------|
| | | A | B | A | B | | |
| 63 | 10 to 50 | 63 | | 73 | | 8 | 33.5 |
| | 75, 100 | 73 | | | | | |
| | 10 to 50 | 74.5 | | 84.5 | | 10 | 43.5 |
| 80 | 10 to 50 | 86 | | 96 | | 12 | 43.5 |
| | 75, 100 | 96 | | | | | |
| | 10 to 50 | 96 | | | | | |

Flange bracket material: Carbon steel

Surface treatment: Nickel plating

(∗ Dimensions except A, L and L₁ are the same as rod flange type.)

Double clevis: CQ2YD/CDQ2YD



Double Clevis

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | CD | CT | CU |
|----------------|-------------------|---------------------|------|-------|------------------|------|-------|----|----|----|
| | | A | B | CL | A | B | CL | | | |
| 63 | 10 to 50 | 98 | 46 | 84 | 108 | 56 | 94 | 14 | 8 | 20 |
| | 75, 100 | 108 | 56 | 94 | | | | | | |
| | 10 to 50 | 119.5 | 53.5 | 101.5 | 129.5 | 63.5 | 111.5 | 18 | 10 | 27 |
| 80 | 10 to 50 | 142 | 63 | 120 | 152 | 73 | 130 | 22 | 13 | 31 |
| | 75, 100 | 152 | 73 | 130 | | | | | | |
| | 10 to 50 | 152 | 73 | 130 | | | | | | |

| Bore size (mm) | Stroke range (mm) | CW | CX | CZ | L | L ₁ | N | RR |
|----------------|-------------------|----|----|----|----|----------------|------------|----|
| 63 | 10 to 50 | 30 | 22 | 44 | 8 | 33.5 | M10 x 1.5 | 14 |
| | 75, 100 | | | | | | | |
| 80 | 10 to 50 | 38 | 28 | 56 | 10 | 43.5 | M12 x 1.75 | 18 |
| | 75, 100 | | | | | | | |
| 100 | 10 to 50 | 45 | 32 | 64 | 12 | 43.5 | M12 x 1.75 | 22 |
| | 75, 100 | | | | | | | |

Double clevis bracket material: Cast iron

Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 257.

* A double clevis pin and retaining rings are included.

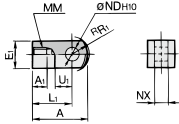
CQ2Y Series

Dimensions of Accessories

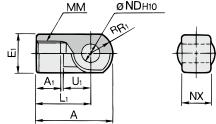
Single Knuckle Joint

For I-G012, I-Z015A
I-G02, I-G03

For I-G04, I-G05
I-G08, I-G10



Material: Carbon steel
Surface treatment: Nickel plating



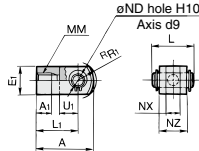
Material: Cast iron
Surface treatment: Nickel plating
(mm)

| Part no. | Applicable bore size (mm) | A | A ₁ | E ₁ | L ₁ | MM | ^h R ₁ | U ₁ | ND _{H10} | NX |
|----------|---------------------------|----|----------------|----------------|----------------|-----------|-----------------------------|----------------|-----------------------------------|---------------------------------|
| I-G04 | 32, 40 | 42 | 14 | ∅22 | 30 | M14 x 1.5 | 12 | 14 | 10 ^{+0.058} ₀ | 18 ^{+0.3} ₀ |
| I-G05 | 50, 63 | 56 | 18 | ∅28 | 40 | M18 x 1.5 | 16 | 20 | 14 ^{+0.070} ₀ | 22 ^{+0.3} ₀ |
| I-G08 | 80 | 71 | 21 | ∅38 | 50 | M22 x 1.5 | 21 | 27 | 18 ^{+0.070} ₀ | 28 ^{+0.3} ₀ |
| I-G10 | 100 | 79 | 21 | ∅44 | 55 | M26 x 1.5 | 24 | 31 | 22 ^{+0.084} ₀ | 32 ^{+0.3} ₀ |

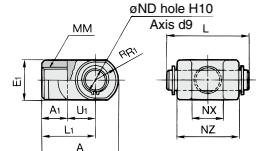
Double Knuckle Joint

For Y-G012, Y-Z015A
Y-G02, Y-G03

For Y-G04, Y-G05
Y-G08, Y-G10



Material: Carbon steel
Surface treatment: Nickel plating

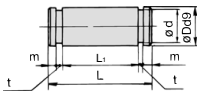


Material: Cast iron
Surface treatment: Nickel plating
(mm)

| Part no. | Applicable bore size (mm) | A | A ₁ | E ₁ | L ₁ | MM | ^h R ₁ | U ₁ | ND _{H10} | NX | NZ | Applicable pin part no. | |
|----------|---------------------------|----|----------------|----------------|----------------|-----------|-----------------------------|----------------|-----------------------------------|---------------------------------|----|-------------------------|--------|
| Y-G04 | 32, 40 | 42 | 16 | ∅22 | 30 | M14 x 1.5 | 12 | 14 | 10 ^{+0.058} ₀ | 18 ^{+0.3} ₀ | 38 | 41 | IY-G04 |
| Y-G05 | 50, 63 | 56 | 20 | ∅28 | 40 | M18 x 1.5 | 16 | 20 | 14 ^{+0.070} ₀ | 22 ^{+0.3} ₀ | 44 | 51 | IY-G05 |
| Y-G08 | 80 | 71 | 23 | ∅38 | 50 | M22 x 1.5 | 21 | 27 | 18 ^{+0.070} ₀ | 28 ^{+0.3} ₀ | 56 | 64 | IY-G08 |
| Y-G10 | 100 | 79 | 24 | ∅44 | 55 | M26 x 1.5 | 24 | 31 | 22 ^{+0.084} ₀ | 32 ^{+0.3} ₀ | 64 | 72 | IY-G10 |

* A knuckle pin and retaining rings are included.

Knuckle Pin (Common with double clevis pin)

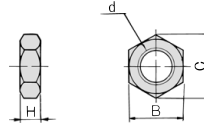


Material: Carbon steel
(mm)

| Part no. | Applicable bore size (mm) | Dd9 | L | d | L ₁ | m | t | Applicable retaining ring |
|----------|---------------------------|--|------|------|----------------|------|------|---------------------------|
| IY-G04 | 32, 40 | 10 ^{+0.040} _{-0.016} | 41.6 | 9.6 | 36.2 | 1.55 | 1.15 | Type C 10 for axis |
| IY-G05 | 50, 63 | 14 ^{+0.050} _{-0.023} | 50.6 | 13.4 | 44.2 | 2.05 | 1.15 | Type C 14 for axis |
| IY-G08 | 80 | 18 ^{+0.050} _{-0.023} | 64 | 17 | 56.2 | 2.55 | 1.35 | Type C 18 for axis |
| IY-G10 | 100 | 22 ^{+0.070} _{-0.027} | 72 | 21 | 64.2 | 2.55 | 1.35 | Type C 22 for axis |

* Type C retaining rings for axis are included.

Rod End Nut



Material: Carbon steel
Surface material: Nickel plating
(mm)

| Part no. | Applicable bore size (mm) | d | H | B | C |
|----------|---------------------------|-----------|----|----|------|
| NT-04 | 32, 40 | M14 x 1.5 | 8 | 22 | 25.4 |
| NT-05 | 50, 63 | M18 x 1.5 | 11 | 27 | 31.2 |
| NT-08 | 80 | M22 x 1.5 | 13 | 32 | 37.0 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | 47.3 |

Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Part No. (Dimensions: Same as standard type)

| Bore size (mm) | Single knuckle joint | Double knuckle joint* | Rod end nut |
|----------------|----------------------|-----------------------|-------------|
| 32 | I-G04SUS | Y-G04SUS | NT-G04SUS |
| 40 | | | |
| 50 | I-G05SUS | Y-G05SUS | NT-05SUS |
| 63 | | | |
| 80 | I-G08SUS | Y-G08SUS | NT-08SUS |
| 100 | | | |

* A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

CQ2Y Series

Simple Joint (CQ2Y): $\phi 32$ to $\phi 100$

Joint/Mounting Bracket (Type A/B) Part Nos.

| Bore size [mm] | Joint | Type A mounting bracket | Type B mounting bracket |
|----------------|-------|-------------------------|-------------------------|
| 32, 40 | YU-03 | YA-03 | YB-03 |
| 50, 63 | YU-05 | YA-05 | YB-05 |
| 80 | YU-08 | YA-08 | YB-08 |
| 100 | YU-10 | YA-10 | YB-10 |

<Ordering>

Joints are not included with type A or B mounting brackets. Order them separately.

(Example)

Bore size $\phi 40$ Part no.

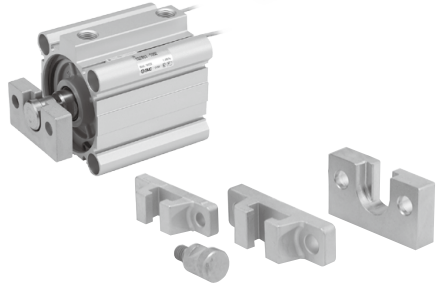
●Type A mounting bracket.....YA-03

●Joint.....YU-03

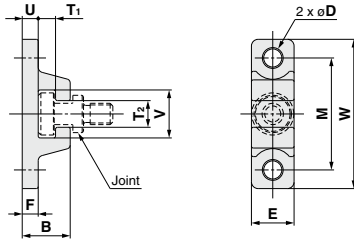
Allowable Eccentricity

[mm]

| Bore size [mm] | 32 | 40 | 50 | 63 | 80 | 100 |
|--------------------------|-----|----|----|------|----|-----|
| Eccentricity tolerance | ±1 | | | ±1.5 | | ±2 |
| Axial direction backlash | 0.5 | | | | | |



Type A Mounting Bracket

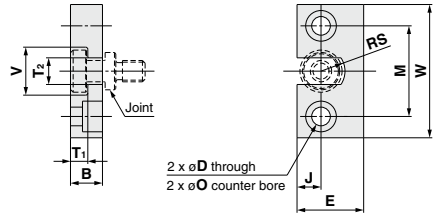


Material: Chromium molybdenum steel (Nickel plating)
[mm]

| Bore size [mm] | Part no. | B | D | E | F | M | T ₁ | T ₂ |
|----------------|----------|----|-----|----|----|----|----------------|----------------|
| 32, 40 | YA-03 | 18 | 6.8 | 16 | 6 | 42 | 6.5 | 10 |
| 50, 63 | YA-05 | 20 | 9 | 20 | 8 | 50 | 6.5 | 12 |
| 80 | YA-08 | 26 | 11 | 25 | 10 | 62 | 8.5 | 16 |
| 100 | YA-10 | 31 | 14 | 30 | 12 | 76 | 10.5 | 18 |

| Bore size [mm] | Part no. | U | V | W | Weight [g] |
|----------------|----------|----|----|-----|------------|
| 32, 40 | YA-03 | 6 | 18 | 56 | 55 |
| 50, 63 | YA-05 | 8 | 22 | 67 | 100 |
| 80 | YA-08 | 10 | 28 | 83 | 195 |
| 100 | YA-10 | 12 | 36 | 100 | 340 |

Type B Mounting Bracket



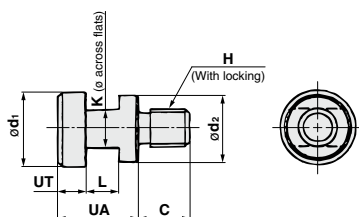
Material: Stainless steel
[mm]

| Bore size [mm] | Part no. | B | D | E | J | M | O |
|----------------|----------|----|----|----|----|----|----------------|
| 32, 40 | YB-03 | 12 | 7 | 25 | 9 | 34 | 11.5 depth 7.5 |
| 50, 63 | YB-05 | 12 | 9 | 32 | 11 | 42 | 14.5 depth 8.5 |
| 80 | YB-08 | 16 | 11 | 38 | 13 | 52 | 18 depth 12 |
| 100 | YB-10 | 19 | 14 | 50 | 17 | 62 | 21 depth 14 |

| Bore size [mm] | Part no. | T ₁ | T ₂ | V | W | RS | Weight [g] |
|----------------|----------|----------------|----------------|----|----|----|------------|
| 32, 40 | YB-03 | 6.5 | 10 | 18 | 50 | 9 | 80 |
| 50, 63 | YB-05 | 6.5 | 12 | 22 | 60 | 11 | 120 |
| 80 | YB-08 | 8.5 | 16 | 28 | 75 | 14 | 230 |
| 100 | YB-10 | 10.5 | 18 | 36 | 90 | 18 | 455 |

Joint

YU-03, YU-05
YU-08, YU-10



Material: Chromium molybdenum steel (Nickel plating)

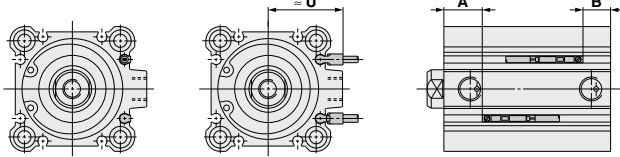
| Bore size [mm] | Part no. | UA | C | d ₁ | d ₂ | H | K | L | UT | Weight [g] |
|----------------|----------|----|----|----------------|----------------|-----------|----|----|----|------------|
| 32, 40 | YU-03 | 17 | 11 | 15.8 | 14 | M8 x 1.25 | 8 | 7 | 6 | 25 |
| 50, 63 | YU-05 | 17 | 13 | 19.8 | 18 | M10 x 1.5 | 10 | 7 | 6 | 40 |
| 80 | YU-08 | 22 | 20 | 24.8 | 23 | M16 x 2 | 13 | 9 | 8 | 90 |
| 100 | YU-10 | 26 | 26 | 29.8 | 28 | M20 x 2.5 | 14 | 11 | 10 | 160 |

CQ2Y Series Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

D-M9□
D-M9□W
D-M9□A
D-A9□V
D-M9□V
D-M9□WV
D-M9□AV
D-A9□

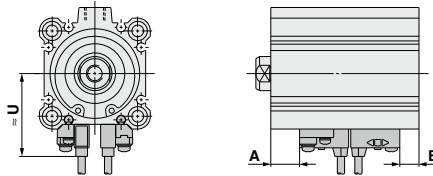
ø32 to ø100



D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F

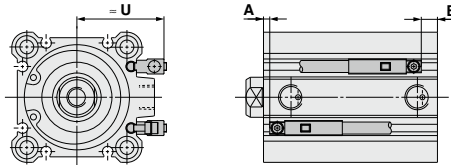
D-F7NT
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V

ø32 to ø100



D-P3DWA

ø32 to ø100



Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-M9□/D-M9□V | | D-A9□ D-A9□V | | D-A73 D-A80 | | D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV | | D-F7NT | | D-A79W | | D-P3DWA | | |
|-------------------|--------------|------|-----------------|------|----------------|------|--|------|--------|------|--------|------|---------|------|--|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | |
| Bore size | | | | | | | | | | | | | | | |
| 32 | 18 | 13 | 14 | 9 | 15 | 10 | 15.5 | 10.5 | 20.5 | 15.5 | 12.5 | 7.5 | 13.5 | 8.5 | |
| 40 | 21.5 | 16 | 17.5 | 12 | 18.5 | 13 | 19 | 13.5 | 24 | 18.5 | 16 | 10.5 | 17 | 11.5 | |
| 50 | 19 | 19.5 | 15 | 15.5 | 16 | 16.5 | 16.5 | 17 | 21.5 | 22 | 13.5 | 14 | 14.5 | 15 | |
| 63 | 21.5 | 22.5 | 17.5 | 18.5 | 18.5 | 19.5 | 19 | 20 | 24 | 25 | 16 | 17 | 17 | 18 | |
| 80 | 24.5 | 27 | 20.5 | 23 | 21.5 | 24 | 22 | 24.5 | 27 | 29.5 | 19 | 21.5 | 20 | 22.5 | |
| 100 | 27.5 | 33.5 | 23.5 | 29.5 | 24.5 | 30.5 | 25 | 31 | 30 | 36 | 22 | 28 | 23 | 29 | |

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

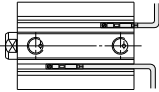
| Auto switch model | D-M9□V | D-A9□V | D-F7□/J79 D-F7□W/J79W D-F7BA D-F79F/F7NT D-A7□H/A80H | D-F7□V D-F7□WV | D-J79C | D-A7□ D-A80 | D-A73C D-A80C | D-A79W | D-P3DWA |
|-------------------|--------|--------|--|-------------------|--------|----------------|------------------|--------|---------|
| | U | U | U | U | U | U | U | U | U |
| Bore size | | | | | | | | | |
| 32 | 30 | 27.5 | 36 | 36.5 | 39.5 | 34 | 40.5 | 37.5 | 35.5 |
| 40 | 32 | 30 | 38 | 40 | 42.5 | 37.5 | 43.5 | 40.5 | 38 |
| 50 | 37.5 | 35 | 43.5 | 45 | 48 | 43 | 49 | 46 | 43 |
| 63 | 42.5 | 40.5 | 48.5 | 50.5 | 53.5 | 48 | 54.5 | 51.5 | 48 |
| 80 | 51 | 49 | 57 | 59 | 61.5 | 56.5 | 62.5 | 59.5 | 56.5 |
| 100 | 59 | 57 | 65.5 | 67 | 70 | 64.5 | 71 | 68 | 65 |

CQ2Y Series

Minimum Stroke for Auto Switch Mounting

| Number of auto switches | (mm) | | | | | | | | | |
|-------------------------|----------------------------|--|--------|-------------------------------|-------------------------|------------------|------------------|--------|--------------------------------------|---------|
| | D-M9□V D-F7□V D-J79C | D-A9□V D-A7□ D-A80 D-A73C D-A80C | D-A9□ | D-M9□WV D-M9□AV D-F7□WV | D-M9□ D-F7□ D-J79 | D-M9□W D-M9□A | D-A7□H D-A80H | D-A79W | D-F7□W D-J79W D-F79F D-F7NT | D-P3DWA |
| With 1 pc. | 5 | 5 | 10 (5) | 10 | 15 (5) | 15 (10) | 15 (5) | 15 | 20 (10) | 15 |
| With 2 pcs. | 5 | 10 | 10 | 15 | 15 (5) | 15 | 15 (10) | 20 | 20 (15) | 15 |

Note) The dimensions stated in () shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure below.)
Order auto switches and auto switch mounting brackets separately.



Operating Range

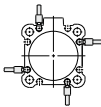
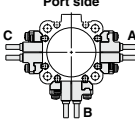
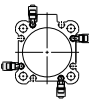
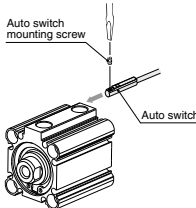
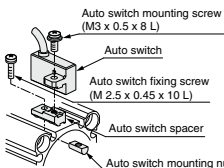
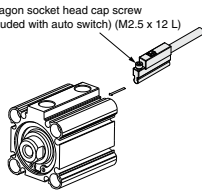
| Auto switch model | (mm) | | | | | |
|---|-----------|------|------|-----|------|------|
| | Bore size | | | | | |
| | 32 | 40 | 50 | 63 | 80 | 100 |
| D-M9□(V) D-M9□W(V) D-M9□A(V) | 5 | 5 | 6 | 6.5 | 7 | 7.5 |
| D-A9□(V) | 9 | 9.5 | 9.5 | 11 | 10.5 | 10.5 |
| D-A7□(H)(C) D-A80□(H)(C) | 10.5 | 11.5 | 11 | 13 | 11.5 | 11.5 |
| D-A79W | 14 | 15.5 | 14.5 | 17 | 15 | 15.5 |
| D-F7□(V) D-J79(C) D-F7□W(V) D-F7NT D-F79F | 5 | 5 | 5 | 6 | 7 | 8 |
| D-P3DWA | 6 | 6 | 7 | 7.5 | 7.5 | 7.5 |

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

* The auto switch mounting bracket BO2-012 is not used for ø32 or more with the D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V) types. The above values indicate the operating range when mounted with the current auto switch installation groove.

Auto Switch Mounting Brackets/Part No.

Applicable Cylinder Series: CDQ2

| Applicable auto switch | D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V | D-F7□/F7□V/J79/J79C/F7□W J79W/F7□WV/D-F7BA/F7BAV F79F/F7NT/D-A7□/A80/A7□H A80H/A73C/A80C/A79W | D-P3DWA | | | | | | | | | |
|---|---|--|---|--------------|-----------|-------|-----------|--------------|----------------------------------|--------------|---|---|
| Bore size (mm) | ø32 to ø100 | | | | | | | | | | | |
| Auto switch mounting bracket part no. | — | BQ5-032 | — | | | | | | | | | |
| Auto switch mounting bracket fitting parts lineup/Weight | — | <ul style="list-style-type: none"> ● Auto switch fixing screw (M2.5 x 10 L) ● Auto switch mounting screw (M3 x 8 L) ● Auto switch spacer ● Auto switch mounting nut Weight: 3.5 g When requesting the enclosure of the auto switch mounting brackets (2 pcs.) with the cylinder for shipment, add "BQ" to the end of the cylinder model number. Standard model no. + BQ Example) CDQ2B32-30DZ- BQ | — | | | | | | | | | |
| Auto switch mounting surface | Surfaces with auto switch mounting slot | A/B/C side except port side | Surfaces with auto switch mounting slot | | | | | | | | | |
| |  | <p style="text-align: center;">Port side</p>  |  | | | | | | | | | |
| <p style="text-align: center;">Mounting of auto switch</p>  <ul style="list-style-type: none"> ● When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter. <p style="text-align: center;">Tightening torque for auto switch mounting screw (N·m)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 60%;">Auto switch model</th> <th style="width: 40%;">Tightening torque</th> </tr> </thead> <tbody> <tr> <td>D-M9□(V)</td> <td rowspan="3" style="text-align: center;">0.05 to 0.15</td> </tr> <tr> <td>D-M9□W(V)</td> </tr> <tr> <td>D-A93</td> </tr> <tr> <td>D-M9□A(V)</td> <td style="text-align: center;">0.05 to 0.10</td> </tr> <tr> <td>D-A9□(V) (Excludes the D-A93)</td> <td style="text-align: center;">0.10 to 0.20</td> </tr> </tbody> </table> | Auto switch model | Tightening torque | D-M9□(V) | 0.05 to 0.15 | D-M9□W(V) | D-A93 | D-M9□A(V) | 0.05 to 0.10 | D-A9□(V) (Excludes the D-A93) | 0.10 to 0.20 | <ol style="list-style-type: none"> ① Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. ② With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut. ③ Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. ④ Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. ⑤ Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m. ⑥ Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m. ⑦ The detection position can be changed under the conditions in step ⑤.  | <ol style="list-style-type: none"> ① Insert the mounting bracket into the mating groove of the cylinder tube. ② Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12L). ③ If the detecting position is changed, go back to step ①. <p>Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.</p> <p>Note 2) The tightening torque for the hexagon socket head cap screw (M2.5 x 12L) is 0.2 to 0.3 N·m.</p> <p style="text-align: center;">Hexagon socket head cap screw (Included with auto switch) (M2.5 x 12 L)</p>  |
| Auto switch model | Tightening torque | | | | | | | | | | | |
| D-M9□(V) | 0.05 to 0.15 | | | | | | | | | | | |
| D-M9□W(V) | | | | | | | | | | | | |
| D-A93 | | | | | | | | | | | | |
| D-M9□A(V) | 0.05 to 0.10 | | | | | | | | | | | |
| D-A9□(V) (Excludes the D-A93) | 0.10 to 0.20 | | | | | | | | | | | |

Note) Auto switch mounting bracket and auto switch are enclosed with the cylinder for shipment.
 The auto switch mounting bracket for the D-F7BA(V) type uses the BQ5-032 with the normal specifications (iron screw).

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

Refer to pages 1341 to 1435 for the detailed specifications.

| Type | Model | Electrical entry | Features | Applicable bore size |
|-------------|------------------|---------------------------|--|----------------------|
| Reed | D-A72 | Grommet (Perpendicular) | — | ø32 to ø100 |
| | D-A73 | | — | |
| | D-A80 | | Without indicator light | |
| | D-A79W | | Diagnostic indication (2-color indicator) | |
| | D-A73C | Connector (Perpendicular) | — | |
| | D-A80C | | Without indicator light | |
| | D-A72H | | — | |
| | D-A73H/A76H | Grommet (In-line) | — | |
| | D-A80H | | Without indicator light | |
| Solid state | D-F7NV/F7PV/F7BV | Grommet (Perpendicular) | — | |
| | D-F7NWV/F7BWV | | Diagnostic indication (2-color indicator) | |
| | D-F7BAV | | Water resistant (2-color indicator) | |
| | D-J79C | Connector (Perpendicular) | — | |
| | D-F79/F7P/J79 | Grommet (In-line) | — | |
| | D-F79W/F7PW/J79W | | Diagnostic indication (2-color indicator) | |
| | D-F7BA | | Water resistant (2-color indicator) | |
| | D-F79F | | With diagnostic output (2-color indicator) | |
| | D-F7NT | | With timer | |

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1360.

* Trimmer auto switch (D-F7K) and heat resistant solid state auto switch (D-F7NJ) are not available.