

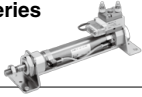
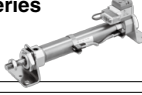
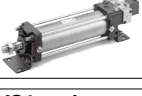



Valve Mounted Cylinder

CV□ Series

ø10, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

Series Variations

| Series | Action | Standard variations | | | | | Bore size (mm) | Page |
|---|---|---------------------|------------------|----------------------------|------------------|---------------------|---------------------------|------------------|
| | | Built-in magnet | With air cushion | Built-in One-touch fitting | With auto switch | With strong scraper | | |
| CVJ5 series  | Double acting | ● | | | ● | | 10 16 | P.1154 |
| CVJ3 series  | Single acting (Spring return) (Spring extend) | ● | | | ● | | 10 16 | P.1164 |
| CVM5/CVM5K series  | Double acting | ● | | ● | ● | ● | 20 25 32 40 | P.1175 P.1185 |
| | Non-rotating rod | ● | | ● | ● | | | |
| CVM3/CVM3K series  | Single acting (Spring return) (Spring extend) | ● | | ● | ● | | 20 25 32 40 | P.1194 P.1207 |
| | Non-rotating rod | ● | | ● | ● | | | |
| CV3/CV3K series  | Double acting | ● | ● | | ● | ● | 40 · 50 63 · 80 100 | P.1216 |
| | Non-rotating rod | ● | ● | | ● | | 40 · 50 63 | P.1228 |
| CVS1 series  | Double acting | ● | ● | | ● | ● | 40 · 50 63 · 80 100 | P.1238 |

Valve Mounted Cylinder

Double Acting, Single Rod

CVJ5 Series

∅10, ∅16

How to Order

Mounting type

| | |
|---|----------------------|
| B | Basic type |
| L | Axial foot type |
| F | Rod side flange type |

Bore size

| | |
|-----|----------------|
| ∅10 | 15, 30, 45, 60 |
| ∅16 | 15, 30, 45, 60 |

Stroke (mm)

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

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |

Light/Surge voltage suppressor

| | |
|-----|---|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (No polarity) |
| U | With light/surge voltage suppressor (No polarity) |

* Type "R", "U": DC only
* In the case of AC, since the rectifier prevents the production of surge voltage, there is no type "S".

With auto switch **CVJ5 L 16 - 60** **5 L**

With auto switch **CDVJ5 L 16 - 60** **5 L** **M9BW** **C**

With auto switch (Built-in magnet)

Auto switch mounting bracket (Note)
Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting type) or "B" (Band mounting type) to the end of the w/ auto switch cylinder part number.

| | | |
|---------|--------------------|---------------|
| Example | Rail mounting type | CDVJ5B16-60-A |
| | Band mounting type | CDVJ5B10-45-B |

Solenoid valve voltage

| DC specifications | | AC specifications (50/60 Hz) | |
|-------------------|--------|------------------------------|-------------------|
| S | 24 VDC | 1 | 100 VAC |
| 6 | 12 VDC | 2 | 200 VAC |
| V | 6 VDC | 3 | 110 VAC (115 VAC) |
| S | 5 VDC | 4 | 220 VAC (230 VAC) |
| R | 3 VDC | | |

Auto switch
Magnet installed even without auto switch

| Symbol | Auto switch mounting |
|--------|----------------------|
| A | Rail mounting type |
| B | Band mounting type |

Number of auto switches

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

Made to Order
Refer to page 1155 for details.

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 | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | — | — | ● | ● | ○ | ○ | ○ | IC circuit |
| | | | | | | | | — | F7NV | F79 | ● | ● | ○ | ○ | | | |
| | | | | M9PV | | | | M9P | — | — | ● | ● | ○ | ○ | | | |
| | | — | | F7PV | | | | F7P | ● | ● | ○ | ○ | | | | | |
| | | M9BV | | M9B | | | | — | — | ● | ● | ○ | ○ | | | | |
| | | — | | F7BV | | | | J79 | ● | ● | ○ | ○ | | | | | |
| | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | — | M9NWV | M9NW | — | — | ● | ● | ○ | ○ | IC circuit |
| | | | | | | | | | — | F7NWV | F79W | ● | ● | ○ | ○ | | |
| | | | | M9PWV | | | | | M9PW | — | — | ● | ● | ○ | ○ | | |
| | | — | | F7PW | | | | | — | — | ● | ● | ○ | ○ | | | |
| | | M9BWW | | M9BW | | | | | — | — | ● | ● | ○ | ○ | | | |
| | | — | | F7BWW | | | | | J79W | ● | ● | ○ | ○ | | | | |
| With diagnostic output (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | — | M9NAV ^{*1} | M9NA ^{*1} | — | — | ○ | ○ | ● | ○ | IC circuit | |
| | | | | | | | | M9PAV ^{*1} | M9PA ^{*1} | — | — | ○ | ○ | ● | ○ | | |
| | | | M9BAV ^{*1} | | | | | M9BA ^{*1} | — | — | ○ | ○ | ○ | ○ | | | |
| | — | | H7NF | | | | | — | — | F79F | — | ● | ● | ○ | ○ | | |
| | — | | A96V | | | | | A96 | — | A76H | — | ● | ● | ○ | ○ | | |
| | — | | 200 V | | | | | — | — | A72 | A72H | ● | ● | ○ | ○ | | |
| Read auto switch | Diagnostic indication (2-color indicator) | Grommet | Yes | 2-wire | 24 V | 12 V | 100 V or less | A93V ^{*2} | A93 | A73 | A73H | ● | ● | ○ | ○ | IC circuit | |
| | | | | | | | | A90V | A90 | A80 | A80H | ● | ● | ○ | ○ | | |
| | | | | | | | | — | C73C | A73C | — | ● | ● | ○ | ○ | | |
| | — | C80C | | | | | | A80C | — | ● | ● | ○ | ○ | | | | |
| | — | — | | | | | | A79W | — | ● | ● | ○ | ○ | | | | |
| | — | 24 V or less | | | | | | — | — | — | — | ● | ● | ○ | ○ | | |

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NZ

* Since there are other applicable auto switches than listed, refer to page 1163 for details.
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

* Solid state auto switches marked with "○" are produced upon receipt of order.
* D-A9□/M9□/A7□/A8□/F7□/J7□ auto switches are shipped together (not assembled). (For D-A9□/M9□, only auto switch mounting brackets are assembled before shipped.)
* D-C7□/C80□/H7□ auto switches are assembled at the time of shipment.
* Order auto switch mounting brackets separately when D-A9□(V)/M9□(V)/M9□(W(V))/M9□(A(V)) are mounted on ∅10 and ∅16 of the rail mounting type. Refer to page 1163 for details.
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

Valve Mounted Cylinder **CVJ5 Series**

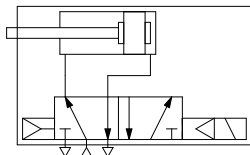
Operation type can be changed to rod extended when energized or rod retracted when energized.

An auto switch cylinder with the switch installed can also be manufactured.



Symbol

Double acting/Single rod, Rubber bumper



Specifications

| Bore size (mm) | ø10 | ø16 |
|-------------------------------|---|----------------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.15 MPa | |
| Ambient and fluid temperature | -10 to 50°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Stroke length tolerance | +1.0 0 | |
| Port size | M5 x 0.8 | |
| Mounting | Basic type, Axial foot type, Rod side flange type | |
| Piston speed | 50 to 750 mm/s | 50 to 150 mm/s |
| Allowable kinetic energy | 0.035J | 0.090J |

Solenoid Valve Specifications

| Applicable solenoid valve model | | SYJ3190 | |
|-------------------------------------|-------------|---|-----------------------------------|
| Electrical entry | | Grommet (G), L plug connector (L), M plug connector (M) | |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Effective area of valve (Cv factor) | | 1.8 mm ² (0.1) | |
| Allowable voltage | | ±10% of the rated voltage* | |
| Power consumption (W) | DC | Standard | 0.35 (With indicator light: 0.4) |
| | AC | 100 V | 0.78 (With indicator light: 0.81) |
| 110 V | | 0.86 (With indicator light: 0.89) | |
| [115 V] | | [0.94 (With indicator light: 0.97)] | |
| 200 V | | 1.18 (With indicator light: 1.22) | |
| 220 V | | 1.30 (With indicator light: 1.34) | |
| | [230 V] | [1.42 (With indicator light: 1.46)] | |
| Surge voltage suppressor | | Diode (Varistor for the non-polar type) | |
| Indicator light | | LED | |

- * 110 VAC and 115 VAC types and 220 VAC and 230 VAC types are common respectively.
- * For 115 VAC and 230 VAC, allowable voltage fluctuation is -15 to +5 % of the rated voltage.
- * For S and Z, the voltage will drop due to the internal circuit. Allowable voltage fluctuation must be in the range below.
- Types S, Z 24 VDC: -7 to 10 %, 12 VDC: -4 to 10 %



Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) |
|----------------|----------------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60 |

- * If types for more than the strokes indicated in the table above (61 strokes) are required, please ask SMC.

CVJ5 Series

Mounting Type and Accessory For details, refer to page 1159.

| Mounting | | Basic type | Axial foot type | Rod side flange type |
|--------------------|----------------------------------|------------|-----------------|----------------------|
| Standard equipment | Mounting nut | ● | ● | ● |
| | Rod end nut | ● | ● | ● |
| Option | Single knuckle joint | ○ | ○ | ○ |
| | Double knuckle joint (With pin)* | ○ | ○ | ○ |

* Knuckle pin and retaining ring are shipped together. ●...Supplied with the product. ○...Please order separately.

Weight (g)

| Bore size (mm) | | 10 | 16 |
|--|----------------------|-----|-----|
| Basic weight* | | 71 | 99 |
| Additional weight per each 15 mm of stroke | | 6.5 | 9.5 |
| Mounting bracket weight | Axial foot type | 7 | 19 |
| | Rod side flange type | 5 | 13 |

* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) **CVJ5L10-45-1G**

- Basic weight.....71 (g) (ø10)
 - Additional weight6.5/15 stroke
 - Cylinder stroke45 stroke
 - Weight of bracket7 (g) (Axial foot type)
- 71 + 6.5/15 x 45 + 7 = 97.5 g

Mounting Bracket Part No.

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

Accessory (Option)

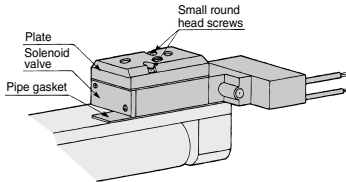
Refer to page 1159 for part numbers and dimensions of the single knuckle joint, double knuckle joint, knuckle pin, mounting nut, and rod end nut.

Changing between Rod Extended when Energized and Rod Retracted when Energized

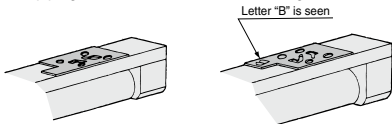
<Step>

This procedure is for changing the rod extended when energized to the rod retracted when energized.

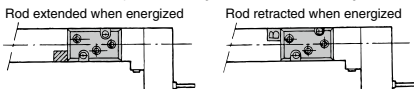
- Using a screwdriver, loosen the two small round head screws, and remove the plate and the solenoid valve. At this time, instead of removing the plate and the solenoid valve separately, remove them together, with the round head screws remaining inserted.



- Turn the pipe gasket at 180° and mount, showing the letter "B".

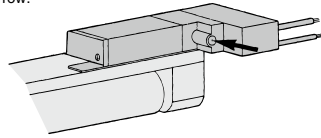


- Install the solenoid valve and the plate, and tighten the small round head screws, with a screw driver. After tightening, press the manual button on the solenoid valve, check for any air leaks, and verify the operating conditions. When the cylinder is viewed from above, the position of the gasket is as shown in the figure below.



Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



Specific Product Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5-port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Handling Precautions

Caution

- During installation, secure the rod cover and tighten the mounting nut or the rod cover body by applying an appropriate tightening force.**

If the head cover is secured or the head cover is tightened, the cover may rotate, leading to the deviation.

- Tighten the mounting screws with an appropriate tightening torque within the range given below.**

ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m
 ø16: 10.8 to 11.8 N·m

- 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).**

In particular, use a pair of ultra-mini pliers for removing and installing the retaining rings on the ø10 cylinder.

- For the auto switch mounting rail, do not remove the pre-equipped rail.**

Since the mounting thread is drilled through inside the cylinder, it may cause air leakage.

Warning

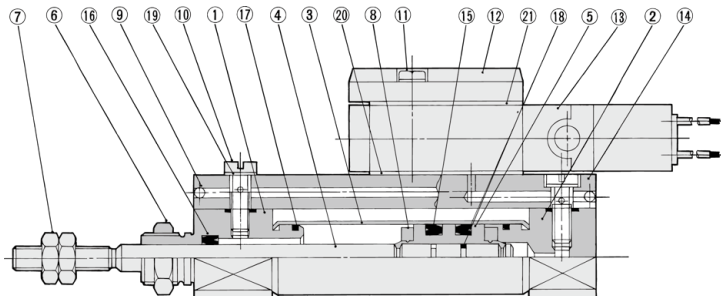
- Confirm the specifications.**

Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

- Energizing continuously for a long period of time**

When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or effect peripheral equipment adversely since temperature rises when coils generate heat.

Construction/(Not able to disassemble.)



Component Parts

| No. | Description | Material | Note |
|-----|----------------|-----------------|---------------------------|
| 1 | Rod cover | Aluminum alloy | Clear anodized |
| 2 | Head cover | Aluminum alloy | Clear anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston rod | Stainless steel | |
| 5 | Piston | Aluminum alloy | Chromated |
| 6 | Mounting nut | Brass | Nickel plated |
| 7 | Rod end nut | Rolled steel | Zinc chromated |
| 8 | Bumper | Urethane | |
| 9 | Steel ball | Carbon steel | |
| 10 | Stud | Brass | Electroless nickel plated |
| 11 | Phillips screw | Rolled steel | Zinc chromated |

| No. | Description | Material | Note |
|-----|----------------|---------------------------|----------------------------|
| 12 | Plate | Zinc alloy | |
| 13 | Solenoid valve | — | * Refer to the note below. |
| 14 | Pipe | Aluminum alloy | Clear anodized |
| 15 | Piston seal | NBR | |
| 16 | Rod seal | NBR | |
| 17 | Tube gasket | NBR | |
| 18 | Piston gasket | NBR | |
| 19 | Gasket | NBR + Stainless steel 304 | |
| 20 | Pipe gasket | NBR | |
| 21 | Plate gasket | NBR | |

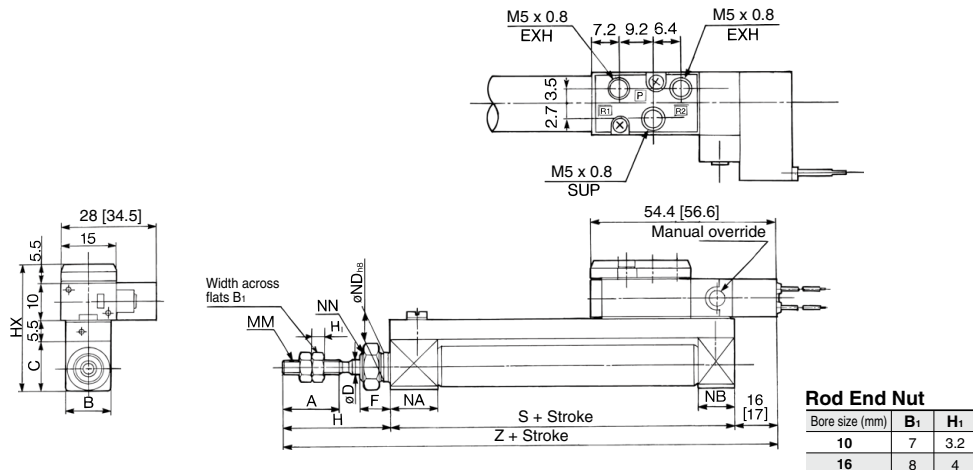
* How to order solenoid valves

SYJ3190 - □ □ □

Rated voltage ↓ □ □ □ □ □
 ↓ Light/surge voltage suppressor
 ↓ Electrical entry

Basic Type (B)

CVJ5



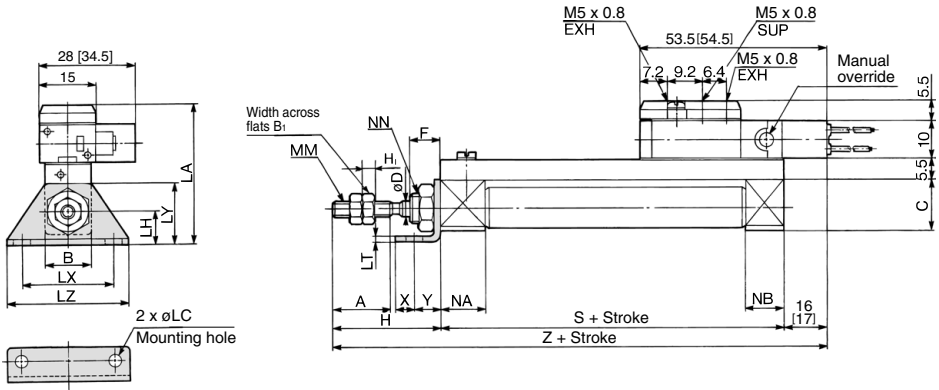
* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | HX | MM | NA | NB | ND | NN | S | Z |
|-----------|----|----|----|---|---|----|----|----------|------|-----|-----------------------------------|---------|----|---------|
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 35 | M4 x 0.7 | 12.5 | 9.5 | 8 ⁰ _{-0.022} | M8 x 1 | 46 | 90 [91] |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 41 | M5 x 0.8 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1 | 47 | 91 [92] |

CVJ5 Series

Axial Foot Type (L)

CVJ5L



Rod End Nut

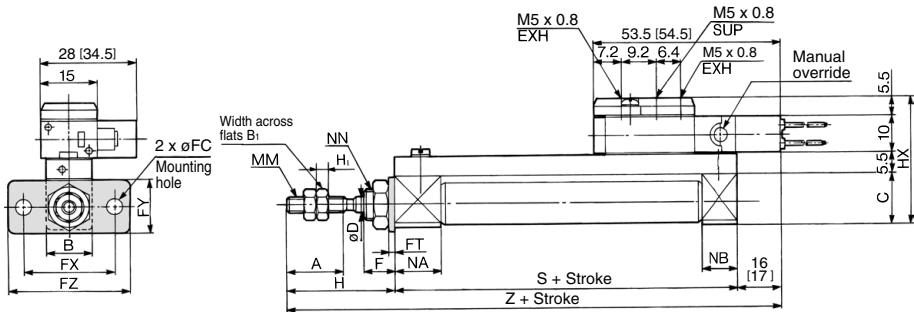
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | LA | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | S | X | Y | Z |
|-----------|----|----|----|---|---|----|----|-----|----|-----|----|------|----|----------|------|-----|---------|----|---|---|---------|
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 38 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 46 | 5 | 7 | 90 [91] |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 46 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 47 | 6 | 9 | 91 [92] |

Rod Side Flange Type (F)

CVJ5F



Rod End Nut

| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

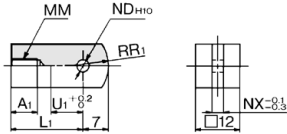
* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | FC | FT | FX | FY | FZ | H | HX | MM | NA | NB | NN | S | X | Y | Z |
|-----------|----|----|----|---|---|-----|-----|----|----|----|----|----|----------|------|-----|---------|----|---|---|---------|
| 10 | 15 | 12 | 14 | 4 | 8 | 4.5 | 1.6 | 24 | 14 | 32 | 28 | 35 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 46 | 5 | 7 | 90 [91] |
| 16 | 15 | 18 | 20 | 5 | 8 | 5.5 | 2.3 | 33 | 20 | 42 | 28 | 41 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 47 | 6 | 9 | 91 [92] |

CVJ5 Series Accessory Dimensions

Single Knuckle Joint

(mm)

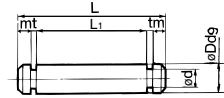


Material: Rolled steel

| 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 |

Knuckle Pin

(mm)



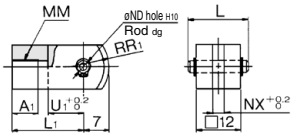
Material: Stainless steel

| Part no. | Applicable bore size | Dd9 | d | L | L ₁ | m | t | Applicable retaining ring |
|----------|----------------------|---|-----|------|----------------|-----|-----|---------------------------|
| IY-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 16.2 | 12.2 | 1.7 | 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 |

* Retaining rings are included.

Double Knuckle Joint

(mm)



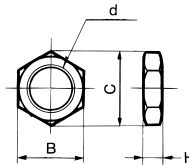
Material: Rolled steel

| Part no. | Applicable bore size | A ₁ | L | L ₁ | MM | ND ₉ | ND ₁₁₀ | NX | R ₁ | U ₁ |
|----------|----------------------|----------------|------|----------------|----------|---|------------------------------------|-----|----------------|----------------|
| Y-J010C | 10 | 8 | 16.2 | 21 | M4 x 0.7 | 3.3 ^{-0.030} _{-0.060} | 3.3 ^{+0.048} ₀ | 3.2 | 8 | 10 |
| Y-J016C | 16 | 11 | 16.6 | 21 | M5 x 0.8 | 5 ^{-0.030} _{-0.060} | 5 ^{+0.048} ₀ | 6.5 | 12 | 10 |

* Knuckle pin and retaining ring are shipped together.

Mounting Nut

(mm)

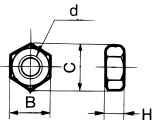


Material: Brass

| Part no. | Applicable bore size | B | C | d | H |
|----------|----------------------|----|------|-----------|---|
| 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

(mm)



Material: Iron

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

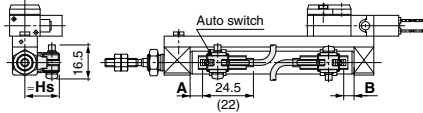
Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Reed auto switch

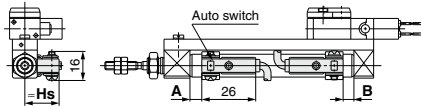
<Band mounting>

D-A9□

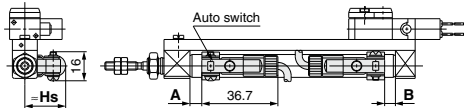


() : For D-A96 type
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80

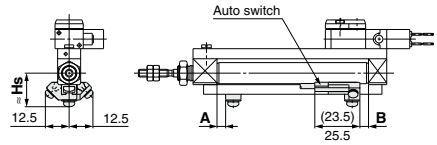


D-C73C□/C80C



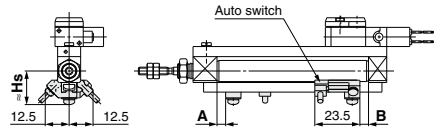
<Rail mounting>

D-A9□

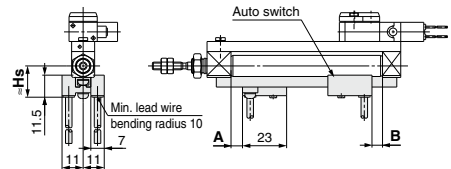


() : For D-A96 type

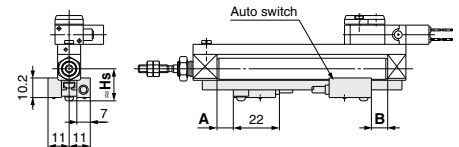
D-A9□V



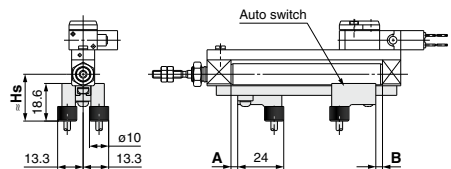
D-A7□/A80



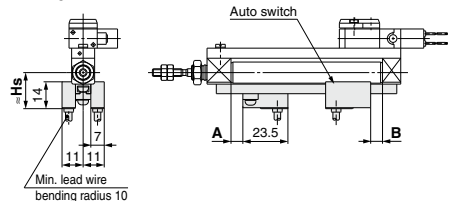
D-A7□H/A80H



D-A73C/A80C



D-A79W

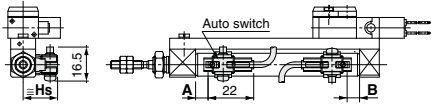


Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

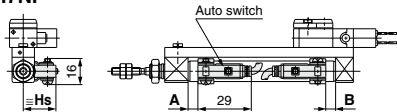
Solid state auto switch

<Band mounting>

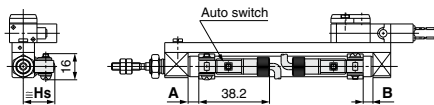
D-M9□
D-M9□W



D-H7□
D-H7□W
D-H7NF

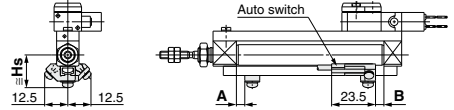


D-H7C

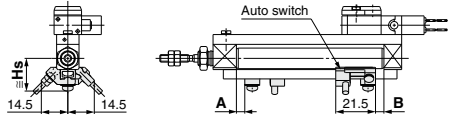


<Rail mounting>

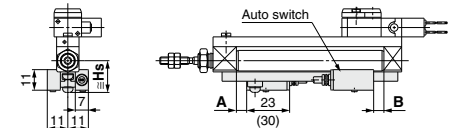
D-M9□
D-M9□W



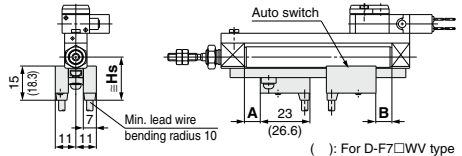
D-M9□V
D-M9□WV



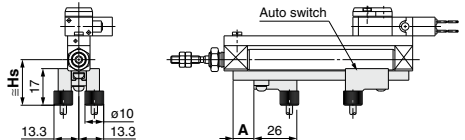
D-F7□/J79
D-F7□W/J79W
D-F79F



D-F7□V/F7□WV



D-J79C



Auto Switch Proper Mounting Position

| Auto switch model | Band mounting | | | | | | | | | | Rail mounting | | | | | | | | | |
|-------------------|-----------------|-----|---|-----|------------------------------------|-----|------------------------------------|-----|-----------------|-----|---|-----|----------------|-----|--|-----|--------|-----|--------|-----|
| | D-A9□ D-A9□V | | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AW | | D-C7□ D-C80 D-C73C D-C80C | | D-H7□ D-H7C D-H7NF D-H7□W | | D-A9□ D-A9□V | | D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AV | | 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/J79C | | D-F7NT | | D-A79W | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| Bore size (mm) 10 | 2 | 2 | 6 | 6 | 2.5 | 2.5 | 1.5 | 1.5 | 0.5 | 0.5 | 4.5 | 4.5 | 3 | 3 | 3.5 | 3.5 | 8.5 | 8.5 | 0.5 | 0.5 |
| Bore size (mm) 16 | 2.5 | 2.5 | 6.5 | 6.5 | 3 | 3 | 2 | 2 | 1 | 1 | 4 | 4 | 3.5 | 3.5 | 4 | 4 | 9 | 9 | 1 | 1 |

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

Auto Switch Mounting Height

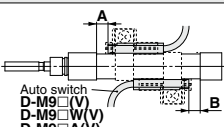
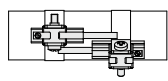
| Auto switch model | Band mounting | | | | | Rail mounting | | | | | | |
|-------------------|------------------------------------|--|-----------------------------------|------------------|-------|--|----------------|--|------------------|-------------------|--------|--------|
| | D-A9□ D-M9□ D-M9□W D-M9□A | D-M9□V D-M9□WV D-M9□AV D-A9□V | D-C7□/C80 D-H7□/H7□W D-H7NF | D-C73C D-C80C | D-H7C | D-A9□A80□V D-M8□M8□V D-M9□W D-M9□WV | D-A7□ D-A80 | D-A7□H/A80H D-F7□J79 D-F7□W/J79W D-F79F | D-A73C D-A80C | D-F7□V D-F7□WV | D-J79C | D-A79W |
| Bore size (mm) | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 10 | 17 | 18 | 17 | 19.5 | 20 | 17.5 | 16.5 | 17.5 | 23.5 | 20 | 23 | 19 |
| 16 | 20.5 | 21 | 20.5 | 23 | 23.5 | 21 | 19.5 | 20.5 | 26.5 | 23 | 26 | 22 |

Minimum Auto Switch Mounting Stroke

| | | (mm) | | | | |
|----------------------|---|------------------------------|-----------------------|-----------------------|--|---|
| Auto switch mounting | Auto switch model | No. of auto switches mounted | | | | |
| | | 1 | 2 | | n (n: No. of auto switches) | |
| | | | Different surfaces | Same surface | Different surfaces | Same surface |
| Band mounting | D-M9□/M9□W D-A9□/M9□A | 10 | 15 ^{Note 1)} | 45 ^{Note 1)} | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $45 + 15 (n-2)$ (n = 2, 3, 4, 5...) |
| | D-M9□V | 5 | 15 ^{Note 1)} | 35 | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $35 + 25 (n-2)$ (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 4)} | $35 + 25 (n-2)$ (n = 2, 3, 4, 5...) |
| | D-A9□V | 5 | 10 | 35 | $10 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $35 + 25 (n-2)$ (n = 2, 3, 4, 5...) |
| | D-C7□ D-C80 | 10 | 15 | 50 | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $50 + 20 (n-2)$ (n = 2, 3, 4, 5...) |
| | D-H7□ D-H7□W D-H7NF | 10 | 15 | 60 | $15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $60 + 22.5 (n-2)$ (n = 2, 3, 4, 5...) |
| | D-C73C D-C80C D-H7C | 10 | 15 | 65 ^{Note 2)} | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 4)} | $50 + 27.5 (n-2)$ (n = 2, 3, 4, 5...) |
| Rail mounting | D-M9□V | 5 | — | 5 | — | $10 + 10 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-A9□V | 5 | — | 10 | — | $10 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-M9□ D-A9□ | 10 | — | 10 | — | $15 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-M9□WV D-M9□AV | 10 | — | 15 | — | $15 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-M9□W | 15 | — | 15 | — | $20 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-M9□A | 15 | — | 20 | — | $20 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-A7□/A80 D-A7□H/A80H D-A73C/A80C | 5 | — | 10 | — | $15 + 10 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-A7□H D-A80H | 5 | — | 10 | — | $15 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-A79W | 10 | — | 15 | — | $10 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-F7□ D-J79 | 5 | — | 5 | — | $15 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-F7□V D-J79C | 5 | — | 5 | — | $10 + 10 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-F7□W/J79W D-F79F/F7NT | 10 | — | 15 | — | $15 + 20 (n-2)$ (n = 4, 6...) ^{Note 5)} |
| | D-F7□WV | 10 | — | 15 | — | $10 + 15 (n-2)$ (n = 4, 6...) ^{Note 5)} |

Note 4) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
 Note 5) 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.

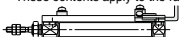
Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

| 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.</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-A93 | — | 45 to less than 50 stroke |
| D-M9□ D-M9□W | 15 to less than 20 stroke | 45 to less than 55 stroke |

Note 2) For the CDVJ5 series, note that 65 strokes cannot be manufactured.

Note 3) The dimension 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.)

These contents apply to the rail mounting with one or two auto switches.



Operating Range

| Auto switch model | Bore size (mm) | |
|----------------------------|----------------|----|
| | 10 | 16 |
| D-A9□(V) | 6 | 7 |
| D-M9□(V) | | |
| D-M9□W(V)/M9□A(V) | 2.5 | 3 |
| D-C7□/C80/C73C/C80C | 7 | 7 |
| D-H7□/H7□W/H7NF | 4 | 4 |
| D-H7C | 8 | 9 |

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

| Auto switch model | Bore size (mm) | |
|-------------------------------------|----------------|-----|
| | 10 | 16 |
| D-A9□/A9□V | 6 | 6.5 |
| D-M9□/M9□V | | |
| D-M9□W/M9□WV | 3 | 3.5 |
| D-M9□A/M9□AV | | |
| D-A7□/A80/A7H/A80H/A73C/A80C | 8 | 9 |
| D-A79W | 11 | 13 |
| D-F7□/J79/F7□W/J79W | | |
| D-F7□V/F7□WV/F79F/J79C | 5 | 5 |
| D-F7NT | | |

Auto Switch Mounting Bracket: Part No.

| Auto switch mounting | Auto switch model | Bore size (mm) | |
|----------------------|---|--|------------------|
| | | ø10 | ø16 |
| Band mounting | D-M9□ D-M9□V D-M9□W D-M9□WV D-A9□ D-A9□V | BJ6-010 Note 1) | BJ6-016 Note 1) |
| | D-M9□A D-M9□AV | BJ6-010S Note 2) | BJ6-016S Note 2) |
| Band mounting | <p>(1) BJ2-□□□ is a set of "a" and "b". (2) BJ2-1 is a set of "c" and "d". BJ4-1 (Switch bracket: White) BJ5-1 (Switch bracket: Transparent)</p> | | |
| | | D-C7□/C80 D-C73C/C80C D-H7□/H7□W D-H7NF | BJ2-010 |
| Rail mounting | D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | BQ2-012 Note 5) | BQ2-012 Note 5) |
| | | | |

Note 1) Set part number which includes the auto switch mounting band (BJ2-□□□) and the holder kit (BJ5-1/Switch bracket: Transparent). 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 consult SMC regarding other chemicals.

Note 2) Set part number which includes the auto switch mounting band (BJ2-□□□S) and the holder kit (BJ4-1/Switch bracket: White).

Note 3) For the D-M9□A (V) type auto switch, do not install the switch bracket on the indicator light.

Note 4) Only auto switch mounting brackets are assembled when cylinders are shipped.

Note 5) When a compact auto switch is mounted on the rail mounting type, the auto switch mounting brackets on the left are required. Order them separately from cylinders.

Example order: CDJ2B10-60-A 1 unit
 D-M9BW 2 pcs.
 BQ2-012 2 pcs.

Besides the models listed in How to Order, the following auto switches are applicable. Refer to pages 1341 to 1435 for detailed specifications.

| Auto switch type | Part no. | Electrical entry (Fetching direction) | Features |
|------------------|--------------------|---------------------------------------|---------------------------------|
| Reed | D-C73, C76 | Grommet (In-let) | — |
| | D-C80 | | Without indicator light |
| Solid state | D-H7A1, H7A2, H7B | | — |
| | D-H7NW, H7PW, H7BW | | Diagnostic indication (2-color) |

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1410 and 1411 for details.

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

Valve Mounted Cylinder Single Acting, Spring Return/Extend

CVJ3 Series

ø10, ø16

How to Order

Mounting type

| | |
|---|----------------------|
| B | Basic type |
| L | Axial foot type |
| F | Rod side flange type |

Stroke (mm)

| | |
|-----|----------------|
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60 |

Bore size

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

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |

Light/Surge voltage suppressor

| | |
|-----|---|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (No polarity) |
| U | With light/surge voltage suppressor (No polarity) |

* Type "R", "U": DC only
* In the case of AC, since the rectifier prevents the production of surge voltage, there is no type "S".

CVJ3 L 16 - 60 S - 5 L

With auto switch CDVJ3 L 16 - 60 S - 5 L - M9BW - C

With auto switch (Built-in magnet)

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Solenoid valve

| | |
|---|--------|
| 5 | 24 VDC |
| 6 | 12 VDC |
| V | 6 VDC |
| S | 5 VDC |
| R | 3 VDC |

DC specifications

| | |
|---|-------------------|
| 1 | 100 VAC |
| 2 | 200 VAC |
| 3 | 110 VAC (115 VAC) |
| 4 | 220 VAC (230 VAC) |

AC specifications (50/60 Hz)

Auto switch
Magnet installed even without auto switch

| | |
|--------|----------------------|
| Symbol | Auto switch mounting |
| A | Rail mounting type |
| B | Band mounting type |

Auto switch mounting bracket (Note)
Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Number of auto switches

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

Made to Order
Refer to page 1165 for details.

Built-in Magnet Cylinder Model

Suffix the symbol "-B" (Band mounting type) or "-A" (Rail mounting type) to the end of the w/ auto switch cylinder part number.

Example: Band mounting type CDVJ3B10-45-B
Rail mounting type CDVJ3B16-60-A

Applicable Auto Switch/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 | | ● | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | 3-wire (PNP) | | | | | F7NV | F79 | ● | ● | ● | ○ | — | | | | | | |
| | | Connector | | 2-wire | | | | | F7PV | F7P | ● | ● | ● | ○ | — | | | | | | |
| | | | | | | | | | H7C | J79C | ● | ● | ● | ○ | — | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NWV | M9NW | | ● | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | 3-wire (PNP) | | | | | F7NWV | F79W | ● | ● | ● | ○ | — | | | | | | |
| | | Grommet | | 2-wire | | | | | F7BV | J79 | ● | ● | ● | ○ | — | | | | | | |
| | | | | | | | | | F7BWV | J79W | ● | ● | ● | ○ | — | | | | | | |
| | | Water resistant (2-color indicator) | | Grommet | | | No | 3-wire (NPN) | 5 V, 12 V | — | M9NAV ^{*1} | M9NA ^{*1} | | ○ | ○ | | ○ | ○ | — | ○ | IC circuit |
| | | | | | | | | 3-wire (PNP) | | | | | M9PAV ^{*1} | M9PA ^{*1} | ○ | | ○ | ● | ○ | — | |
| With diagnostic output (2-color indicator) | Grommet | No | 2-wire | 12 V | — | M9BAV ^{*1} | M9BA ^{*1} | | ○ | ○ | ○ | ○ | — | ○ | — | | | | | | |
| | | | 4-wire (NPN) | | | | | H7NF | F79F | ● | ● | ● | ○ | — | | | | | | | |
| Reed auto switch | | Grommet | Yes | 3-wire (NPN equivalent) | 5 V | — | A96V | A96 | | ● | ● | ● | — | — | — | IC circuit | | | | | |
| | | | | | | | No | 200 V | | | A72 | A72H | ● | ● | ● | | — | — | | | |
| | | | | | | | | 100 V | A93V ^{*2} | A93 | A73 | A73H | ● | ● | ● | | — | — | | | |
| | | Connector | No | 12 V | 100 V or less | A90V | A90 | A80 | A80H | ● | ● | ● | — | — | IC circuit | | | | | | |
| | | | | | 24 V or less | | C73C | A73C | ● | ● | ● | — | — | | | | | | | | |
| | | Grommet | Yes | — | — | — | — | C80C | A80C | | ● | ● | ● | — | — | IC circuit | | | | | |
| | | | | | | | | | | | A79W | ● | ● | ● | — | | — | | | | |

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

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) M9NWZ

* Since there are other applicable auto switches than listed, refer to page 1174 for details.

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

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

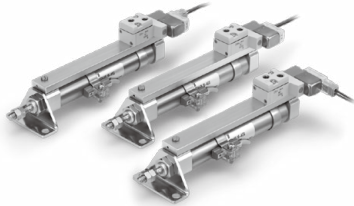
* D-A9□/M9□/A7□/A80□/F7□/□ auto switches are shipped together (not assembled). (For D-A9□/M9□, only auto switch mounting brackets are assembled before shipped.)

* D-C7□/□/□/□ auto switches are assembled at the time of shipment.

* Order auto switch mounting brackets separately when D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) are mounted on ø10 and ø16 of the rail mounting type. Refer to page 1174 for details.

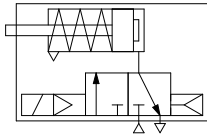
Valve Mounted Cylinder **CVJ3 Series**

An auto switch cylinder with the switch installed can also be manufactured.

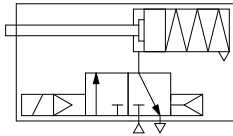


Symbol

Single acting:
Spring return, Rubber bumper



Single acting:
Spring extend, Rubber bumper



Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Specifications

| Bore size (mm) | ø10 | ø16 |
|-------------------------------|--|----------------|
| Action | Single acting, Single rod, Spring return/Spring extend | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.15 MPa | |
| Ambient and fluid temperature | -10 to 50°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Stroke length tolerance | +1.0 0 | |
| Port size | M5 x 0.8 | |
| Mounting | Basic type, Axial foot type, Rod side flange type | |
| Piston speed | 50 to 750 mm/s | 50 to 350 mm/s |
| Allowable kinetic energy | 0.035 J | 0.090 J |

Solenoid Valve Specifications

| Applicable solenoid valve model | | SYJ319 | |
|-------------------------------------|-------------|---|---|
| Electrical entry | | Grommet (G), L plug connector (L), M plug connector (M) | |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Effective area of valve (Cv factor) | | 1.8 mm ² (0.1) | |
| Allowable voltage | | ±10% of the rated voltage* | |
| Power consumption (W) | DC | Standard | |
| | | 0.35 (With indicator light: 0.4) | |
| Apparent power (VA)* | AC | 100 V | 0.78 (With indicator light: 0.81) |
| | | 110 V [115 V] | 0.86 (With indicator light: 0.89) [0.94 (With indicator light: 0.97)] |
| | | 200 V | 1.18 (With indicator light: 1.22) |
| | | 220 V [230 V] | 1.30 (With indicator light: 1.34) [1.42 (With indicator light: 1.46)] |
| Surge voltage suppressor | | Diode (Varistor for the non-polar type) | |
| Indicator light | | LED | |

* 110 VAC and 115 VAC types and 220 VAC and 230 VAC types are common respectively.

* For 115 VAC and 230 VAC, allowable voltage fluctuation is -15 to +5 % of the rated voltage.

* For S and Z, the voltage will drop due to the internal circuit. Allowable voltage fluctuation must be in the range below.

Types S, Z 24 VDC: -7 to 10 %, 12 VDC: -4 to 10 %

Standard Stroke

(mm)

| Bore size (mm) | Standard stroke |
|----------------|-----------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60 |

Spring Back Force

(N)

| Bore size (mm) | Spring reaction force | |
|----------------|-----------------------|---------|
| | Secondary | Primary |
| 10 | 6.9 | 3.5 |
| 16 | 14.2 | 6.9 |

CVJ3 Series

Mounting Type and Accessory/For details, refer to page 1159.

| | Mounting | Basic type | Axial foot type | Rod side flange type |
|--------------------|----------------------------------|------------|-----------------|----------------------|
| Standard equipment | Mounting nut | ● | ● | ● |
| | Rod end nut | ● | ● | ● |
| Option | Single knuckle joint | ○ | ○ | ○ |
| | Double knuckle joint (With pin)* | ○ | ○ | ○ |

* Knuckle pin and retaining ring are shipped together. ●...Supplied with the product. ○...Please order separately.

Accessory

Accessories of the CVJ3 series are the same specifications as those of the CVJ5 series. Refer to page 1159.

Mounting Bracket Part No.

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

Accessory (Option)

Refer to page 1159 for part numbers and dimensions of the single knuckle joint, double knuckle joint, knuckle pin, mounting nut, and rod end nut.

Weight

Spring Return

| Bore size (mm) | | 10 | 16 |
|-------------------------|----------------------|-----|-----|
| Basic weight* | 15 stroke | 79 | 116 |
| | 30 stroke | 87 | 135 |
| | 45 stroke | 97 | 159 |
| | 60 stroke | 109 | 184 |
| Mounting bracket weight | Axial foot type | 7 | 19 |
| | Rod side flange type | 5 | 13 |

* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) **CVJ3L10-45T**

- Basic weight 97 (g) (ø10-45 stroke)
- Mounting bracket weight 7 (g) (Axial foot type)
- 97 + 7 = 104 g

Spring Extend

| Bore size (mm) | | 10 | 16 |
|-------------------------|----------------------|-----|-----|
| Basic weight* | 15 Stroke | 75 | 111 |
| | 30 Stroke | 82 | 129 |
| | 45 Stroke | 93 | 151 |
| | 60 Stroke | 103 | 175 |
| Mounting bracket weight | Axial foot type | 7 | 19 |
| | Rod side flange type | 5 | 13 |

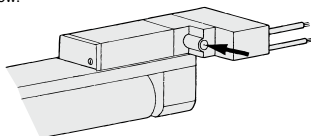
* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) **CVJ3L10-45T**

- Basic weight 93 (g) (ø10-45 stroke)
- Mounting bracket weight 7 (g) (Axial foot type)
- 93 + 7 = 100 g

Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



Specific Product Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5-port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Handling Precautions

Caution

1. During installation, secure the rod cover and tighten the mounting nut or the rod cover body by applying an appropriate tightening force.

If the head cover is secured or the head cover is tightened, the cover may rotate, leading to the deviation.

2. Tighten the mounting screws with an appropriate tightening torque within the range given below.

ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m
ø16: 10.8 to 11.8 N·m

3. Do not operate the single acting cylinder in such a way that a load would be applied when retracting the piston rod of the spring return type or extending the piston rod of the spring extend type.

The spring that is built into the cylinder provides only enough force to retract the piston rod. If a load is applied, the piston rod will not be able to retract to the stroke end.

4. For the single acting cylinder, a breather hole is provided in the cover surface. Do not block this hole during installation.

This may cause malfunction.

5. 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).

In particular, use a pair of ultra-mini pliers for removing and installing the retaining rings on the ø10 cylinder.

6. For the auto switch mounting rail, do not remove the pre-equipped rail.

Since the mounting thread is drilled through inside the cylinder, it may cause air leakage.

Warning

1. Confirm the specifications.

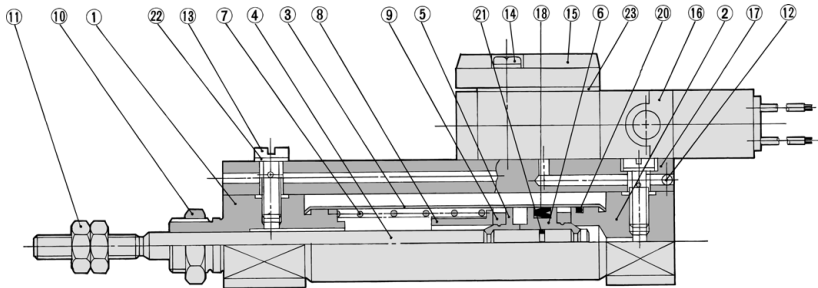
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time

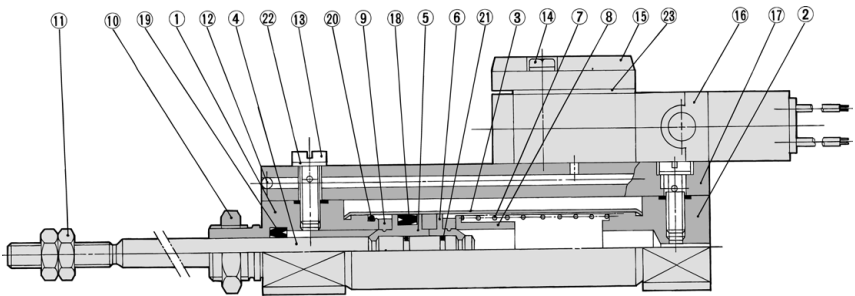
When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or effect peripheral equipment adversely since temperature rises when coils generate heat.

Construction/Component Parts

Single acting, Spring return



Single acting, Spring extend



Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|----------------|
| 1 | Rod cover | Aluminum alloy | Clear anodized |
| 2 | Head cover | Aluminum alloy | Clear anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston rod | Stainless steel | |
| 5 | Piston A | Aluminum alloy | Chromated |
| 6 | Piston B | Aluminum alloy | Chromated |
| 7 | Return spring | Piano wire | |
| 8 | Spring seat | Brass | |
| 9 | Bumper | Urethane | |
| 10 | Mounting nut | Brass | Nickel plated |
| 11 | Rod end nut | Rolled steel | Zinc chromated |
| 12 | Steel ball | Carbon steel | |

| No. | Description | Material | Note |
|-----|----------------|---------------------------|---------------------------------|
| 13 | Stud | Brass | Electroless nickel plated |
| 14 | Phillips screw | Rolled steel | Nickel plated |
| 15 | Plate | Zinc alloy | |
| 16 | Solenoid valve | — | Refer to "How to Order" below.* |
| 17 | Pipe | Aluminum alloy | Clear anodized |
| 18 | Piston seal | NBR | |
| 19 | Rod seal | NBR | |
| 20 | Tube gasket | NBR | |
| 21 | Piston gasket | NBR | |
| 22 | Gasket | NBR + Stainless steel 304 | |
| 23 | Plate gasket | NBR | |

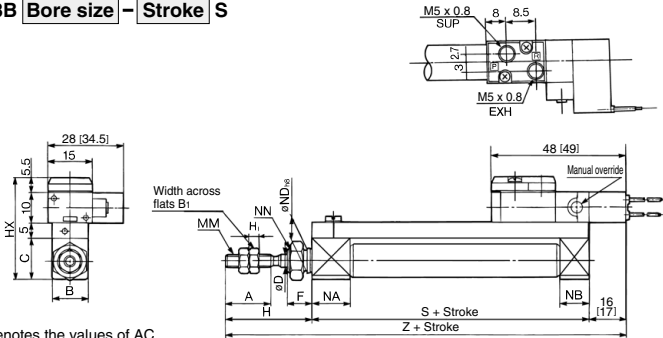
* How to Order solenoid valves
SYJ319 - □□□□

Rated voltage • Light/surge voltage suppressor
• Electrical entry

CVJ3 Series

Single Acting, Spring Return/Basic Type (B)

CVJ3B **Bore size** - **Stroke** S



Rod End Nut

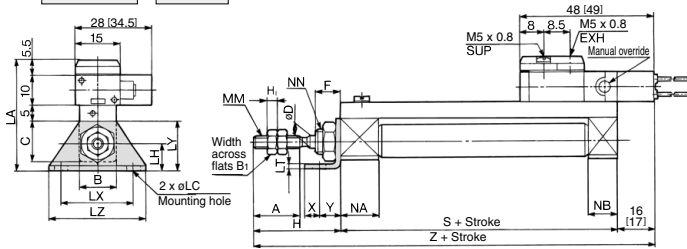
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | HX | MM | NA | NB | ND | NN | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|----|------|----------|------|-----|-----------------------------------|---------|------------|----------------|-------------|--------------|-------------|--------------|-------------|--------------|
| | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 34.5 | M4 x 0.7 | 12.5 | 9.5 | 8 ⁰ _{-0.022} | M8 x 1 | 52.5 | 96.5 (97.5) | 60 | 104 (105) | 72 | 116 (117) | 84 | 128 (129) |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 40.5 | M5 x 0.8 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1 | 52.5 | 96.5 (97.5) | 61 | 105 (106) | 73 | 117 (118) | 85 | 129 (130) |

Single Acting, Spring Return/Axial Foot Type (L)

CVJ3L **Bore size** - **Stroke** S



Rod End Nut

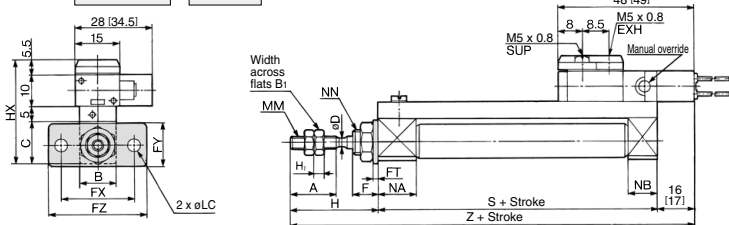
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | LA | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|----|------|----|-----|----|-----|----|------|----|----------|------|-----|---------|---|---|------------|----------------|-------------|--------------|-------------|--------------|-------------|--------------|
| | | | | | | | | | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 37.5 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 5 | 7 | 52.5 | 96.5 (97.5) | 60 | 104 (105) | 72 | 116 (117) | 84 | 128 (129) |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 45.5 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 6 | 9 | 52.5 | 96.5 (97.5) | 61 | 105 (106) | 73 | 117 (118) | 85 | 129 (130) |

Single Acting, Spring Return/Rod Side Flange Type (F)

CVJ3F **Bore size** - **Stroke** S



Rod End Nut

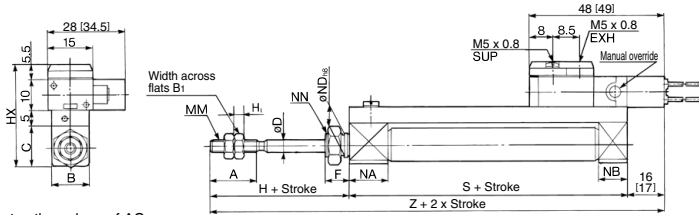
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | FC | FT | FX | FY | FZ | H | HX | MM | NA | NB | NN | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|-----|-----|----|----|----|----|------|----------|------|-----|---------|------------|----------------|-------------|--------------|-------------|--------------|-------------|--------------|
| | | | | | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 4.5 | 1.6 | 24 | 14 | 32 | 28 | 34.5 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 52.5 | 96.5 (97.5) | 60 | 104 (105) | 72 | 116 (117) | 84 | 128 (129) |
| 16 | 15 | 18 | 20 | 5 | 8 | 5.5 | 2.3 | 33 | 20 | 42 | 28 | 40.5 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 52.5 | 96.5 (97.5) | 61 | 105 (106) | 73 | 117 (118) | 85 | 129 (130) |

Single Acting, Spring Extend/Basic Type (B)

CVJ3B **Bore size** - **Stroke** T



Rod End Nut

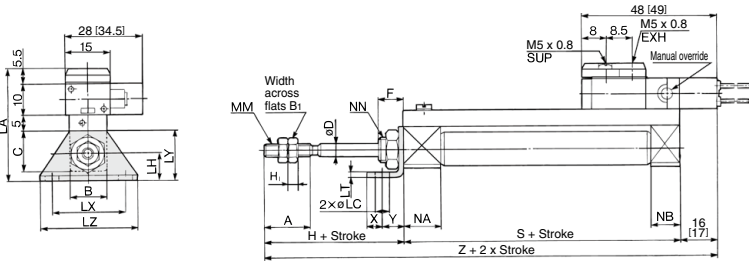
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | HX | MM | NA | NB | ND | NN | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|----|------|----------|------|-----|-----------------------------------|---------|------------|----|-------------------------------------|----|-------------------------------------|----|-------------------------------------|---|
| | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 34.5 | M4 x 0.7 | 12.5 | 9.5 | 8 ⁰ _{-0.022} | M8 x 1 | 52.5 | 60 | 104 ¹⁰⁴ _[109] | 72 | 116 ¹¹⁶ _[117] | 84 | 128 ¹²⁸ _[129] | |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 40.5 | M5 x 0.8 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1 | 52.5 | 61 | 105 ¹⁰⁵ _[106] | 73 | 117 ¹¹⁷ _[118] | 85 | 129 ¹²⁹ _[130] | |

Single Acting, Spring Extend/Axial Foot Type (L)

CVJ3L **Bore size** - **Stroke** T



Rod End Nut

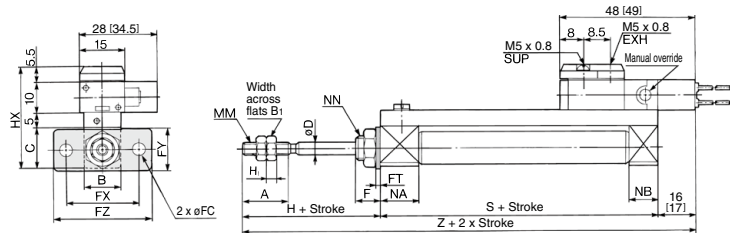
| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

| Bore size | A | B | C | D | F | H | LA | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|----|------|----|-----|----|-----|----|------|----|----------|------|-----|---------|---|---|------------|----|-------------------------------------|----|-------------------------------------|----|-------------------------------------|---|
| | | | | | | | | | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 28 | 37.5 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 5 | 7 | 52.5 | 60 | 104 ¹⁰⁴ _[109] | 72 | 116 ¹¹⁶ _[117] | 84 | 128 ¹²⁸ _[129] | |
| 16 | 15 | 18 | 20 | 5 | 8 | 28 | 45.5 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 6 | 9 | 52.5 | 61 | 105 ¹⁰⁵ _[106] | 73 | 117 ¹¹⁷ _[118] | 85 | 129 ¹²⁹ _[130] | |

Single Acting, Spring Extend/Rod Side Flange Type (F)

CVJ3F **Bore size** - **Stroke** T



Rod End Nut

| Bore size (mm) | B ₁ | H ₁ |
|----------------|----------------|----------------|
| 10 | 7 | 3.2 |
| 16 | 8 | 4 |

* []: Denotes the values of AC.

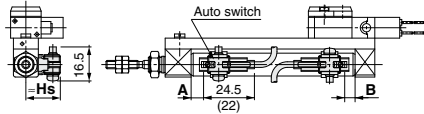
| Bore size | A | B | C | D | F | FC | FT | FX | FY | FZ | H | HX | MM | NA | NB | NN | 5 to 15 st | | 16 to 30 st | | 31 to 45 st | | 46 to 60 st | |
|-----------|----|----|----|---|---|-----|-----|----|----|----|----|------|----------|------|-----|---------|------------|------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|-------------------------------------|
| | | | | | | | | | | | | | | | | | S | Z | S | Z | S | Z | S | Z |
| 10 | 15 | 12 | 14 | 4 | 8 | 4.5 | 1.6 | 24 | 14 | 32 | 28 | 34.5 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1 | 52.5 | 52.5 | 60 | 104 ¹⁰⁴ _[109] | 72 | 116 ¹¹⁶ _[117] | 84 | 128 ¹²⁸ _[129] |
| 16 | 15 | 18 | 20 | 5 | 8 | 5.5 | 2.3 | 33 | 20 | 42 | 28 | 40.5 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1 | 52.5 | 52.5 | 61 | 105 ¹⁰⁵ _[106] | 73 | 117 ¹¹⁷ _[118] | 85 | 129 ¹²⁹ _[130] |

Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

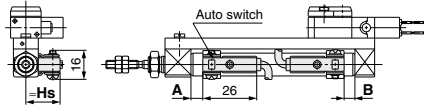
Reed auto switch <Band mounting>

D-A9□

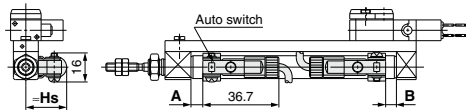


() : For D-A96 type
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80

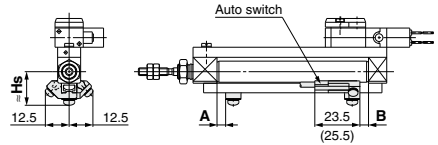


D-C73C□/C80C



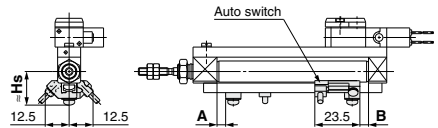
<Rail mounting>

D-A9□

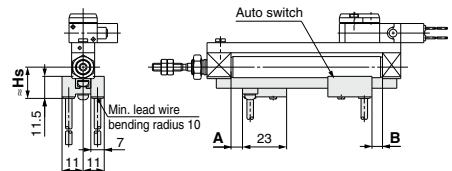


() : For D-A93 type

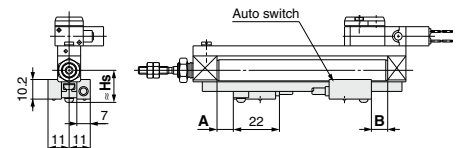
D-A9□V



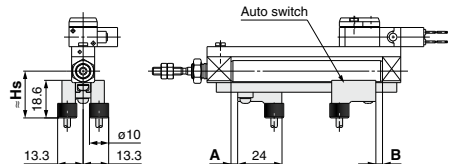
D-A7□/A80



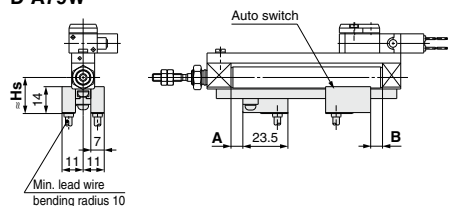
D-A7□H/A80H



D-A73C/A80C



D-A79W



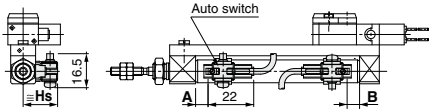
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Solid state auto switch

<Band mounting>

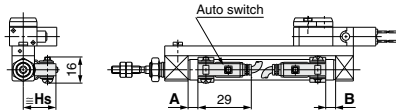
D-M9□

D-M9□W

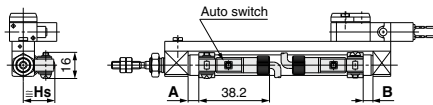


D-H7□

D-H7□W



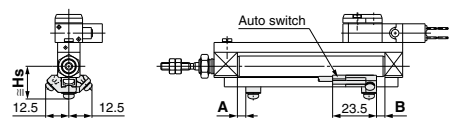
D-H7C



<Rail mounting>

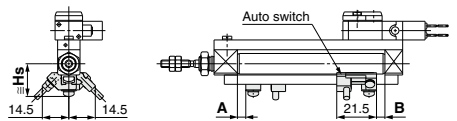
D-M9□

D-M9□W



D-M9□V

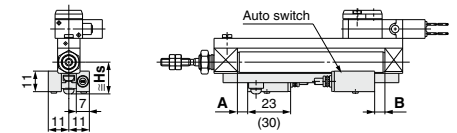
D-M9□WV



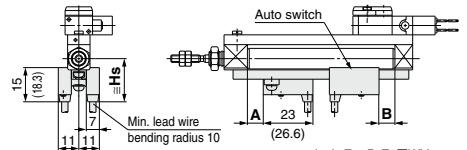
D-F7□/J79

D-F7□W/J79W

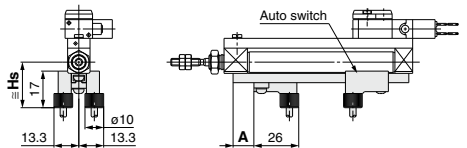
D-F79F



D-F7□V/F7□WV



D-J79C



Auto Switch Mounting 2

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height: Single Acting, Spring Return (S) / Spring Extend (T)

Auto Switch Proper Mounting Position / Spring Return (S) (mm)

| Auto switch model | Bore size (mm) | Dimension A | | | | B |
|---|----------------|------------------------|------------------------|------------------------|------------------------|-----|
| | | 10 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | |
| Band mounting D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V) D-C7□/C80 D-C73C/C80C D-H7□/H7C D-H7□W D-H7NF | 10 | 8.5 | 16 | 28 | 40 | 2 |
| | 16 | 8 | 16.5 | 28.5 | 40.5 | 2.5 |
| | 10 | 12.5 | 20 | 32 | 44 | 6 |
| | 16 | 12 | 20.5 | 32.5 | 44.5 | 6.5 |
| | 10 | 9 | 16.5 | 28.5 | 40.5 | 2.5 |
| | 16 | 8.5 | 17 | 29 | 41 | 3 |
| Rail mounting D-A9□ D-A9□V D-M9□/M9□V D-M9□W/M9□WV 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/J79C D-F7NT D-A79W | 10 | 7 | 14.5 | 26.5 | 38.5 | 0.5 |
| | 16 | 6.5 | 15 | 27 | 39 | 1 |
| | 10 | 11 | 18.5 | 30.5 | 42.5 | 4.5 |
| | 16 | 10.5 | 19 | 31 | 43 | 5 |
| | 10 | 9.5 | 17 | 29 | 41 | 3 |
| | 16 | 9 | 17.5 | 29.5 | 41.5 | 3.5 |
| | 10 | 10 | 17.5 | 29.5 | 41.5 | 3.5 |
| | 16 | 9.5 | 18 | 30 | 42 | 4 |
| | 10 | 15 | 22.5 | 34.5 | 46.5 | 8.5 |
| | 16 | 14.5 | 23 | 35 | 47 | 9 |
| | 10 | 7 | 14.5 | 26.5 | 38.5 | 0.5 |
| | 16 | 6.5 | 15 | 27 | 39 | 1 |

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

Auto Switch Proper Mounting Position / Spring Extend (T) (mm)

| Auto switch model | Bore size (mm) | A | Dimension B | | | |
|---|----------------|-----|------------------------|------------------------|------------------------|------------------------|
| | | | 10 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st |
| Band mounting D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V) D-C7□/C80 D-C73C/C80C D-H7□/H7C D-H7□W D-H7NF | 10 | 2 | 8.5 | 16 | 28 | 40 |
| | 16 | 2.5 | 8 | 16.5 | 28.5 | 40.5 |
| | 10 | 6 | 12.5 | 20 | 32 | 44 |
| | 16 | 6.5 | 12 | 20.5 | 32.5 | 44.5 |
| | 10 | 2.5 | 9 | 16.5 | 28.5 | 40.5 |
| | 16 | 3 | 8.5 | 17 | 29 | 41 |
| Rail mounting D-A9□ D-A9□V D-M9□/M9□V D-M9□W/M9□WV 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/J79C D-F7NT D-A79W | 10 | 0.5 | 7 | 14.5 | 16.5 | 38.5 |
| | 16 | 1 | 6.5 | 15 | 27 | 39 |
| | 10 | 4.5 | 11 | 18.5 | 30.5 | 42.5 |
| | 16 | 5 | 10.5 | 19 | 31 | 43 |
| | 10 | 3 | 9.5 | 17 | 29 | 41 |
| | 16 | 3.5 | 9 | 17.5 | 29.5 | 41.5 |
| | 10 | 3.5 | 10 | 17.5 | 29.5 | 41.5 |
| | 16 | 4 | 9.5 | 18 | 30 | 42 |
| | 10 | 8.5 | 15 | 22.5 | 34.5 | 46.5 |
| | 16 | 9 | 14.5 | 23 | 35 | 47 |
| | 10 | 0.5 | 7 | 14.5 | 26.5 | 38.5 |
| | 16 | 1 | 6.5 | 15 | 27 | 39 |

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

Auto Switch Mounting Height (mm)

| Auto switch model | Band mounting | | | | | Rail mounting | | | | | | |
|-------------------|------------------------------------|--|--|------------------|-------|--|----------------|---|------------------|-------------------|--------|--------|
| | D-A9□ D-M9□ D-M9□W D-M9□A | D-M9□V D-M9□WV D-A9□AV D-A9□V | D-C7□/C80 D-H7□ D-H7□W D-H7NF | D-C73C D-C80C | D-H7C | D-A9□/A9□V D-M9□ D-M9□V D-M9□W D-M9□WV | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F79F D-F7NT | D-A73C D-A80C | D-F7□V D-F7□WV | D-J79C | D-A79W |
| Bore size (mm) | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 10 | 17 | 18 | 17 | 19.5 | 20 | 17.5 | 16.5 | 17.5 | 23.5 | 20 | 23 | 19 |
| 16 | 20.5 | 21 | 20.5 | 23 | 23.5 | 21 | 19.5 | 20.5 | 26.5 | 23 | 26 | 22 |

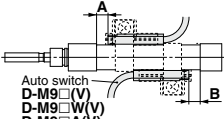
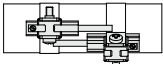
Minimum Auto Switch Mounting Stroke

(mm)

| Auto switch mounting | Auto switch model | No. of auto switches mounted | | | | |
|----------------------|---|------------------------------|---------------------------|---------------------------|---|--|
| | | 1 | 2 | | n (n: No. of auto switches) | |
| | | | Different surfaces | Same surface | Different surfaces | Same surface |
| Band mounting | D-M9□/M9□W D-A9□/M9□A | 10 | 15 <small>Note 1)</small> | 45 <small>Note 1)</small> | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 45 + 15 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| | D-M9□V | 5 | 15 <small>Note 1)</small> | 35 | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 35 + 25 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| | D-M9□WV D-M9□AV | 10 | 15 <small>Note 1)</small> | 35 | $15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 35 + 25 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| | D-A9□V | 5 | 10 | 35 | $10 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 35 + 25 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| | D-C7□ D-C80 | 10 | 15 | 50 | $15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 50 + 20 (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 4)</small> | 60 + 22.5 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| | D-C73C D-C80C D-H7C | 10 | 15 | 65 <small>Note 2)</small> | $15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 4)</small> | 50 + 27.5 (n-2) <small>(n = 2, 3, 4, 5...)</small> |
| Rail mounting | D-M9□V | 5 | — | 5 | — | 10 + 10 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-A9□V | 5 | — | 10 | — | 10 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-M9□ D-A9□ | 10 | — | 10 | — | 15 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-M9□WV D-M9□AV | 10 | — | 15 | — | 15 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-M9□W | 15 | — | 15 | — | 20 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-M9□A | 15 | — | 20 | — | 20 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-A7□/A80 D-A7□H/A80H D-A73C/A80C | 5 | — | 10 | — | 15 + 10 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-A7□H D-A80H | 5 | — | 10 | — | 15 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-A79W | 10 | — | 15 | — | 10 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-F7□ D-J79 | 5 | — | 5 | — | 15 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-F7□V D-J79C | 5 | — | 5 | — | 10 + 10 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-F7□W/J79W D-F79F/F7NT | 10 | — | 15 | — | 15 + 20 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |
| | D-F7□WV | 10 | — | 15 | — | 10 + 15 (n-2) <small>(n = 4, 6...)</small> <small>Note 5)</small> |

Note 4) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
 Note 5) 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.

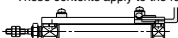
Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

| Auto switch model | With 2 auto switches | |
|-------------------|---|---|
| | Different surfaces <small>Note 1)</small> | Same surface <small>Note 1)</small> |
| |  <p>Auto switch D-M9□(V) D-M9□W(V) D-M9□A(V)</p> <p>The proper auto switch mounting position is 5.5 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-A93 | — | 45 to less than 50 stroke |
| D-M9□ D-M9□W | 15 to less than 20 stroke | 45 to less than 55 stroke |

Note 2) For the CDVJ3 series, note that 65 strokes cannot be manufactured.

Note 3) The dimension 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.)

These contents apply to the rail mounting with one or two auto switches.



Operating Range

| Auto switch model | Bore size (mm) | |
|----------------------|----------------|----|
| | 10 | 16 |
| Band mounting | | |
| D-A9□(V) | 6 | 7 |
| D-M9□(V) | 2.5 | 3 |
| D-M9□W(V)/M9□A(V) | | |
| D-C7□/C80/C73C/C80C | 7 | 7 |
| D-H7□/H7□W/H7NF | 4 | 4 |
| D-H7C | 8 | 9 |

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

| Auto switch model | Bore size (mm) | |
|------------------------------|----------------|-----|
| | 10 | 16 |
| Rail mounting | | |
| D-A9□/A9□V | 6 | 6.5 |
| D-M9□/M9□V | 3 | 3.5 |
| D-M9□W/M9□WV | | |
| D-M9□A/M9□AV | | |
| D-A7□/A80/A7H/A80H/A73C/A80C | 8 | 9 |
| D-A79W | 11 | 13 |
| D-F7□/J79/F7□W/J79W | 5 | 5 |
| D-F7□V/F7□WV/F79F/J79C | | |
| D-F7NT | | |

Auto Switch Mounting Bracket: Part No.

| Auto switch mounting | Auto switch model | Bore size (mm) | |
|----------------------|--|---------------------------------|---------------------------------|
| | | ø10 | ø16 |
| Band mounting | D-M9□ D-M9□V D-M9□W D-M9□WV D-A9□ D-A9□V | BJ6-010 <small>Note 1)</small> | BJ6-016 <small>Note 1)</small> |
| | D-M9□A D-M9□AV | BJ6-010S <small>Note 2)</small> | BJ6-016S <small>Note 2)</small> |
| Rail mounting | D-C7□/C80 D-C73C/C80C D-H7□/H7□W D-H7NF | BJ2-010 | BJ2-016 |
| | D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV | BQ2-012 <small>Note 5)</small> | BQ2-012 <small>Note 5)</small> |

(1) BJ2-□□□ is a set of "a" and "b".
 (2) BJ□-1 is a set of "c" and "d".
 BJ4-1 (Switch bracket: White)
 BJ5-1 (Switch bracket: Transparent)

Note 1) Set part number which includes the auto switch mounting band (BJ2-□□□) and the holder kit (BJ5-1/Switch bracket: Transparent). 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 consult SMC regarding other chemicals.

Note 2) Set part number which includes the auto switch mounting band (BJ2-□□□S) and the holder kit (BJ4-1/Switch bracket: White).

Note 3) For the D-M9□A (V) type auto switch, do not install the switch bracket on the indicator light.

Note 4) Only auto switches are assembled when cylinders are shipped.

Note 5) When a compact auto switch is mounted on the rail mounting type, the auto switch mounting brackets on the left are required. Order them separately from cylinders.

Example order: CDJ2B10-60-A 1 unit
 D-M9BWV 2 pcs.
 BQ2-012 2 pcs.

Besides the models listed in How to Order, the following auto switches are applicable. Refer to pages 1341 to 1435 for detailed specifications.

| Auto switch type | Part no. | Electrical entry (Fetching direction) | Features |
|------------------|--------------------|---------------------------------------|---------------------------------|
| Reed | D-C73, C76 | Grommet (In-let) | — |
| | D-C80 | | Without indicator light |
| Solid state | D-H7A1, H7A2, H7B | | — |
| | D-H7NW, H7PW, H7BW | | Diagnostic indication (2-color) |

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1410 and 1411 for details.

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

Valve Mounted Cylinder

Double Acting, Single Rod

CVM5 Series

ø20, ø25, ø32, ø40

How to Order

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Rated voltage

| DC | | AC (50/60 Hz) | |
|----|--------|---------------|-------------------|
| 5 | 24 VDC | 1 | 100 VAC |
| 6 | 12 VDC | 2 | 200 VAC |
| V | 6 VDC | 3 | 110 VAC (115 VAC) |
| S | 5 VDC | 4 | 220 VAC (230 VAC) |
| R | 3 VDC | | |

* For the DC specification DIN terminal, only 24 and 12 VDC are available.

Mounting type

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

Type of actuation

| | |
|---|---------------------------|
| 1 | 2 position single |
| 2 | 2 position double |
| 3 | 3 position closed center |
| 4 | 3 position exhaust center |

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |
| D | DIN terminal |

Light/Surge voltage suppressor

Electrical entry for G, L, M

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (Non-polar type) |
| U | With light/surge voltage suppressor (Non-polar type) |

* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.
* For type "R" and "U", DC voltage is only available.

Electrical entry for D

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor (Non-polar type) |
| Z | With light/surge voltage suppressor (Non-polar type) |

* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.

Manual override

| | |
|-----|--------------------------------|
| Nil | Non-locking push type |
| D | Push-turn locking slotted type |
| E | Push-turn locking lever type |

Made to Order
Refer to page 1176 for details.

Port thread type

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

Piping

| | |
|-----|----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fitting |

Rod extended/retracted when energized

| | |
|-----|------------------------------|
| Nil | Rod extended when energized |
| B | Rod retracted when energized |

* Only in case of 2 position single solenoid valve.

Suffix for cylinder

| | |
|-----|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

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) CDVM5B25-150-25GS

Auto switch

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

* For the applicable auto switch model, refer to the table below.

Auto switch mounting bracket
(Note)
This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Number of auto switches

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

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 1176.)

Ordering Example:
CVM5 L 32 100 1 1 G Z M9BW C

With auto switch: CDVM5 L 32 100 1 1 G Z M9BW C

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 | | | | | Pre-wired connector | Applicable load | | | |
|-------------------------|--|------------------|-----------------|-------------------------|--------------|------|----------------------|---------|---------------|---------|----------|---------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | Lead wire length (m) | | Perpendicular | In-line | None (N) | | | | | |
| | | | | | | | 0.5 (Nil) | 1 (M) | | | | | | 3 (L) | 5 (Z) | |
| Solid state auto switch | | Grommet | | 3-wire (NPN) | 5 V, 12 V | | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ● | ○ | ○ | | | |
| | | Connector | | 2-wire | 12 V | | M9BV | M9B | ● | ● | ● | ○ | ○ | | — | |
| | | | | | | | H7C | ● | — | ● | ● | — | — | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | 24 V | — | M9NWV | M9NW | ● | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | | M9PWV | M9PW | ● | ● | ● | ○ | ○ | | |
| | Water resistant (2-color indicator) | Grommet | | 2-wire | 12 V | | | M9BWW | M9BW | ● | ● | ● | ○ | ○ | — | |
| | | | | 3-wire (NPN) | | | | M9NAV*1 | M9NA*1 | ○ | ○ | ○ | ○ | ○ | | IC circuit |
| | With diagnostic output (2-color indicator) | Grommet | | 3-wire (PNP) | 5 V, 12 V | | | M9PAV*1 | M9PA*1 | ○ | ○ | ○ | ○ | ○ | IC circuit | |
| | | | | 2-wire | | | | M9BAV*1 | M9BA*1 | ○ | ○ | ○ | ○ | ○ | | |
| Reed auto switch | | Grommet | Yes | 3-wire (NPN equivalent) | 5 V | — | A96V | A96 | ● | ● | ● | ○ | ○ | IC circuit | | |
| | | | | 100 V | | | A93V*2 | A93 | ● | ● | ● | ○ | ○ | | | |
| | | | | 100 V or less | | | A90V | A90 | ● | ● | ● | ○ | ○ | | | |
| | | | | 100 V, 200 V | | | B54 | ● | ● | ● | ○ | ○ | | | | |
| | | | | 200 V or less | | | B64 | ● | ● | ● | ○ | ○ | | | | |
| | | Connector | | Yes | 2-wire | 24 V | 12 V | | C73C | ● | ● | ● | ○ | ○ | — | |
| | | | | | | | | | C80C | ● | ● | ● | ○ | ○ | | |
| | | | | | | | | | B59W | ● | ● | ● | ○ | ○ | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWV
3 m L (Example) M9NWV
5 m Z (Example) M9NWZ
None N (Example) H7CN

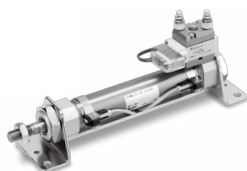
* Solid state auto switches marked with "○" are produced upon receipt of order.
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

* Since there are other applicable auto switches than listed, refer to page 1193 for details.
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
* D-A9□/M9□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

CVM5 Series

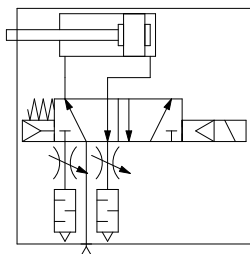
Operation type can be changed to rod extended when energized or rod retracted when energized.

An auto switch cylinder with the switch installed can also be manufactured.



Symbol

Rubber bumper



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

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC4 | With heavy duty scraper |
| -XC6 | Made of stainless steel |

Refer to pages 1191 to 1193 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Applicable bore size (mm) | | 20 | 25 | 32 | 40 |
|---------------------------------------|----------------------------|---|------------|------------|------------|
| Fluid | | Air | | | |
| Action | | Double acting, Single rod | | | |
| Cushion | | Rubber bumper | | | |
| Proof pressure | | 1.0 MPa | | | |
| Maximum operating pressure | | 0.7 MPa | | | |
| Minimum operating pressure | | 0.15 MPa | | | |
| Ambient and fluid temperature | | -10 to 50°C (No freezing) | | | |
| Lubrication | | Not required (Non-lube) | | | |
| Stroke length tolerance | | $+1.4$ 0 | | | |
| Port size | Screw-in type | Rc 1/8 | | | |
| | Built-in One-touch fitting | O.D.: $\phi 6$ /I.D.: $\phi 4$ | | | |
| Piston speed (mm/s) ^(Note) | | 50 to 700* | 50 to 650* | 50 to 590* | 50 to 420* |
| Allowable kinetic energy | | 0.27 J | 0.4 J | 0.65 J | 1.2 J |
| Mounting | | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Head side trunnion type, Rod side trunnion type | | | |

(Note) The figures marked with "*" represent the values of the cylinder with the silencer type exhaust throttle valve removed. To operate the cylinder at these values, prevent dust from entering by installing an AN120-M5 silencer on the EXH port.

Solenoid Valve Specifications

| Series | | SYJ5□90 series | |
|---|---|---|---|
| Manual override | | Non-locking push type, Push-turn locking slotted type, Push-turn locking lever type | |
| Pilot exhaust | | Pilot valve individual exh. Type | |
| Impact/Vibration resistance (m/s ²) ^(Note 1) | | 150/30 | |
| Enclosure | | Dustproof | |
| Electrical entry | | Grommet (G), L plug connector (L), M plug connector (M), DIN terminal (D) | |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | 24, 12 |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Allowable voltage | | ±10% of the rated voltage* | |
| Power consumption (W) ^(Note 2) | | DC 0.35 (With light: 0.4 (DIN terminal with light: 0.45)) | |
| Apparent power (VA) ^(Note 2) | AC | 100 V | 0.78 (With light: 0.81) 0.78 (With light: 0.87) |
| | | 110 V | 0.86 (With light: 0.89) 0.86 (With light: 0.97) |
| | | [115 V] | [0.94 (With light: 0.97)] [0.94 (With light: 1.07)] |
| | | 200 V | 1.18 (With light: 1.22) 1.15 (With light: 1.30) |
| | | 220 V | 1.30 (With light: 1.34) 1.27 (With light: 1.46) |
| [230 V] | [1.42 (With light: 1.46)] [1.39 (With light: 1.60)] | | |
| Surge voltage suppressor | | Diode (DIN terminal, Varistor when non-polar types) | |
| Indicator light | | LED (Neon light when AC with DIN terminal) | |

* Based on IEC60529

* In common between 110 VAC and the 115 VAC, and between 220 VAC and 230 VAC.

* For 115 VAC and 230 VAC, the allowable voltage is -15% to +5% of rated voltage.

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) At the rated voltage.

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ^(Note) | Maximum stroke (mm) |
|----------------|--|---------------------|
| 20 | 25, 50, 75, 100, 125, 150, 200, 250, 300 | 1000 |
| 25 | | |
| 32 | | |
| 40 | | |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to the CM2 series of the "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.

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C* |

* Maximum ambient temperature for the rod boot itself.

Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic Weight | Basic type | 0.22 | 0.29 | 0.36 | 0.64 |
| | Axial foot type | 0.37 | 0.45 | 0.52 | 0.91 |
| | Flange type | 0.28 | 0.38 | 0.45 | 0.76 |
| | Single clevis type | 0.26 | 0.33 | 0.40 | 0.73 |
| | Double clevis type | 0.27 | 0.35 | 0.41 | 0.77 |
| | Trunnion type | 0.26 | 0.36 | 0.42 | 0.74 |
| Additional weight per each 50 mm of stroke | | 0.05 | 0.07 | 0.09 | 0.14 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) **CVM5L32-100-11G**

- Basic weight 0.52 (Axial foot type ø32) • Additional weight 0.09/50 st
- Cylinder stroke 100 (st)
- $0.52 + 0.09 \times 100/50 = 0.70$ kg
- Add 0.03 kg for the DIN terminal.
- Add 0.02 kg for the double solenoids.
- Add 0.03 kg for the closed center and exhaust center.

Mounting Type and Accessory

| Mounting | Accessory | | | Standard equipment | | | Option | | | |
|-----------------------------------|----------------------|-------------|------------------|----------------------|----------------------|------------------------------|----------------------------------|--|--|--|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double knuckle joint | Pivot bracket ⁽⁵⁾ | Pivot bracket pin ⁽⁶⁾ | | | |
| Basic type | ● (1 pc.) | ● | — | ● | ● | | | | | |
| Axial foot type | ● (2) | ● | — | ● | ● | | | | | |
| Rod side flange type | ● (1) | ● | — | ● | ● | | | | | |
| Head side flange type | ● (1) | ● | — | ● | ● | | | | | |
| Single clevis type | — ⁽¹⁾ | ● | — | ● | ● | ● | ● | | | |
| Double clevis type ⁽³⁾ | — ⁽¹⁾ | ● | ● ⁽⁴⁾ | ● | ● | | | | | |
| Head side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | | | | | |
| Rod side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | | | | | |

Note 1) Mounting nut is not equipped with single clevis type and double clevis type

Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.

Note 3) Pin and set ring are shipped together with double clevis and double knuckle joint.

Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.

Note 5) Pin and retaining ring are not included in pivot bracket.

Note 6) Retaining rings are included in pivot bracket pin.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----|----------|----------|
| Axial foot* | CM-L020B | | CM-L032B | CM-L040B |
| Flange | CM-F020B | | CM-F032B | CM-F040B |
| Single clevis | CM-C020B | | CM-C032B | CM-C040B |
| Double clevis** | CM-D020B | | CM-D032B | CM-D040B |
| Trunnion (With nut) | CM-T020B | | CM-T032B | CM-T040B |

* Two foot brackets and a mounting nut are attached.

When ordering the foot bracket, order 2 pcs. per cylinder.

** Clevis pin and retaining ring (cotter pin for ø40) are packaged together.

Accessory (Option)

* Refer to page 1190 for part numbers and dimensions of the single knuckle joint, double knuckle joint, clevis pin, knuckle pin, rod end nut, mounting nut, and trunnion nut.

* Refer to page 255 of the CM2-Z series catalog for the part numbers and external dimensions of the pivot bracket and pivot bracket pin as well as for the dimensions when the cylinder is mounted.

⚠️ Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5 port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Mounting

⚠️ Warning

1. 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

1. 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.

2. 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 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.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burns.

4. 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.

5. Conjoin the rod end part, so that rod boot might not be twisted.

If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

Model Selection

⚠️ Warning

1. Confirm the specifications.

Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time

When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or affect peripheral equipment adversely since temperature rises when coils generate heat.

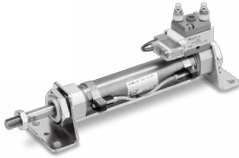
CVM5 Series

Built-in One-touch Fitting

CVM5 **Mounting type** **Bore size** **F** — For “How to Order”, refer to page 1175.

● Built-in One-touch fitting

One-touch fittings are installed on cylinders.



Application/Tubing O.D.

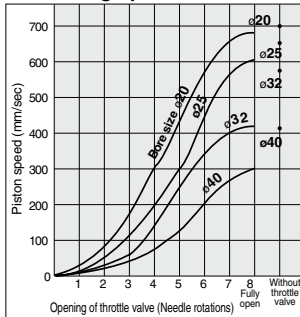
| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|--|------|------|------|
| Applicable tubing O.D. (mm) | ø6/4 | ø6/4 | ø6/4 | ø6/4 |
| Applicable tubing material | Can be used for either nylon, soft nylon or polyurethane tube. | | | |

Specifications

| | | | | |
|-----------------------------------|---|-----------|-----------|-----------|
| Action | Double acting, Single rod | | | |
| Bore size (mm) | 20, 25, 32, 40 | | | |
| Maximum operating pressure | 0.7 MPa | | | |
| Minimum operating pressure | 0.15 MPa | | | |
| Cushion | Rubber bumper | | | |
| Piping | Built-in One-touch fitting | | | |
| Piston speed (mm/s) | ø20 | ø25 | ø32 | ø40 |
| | 50 to 700 | 50 to 650 | 50 to 590 | 50 to 420 |
| Mounting | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Rod side trunnion type, Head side trunnion type | | | |

For the dimensions of mounting bracket, refer to pages 1181 to 1184.

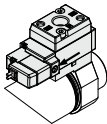
Opening Range of Throttle Valve and Driving Speed



Measuring conditions: Operating pressure 0.5 MPa
Mounting: horizontal Load: no load on the return side
The speeds indicated above are for reference.

Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



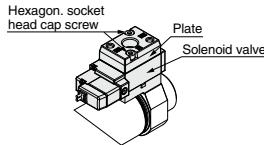
Piston Speed Adjustment

- To slow down the piston speed, screw in the needle of the silencer type exhaust throttle valve clockwise, which reduces the amount of air that is discharged.
- To adjust the piston extension side, regulate the “R1” side silencer type exhaust throttle valve.
To adjust the retraction side, regulate the “R2” side silencer exhaust throttle valve.
- The needle valve of the throttle valve can be fully opened by loosening it 8 turns from the fully closed position.
- The needle valve has a loosening prevention construction.

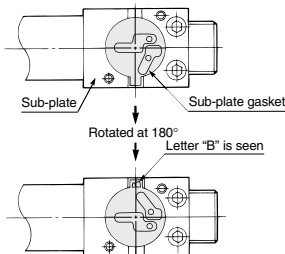
Changing between Rod Extended when Energized and Rod Retracted when Energized

Step [This procedure is for changing the rod extended when energized to the rod retracted when energized.]

1. Using a tool, loosen the two hexagon socket bolts, and remove the plate and the solenoid valve. At this time, instead of removing the plate and the solenoid valve separately, remove them together, with the hexagon socket bolts remaining inserted.

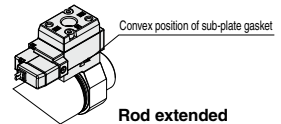


2. A sub-plate gasket is inside the sub-plate. Invert this sub-plate gasket 180° and install it with its letter “B” visible. (A portion that protrudes is provided on the periphery of the sub-plate gasket, and the letter “B” is on one side of this protrusion.)



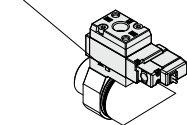
3. Install the solenoid valve and the plate, and tighten the hexagon socket bolts with a tool. The tightening torque is between 0.6 and 0.8 N·m.

After tightening, press the manual button on the solenoid valve, check for any air leaks, and verify the operating conditions. Distinction between rod extended when energized and rod retracted when energized can be determined from the outside, by looking through the small window in the sub-plate.



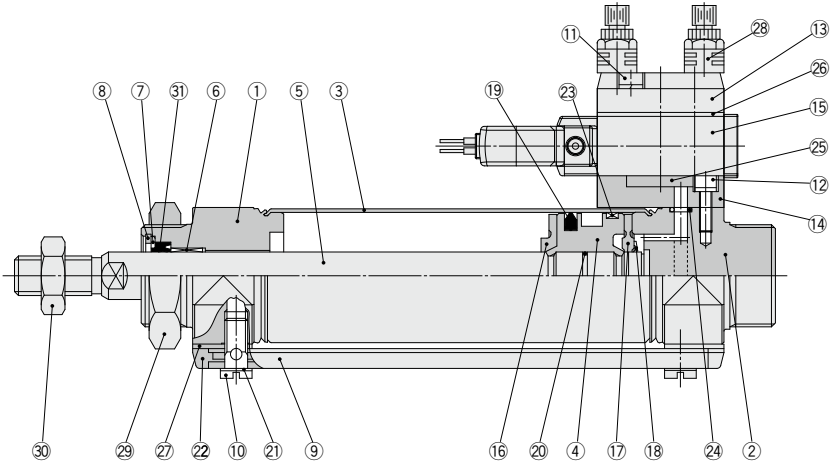
Rod extended when energized

Convex position of sub-plate gasket

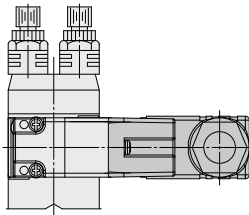


Rod retracted when energized

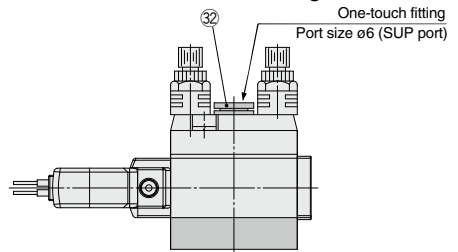
Construction



DIN terminal



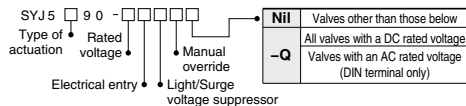
Built-in One-touch fitting



Component Parts

| No. | Description | Material | Note |
|-----|---|-----------------|-------------------------------------|
| 1 | Rod cover | Aluminum alloy | Anodized |
| 2 | Head cover | Aluminum alloy | Anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston rod | Carbon steel | Hard chrome plated |
| 6 | Bushing | Bearing alloy | |
| 7 | Seal retainer | Stainless steel | |
| 8 | Retaining ring | Carbon steel | Phosphate coated |
| 9 | Pipe | Aluminum alloy | |
| 10 | Stud | Brass | Electroless nickel plated |
| 11 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 12 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 13 | Plate | Aluminum alloy | Metallic painted |
| 14 | Sub-plate | Aluminum alloy | Metallic painted |
| 15 | Solenoid valve | — | Refer to the "How to order" below.* |
| 16 | Bumper A | Urethane | |
| 17 | Bumper B | Urethane | |

* How to order solenoid valves



Component Parts

| No. | Description | Material | Note |
|-----|--------------------------------|-----------------|----------------|
| 18 | Retaining ring | Stainless steel | |
| 19 | Piston seal | NBR | |
| 20 | Piston gasket | NBR | |
| 21 | Gasket | Resin | |
| 22 | Pipe gasket | Urethane rubber | |
| 23 | Wear ring | Resin | |
| 24 | Head cover gasket | NBR | |
| 25 | Sub-plate gasket | NBR | |
| 26 | Gasket | NBR | |
| 27 | Spacer gasket | Resin | Except ø25 |
| 28 | Exhaust throttle with silencer | — | ASN2-M5 |
| 29 | Mounting nut | Carbon steel | Nickel plated |
| 30 | Rod end nut | Carbon steel | Zinc chromated |
| 32 | One-touch fitting | — | Port size: ø6 |

Replacement Parts/Seal Kit

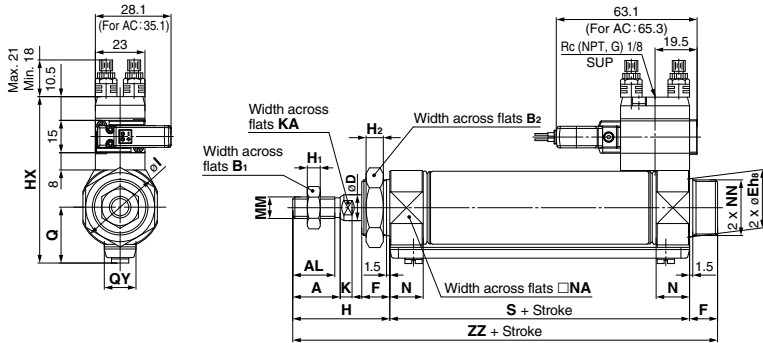
| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|----------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| 31 | Rod seal | NBR | CM220-PS | CM225-PS | CM232-PS | CM240-PS |

* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

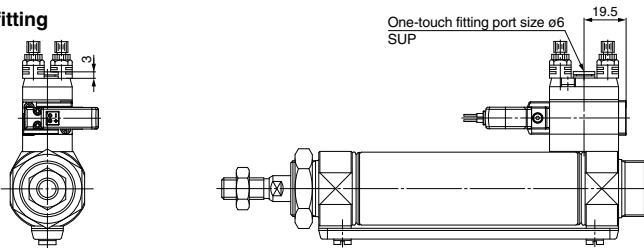
CVM5 Series

Basic Type (B)

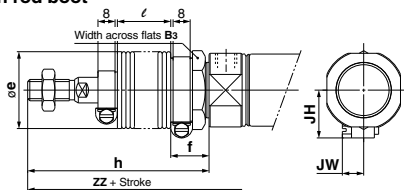
CVM5B —



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1184.

| Bore size (mm) | Stroke range | A | AL | B ₁ | B ₂ | D | Eh _s | F | Q | QY | H | H ₁ | H ₂ | HX | I | K | KA | MM | N | NA | NN | S | ZZ |
|----------------|--------------|----|------|----------------|----------------|----|--|----|------|----|----|----------------|----------------|------|------|-----|----|------------|------|------|-----------|----|-----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 8 | 20 ^{+0.033} _{-0.033} | 13 | 19.8 | 14 | 41 | 5 | 8 | 65.3 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 62 | 116 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 10 | 26 ^{+0.033} _{-0.033} | 13 | 22 | 14 | 45 | 6 | 8 | 70.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 62 | 120 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 12 | 26 ^{+0.033} _{-0.033} | 13 | 25.8 | 16 | 45 | 6 | 8 | 76.5 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 64 | 122 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 14 | 32 ^{+0.039} _{-0.039} | 16 | 29.8 | 16 | 50 | 8 | 10 | 84.5 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 88 | 154 |

With Rod Boot

| Bore size (mm) | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | JH | JW |
|----------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|------|------|----|----|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | | |
| 20 | 30 | 36 | 18 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 23.5 | 10.5 | | |
| 25 | 32 | 36 | 18 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 23.5 | 10.5 | | |
| 32 | 32 | 36 | 18 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 23.5 | 10.5 | | |
| 40 | 41 | 46 | 20 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 27 | 10.5 | | |

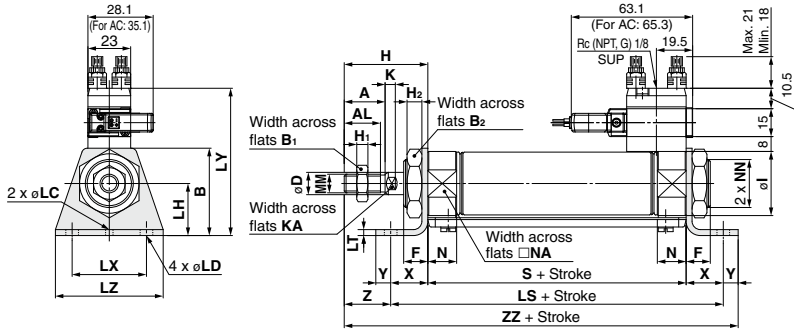
| Bore size (mm) | ZZ | | | | | | |
|----------------|---------|-----------|------------|------------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 143 | 156 | 168 | 181 | 206 | 231 | 256 |
| 25 | 147 | 160 | 172 | 185 | 210 | 235 | 260 |
| 32 | 149 | 162 | 174 | 187 | 212 | 237 | 262 |
| 40 | 181 | 194 | 206 | 219 | 244 | 269 | 294 |

* For short strokes, a solenoid valve may protrude from the rod cover end. Confirm S dimension and solenoid dimensions.

* Long stroke type includes ones for strokes more than 301 mm.

Axial Foot Type (L)

CVM5L —



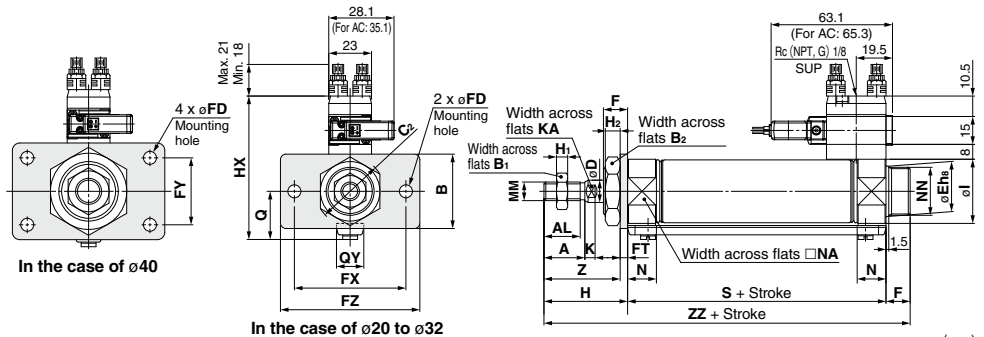
| Bore size (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | D | F | H | H ₁ | H ₂ | I | K | KA | LC | LD | LH | LS | LT | LX |
|----------------|--------------|----|------|----|----------------|----------------|----|----|----|----------------|----------------|------|-----|----|----|-----|----|-----|-----|----|
| 20 | Up to 300 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 41 | 5 | 8 | 28 | 5 | 6 | 4 | 6.8 | 25 | 102 | 3.2 | 40 |
| 25 | Up to 300 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 45 | 6 | 8 | 33.5 | 5.5 | 8 | 4 | 6.8 | 28 | 102 | 3.2 | 40 |
| 32 | Up to 300 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 45 | 6 | 8 | 37.5 | 5.5 | 10 | 4 | 6.8 | 28 | 104 | 3.2 | 40 |
| 40 | Up to 300 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 50 | 8 | 10 | 46.5 | 7 | 12 | 4 | 7 | 30 | 134 | 3.2 | 55 |

| Bore size (mm) | LY | LZ | MM | N | NA | NN | S | X | Y | Z | ZZ |
|----------------|------|----|------------|------|------|-----------|----|----|----|----|-----|
| 20 | 70.5 | 55 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 62 | 20 | 8 | 21 | 131 |
| 25 | 76.5 | 55 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 62 | 20 | 8 | 25 | 135 |
| 32 | 78.8 | 55 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 64 | 20 | 8 | 25 | 137 |
| 40 | 84.8 | 75 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 88 | 23 | 10 | 27 | 171 |

* Brackets are packaged together.

Rod Side Flange Type (F)

CVM5F —



| Bore size (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | C ₂ | D | Eh ₈ | F | FD | FT | FX | FY | FZ | H | H ₁ | H ₂ | HX |
|----------------|--------------|----|------|----|----------------|----------------|----------------|----|---------------------|----|----|----|----|----|----|----|----------------|----------------|------|
| 20 | Up to 300 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ^{0.033} | 13 | 7 | 4 | 60 | — | 75 | 41 | 5 | 8 | 65.3 |
| 25 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ^{0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 70.5 |
| 32 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ^{0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 76.5 |
| 40 | Up to 300 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ^{0.033} | 16 | 7 | 5 | 66 | 36 | 82 | 50 | 8 | 10 | 84.5 |

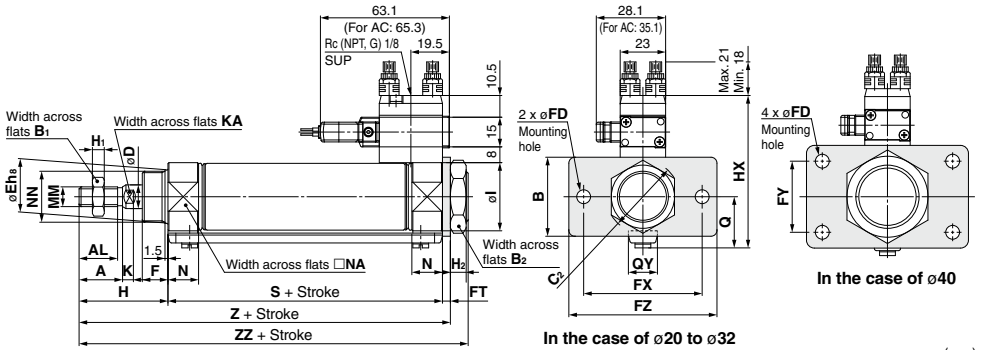
| Bore size (mm) | I | K | KA | MM | N | NA | NN | Q | QY | S | Z | ZZ |
|----------------|------|-----|----|------------|------|------|-----------|------|----|----|----|-----|
| 20 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 19.8 | 14 | 62 | 37 | 116 |
| 25 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 22 | 14 | 62 | 41 | 120 |
| 32 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 25.8 | 16 | 64 | 41 | 122 |
| 40 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 29.8 | 16 | 88 | 45 | 154 |

* For short strokes, a solenoid valve may protrude from the rod cover end. Confirm S dimension and solenoid dimensions.
* Brackets are packaged together.

CVM5 Series

Head Side Flange Type (G)

CVM5G -



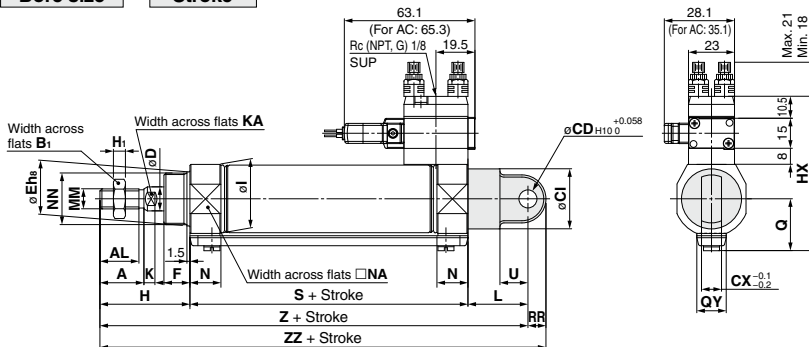
| Bore size (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | C ₂ | D | Eh ₈ | F | FD | FT | FX | FY | FZ | H | H ₁ | H ₂ | HX |
|----------------|--------------|----|------|----|----------------|----------------|----------------|----|--------------------------------------|----|----|----|----|----|----|----|----------------|----------------|------|
| 20 | Up to 300 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ^{0.033} _{0.033} | 13 | 7 | 4 | 60 | — | 75 | 41 | 5 | 8 | 65.3 |
| 25 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ^{0.033} _{0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 70.5 |
| 32 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ^{0.033} _{0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 76.5 |
| 40 | Up to 300 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ^{0.039} _{0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 50 | 8 | 10 | 84.5 |

| Bore size (mm) | I | K | KA | MM | N | NA | NN | Q | QY | S | Z | Z |
|----------------|------|-----|----|------------|------|------|-----------|------|----|----|-----|-----|
| 20 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 19.8 | 14 | 62 | 107 | 107 |
| 25 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 22 | 14 | 62 | 111 | 111 |
| 32 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 25.8 | 16 | 64 | 113 | 113 |
| 40 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 29.8 | 16 | 88 | 143 | 143 |

* Brackets are packaged together.

Single Clevis Type (C)

CVM5C -

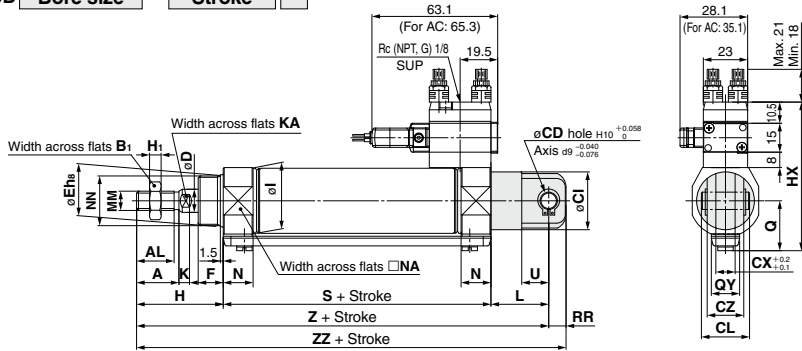


| Bore size (mm) | Stroke range | A | AL | B ₁ | CD | CI | CX | D | Eh ₈ | F | H | H ₁ | I | HX | K | KA | L | MM |
|----------------|--------------|----|------|----------------|----|----|----|----|--------------------------------------|----|----|----------------|------|------|-----|----|----|------------|
| 20 | Up to 300 | 18 | 15.5 | 13 | 9 | 24 | 10 | 8 | 20 ^{0.033} _{0.033} | 13 | 41 | 5 | 28 | 65.3 | 5 | 6 | 30 | M8 x 1.25 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 9 | 30 | 10 | 10 | 26 ^{0.033} _{0.033} | 13 | 45 | 6 | 33.5 | 70.5 | 5.5 | 8 | 30 | M10 x 1.25 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 9 | 30 | 10 | 12 | 26 ^{0.033} _{0.033} | 13 | 45 | 6 | 37.5 | 76.5 | 5.5 | 10 | 30 | M10 x 1.25 |
| 40 | Up to 300 | 24 | 21 | 22 | 10 | 38 | 15 | 14 | 32 ^{0.039} _{0.039} | 16 | 50 | 8 | 46.5 | 84.5 | 7 | 12 | 39 | M14 x 1.5 |

| Bore size (mm) | N | NA | NN | Q | QY | RR | S | U | Z | ZZ |
|----------------|------|------|-----------|------|----|----|----|----|-----|-----|
| 20 | 15 | 24 | M20 x 1.5 | 19.8 | 14 | 9 | 62 | 14 | 133 | 142 |
| 25 | 15 | 30 | M26 x 1.5 | 22 | 14 | 9 | 62 | 14 | 137 | 146 |
| 32 | 15 | 34.5 | M26 x 1.5 | 25.8 | 16 | 9 | 64 | 14 | 139 | 148 |
| 40 | 21.5 | 42.5 | M32 x 2 | 29.8 | 16 | 11 | 88 | 18 | 177 | 188 |

Double Clevis Type (D)

CVM5D –



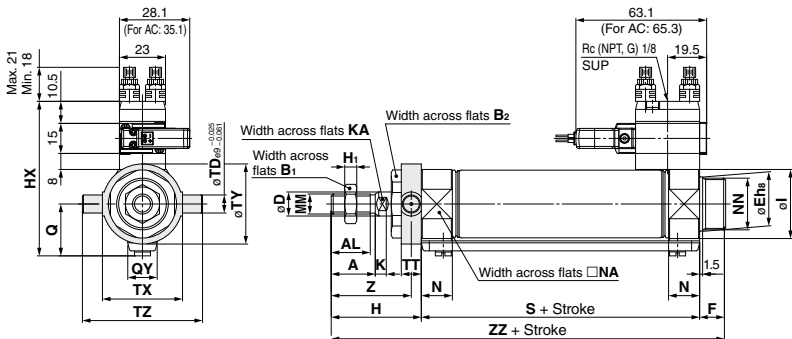
| Bore size (mm) | Stroke range | A | AL | B ₁ | CD | CI | CL | CX | CZ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | L |
|----------------|--------------|----|------|----------------|----|----|------|----|----|----|-----------------------------------|----|----|----------------|------|------|-----|----|----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 9 | 24 | 25 | 10 | 19 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 65.3 | 28 | 5 | 6 | 30 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 70.5 | 33.5 | 5.5 | 8 | 30 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 76.5 | 37.5 | 5.5 | 10 | 30 |
| 40 | Up to 300 | 24 | 21 | 22 | 10 | 38 | 41.2 | 15 | 30 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 84.5 | 46.5 | 7 | 12 | 39 |

| Bore size (mm) | MM | N | NA | NN | Q | QY | RR | S | U | Z | ZZ |
|----------------|------------|------|------|-----------|------|----|----|----|----|-----|-----|
| 20 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 19.8 | 14 | 9 | 62 | 14 | 133 | 142 |
| 25 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 22 | 14 | 9 | 62 | 14 | 137 | 146 |
| 32 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 25.8 | 16 | 9 | 64 | 14 | 139 | 148 |
| 40 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 29.8 | 16 | 11 | 88 | 18 | 177 | 188 |

* Clevis pin and snap ring (cotter pin for ø40) are packaged together.

Rod Side Trunnion Type (U)

CVM5U –



| Bore size (mm) | Stroke range | A | AL | B ₁ | B ₂ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | MM | N | NA | NN |
|----------------|--------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----------------|------|------|-----|----|------------|------|------|-----------|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 65.3 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 70.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 76.5 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 84.5 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 |

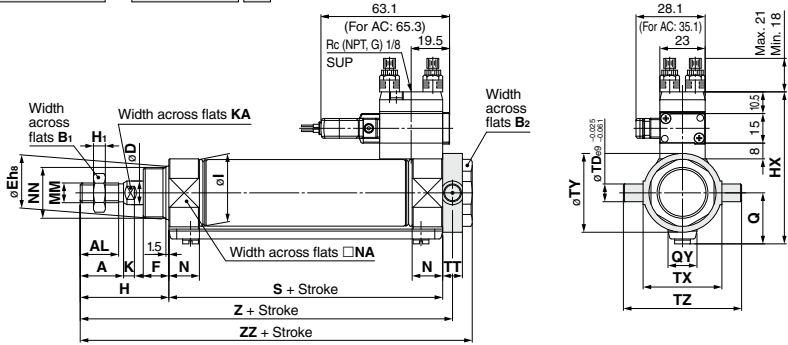
| Bore size (mm) | Q | QY | S | TD | TT | TX | TY | TZ | Z | ZZ |
|----------------|------|----|----|----|----|----|----|----|------|-----|
| 20 | 19.8 | 14 | 62 | 8 | 10 | 32 | 32 | 52 | 36 | 116 |
| 25 | 22 | 14 | 62 | 9 | 10 | 40 | 40 | 60 | 40 | 120 |
| 32 | 25.8 | 16 | 64 | 9 | 10 | 40 | 40 | 60 | 40 | 122 |
| 40 | 29.8 | 16 | 88 | 10 | 11 | 53 | 53 | 77 | 44.5 | 154 |

* Brackets are packaged together.

CVM5 Series

Head Side Trunnion Type (T)

CVM5T –



(mm)

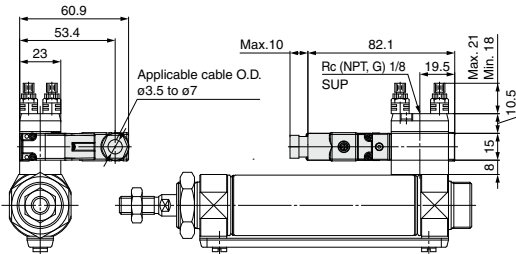
| Bore size (mm) | Stroke range | A | AL | B ₁ | B ₂ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | MM | N | NA | NN |
|----------------|--------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----------------|------|------|-----|----|------------|------|------|-----------|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 65.3 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 70.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 76.5 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 84.5 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 |

(mm)

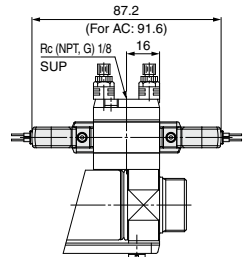
| Bore size (mm) | Q | QY | S | TD | TT | TX | TY | TZ | Z | ZZ |
|----------------|------|----|----|----|----|----|----|----|-------|-----|
| 20 | 19.8 | 14 | 62 | 8 | 10 | 32 | 32 | 52 | 108 | 118 |
| 25 | 22 | 14 | 62 | 9 | 10 | 40 | 40 | 60 | 112 | 122 |
| 32 | 25.8 | 16 | 64 | 9 | 10 | 40 | 40 | 60 | 114 | 124 |
| 40 | 29.8 | 16 | 88 | 10 | 11 | 53 | 53 | 77 | 143.5 | 154 |

* Brackets are packaged together.

DIN Terminal



Double Solenoid



* For the mounting brackets of flange, single clevis, double clevis and head side trunnion type, the double solenoid may not be used depending on the mounting conditions.

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting

CVM5K Series

ø20, ø25, ø32, ø40

How to Order

Rated voltage

| DC | | AC (50/60 Hz) | |
|----|--------|---------------|-------------------|
| 5 | 24 VDC | 1 | 100 VAC |
| 6 | 12 VDC | 2 | 200 VAC |
| V | 6 VDC | 3 | 110 VAC (115 VAC) |
| S | 5 VDC | 4 | 220 VAC (230 VAC) |
| R | 3 VDC | | |

* For the DC specification DIN terminal, only 24 and 12 VDC are available.

Mounting type

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

Type of actuation

| | |
|---|---------------------------|
| 1 | 2 position single |
| 2 | 2 position double |
| 3 | 3 position closed center |
| 4 | 3 position exhaust center |

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |
| D | DIN terminal |

Light/Surge voltage suppressor

Electrical entry for G, L, M

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (Non-polar type) |
| U | With light/surge voltage suppressor (Non-polar type) |

* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.
* For type "R" and "U", DC voltage is only available.

Electrical entry for D

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor (Non-polar type) |
| Z | With light/surge voltage suppressor (Non-polar type) |

* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.

Manual override

| | |
|-----|--------------------------------|
| Nil | Non-locking push type |
| D | Push-turn locking slotted type |
| E | Push-turn locking lever type |

Made to Order
Refer to page 1186 for details.

Ordering Example: CVM5K L 32 [] [] [] - 100 [] [] [] - 1 1 G Z [] [] [] - [] [] [] - [] [] [] - C [] [] []

With auto switch CDVM5K L 32 [] [] [] - 100 [] [] [] - 1 1 G Z [] [] [] - M9BW [] [] [] - C [] [] []

With auto switch (Built-in magnet)
Non-rotating rod type

Port thread type

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

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Piping

| | |
|-----|----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fitting |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 1186.)

Suffix for cylinder

| | |
|-----|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

Auto switch

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

* For the applicable auto switch model, refer to the table below.

Number of auto switches

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

Auto switch mounting bracket (Note)
Note) This symbol is indicated when the D-A93 or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Rod extended/retracted when energized

| | |
|-----|------------------------------|
| Nil | Rod extended when energized |
| B | Rod retracted when energized |

* Only in case of 2 position single solenoid valve.

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) CDVM5K40-100-11GZ

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 | | 3-wire (NPN) | 5 V, 12 V | | M9NV | M9N | ● | ● | ● | ○ | ○ | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ○ | ○ | | | |
| | | Connector | | 2-wire | 12 V | | M9BV | M9B | ● | ● | ● | ● | ○ | | |
| | | | | 3-wire (NPN) | | | M9NVV | M9NW | ● | ● | ● | ○ | ○ | | |
| | | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 5 V, 12 V | | M9PWV | M9PW | ● | ● | ○ | ○ | | ○ |
| | 2-wire | | | | M9BWW | | | M9BW | ● | ● | ● | ○ | ○ | | |
| | Water resistant (2-color indicator) | Grommet | | 3-wire (NPN) | 5 V, 12 V | | M9NAV*1 | M9NA*1 | ○ | ○ | ○ | ○ | ○ | | ○ |
| | | | | 3-wire (PNP) | | | M9PAV*1 | M9PA*1 | ○ | ○ | ○ | ○ | ○ | | |
| | | | | 2-wire | | | M9BAV*1 | M9BA*1 | ○ | ○ | ○ | ○ | ○ | | |
| | With diagnostic output (2-color indicator) | | | 4-wire (NPN) | 5 V, 12 V | | H7NF | | ● | ○ | ○ | ○ | ○ | | |
| Reed auto switch | | Grommet | Yes | 3-wire (NPN equivalent) | 24 V | 12 V | A96V | A96 | ● | ● | ● | ○ | ○ | ○ | |
| | | | | | | | A93V*2 | A93 | ● | ● | ● | ○ | ○ | | |
| | | | | | | | 100 V or less | A90V | A90 | ● | ● | ○ | ○ | ○ | |
| | | | | | | | 100 V, 200 V | B54 | ● | ● | ● | ○ | ○ | | |
| | | | | | | | 200 V or less | B64 | ● | ● | ○ | ○ | ○ | | |
| | | Connector | Yes | | 2-wire | 24 V | 12 V | | C73C | ● | ● | ● | ○ | ○ | ○ |
| | | | | | | | | | C80C | ● | ● | ● | ○ | ○ | |
| | | | | | | | | | B59W | ● | ● | ○ | ○ | ○ | |
| | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | |
| | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | |

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
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.
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

* Since there are other applicable auto switches than listed, refer to page 1193 for details.
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
* D-A9□/M9□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

CVM5K Series

A hexagon shaped rod that does not rotate.

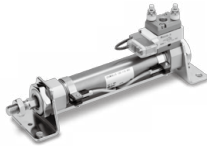
Non-rotating accuracy

∅20, ∅25 — ±0.7°
∅32, ∅40 — ±0.5°

Can operate without lubrication.

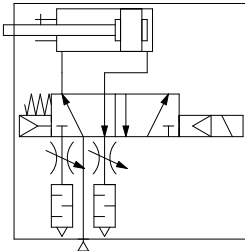
Auto switches can also be mounted.

Can be installed with auto switches to facilitate the detection of the cylinder's stroke position.



Symbol

Rubber bumper



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

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Refer to pages 1191 to 1193 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Applicable bore size (mm) | | 20 | 25 | 32 | 40 |
|-------------------------------|----------------------------|---|-------------|-------------|-------------|
| Rod non-rotating accuracy | | ± 0.7° | | | ± 0.5° |
| Fluid | | Air | | | |
| Action | | Double acting, Single rod | | | |
| Proof pressure | | 1.0 MPa | | | |
| Maximum operating pressure | | 0.7 MPa | | | |
| Minimum operating pressure | | 0.15 MPa | | | |
| Ambient and fluid temperature | | -10 to 50°C (No freezing) | | | |
| Lubrication | | Not required (Non-lube) | | | |
| Stroke length tolerance | | +1.4 0 | | | |
| Piston speed (mm/s) | | 50 to 700 * | 50 to 650 * | 50 to 590 * | 50 to 420 * |
| Allowable kinetic energy | | 0.27 J | 0.4 J | 0.65 J | 1.2 J |
| Port size | Screw-in type | Rc 1/8 | | | |
| | Built-in One-touch fitting | O.D.: ∅6/I.D.: ∅4 | | | |
| Mounting | | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Head side trunnion type, Rod side trunnion type | | | |

Note) The figures marked with "*" represent the values of the cylinder with the silencer type exhaust throttle valve removed. To operate the cylinder at these values, prevent dust from entering by installing an AN120-M5 silencer on the EXH port.

Solenoid Valve Specifications

| Series | | SYJ5□90 series | |
|--|---------------------------|---|---------------------------|
| Manual override | | Non-locking push type, Push-turn locking slotted type, Push-turn locking lever type | |
| Pilot exhaust | | Pilot valve individual exh. Type | |
| Impact/Vibration resistance (m/s ²) ^{Note 1)} | | 150/30 | |
| Enclosure | | Dustproof | |
| Electrical entry | | Grommet (G), L plug connector (L), M plug connector (M), DIN terminal (D) | |
| | | G, L, M | D |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | 24, 12 |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Allowable voltage | | ±10% of the rated voltage* | |
| Power consumption (W) ^{Note 2)} | | DC 0.35 (With light: 0.4 (DIN terminal with light: 0.45)) | |
| Apparent power (VA) ^{Note 2)} | AC 100 V | 0.78 (With light: 0.81) | 0.78 (With light: 0.87) |
| | 110 V | 0.86 (With light: 0.89) | 0.86 (With light: 0.97) |
| | [115 V] | [0.94 (With light: 0.97)] | [0.94 (With light: 1.07)] |
| | 200 V | 1.18 (With light: 1.22) | 1.15 (With light: 1.30) |
| | 220 V | 1.30 (With light: 1.34) | 1.27 (With light: 1.46) |
| [230 V] | [1.42 (With light: 1.46)] | [1.39 (With light: 1.60)] | |
| Surge voltage suppressor | | Diode (DIN terminal, Varistor when non-polar types) | |
| Indicator light | | LED (Neon light when AC with DIN terminal) | |

* Based on IEC60529

** In common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

** For 115 VAC and 230 VAC, the allowable voltage is -15% to +5% of rated voltage.

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) At the rated voltage.

Standard Stroke

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

Note) Other intermediate strokes can be manufactured upon receipt of order.

Although it is possible to make up to 1000 stroke length, when exceeding the standard stroke, there may be the case which cannot meet the specifications.

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C * |

* Maximum ambient temperature for the rod boot itself.

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting **CVM5K Series**

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic type | 0.22 | 0.29 | 0.36 | 0.64 |
| | Axial foot type | 0.37 | 0.45 | 0.52 | 0.91 |
| | Flange type | 0.28 | 0.38 | 0.45 | 0.76 |
| | Single clevis type | 0.26 | 0.33 | 0.40 | 0.73 |
| | Double clevis type | 0.27 | 0.35 | 0.41 | 0.77 |
| | Trunnion type | 0.26 | 0.36 | 0.42 | 0.74 |
| Additional weight per each 50 mm of stroke | | 0.05 | 0.07 | 0.09 | 0.14 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (with pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) **CVM5KL32-100-11G**

• Basic weight 0.52 (Axial foot type ø32) • Additional weight 0.09/50 st

• Cylinder stroke 100 (st)

$$0.52 + 0.09 \times 100/50 = 0.70 \text{ kg}$$

• Add 0.03 kg for the DIN terminal.

• Add 0.02 kg for the double solenoids.

• Add 0.03 kg for the closed center and exhaust center.

Mounting Bracket and Accessory

| Mounting | Accessory | | | Standard equipment | | | | Option | |
|-----------------------------------|----------------------|-------------|------------------|----------------------|-------------------------------------|------------------------------|----------------------------------|--------|--|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Pivot ⁽⁵⁾ bracket | Pivot ⁽⁶⁾ bracket pin | | |
| Basic type | ● (1 pc.) | ● | — | ● | ● | | | | |
| Axial foot type | ● (2) | ● | — | ● | ● | | | | |
| Rod side flange type | ● (1) | ● | — | ● | ● | | | | |
| Head side flange type | ● (1) | ● | — | ● | ● | | | | |
| Single clevis type | — ⁽¹⁾ | ● | — | ● | ● | ● | ● | | |
| Double clevis type ⁽³⁾ | — ⁽¹⁾ | ● | ● ⁽⁴⁾ | ● | ● | | | | |
| Head side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | | | | |
| Rod side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | ● | | | |

Note 1) Mounting nut is not equipped with single clevis type and double clevis type.

Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.

Note 3) Pin and set ring are shipped together with double clevis and double knuckle joint.

Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.

Note 5) Pin and retaining ring are not included in pivot bracket.

Note 6) Retaining rings are included in pivot bracket pin.

Accessory (Option)

* Refer to page 1190 for part numbers and dimensions of the single knuckle joint, double knuckle joint, clevis pin, knuckle pin, rod end nut, mounting nut, and trunnion nut.

* Refer to page 255 of the CM2-Z series catalog for the part numbers and external dimensions of the pivot bracket and pivot bracket pin as well as for the dimensions when the cylinder is mounted.

⚠ Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5 port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Precautions

⚠ Warning

1. **Do not rotate the cover.**

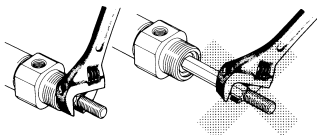
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ Caution

1. **Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.**

If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Also, to screw a bracket or a nut onto the threaded portion at the end of the piston rod, make sure to retract the piston rod entirely, and place a wrench on the parallel sections of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.

| Allowable rotational torque (N·m or less) | ø20 | ø25 | ø32 | ø40 |
|---|-----|------|------|------|
| | 0.2 | 0.25 | 0.25 | 0.44 |



Disassembly/Replacement

⚠ Caution

1. **When replacing rod seals, please contact SMC.**

Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

2. **Not able to disassemble.**

Since the cover and the cylinder tube are combined by crimping method, it is impossible to disassemble it. Therefore, the internal parts of a cylinder other than rod seal cannot be replaced at all.

3. **Do not touch the cylinder during operation.**

If the cylinder is operating at a high frequency, be aware that the cylinder tube surface could become very hot, creating the risk of burns.

4. **Conjoin the rod end part, so that rod boot might not be twisted.**

If a cylinder were installed with its rod boot being twisted, the rod boot could be damaged during operation.

Model Selection

⚠ Warning

1. **Confirm the specifications.**

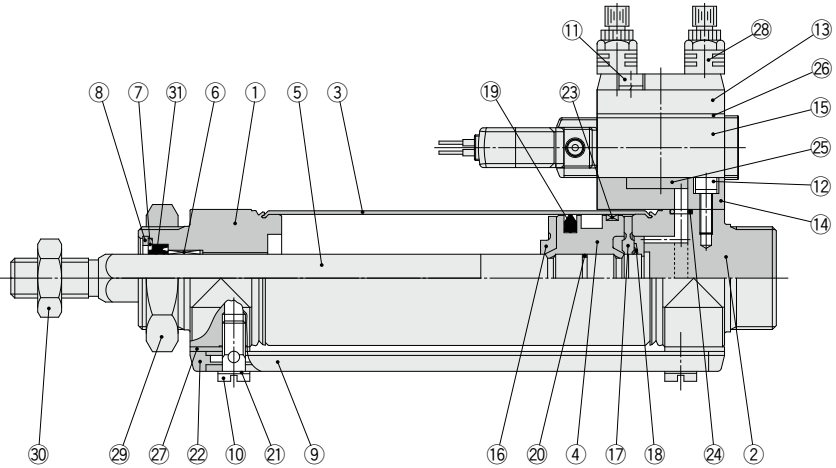
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. **Energizing continuously for a long period of time**

When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or affect peripheral equipment adversely since temperature rises when coils generate heat.

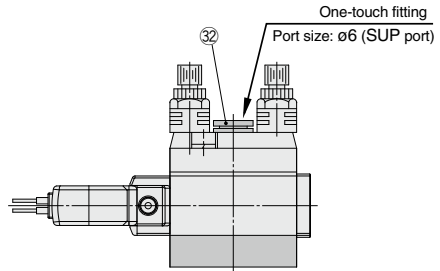
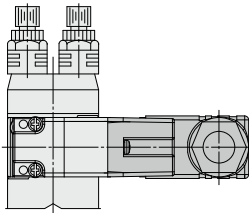
CVM5K Series

Construction



DIN terminal

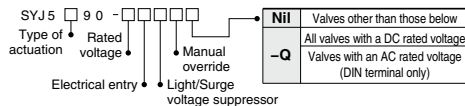
Built-in One-touch fitting



Component Parts

| No. | Description | Material | Note |
|-----|---|-----------------|-------------------------------------|
| 1 | Rod cover | Aluminum alloy | Anodized |
| 2 | Head cover | Aluminum alloy | Anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston rod | Stainless steel | |
| 6 | Non-rotating guide | Bearing alloy | |
| 7 | Seal retainer | Rolled steel | Nickel plated |
| 8 | Retaining ring | Carbon steel | Phosphate coated |
| 9 | Pipe | Aluminum alloy | |
| 10 | Stud | Brass | Electroless nickel plated |
| 11 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 12 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 13 | Plate | Aluminum alloy | Metallic painted |
| 14 | Sub-plate | Aluminum alloy | Metallic painted |
| 15 | Solenoid valve | — | Refer to the "How to order" below.* |
| 16 | Bumper A | Urethane | |
| 17 | Bumper B | Urethane | |

* How to order solenoid valves



Component Parts

| No. | Description | Material | Note |
|-----|--------------------------------|-----------------|----------------|
| 18 | Retaining ring | Stainless steel | |
| 19 | Piston seal | NBR | |
| 20 | Piston gasket | NBR | |
| 21 | Gasket | Resin | |
| 22 | Pipe gasket | Urethane rubber | |
| 23 | Wear ring | Resin | |
| 24 | Head cover gasket | NBR | |
| 25 | Sub-plate gasket | NBR | |
| 26 | Gasket | NBR | |
| 27 | Spacer gasket | Resin | Except ø25 |
| 28 | Exhaust throttle with silencer | — | ASN2-M5 |
| 29 | Mounting nut | Carbon steel | Nickel plated |
| 30 | Rod end nut | Carbon steel | Zinc chromated |
| 32 | One-touch fitting | — | Port size: ø6 |

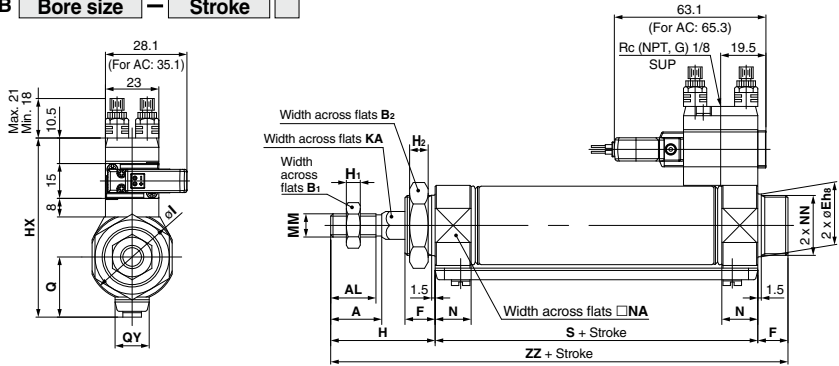
Replacement Parts/Seal Kit

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|-----------|-----------|-----------|-----------|
| | | | 20 | 25 | 32 | 40 |
| 31 | Rod seal | NBR | CM2K20-PS | CM2K25-PS | CM2K32-PS | CM2K40-PS |

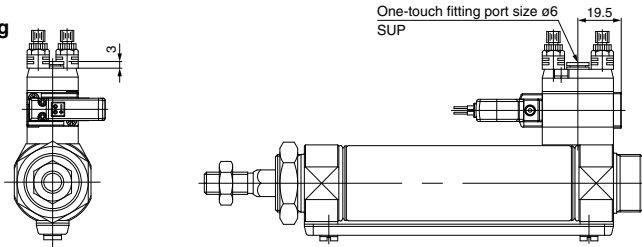
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

Basic Type (B): External Dimensions

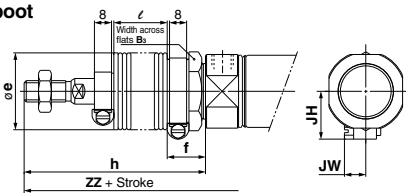
CVM5KB —



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1184.

| Bore size (mm) | Stroke range | A | AL | B ₁ | B ₂ | Eh ₁₈ | F | Q | QY | H | H ₁ | H ₂ | HX | I | KA | MM | N | NA | NN | S | ZZ |
|----------------|--------------|----|------|----------------|----------------|-----------------------------------|----|------|----|----|----------------|----------------|------|------|------|------------|------|------|-----------|----|-----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 20 ⁰ _{-0.033} | 13 | 19.8 | 14 | 41 | 5 | 8 | 65.3 | 28 | 8.2 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 62 | 116 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 22 | 14 | 45 | 6 | 8 | 70.5 | 33.5 | 10.2 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 62 | 120 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 25.8 | 16 | 45 | 6 | 8 | 76.5 | 37.5 | 12.2 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 64 | 122 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 32 ⁰ _{-0.039} | 16 | 29.8 | 16 | 50 | 8 | 10 | 84.5 | 46.5 | 14.2 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 88 | 154 |

With Rod Boot

| Bore size (mm) | B _s | e | f | h | | | | | l | | | | | JH | JW |
|----------------|----------------|----|----|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|------|------|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | | |
| 20 | 30 | 36 | 18 | 68 | 81 | 93 | 106 | 131 | 12.5 | 25 | 37.5 | 50 | 75 | 23.5 | 10.5 |
| 25 | 32 | 36 | 18 | 72 | 85 | 97 | 110 | 135 | 12.5 | 25 | 37.5 | 50 | 75 | 23.5 | 10.5 |
| 32 | 32 | 36 | 18 | 72 | 85 | 97 | 110 | 135 | 12.5 | 25 | 37.5 | 50 | 75 | 23.5 | 10.5 |
| 40 | 41 | 46 | 20 | 77 | 90 | 102 | 115 | 140 | 12.5 | 25 | 37.5 | 50 | 75 | 27 | 10.5 |

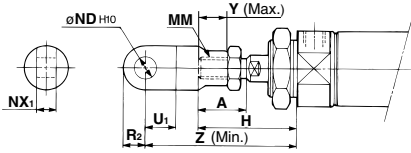
(mm)

| Bore size (mm) | ZZ | | | | |
|----------------|---------|-----------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 |
| 20 | 143 | 156 | 168 | 181 | 206 |
| 25 | 147 | 160 | 172 | 185 | 210 |
| 32 | 149 | 162 | 174 | 187 | 212 |
| 40 | 181 | 194 | 206 | 219 | 244 |

CVM5 Series

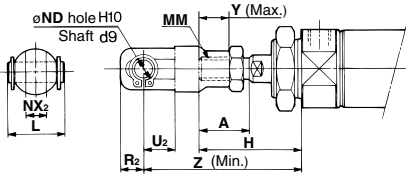
Accessory dimensions

Single Knuckle Joint Mounting (mm)



| Bore size | A | H | MM | ND H10 | NX1 | U1 | R2 | Y | Z |
|-----------|----|----|------------|------------------------|-------------------------|----|----|----|----|
| 20 | 18 | 41 | M8 x 1.25 | 9 ^{+0.058/0} | 9 ^{+0.1/-0.2} | 14 | 10 | 11 | 66 |
| 25, 32 | 22 | 45 | M10 x 1.25 | 9 ^{+0.058/0} | 9 ^{+0.1/-0.2} | 14 | 10 | 14 | 69 |
| 40 | 24 | 50 | M14 x 1.5 | 12 ^{+0.070/0} | 16 ^{+0.1/-0.3} | 20 | 14 | 13 | 92 |

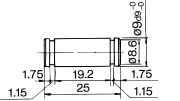
Double Knuckle Joint Mounting (mm)



| Bore size | A | H | L | MM | ND | NX2 | R2 | U2 | Y | Z |
|-----------|----|----|------|------------|----|-------------------------|----|----|----|----|
| 20 | 18 | 41 | 25 | M8 x 1.25 | 9 | 9 ^{+0.2/-0.1} | 10 | 14 | 11 | 66 |
| 25, 32 | 22 | 45 | 25 | M10 x 1.25 | 9 | 9 ^{+0.2/-0.1} | 10 | 14 | 14 | 69 |
| 40 | 24 | 50 | 49.7 | M14 x 1.5 | 12 | 16 ^{+0.3/-0.1} | 13 | 25 | 13 | 92 |

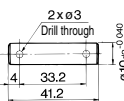
Double Clevis Pin/Material: Carbon steel (mm)

Bore size: $\phi 20, \phi 25, \phi 32$
CDP-1



Retaining ring: Type C9 for shaft
* Retaining rings (cotter pins for $\phi 40$) are included.

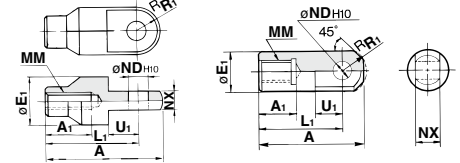
Bore size: $\phi 40$
CDP-2



Cotter pins used $\phi 3 \times 18 \ell$

Single Knuckle Joint (mm)

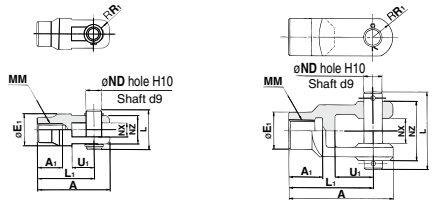
I-020B, 032B Material: Rolled steel I-040B Material: Free cutting sulfur steel



| Part no. | Applicable bore size | A | A1 | E1 | L1 | MM | ND H10 | NX | R1 | U1 |
|----------|----------------------|----|----|----|----|------------|------------------------|-------------------------|------|----|
| I-020B | 20 | 46 | 16 | 20 | 36 | M8 x 1.25 | 9 ^{+0.058/0} | 9 ^{+0.1/-0.2} | 10 | 14 |
| I-032B | 25, 32 | 48 | 18 | 20 | 38 | M10 x 1.25 | 9 ^{+0.058/0} | 9 ^{+0.1/-0.2} | 10 | 14 |
| I-040B | 40 | 69 | 22 | 24 | 55 | M14 x 1.5 | 12 ^{+0.070/0} | 16 ^{+0.1/-0.3} | 15.5 | 20 |

Double Knuckle Joint (mm)

Y-020B, Y-032B Material: Rolled steel Y-040B Material: Cast iron



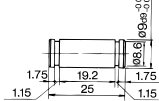
| Part no. | Applicable cylinder bore size | A | A1 | E1 | L | L1 | MM | ND |
|----------|-------------------------------|----|----|----|------|----|------------|----|
| Y-020B | 20 | 46 | 16 | 20 | 25 | 36 | M8 x 1.25 | 9 |
| Y-032B | 25, 32 | 48 | 18 | 20 | 25 | 38 | M10 x 1.25 | 9 |
| Y-040B | 40 | 68 | 22 | 24 | 49.7 | 55 | M14 x 1.5 | 12 |

| Part no. | NX | NZ | R1 | U1 | Applicable pin pair no. | Retaining ring size |
|----------|-------------------------|----|----|----|-------------------------|-------------------------|
| Y-020B | 9 ^{+0.2/-0.1} | 18 | 5 | 14 | CDP-1 | Type C9 for shaft |
| Y-032B | 9 ^{+0.2/-0.1} | 18 | 5 | 14 | CDP-1 | Type C9 for shaft |
| Y-040B | 16 ^{+0.3/-0.1} | 38 | 13 | 25 | CDP-3 | $\phi 3 \times 18 \ell$ |

* Knuckle pins and retaining rings (cotter pins for $\phi 40$) are included.

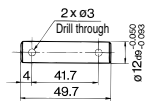
Double Knuckle Pin/Material: Carbon steel (mm)

Bore size: $\phi 20, \phi 25, \phi 32$
CDP-1



Retaining ring: Type C9 for shaft
* Retaining rings (cotter pins for $\phi 40$) are included.

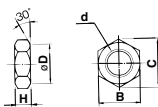
Bore size: $\phi 40$
CDP-3



Cotter pins used $\phi 3 \times 18 \ell$

Rod End Nut (mm)

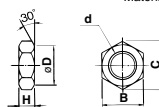
Material: Carbon steel



| 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 (mm)

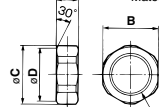
Material: Carbon steel



| 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 (mm)

Material: Carbon steel



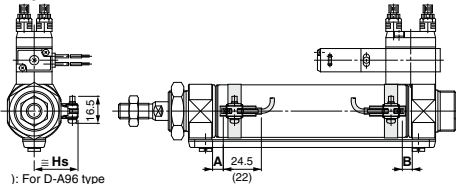
| Part no. | Applicable bore size | B | C | D | d | H |
|----------|----------------------|----|----|------|-----------|----|
| TN-020B | 20 | 26 | 28 | 25.5 | M20 x 1.5 | 10 |
| TN-032B | 25, 32 | 32 | 34 | 31.5 | M26 x 1.5 | 10 |
| TN-040B | 40 | 41 | 45 | 40.5 | M32 x 2 | 10 |

Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Mounting Height

Reed auto switch

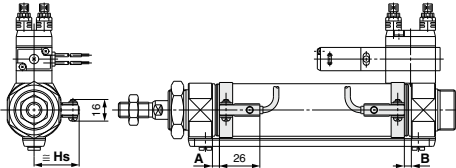
D-A9□



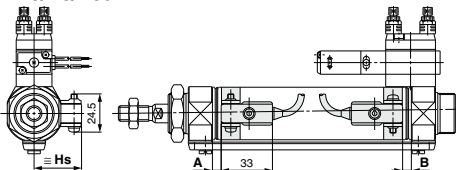
() : For D-A96 type

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

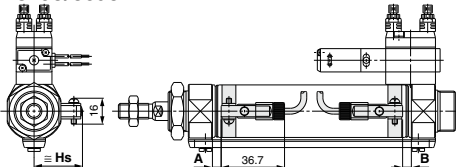
D-C7/C8



D-B5/B6/B59W

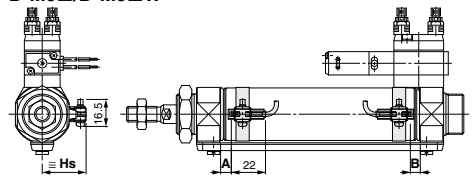


D-C73C/C80C

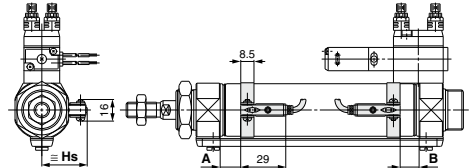


Solid state auto switch

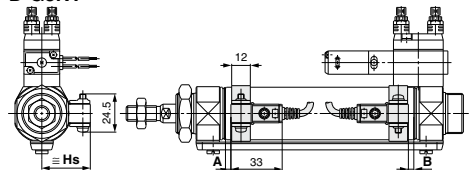
D-M9□/D-M9□W



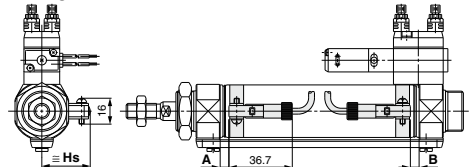
D-H7□/H7□W/H7NF



D-G5NT



D-H7C



Auto Switch Proper Mounting Position (Detection at Stroke End) and Mounting Height

Auto Switch Proper Mounting Position

(mm)

| Auto switch model | D-A9□(V) | | D-M9□(V) D-M9□W(V) D-A9□A(V) | | D-B5□ D-B64 | | D-C7□ D-C80 D-C73C D-C80C | | D-B59W | | 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 |
| Bore size (mm) | | | | | | | | | | | | | | |
| 20 | 6.5 | 5.5 | 10.5 | 9.5 | 1 | 0 | 7 | 6 | 4 | 3 | 6 | 5 | 2.5 | 1.5 |
| 25 | 6.5 | 5.5 | 10.5 | 9.5 | 1 | 0 | 7 | 6 | 4 | 3 | 6 | 5 | 2.5 | 1.5 |
| 32 | 7.5 | 6.5 | 11.5 | 10.5 | 2 | 1 | 8 | 7 | 5 | 4 | 7 | 6 | 3.5 | 2.5 |
| 40 | 13.5 | 11.5 | 17.5 | 15.5 | 7 | 6 | 13 | 12 | 10 | 9 | 12 | 11 | 8.5 | 7.5 |

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

Auto Switch Mounting Height

(mm)

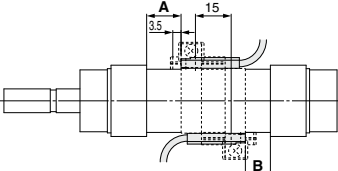
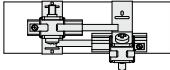
| Auto switch model | D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V) | | D-B5□ D-B64 D-B59W D-G5NT D-H7C | | D-C7□ D-C80 D-H7□ D-H7□W D-H7NF | | D-C73C D-C80C | |
|-------------------|--|------|---|------|---|----|------------------|----|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| Bore size (mm) | | | | | | | | |
| 20 | 23 | 25.5 | 22.5 | 25 | | | | |
| 25 | 25.5 | 28 | 25 | 27.5 | | | | |
| 32 | 29 | 31.5 | 28.5 | 31 | | | | |
| 40 | 33 | 35.5 | 32.5 | 35 | | | | |

Minimum Auto Switch Mounting Stroke

| Auto switch model | No. of auto switch mounted | | | | n: No. of auto switches (mm) | |
|---------------------------|----------------------------|-----------------------|-----------------------|--|--|--|
| | 1 | 2 | | n | | |
| | | Different surfaces | Same surface | Different surfaces | Same surface | |
| D-A9□ D-M9□ D-M9□W | 10 | 15 ^{Note 1)} | 45 ^{Note 1)} | $15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $45 + 45 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-M9□V | 5 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $35 + 35 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-A9□V | 5 | 15 | 25 | $15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $25 + 35 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-M9□WV D-M9□AV | 10 | 20 | 35 | $20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $35 + 35 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-C7□ D-C80 | 10 | 15 | 50 | $15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $50 + 45 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-H7□ D-H7□W D-H7NF | 10 | 15 | 60 | $15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $60 + 45 (n-2)$ (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 2)} | $65 + 50 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-B5□/B64 D-G5NT | 10 | 15 | 75 | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $75 + 55 (n-2)$ (n = 2, 3, 4, 5...) | |
| D-B59W | 15 | 20 | 75 | $20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...) ^{Note 2)} | $75 + 55 (n-2)$ (n = 2, 3, 4, 5...) | |

Note 2) 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 (The adjustment as shown in the figures below is required with the following stroke ranges.)

| Auto switch model | With 2 auto switches | |
|-------------------|--|--|
| | Different surfaces ^{Note 1)} | Same surface ^{Note 1)} |
| |  <p>The proper auto switch mounting position is 6 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-A93 | — | 45 to less than 50 stroke |
| D-M9□ D-M9□W | 15 to less than 20 stroke | 45 to less than 55 stroke |

Operating Range

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

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket: Part No.

| Auto switch mounting | Bore size (mm) | | | |
|--|---|---|---|---|
| | φ20 | φ25 | φ32 | φ40 |
| 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) (Note 2) | 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) |
| 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-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) |

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 consult SMC regarding other chemicals.

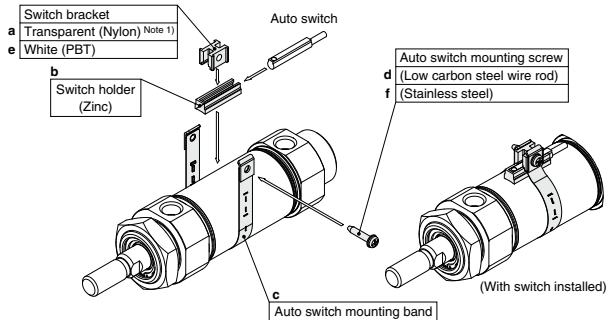
Note 2) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA4: For D-C7/C8/H7 types

Note) Refer to page 1440 for the details of BBA4.



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

Besides the models listed in How to Order, the following auto switches are applicable. Refer to pages 1341 to 1435 for detailed specifications.

| Auto switch type | Part no. | Electrical entry (Fetching direction) | Features |
|--------------------|--------------------|---------------------------------------|---------------------------------|
| Reed | D-B53, C73, C76 | Grommet (In-let) | — |
| | D-C80 | | Without indicator light |
| Solid state | D-H7A1, H7A2, H7B | | — |
| | D-H7NW, H7PW, H7BW | | Diagnostic indication (2-color) |
| | D-G5NT | With timer | |

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1410 and 1411 for details.

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

Valve Mounted Cylinder

Single Acting, Spring Return/Extend

CVM3 Series

∅20, ∅25, ∅32, ∅40

How to Order

Mounting type

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

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Rated voltage

| DC | | AC (50/60 Hz) | |
|----|--------|---------------|-------------------|
| 5 | 24 VDC | 1 | 100 VAC |
| 6 | 12 VDC | 2 | 200 VAC |
| V | 6 VDC | 3 | 110 VAC [115 VAC] |
| S | 5 VDC | 4 | 220 VAC [230 VAC] |
| R | 3 VDC | | |

Light/Surge voltage suppressor

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (Non-polar type) |
| U | With light/surge voltage suppressor (Non-polar type) |

Electrical entry for G, L, M

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor (Non-polar type) |
| Z | With light/surge voltage suppressor (Non-polar type) |

Electrical entry for D

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor (Non-polar type) |
| Z | With light/surge voltage suppressor (Non-polar type) |

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Manual override

| | |
|-----|--------------------------------|
| Nil | Non-locking push type |
| D | Push-turn locking slotted type |
| E | Push-turn locking lever type |

Port thread type

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

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |
| D | DIN terminal |

Number of auto switches

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

Auto switch

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

Auto switch mounting bracket (Note)
Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Example Order Codes:
CVM3 L 32 [] [] - 100 T - 1 G Z [] [] [] []
CDVM3 L 32 [] [] - 100 T - 1 G Z [] [] [] [] - M9BW [] - C - []

Notes:
* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.
* For type "R" and "U", DC voltage is only available.
* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.
* For the DC specification DIN terminal, only 24 and 12 VDC are available.
* For the applicable auto switch model, 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) CDVM3B25-150S-5G

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 1195).

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 | 1 | 3 | 5 | | | None (N) | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | (Nil) | (M) | (L) | (Z) | | | | | | | | | | | | | | | | | | | | | | | | |
| Solid state auto switch | | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ● | — | — | Relay, PLC | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ● | ● | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | | Connector | | 2-wire | M9BV | M9B | ● | — | ● | ● | — | — | — | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3-wire (NPN) | M9NWV | M9NV | ● | ● | ● | ● | — | — | — | | | | | | | | | | | | | | | | | | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 5 V, 12 V | — | M9PWV | M9PW | ● | ● | ● | ● | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2-wire | | | M9BWW | M9WB | ● | ● | ● | ● | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NAV*1 | M9NA*1 | ○ | ○ | ○ | ○ | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3-wire (PNP) | | | M9PAV*1 | M9PA*1 | ○ | ○ | ○ | ○ | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | With diagnostic output (2-color indicator) | Connector | Yes | 2-wire | 12 V | — | M9BAV*1 | M9BA*1 | ○ | ○ | ○ | ○ | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4-wire (NPN) | | | M9BAV*1 | M9BA*1 | ○ | ○ | ○ | ○ | — | — | | | | | | | | | | | | | | | | | | | | | | |
| Reed auto switch | | Grommet | Yes | 2-wire | 24 V | 12 V | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | None | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | Yes | — | — | — | — | — | — | — | | | | |
| | | | | | | | | | | | | | | | None | — | — | — | — | — | — | — | — | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Yes | — | — | — | — | — | — | — | — | | | | |
| | | Connector | | | | | | | | | | | | | Yes | — | — | — | — | — | — | — | — | | | | | | | | | | — | — | — | |
| | | | | | | | | | | | | | | | | | | | | | | | | None | — | — | — | — | — | — | — | — | | | | — |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | None | — | — | — | — | — | — | — | — | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Yes |
| Grommet | Yes | — | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | None | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | |
| Yes | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | None | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | | | |
| Yes | — | — | — | — | — | — | — | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWV
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ
None N (Example) H7CN

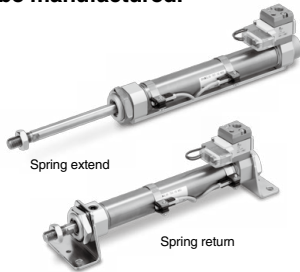
* Solid state auto switches marked with "O" are produced upon receipt of order.
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

* Since there are other applicable auto switches than listed, refer to page 1215 for details.
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
* D-A9□/M9□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

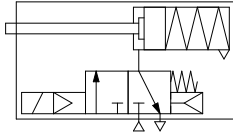
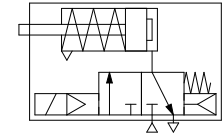


Valve Mounted Cylinder Single Acting, Spring Return/Extend **CVM3 Series**

An auto switch cylinder with the switch installed can also be manufactured.



Symbol
Rubber bumper



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

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Refer to pages 1212 to 1215 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Applicable bore size (mm) | | 20 | 25 | 32 | 40 |
|--------------------------------------|-----------------------------------|---|------------------------|--------|-------|
| Action | | Single acting, Spring return/Spring extend | | | |
| Fluid | | Air | | | |
| Cushion | | Rubber bumper | | | |
| Proof pressure | | 1.0 MPa | | | |
| Maximum operating pressure | | 0.7 MPa | | | |
| Minimum operating pressure | | 0.18 MPa Spring return | 0.23 MPa Spring extend | | |
| Ambient and fluid temperature | | -10 to 50°C (No freezing) | | | |
| Lubrication | | Not required (Non-lube) | | | |
| Stroke length tolerance | | +1.4 0 | | | |
| Piping | Screw-in type | Rc 1/8 | | | |
| | Built-in One-touch fitting | O.D.: ø6/I.D.: ø4 | | | |
| Manual override | | Non locking (Standard) | | | |
| Allowable kinetic energy | | 0.27 J | 0.4 J | 0.65 J | 1.2 J |
| Mounting | | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Head side trunnion type, Rod side trunnion type | | | |

Solenoid Valve Specifications

| Series | | SYJ519 | |
|---|--------------------|---|---|
| Manual override | | Non-locking push type, Push-turn locking slotted type, Push-turn locking lever type | |
| Pilot exhaust | | Pilot valve individual exh. Type | |
| Impact/Vibration resistance (m/s²)^{Note 1} | | 150/30 | |
| Enclosure | | Dustproof | |
| Electrical entry | | Grommet (G), L plug connector (L), M plug connector (M), DIN terminal (D) | |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | D |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Allowable voltage | | ±10% of the rated voltage* | |
| Power consumption (W)^{Note 2} | | DC 0.35 (With light: 0.4 (DIN terminal with light: 0.45)) | |
| Apparent power (VA)^{Note 2} | AC | 100 V | 0.78 (With light: 0.81) 0.78 (With light: 0.87) |
| | | 110 V | 0.86 (With light: 0.89) 0.86 (With light: 0.97) |
| | | [115 V] | [0.94 (With light: 0.97)] [0.94 (With light: 1.07)] |
| | | 200 V | 1.18 (With light: 1.22) 1.15 (With light: 1.30) |
| | | 220 V | 1.30 (With light: 1.34) 1.27 (With light: 1.46) |
| | [230 V] | [1.42 (With light: 1.46)] [1.39 (With light: 1.60)] | |
| Surge voltage suppressor | | Diode (DIN terminal, Varistor when non-polar types) | |
| Indicator light | | LED (Neon light when AC with DIN terminal) | |

* Based on IEC60529

* In common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

* For 115 VAC and 230 VAC, the allowable voltage is -15% to +5% of rated voltage.

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once on each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) At the rated voltage.

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ^{Note} |
|----------------|---------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150 * |
| 25 | 25, 50, 75, 100, 125, 150 * |
| 32 | 25, 50, 75, 100, 125, 150, 200 * |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250 * |

Note 1) Intermediate stroke except mentioned above is produced upon receipt of order.

Note 2) Strokes marked with "*" are the maximum strokes which are available.

Theoretical Output

Refer to the Technical Data (Theoretical Output 1) in the **Web Catalog**.

Spring Reaction Force

Refer to the Technical Data (Table 2: Spring Reaction Force) in the **Web Catalog**.

CVM3 Series

Mounting Bracket and Accessory

| Accessory | Standard equipment | | | Option | | | |
|-----------------------------------|----------------------|-------------|------------------|----------------------|-------------------------------------|------------------------------|----------------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double knuckle joint ⁽³⁾ | Pivot bracket ⁽⁵⁾ | Pivot bracket pin ⁽⁶⁾ |
| Mounting | | | | | | | |
| Basic type | ● (1 pc.) | ● | — | ● | ● | | |
| Axial foot type | ● (2) | ● | — | ● | ● | | |
| Rod side flange type | ● (1) | ● | — | ● | ● | | |
| Head side flange type | ● (1) | ● | — | ● | ● | | |
| Single clevis type | — ⁽¹⁾ | ● | — | ● | ● | ● | ● |
| Double clevis type ⁽³⁾ | — ⁽¹⁾ | ● | ● ⁽⁴⁾ | ● | ● | — | — |
| Head side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | | |
| Rod side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | ● | — |

- Note 1) Mounting nut is not equipped with single clevis type and double clevis type.
 Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.
 Note 3) Pin and retaining ring are shipped together with double clevis and double knuckle joint.
 Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.
 Note 5) Pin and retaining ring are not included in pivot bracket.
 Note 6) Retaining rings are included in pivot bracket pin.

Weight

Spring Return(): Denotes Spring Extend.

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|-------------------------|---------------------------|-------------|-------------|-------------|-------------|
| Basic weight | 25 stroke | 0.27 (0.27) | 0.37 (0.37) | 0.49 (0.48) | 0.84 (0.83) |
| | 50 stroke | 0.29 (0.29) | 0.40 (0.40) | 0.53 (0.53) | 0.91 (0.90) |
| | 75 stroke | 0.34 (0.34) | 0.49 (0.48) | 0.65 (0.63) | 1.10 (1.06) |
| | 100 stroke | 0.36 (0.36) | 0.52 (0.51) | 0.70 (0.67) | 1.16 (1.13) |
| | 125 stroke | 0.42 (0.41) | 0.61 (0.58) | 0.83 (0.79) | 1.36 (1.30) |
| | 150 stroke | 0.44 (0.43) | 0.64 (0.61) | 0.87 (0.83) | 1.43 (1.37) |
| | 200 stroke | — | — | 1.03 (0.99) | 1.68 (1.60) |
| | 250 stroke | — | — | — | 1.94 (1.82) |
| Mounting bracket weight | Axial foot | 0.15 (0.15) | 0.16 (0.16) | 0.16 (0.16) | 0.27 (0.27) |
| | Flange | 0.06 (0.06) | 0.09 (0.09) | 0.09 (0.09) | 0.12 (0.12) |
| | Single clevis | 0.04 (0.04) | 0.04 (0.04) | 0.04 (0.04) | 0.09 (0.09) |
| | Double clevis | 0.05 (0.05) | 0.06 (0.06) | 0.06 (0.06) | 0.13 (0.13) |
| Option bracket | Trunnion | 0.04 (0.04) | 0.07 (0.07) | 0.07 (0.07) | 0.10 (0.10) |
| | Single knuckle joint | 0.06 (0.06) | 0.06 (0.06) | 0.06 (0.06) | 0.23 (0.23) |
| | Double knuckle (With pin) | 0.07 (0.07) | 0.07 (0.07) | 0.07 (0.07) | 0.20 (0.20) |

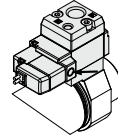
Calculation
 (Example) CVM3L32-100S-1G
 (ø32, 100 stroke, Spring return)
 • Basic weight:.....0.70 (kg)
 • Weight of brackets:.....0.16 (kg)
 0.70 + 0.16 = 0.86 kg
 • Add 0.03 kg for the DIN terminal.

Accessory Bracket

Further information on accessories are the same specifications as these of the standard double acting single rod. Refer to page 1190.

Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



⚠️ Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and I/O switch precautions, and 3/4/5 port solenoid valve precautions on the SMC web site: <https://www.smcworld.com>

Operating Precautions

⚠️ Warning

1. Do not rotate the cover.

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

⚠️ Caution

1. 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.

2. 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 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 installation.

⚠️ Caution

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. One-touch fitting cannot be replaced.

One-touch fitting is press-fit into the cover, thus cannot be replaced.

Model Selection

⚠️ Warning

1. Confirm the specifications.

Products in this catalog are designed to be used for compressed air systems (including vacuum). If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time

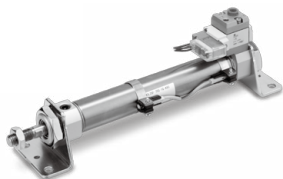
When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or affect peripheral equipment adversely since temperature rises when coils generate heat.

Built-in One-touch Fitting

CVM3 **Mounting type** **Bore size** F — For “How to Order”, refer to page 1194.

• Built-in One-touch fitting

One-touch fittings are installed on cylinders.



For dimensions of each mounting bracket, refer to pages 1200 to 1206.

Specifications

| | | | | |
|-----------------------------------|---|-----------|------------------------------|-----------|
| Action | Single acting, Spring return | | Single acting, Spring extend | |
| Bore size (mm) | ø20, ø25, ø32, ø40 | | | |
| Max. operating pressure | 0.7 MPa | | | |
| Min. operating pressure | 0.18 MPa | | 0.23 MPa | |
| Cushion | Rubber bumper | | | |
| Piping | Built-in One-touch fitting | | | |
| Piston speed (mm/s) | ø20 | ø25 | ø32 | ø40 |
| | 50 to 700 | 50 to 650 | 50 to 590 | 50 to 420 |
| Port size (Tube bore size) | O.D.: ø6/I.D.: ø4 | | | |
| Applicable bore size | Can be used for either nylon, soft nylon or polyurethane tube. | | | |
| Mounting | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Head side trunnion type, Rod side trunnion type | | | |

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----------|----------|----------|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | CM-L040B |
| Flange | CM-F020B | CM-F032B | CM-F040B | CM-F040B |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | CM-C040B |
| Double clevis ** | CM-D020B | CM-D032B | CM-D040B | CM-D040B |
| Trunnion (with nut) | CM-T020B | CM-T032B | CM-T040B | CM-T040B |

* Two foot brackets and a mounting nut are attached.

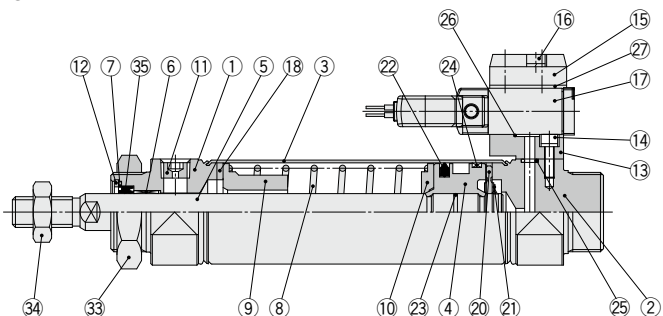
When ordering the foot bracket, order 2 pcs. per cylinder.

** Clevis pin and retaining ring (cotter pin for ø40) are packaged together.

CVM3 Series

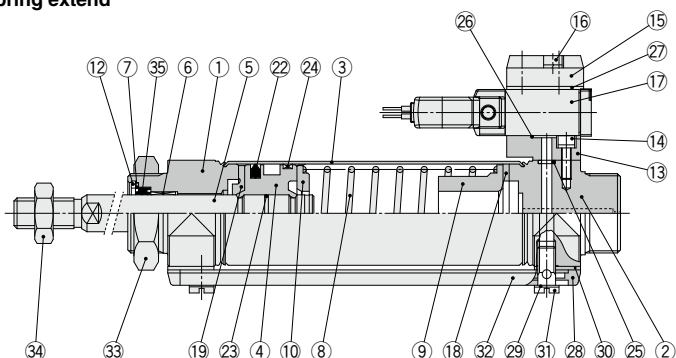
Construction

Spring return



Built-in One-touch fitting

Spring extend



DIN terminal

Component Parts

| No. | Description | Material | Note |
|-----|---|-----------------|---------------------------------|
| 1 | Rod cover | Aluminum alloy | Anodized |
| 2 | Head cover | Aluminum alloy | Anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston rod | Carbon steel | Hard chromium electroplated |
| 6 | Bushing | Bearing alloy | |
| 7 | Seal retainer | Stainless steel | |
| 8 | Return spring | Steel wire | Zinc chromated |
| 9 | Spring guide | Aluminum alloy | |
| 10 | Spring seat | Aluminum alloy | |
| 11 | Plug with fixed orifice | Alloy steel | Black dyed |
| 12 | Retaining ring | Carbon steel | Phosphate coated |
| 13 | Sub-plate | Aluminum alloy | Metallic painted |
| 14 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 15 | Plate | Alloy | Metallic painted |
| 16 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 17 | Solenoid valve | — | Refer to "How to order" below.* |
| 18 | Bumper | Urethane | |
| 19 | Bumper A | Urethane | |

* How to order solenoid valves
SYJ 519 - □□□□□□□□

Rated voltage ●
Electrical entry ●
Manual override ●
Light/surge voltage suppressor ●

| | |
|-----|---|
| Nil | Valves other than those below All valves with a DC rated voltage |
| -Q | Valves with an AC rated voltage (DIN terminal only) |

Component Parts

| No. | Description | Material | Note |
|-----|-------------------|-----------------|---------------------------|
| 20 | Bumper B | Urethane | |
| 21 | Retaining ring | Stainless steel | |
| 22 | Piston seal | NBR | |
| 23 | Piston gasket | NBR | |
| 24 | Wear ring | Resin | |
| 25 | Head cover gasket | NBR | |
| 26 | Sub-plate gasket | NBR | |
| 27 | Gasket | NBR | |
| 28 | Pipe gasket | Urethane rubber | |
| 29 | Gasket | Resin | |
| 30 | Spacer gasket | Resin | |
| 31 | Stud | Brass | Electroless nickel plated |
| 32 | Pipe | Aluminum alloy | |
| 33 | Mounting nut | Carbon steel | Nickel plated |
| 34 | Rod end nut | Carbon steel | Zinc chromated |
| 36 | One-touch fitting | — | Port size: ø6 |

Replacement Parts/Seal Kit

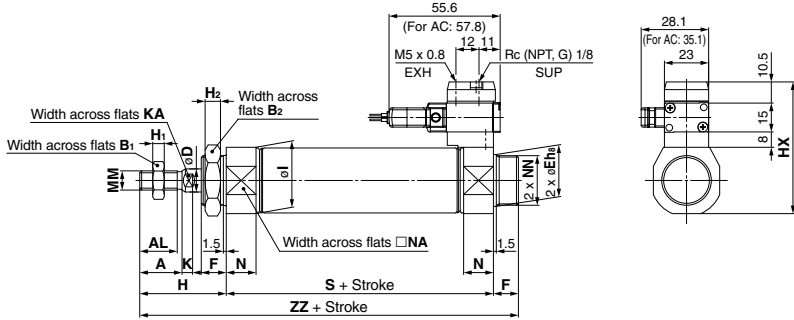
| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|----------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| 35 | Rod seal | NBR | CM220-PS | CM225-PS | CM232-PS | CM240-PS |

* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

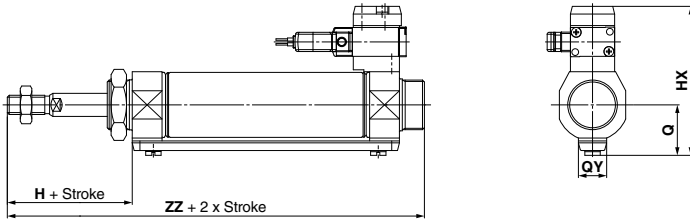
Valve Mounted Cylinder Single Acting, Spring Return/Extend **CVM3 Series**

Basic Type (B)

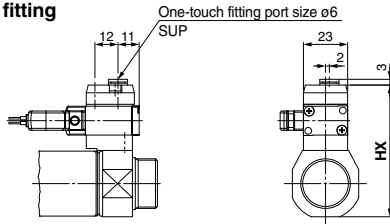
Single acting, Spring return: CVM3B Bore size — Stroke **S**



Single acting, Spring extend: CVM3B Bore size — Stroke **T**



Built-in One-touch fitting



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | Eh ₈ | F | H | H ₁ | H ₂ | HX | I | K | KA | MM | N | NA | NN |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----------------|----------------|------|------|-----|----|------------|------|------|-----------|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 8 | 57.5 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 8 | 63.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 8 | 68 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 10 | 76 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 |

Dimensions by Stroke

| Bore size (mm) | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|----------------|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

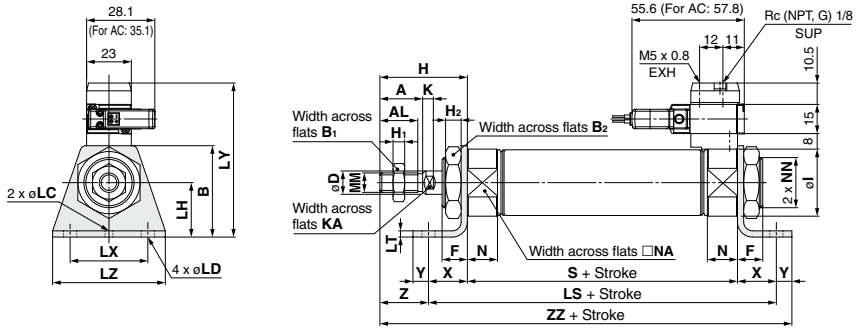
Single Acting/Spring Extend (mm)

| Bore size (mm) | HX | Q | QY |
|----------------|------|------|----|
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

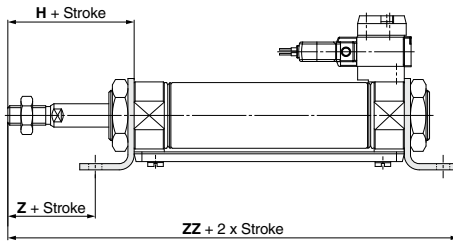
CVM3 Series

Axial Foot Type (L)

Single acting, Spring return: CVM3L — S



Single acting, Spring extend: CVM3L — T



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | D | F | H | H ₁ | H ₂ | I | K | KA | LC | LD | LH | LT | LX | LY | LZ | MM | N | NA |
|----------------|----|------|----|----------------|----------------|----|----|----|----------------|----------------|------|-----|----|----|-----|----|-----|----|------|----|------------|------|------|
| 20 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 41 | 5 | 8 | 28 | 5 | 6 | 4 | 6.8 | 25 | 3.2 | 40 | 70.5 | 55 | M8 x 1.25 | 15 | 24 |
| 25 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 45 | 6 | 8 | 33.5 | 5.5 | 8 | 4 | 6.8 | 28 | 3.2 | 40 | 76.5 | 55 | M10 x 1.25 | 15 | 30 |
| 32 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 45 | 6 | 8 | 37.5 | 5.5 | 10 | 4 | 6.8 | 28 | 3.2 | 40 | 78.8 | 55 | M10 x 1.25 | 15 | 34.5 |
| 40 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 50 | 8 | 10 | 46.5 | 7 | 12 | 4 | 7 | 30 | 3.2 | 55 | 84.8 | 75 | M14 x 1.5 | 21.5 | 42.5 |

| (mm) | | | | |
|----------------|-----------|----|----|----|
| Bore size (mm) | NN | X | Y | Z |
| 20 | M20 x 1.5 | 20 | 8 | 21 |
| 25 | M26 x 1.5 | 20 | 8 | 25 |
| 32 | M26 x 1.5 | 20 | 8 | 25 |
| 40 | M32 x 2 | 23 | 10 | 27 |

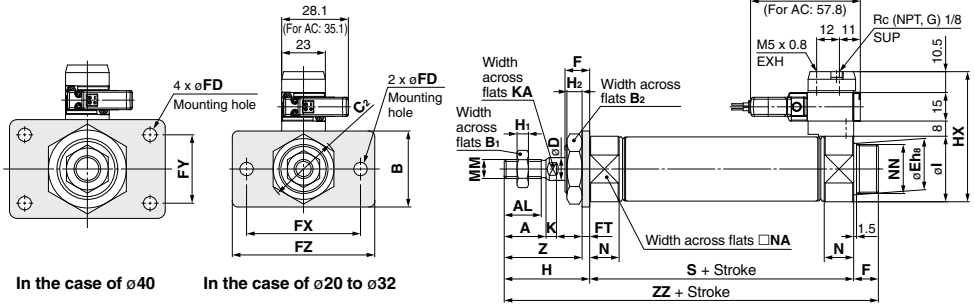
Dimensions by Stroke

| Bore size (mm) | Stroke | | | | | | | | | | | |
|----------------|---------|-----------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | | | | | | | |
| Symbol | S | LS | ZZ | S | LS | ZZ | S | LS | ZZ | S | LS | ZZ |
| 20 | 87 | 127 | 156 | 112 | 152 | 181 | 137 | 177 | 206 | — | — | — |
| 25 | 87 | 127 | 160 | 112 | 152 | 185 | 137 | 177 | 210 | — | — | — |
| 32 | 89 | 129 | 162 | 114 | 154 | 187 | 139 | 179 | 212 | 164 | 204 | 237 |
| 40 | 113 | 159 | 196 | 138 | 184 | 221 | 163 | 209 | 246 | 188 | 234 | 271 |

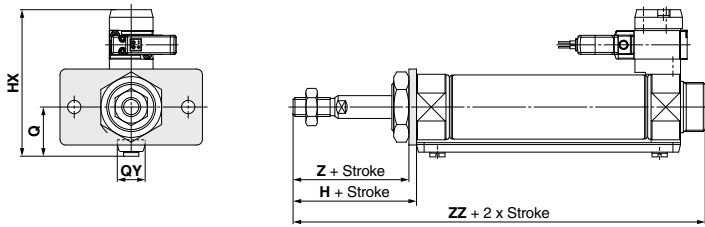
* Brackets are packaged together.

Rod Side Flange Type (F)

Single acting, Spring return: CVM3F — S



Single acting, Spring extend: CVM3F — T



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | Eh ₈ | F | FD | FT | FX | FY | FZ | H | H ₁ | H ₂ | HX | I | K | KA |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----------------|----------------|------|------|-----|----|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 41 | 5 | 8 | 57.5 | 28 | 5 | 6 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 63.5 | 33.5 | 5.5 | 8 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 68 | 37.5 | 5.5 | 10 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 50 | 8 | 10 | 76 | 46.5 | 7 | 12 |

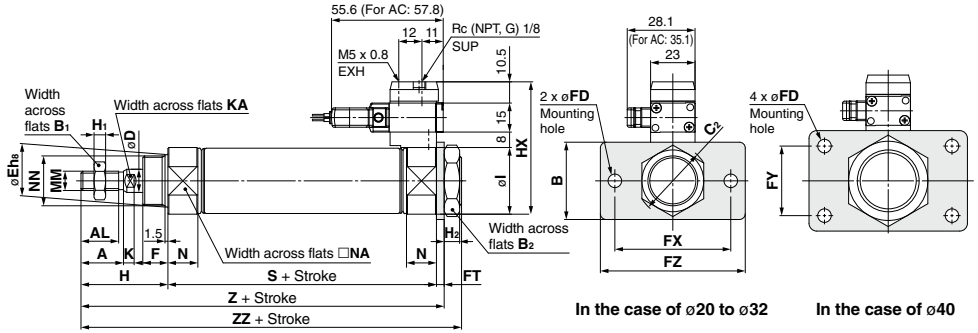
| Bore size (mm) | MM | N | NA | NN | Z | Dimensions by Stroke (mm) | | | | | | | | | | Single Acting/Spring Extend (mm) | | | | |
|----------------|--------|-----|-----|-----|-----|---------------------------|-----|------------------|-----|-------------------|----|-------------------|----|-------------------|----|----------------------------------|------|------|----|--|
| | | | | | | Stroke 1 to 50 | | Stroke 51 to 100 | | Stroke 101 to 150 | | Stroke 151 to 200 | | Stroke 201 to 250 | | Bore size (mm) | HX | Q | QY | |
| Bore size (mm) | Symbol | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ | | | | | |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — | — | — | — | — | — | 20 | 65.3 | 19.8 | 14 | |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — | — | — | — | — | — | 25 | 70.5 | 22 | 14 | |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — | — | — | — | — | — | 32 | 76.5 | 25.8 | 16 | |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 | — | — | — | — | — | 40 | 84.5 | 29.8 | 16 | |

* Brackets are packaged together.

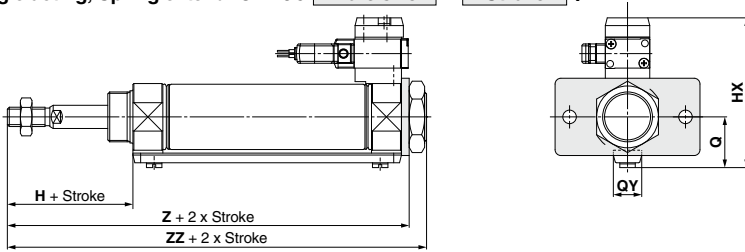
CVM3 Series

Head Side Flange Type (G)

Single acting, Spring return: CVM3G — S



Single acting, Spring extend: CVM3G — T



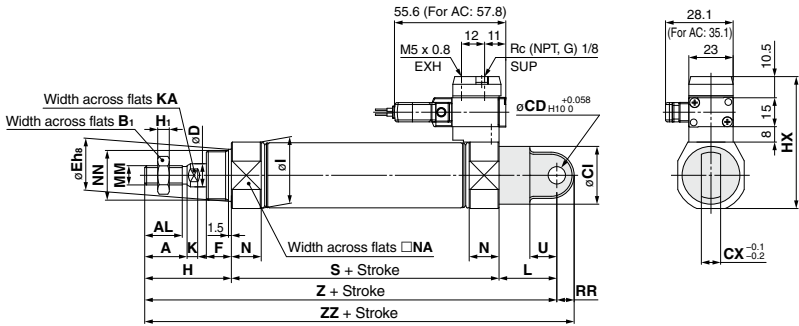
| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | Eh ₈ | F | FD | FT | FX | FY | FZ | H | H ₁ | H ₂ | HX | I | K | KA | MM |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----------------|----------------|------|------|-----|----|------------|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 41 | 5 | 8 | 57.5 | 28 | 5 | 6 | M8 x 1.25 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 63.5 | 33.5 | 5.5 | 8 | M10 x 1.25 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 45 | 6 | 8 | 68 | 37.5 | 5.5 | 10 | M10 x 1.25 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 50 | 8 | 10 | 76 | 46.5 | 7 | 12 | M14 x 1.5 |

| Bore size (mm) | (mm) Dimensions by Stroke | | | | | | | | | | | | (mm) Single Acting/Spring Extend | | | | | | | | | | | | | |
|----------------|---------------------------|------|-----------|---------------|-----|-----|---------|-----|-----|-----------|-----|-----|----------------------------------|-----|-----|------------|-----|-----|------------|---|---|----------------|------|------|------|----|
| | N | NA | NN | Stroke Symbol | | | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | | Bore size (mm) | HX | Q | QY | |
| S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | | | | | | | | | |
| 20 | 15 | 24 | M20 x 1.5 | 20 | 87 | 132 | 141 | 112 | 157 | 166 | 137 | 182 | 191 | — | — | — | — | — | — | — | — | 20 | 65.3 | 19.8 | 14 | |
| 25 | 15 | 30 | M26 x 1.5 | 25 | 87 | 136 | 145 | 112 | 161 | 170 | 137 | 186 | 195 | — | — | — | — | — | — | — | — | 25 | 70.5 | 22 | 14 | |
| 32 | 15 | 34.5 | M26 x 1.5 | 32 | 89 | 138 | 147 | 114 | 163 | 172 | 139 | 188 | 197 | 164 | 213 | 222 | — | — | — | — | — | — | 32 | 76.5 | 25.8 | 16 |
| 40 | 21.5 | 42.5 | M32 x 2 | 40 | 113 | 168 | 179 | 138 | 193 | 204 | 163 | 218 | 229 | 188 | 243 | 254 | 213 | 268 | 279 | — | — | — | 40 | 84.5 | 29.8 | 16 |

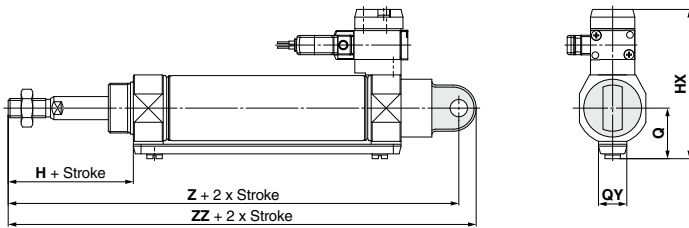
* Brackets are packaged together.

Single Clevis Type (C)

Single acting, Spring return: CVM3C — S



Single acting, Spring extend: CVM3C — T



| Bore size (mm) | A | AL | B1 | CD | CI | CX | D | Eh _e | F | H | H ₁ | HX | I | K | KA | L | MM | N | NA | NN | RR | U |
|----------------|----|------|----|----|----|----|----|-----------------------------------|----|----|----------------|------|------|-----|----|----|------------|------|------|-----------|----|----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 10 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 57.5 | 28 | 5 | 6 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 9 | 14 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 10 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 63.5 | 33.5 | 5.5 | 8 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 9 | 14 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 10 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 68 | 37.5 | 5.5 | 10 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 9 | 14 |
| 40 | 24 | 21 | 22 | 10 | 38 | 15 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 76 | 46.5 | 7 | 12 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 11 | 18 |

Dimensions by Stroke

| Bore size (mm) | Stroke Symbol | | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|----------------|---------------|-----|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 158 | 167 | 112 | 183 | 192 | 137 | 208 | 217 | — | — | — |
| 25 | 87 | 162 | 171 | 112 | 187 | 196 | 137 | 212 | 221 | — | — | — |
| 32 | 89 | 164 | 173 | 114 | 189 | 198 | 139 | 214 | 223 | 164 | 239 | 248 |
| 40 | 113 | 202 | 213 | 138 | 227 | 238 | 163 | 252 | 263 | 188 | 277 | 288 |

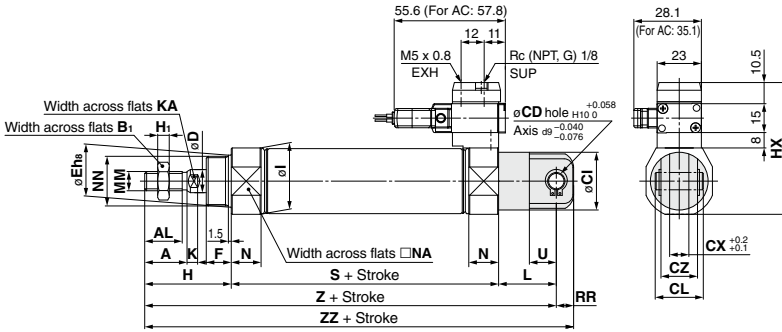
Single Acting/Spring Extend (mm)

| Bore size (mm) | HX | Q | QY |
|----------------|------|------|----|
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

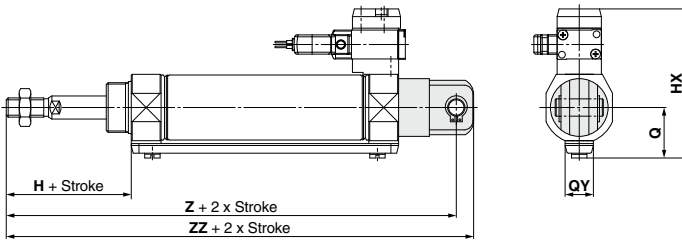
CVM3 Series

Double Clevis Type (D)

Single acting, Spring return: CVM3D — S



Single acting, Spring extend: CVM3D — T



| Bore size (mm) | A | AL | B ₁ | CD | CI | CL | CX | CZ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | L | MM | N | NA | NN | RR | U |
|----------------|----|------|----------------|----|----|------|----|----|----|----------------------|----|----|----------------|------|------|-----|----|----|------------|------|------|-----------|----|----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 25 | 10 | 19 | 8 | 20 ^{+0.033} | 13 | 41 | 5 | 57.5 | 28 | 5 | 6 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 9 | 14 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 10 | 26 ^{+0.033} | 13 | 45 | 6 | 63.5 | 33.5 | 5.5 | 8 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 9 | 14 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 12 | 26 ^{+0.033} | 13 | 45 | 6 | 68 | 37.5 | 5.5 | 10 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 9 | 14 |
| 40 | 24 | 21 | 22 | 10 | 38 | 41.2 | 15 | 30 | 14 | 32 ^{+0.038} | 16 | 50 | 8 | 76 | 46.5 | 7 | 12 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 11 | 18 |

Dimensions by Stroke

| Bore size (mm) | Stroke Symbol | | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|----------------|---------------|-----|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|--|--|
| | S | Z | Z | S | Z | Z | S | Z | Z | S | Z | Z | S | Z | Z | | |
| 20 | 87 | 158 | 167 | 112 | 183 | 192 | 137 | 208 | 217 | — | — | — | — | — | — | | |
| 25 | 87 | 162 | 171 | 112 | 187 | 196 | 137 | 212 | 221 | — | — | — | — | — | — | | |
| 32 | 89 | 164 | 173 | 114 | 189 | 198 | 139 | 214 | 223 | 164 | 239 | 248 | — | — | — | | |
| 40 | 113 | 202 | 213 | 138 | 227 | 238 | 163 | 252 | 263 | 188 | 277 | 288 | 213 | 302 | 313 | | |

Single Acting/Spring Extend (mm)

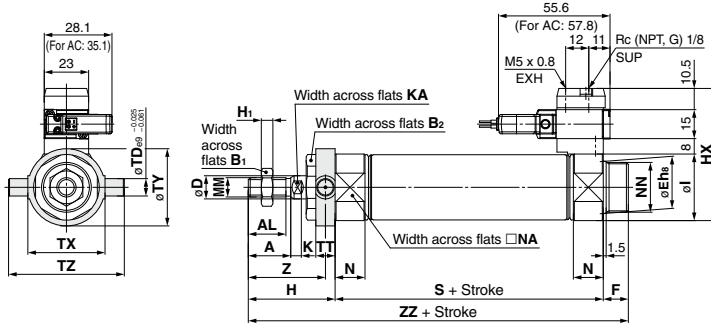
| Bore size (mm) | HX | Q | QY |
|----------------|------|------|----|
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

* Clevis pin and snap ring (cotter pin for ø40) is shipped together.

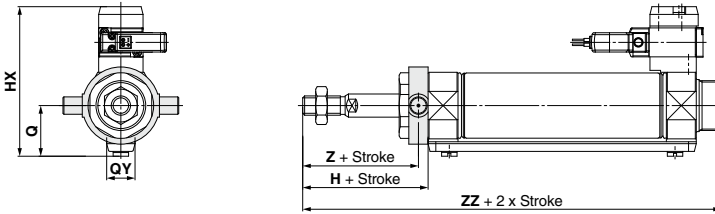
Valve Mounted Cylinder Single Acting, Spring Return/Extend **CVM3 Series**

Rod Side Trunnion Type (U)

Single acting, Spring return: CVM3U Bore size — Stroke S



Single acting, Spring extend: CVM3U Bore size — Stroke T



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | MM | N | NA | NN | TD | TT | TX | TY | TZ | Z |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----------------|------|------|-----|----|------------|------|------|-----------|----|----|----|----|----|------|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 57.5 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 8 | 10 | 32 | 32 | 52 | 36 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 63.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 9 | 10 | 40 | 40 | 60 | 40 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 68 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 9 | 10 | 40 | 40 | 60 | 40 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 76 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 10 | 11 | 53 | 53 | 77 | 44.5 |

| Stroke | | (mm) | | | | | | | | | | | |
|----------------|--------|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|---|----|
| Bore size (mm) | Symbol | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | | | |
| | | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — | — | — |
| 25 | | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — | — | — |
| 32 | | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — | — | — |
| 40 | | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 | — | — |

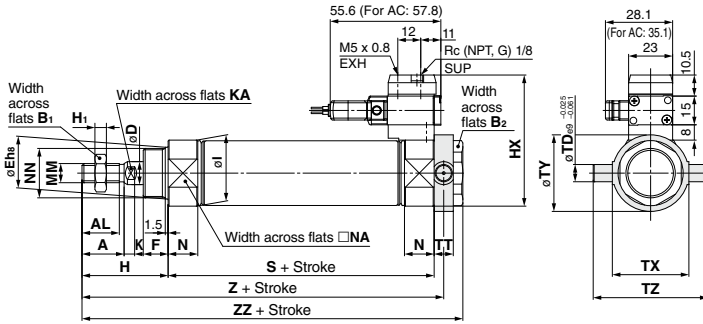
| Single Acting/Spring Extend (mm) | | | |
|----------------------------------|------|------|----|
| Bore size (mm) | HX | Q | QY |
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

* Brackets are packaged together.

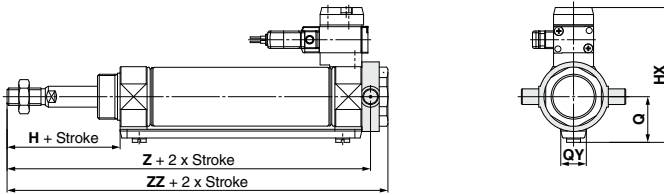
CVM3 Series

Head Side Trunnion Type (T)

Single acting, Spring return: CVM3T — S



Single acting, Spring extend: CVM3T — T



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | Eh ₈ | F | H | H ₁ | HX | I | K | KA | MM | N | NA | NN | TD | TT | TX | TY | TZ |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----------------|------|------|-----|----|------------|------|------|-----------|----|----|----|----|----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 57.5 | 28 | 5 | 6 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 8 | 10 | 32 | 32 | 52 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 63.5 | 33.5 | 5.5 | 8 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 9 | 10 | 40 | 40 | 60 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 68 | 37.5 | 5.5 | 10 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 9 | 10 | 40 | 40 | 60 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 76 | 46.5 | 7 | 12 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 10 | 11 | 53 | 53 | 77 |

Dimensions by Stroke

| Bore size (mm) | Stroke | | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|----------------|--------|-------|---------|-----|-------|-----------|-----|-------|------------|-----|-------|------------|-----|-------|------------|--|--|
| | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | | |
| 20 | 87 | 133 | 143 | 112 | 158 | 168 | 137 | 183 | 193 | — | — | — | — | — | — | | |
| 25 | 87 | 137 | 147 | 112 | 162 | 172 | 137 | 187 | 197 | — | — | — | — | — | — | | |
| 32 | 89 | 139 | 149 | 114 | 164 | 174 | 139 | 189 | 199 | 164 | 214 | 224 | — | — | — | | |
| 40 | 113 | 168.5 | 179 | 138 | 193.5 | 204 | 163 | 218.5 | 229 | 188 | 243.5 | 254 | 213 | 268.5 | 279 | | |

Single Acting/Spring Extend (mm)

| Bore size (mm) | HX | Q | QY |
|----------------|------|------|----|
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

* Brackets are packaged together.

Valve Mounted Cylinder: Non-rotating Rod Type

Single Acting, Spring Return/Extend

CVM3K Series

∅20, ∅25, ∅32, ∅40

How to Order

Mounting type

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

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Rated voltage

| DC | | AC (50/60 Hz) | |
|----|--------|---------------|-------------------|
| 5 | 24 VDC | 1 | 100 VAC |
| 6 | 12 VDC | 2 | 200 VAC |
| V | 6 VDC | 3 | 110 VAC [115 VAC] |
| S | 5 VDC | 4 | 220 VAC [230 VAC] |
| R | 3 VDC | | |

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Light/Surge voltage suppressor

Electrical entry for G, L, M

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor |
| Z | With light/surge voltage suppressor |
| R | With surge voltage suppressor (Non-polar type) |
| U | With light/surge voltage suppressor (Non-polar type) |

Electrical entry for D

| | |
|-----|--|
| Nil | Without light/surge voltage suppressor |
| S | With surge voltage suppressor (Non-polar type) |
| Z | With light/surge voltage suppressor (Non-polar type) |

Manual override

| | |
|-----|--------------------------------|
| Nil | Non-locking push type |
| D | Push-turn locking slotted type |
| E | Push-turn locking lever type |

Port thread type

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

Electrical entry

| | |
|---|------------------|
| G | Grommet |
| L | L plug connector |
| M | M plug connector |
| D | DIN terminal |

Number of auto switches

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

Auto switch

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

Auto switch mounting bracket ^(Note)

Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Example 1: CVM3K L 20 - 100 T - 1 G Z -

Example 2: CDVM3K L 20 - 100 T - 1 G Z - M9BW - C -

With auto switch (Built-in magnet)

Non-rotating rod type

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) CDVM3K40-100S-5G

Cylinder stroke (mm)

| | |
|-----|----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fitting |

Piping

Auto switch

Refer to pages 1341 to 1435 for further information on auto switches.

Applicable 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 | — | 3-wire (NPN) 3-wire (PNP) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ○ | — | ○ | IC circuit | | | | | | | | |
| | | | | | | | M9PV | M9P | ● | ● | ○ | — | ○ | | | | | | | | | |
| | Diagnostic indication (2-color indicator) | Connector | Yes | 2-wire | 12 V | — | M9BV | M9B | ● | ● | ○ | — | ○ | — | | | | | | | | |
| | | | | | | | — | H7C | ● | — | ● | — | — | | | | | | | | | |
| | Water resistant (2-color indicator) | Grommet | — | 3-wire (NPN) 2-wire | 5 V, 12 V | — | M9NVV | M9NV | ● | ● | ○ | — | ○ | IC circuit | | | | | | | | |
| | | | | | | | M9PVV | M9PV | ● | ● | ○ | — | ○ | | | | | | | | | |
| | With diagnostic output (2-color indicator) | Grommet | — | 3-wire (NPN) 3-wire (PNP) 2-wire | 5 V, 12 V | — | M9BWW | M9BW | ● | ● | ○ | — | ○ | — | | | | | | | | |
| | | | | | | | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ● | — | ○ | | | | | | | | | |
| | — | Grommet | — | 3-wire (PNP) 2-wire | 5 V, 12 V | — | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ● | — | ○ | IC circuit | | | | | | | | |
| | | | | | | | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ● | — | ○ | | | | | | | | | |
| — | Grommet | — | 4-wire (NPN) | 5 V, 12 V | — | — | H7FN | ● | — | ● | — | ○ | IC circuit | | | | | | | | | |
| | | | | | | — | A96V | A96 | ● | ● | ○ | — | | ○ | | | | | | | | |
| Reed auto switch | — | Grommet | Yes | 2-wire (NPN equivalent) | — | 5 V | — | A96V | A96 | ● | ● | ○ | — | ○ | IC circuit | | | | | | | |
| | | | | | | | | None | 24 V | 12 V | 100 V | A93V ^{*2} | A93 | ● | | ● | ○ | — | ○ | | | |
| | | | | | | | | | | | 100 V or less | A90V | A90 | ● | | ● | ○ | — | ○ | | | |
| | | | | | | | | | | | 100 V, 200 V | — | B54 | ● | | ● | ○ | — | ○ | | | |
| | | | | | | | | Yes | Connector | None | 2-wire | 24 V or less | — | — | | C73C | ● | — | ● | — | ○ | — |
| | | | | | | | | | | | | | | — | | C80C | ● | — | ● | — | ○ | |
| | | | | | | | | Diagnostic indication (2-color indicator) | Grommet | Yes | — | — | — | — | | B59W | ● | — | ● | — | ○ | IC circuit |

* 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
None N (Example) H7CN

* Solid state auto switches marked with "○" are produced upon receipt of order.
* D-A9□/M9□/M9□W/M9□A/M9□A(V) types cannot be mounted.
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

* Since there are other applicable auto switches than listed, refer to page 1215 for details.
* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
* D-A9□/M9□/M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

CVM3K Series

A hexagon shaped rod that does not rotate.

Non-rotating accuracy

ø20, ø25 — ±0.7°

ø32, ø40 — ±0.5°

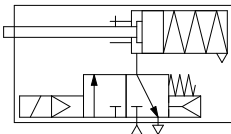
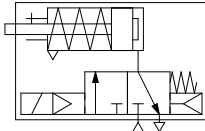
Can operate without lubrication.

Auto switches can also be mounted.

Can be installed with auto switches to facilitate the detection of the cylinder's stroke position.



Symbol
Rubber bumper



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

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----------|----------|----------|
| Axial foot* | CM-L020B | CM-L032B | CM-L040B | CM-L040B |
| Flange | CM-F020B | CM-F032B | CM-F040B | CM-F040B |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | CM-C040B |
| Double clevis** | CM-D020B | CM-D032B | CM-D040B | CM-D040B |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | CM-T040B |

* Two foot brackets and a mounting nut are attached.

When ordering the foot bracket, order 2 pcs. per cylinder.

** Clevis pin and retaining ring (cotter pin for ø40) are packaged together.

Specifications

| | | | | |
|-------------------------------|---|------------------------|-----------|-----------|
| Applicable bore size (mm) | 20 | 25 | 32 | 40 |
| Rod non-rotating accuracy | ±0.7° | | | |
| Action | Single acting, Spring return/Spring extend | | | |
| Fluid | Air | | | |
| Cushion | Rubber bumper | | | |
| Proof pressure | 1.0 MPa | | | |
| Maximum operating pressure | 0.7 MPa | | | |
| Minimum operating pressure | 0.18 MPa spring return | 0.23 MPa spring extend | | |
| Ambient and fluid temperature | -10 to 50°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Stroke length tolerance | +1.4 | | | |
| Piping | Screw-in type | Rc 1/8 | | |
| | Built-in One-touch fitting | O.D.: ø6/I.D.: ø4 | | |
| Piston speed (mm/s) | 50 to 700 | 50 to 650 | 50 to 590 | 50 to 420 |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |
| Mounting | Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Head side trunnion type, Rod side trunnion type | | | |

Solenoid Valve Specifications

| Series | | SYJ519 | |
|--|---|--|---------------------------|
| Manual override | Non-locking push type, Push-turn locking slotted type, Push-turn locking lever type | | |
| Pilot exhaust | Pilot valve individual exh. Type | | |
| Impact/Vibration resistance (m/s ²) ^{Note 1)} | 150/30 | | |
| Enclosure | Dustproof | | |
| Electrical entry | Grommet (G), L plug connector (L), M plug connector (M), DIN terminal (D) | | |
| | G, L, M | D | |
| Coil rated voltage (V) | DC | 24, 12, 6, 5, 3 | |
| | AC 50/60 Hz | 100, 110, 200, 220 | |
| Allowable voltage | ±10% of the rated voltage* | | |
| Power consumption (W) ^{Note 2)} | DC | 0.35 (With light: 0.4 (DIN terminal with light: 0.45)) | |
| | AC | 100 V | 0.78 (With light: 0.81) |
| 110 V | | 0.86 (With light: 0.89) | 0.86 (With light: 0.97) |
| [115 V] | | [0.94 (With light: 0.97)] | [0.94 (With light: 1.07)] |
| 200 V | | 1.18 (With light: 1.22) | 1.15 (With light: 1.30) |
| 220 V | | 1.30 (With light: 1.34) | 1.27 (With light: 1.46) |
| [230 V] | [1.42 (With light: 1.46)] | [1.39 (With light: 1.60)] | |
| Surge voltage suppressor | Diode (DIN terminal, Varistor when non-polar types) | | |
| Indicator light | LED (Neon light when AC with DIN terminal) | | |

* Based on IEC60529

* In common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

* For 115 VAC and 230 VAC, the allowable voltage is -15% to +5% of rated voltage.

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) At the rated voltage.

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ^{Note)} |
|----------------|---------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150 * |
| 25 | 25, 50, 75, 100, 125, 150 * |
| 32 | 25, 50, 75, 100, 125, 150, 200 * |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250 * |

Note 1) Intermediate stroke other than above is manufactured upon receipt of order.

Note 2) Strokes marked with "*" are the maximum strokes which are available.

Refer to pages 1212 to 1215 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Theoretical Output

Refer to the Technical Data (Theoretical Output 1) in the [Web Catalog](#).

Spring Reaction Force

Refer to the Technical Data (Table 2: Spring Reaction Force) in the [Web Catalog](#).

Valve Mounted Cylinder: Non-rotating Rod Type Single Acting, Spring Return/Extend **CVM3K Series**

Mounting Bracket and Accessory

| Accessory | Standard equipment | | | Option | | | |
|-----------------------------------|----------------------|-------------|------------------|----------------------|-------------------------------------|------------------------------|----------------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double knuckle joint ⁽³⁾ | Pivot bracket ⁽⁵⁾ | Pivot bracket pin ⁽⁶⁾ |
| Mounting | | | | | | | |
| Basic type | ● (1 pc.) | ● | — | ● | ● | | |
| Axial foot type | ● (2) | ● | — | ● | ● | | |
| Rod side flange type | ● (1) | ● | — | ● | ● | | |
| Head side flange type | ● (1) | ● | — | ● | ● | | |
| Single clevis type | — ⁽¹⁾ | ● | — | ● | ● | ● | ● |
| Double clevis type ⁽³⁾ | — ⁽¹⁾ | ● | ● ⁽⁴⁾ | ● | ● | — | — |
| Head side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | ● | — |
| Rod side trunnion type | ● (1) ⁽²⁾ | ● | — | ● | ● | | |

- Note 1) Mounting nut is not equipped with single clevis type and double clevis type.
 Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.
 Note 3) Pin and retaining ring are shipped together with double clevis and double knuckle joint.
 Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.
 Note 5) Pin and retaining ring are not included in pivot bracket.
 Note 6) Retaining rings are included in pivot bracket pin.

Weight

Spring Return/(): Denotes Spring Extend.

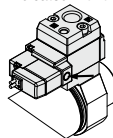
| Bore size (mm) | | 20 | 25 | 32 | 40 |
|-------------------------|---------------------------|-------------|-------------|-------------|-------------|
| Basic weight | 25 stroke | 0.27 (0.27) | 0.37 (0.37) | 0.49 (0.48) | 0.84 (0.83) |
| | 50 stroke | 0.29 (0.29) | 0.40 (0.40) | 0.53 (0.53) | 0.91 (0.90) |
| | 75 stroke | 0.34 (0.34) | 0.49 (0.48) | 0.65 (0.63) | 1.10 (1.06) |
| | 100 stroke | 0.36 (0.36) | 0.52 (0.51) | 0.70 (0.67) | 1.16 (1.13) |
| | 125 stroke | 0.42 (0.41) | 0.61 (0.58) | 0.83 (0.79) | 1.36 (1.30) |
| | 150 stroke | 0.44 (0.43) | 0.64 (0.61) | 0.87 (0.83) | 1.43 (1.37) |
| | 200 stroke | — | — | 1.03 (0.99) | 1.68 (1.60) |
| 250 stroke | — | — | — | 1.94 (1.82) | |
| Mounting bracket weight | Axial foot | 0.15 (0.15) | 0.16 (0.16) | 0.16 (0.16) | 0.27 (0.27) |
| | Flange | 0.06 (0.06) | 0.09 (0.09) | 0.09 (0.09) | 0.12 (0.12) |
| | Single clevis | 0.04 (0.04) | 0.04 (0.04) | 0.04 (0.04) | 0.09 (0.09) |
| | Double clevis | 0.05 (0.05) | 0.06 (0.06) | 0.06 (0.06) | 0.13 (0.13) |
| | Trunnion | 0.04 (0.04) | 0.07 (0.07) | 0.07 (0.07) | 0.10 (0.10) |
| Option bracket weight | Single knuckle joint | 0.06 (0.06) | 0.06 (0.06) | 0.06 (0.06) | 0.23 (0.23) |
| | Double knuckle (With pin) | 0.07 (0.07) | 0.07 (0.07) | 0.07 (0.07) | 0.20 (0.20) |

Calculation: (Example) CVM3KL32-100S-1G (ø32, 100 stroke, Spring return)

- Basic weight:0.70 (kg)
- Weight of brackets:0.16 (kg)
- 0.70 + 0.16 = 0.86 kg
- Add 0.03 kg for the DIN terminal.

Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



⚠ Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5 port solenoid valve precautions on the SMC web site: <https://www.smcworld.com>

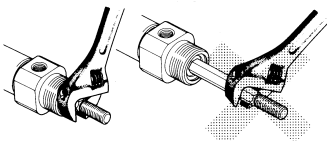
Operating Precautions

⚠ Caution

1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.

If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Also, to screw a bracket or a nut onto the threaded portion at the end of the piston rod, make sure to retract the piston rod entirely, and place a wrench on the parallel sections of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.

| Allowable rotational torque (N·m or less) | ø20 | ø25 | ø32 | ø40 |
|---|-----|------|------|------|
| | 0.2 | 0.25 | 0.25 | 0.44 |



Disassembly/Replacement

⚠ Caution

1. When replacing rod seals, please contact SMC.

Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

Model Selection

⚠ Warning

1. Confirm the specifications.

Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

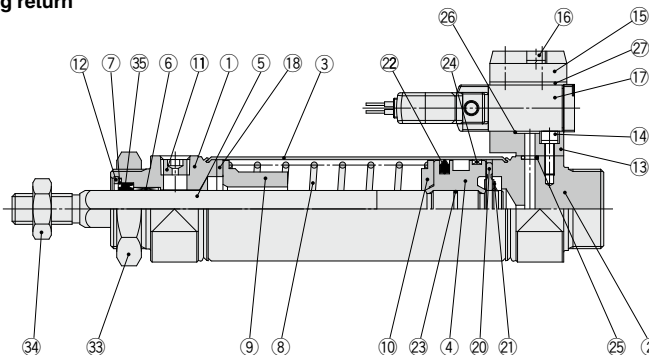
2. Energizing continuously for a long period of time

When the valve is continuously energized for a long period of time, the performance may deteriorate or affect peripheral equipment adversely since temperature rises when coils generate heat.

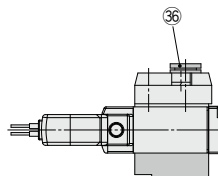
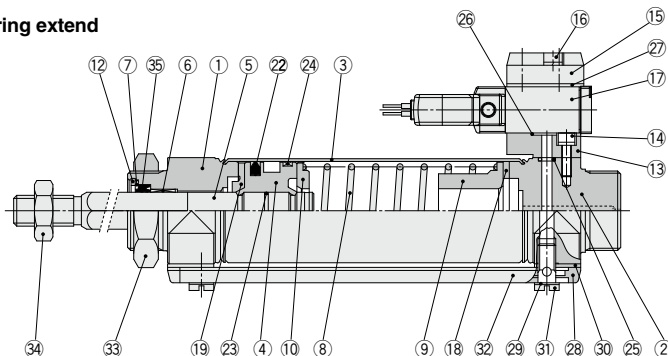
CVM3K Series

Construction

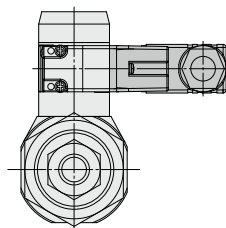
Spring return



Spring extend



Built-in One-touch fitting

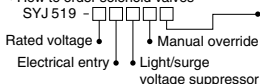


DIN terminal

Component Parts

| No. | Description | Material | Note |
|-----|---|-----------------|----------------------|
| 1 | Rod cover | Aluminum alloy | Anodized |
| 2 | Head cover | Aluminum alloy | Anodized |
| 3 | Cylinder tube | Stainless steel | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston rod | Stainless steel | |
| 6 | Non-rotating guide | Bearing alloy | |
| 7 | Seal retainer | Rolled steel | Nickel plated |
| 8 | Return spring | Steel wire | Zinc chromated |
| 9 | Spring guide | Aluminum alloy | |
| 10 | Spring seat | Aluminum alloy | |
| 11 | Plug with fixed orifice | Alloy steel | Black dyed |
| 12 | Retaining ring | Carbon steel | Phosphate coated |
| 13 | Sub-plate | Aluminum alloy | Metallic painted |
| 14 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 15 | Plate | Aluminum alloy | Metallic painted |
| 16 | Hex. socket head cap screw with spring washer | Stainless steel | |
| 17 | Solenoid valve | — | Refer to the below.* |
| 18 | Bumper | Urethane | |
| 19 | Bumper A | Urethane | |

* How to order solenoid valves



| | |
|-----|---|
| Nil | Valves other than those below |
| All | All valves with a DC rated voltage |
| -Q | Valves with an AC rated voltage (DIN terminal only) |

Component Parts

| No. | Description | Material | Note |
|-----|-------------------|-----------------|---------------------------|
| 20 | Bumper B | Urethane | |
| 21 | Retaining ring | Stainless steel | |
| 22 | Piston seal | NBR | |
| 23 | Piston gasket | NBR | |
| 24 | Wear ring | Resin | |
| 25 | Head cover gasket | NBR | |
| 26 | Sub-plate gasket | NBR | |
| 27 | Gasket | NBR | |
| 28 | Pipe gasket | Urethane rubber | |
| 29 | Gasket | Resin | |
| 30 | Spacer gasket | Resin | |
| 31 | Stud | Brass | Electroless nickel plated |
| 32 | Pipe | Aluminum alloy | |
| 33 | Mounting nut | Carbon steel | Nickel plated |
| 34 | Rod end nut | Carbon steel | Zinc chromated |
| 36 | One-touch fitting | — | Port size: ø6 |

Replacement Parts/Seal Kit

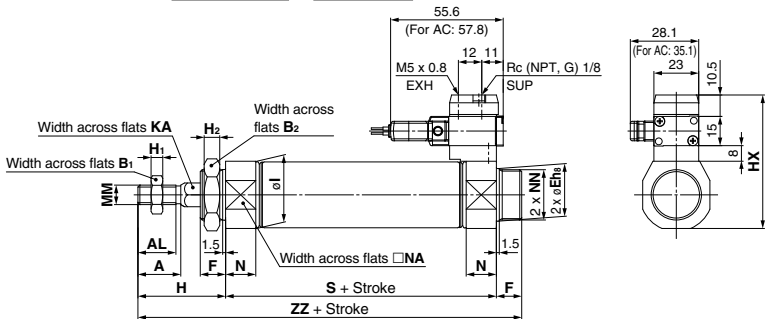
| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|-----------|-----------|-----------|-----------|
| | | | 20 | 25 | 32 | 40 |
| 35 | Rod seal | NBR | CM2K20-PS | CM2K25-PS | CM2K32-PS | CM2K40-PS |

* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

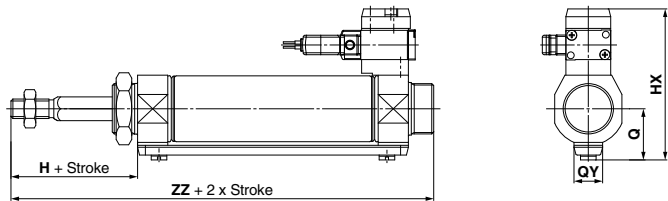
Valve Mounted Cylinder: Non-rotating Rod Type Single Acting, Spring Return/Extend **CVM3K Series**

Basic Type (B): External Dimensions

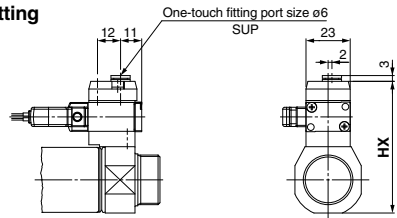
Single acting, Spring return: CVM3KB Bore size — Stroke **S**



Single acting, Spring extend: CVM3KB Bore size — Stroke **T**



Built-in One-touch fitting



| Bore size (mm) | (mm) | | | | | | | | | | | | | | | |
|----------------|------|------|----|----|-----------------------------------|----|----|----------------|----------------|------|------|------|------------|------|------|-----------|
| | A | AL | B1 | B2 | Eh ₈ | F | H | H ₁ | H ₂ | HX | I | KA | MM | N | NA | NN |
| 20 | 18 | 15.5 | 13 | 26 | 20 ⁰ _{-0.033} | 13 | 41 | 5 | 8 | 57.5 | 28 | 8.2 | M8 x 1.25 | 15 | 24 | M20 x 1.5 |
| 25 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 8 | 63.5 | 33.5 | 10.2 | M10 x 1.25 | 15 | 30 | M26 x 1.5 |
| 32 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 45 | 6 | 8 | 68 | 37.5 | 12.2 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 |
| 40 | 24 | 21 | 22 | 41 | 32 ⁰ _{-0.039} | 16 | 50 | 8 | 10 | 76 | 46.5 | 14.2 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 |

Dimensions by Stroke

| Bore size (mm) | (mm) | | | | | | | | | |
|----------------|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
| Stroke Symbol | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

Single Acting/Spring Extend (mm)

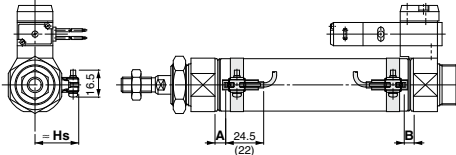
| Bore size (mm) | HX | Q | QY |
|----------------|------|------|----|
| 20 | 65.3 | 19.8 | 14 |
| 25 | 70.5 | 22 | 14 |
| 32 | 76.5 | 25.8 | 16 |
| 40 | 84.5 | 29.8 | 16 |

Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

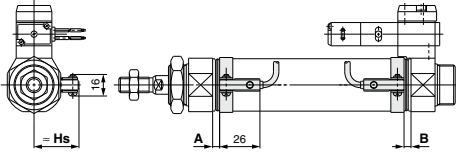
Reed auto switch

D-A9□

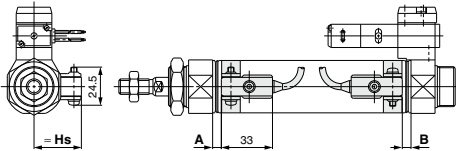


() : For D-A96 type
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

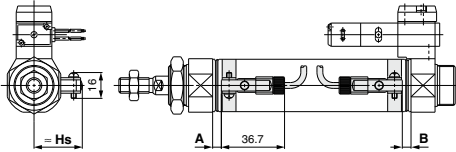
D-C7/C8



D-B5/B6/B59W

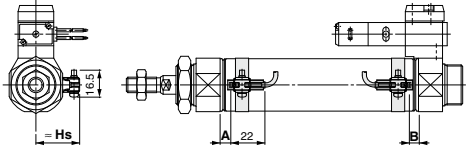


D-C73C/C80C

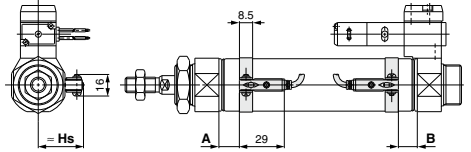


Solid state auto switch

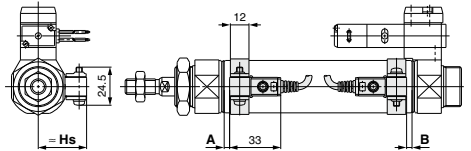
**D-M9□
D-M9□W**



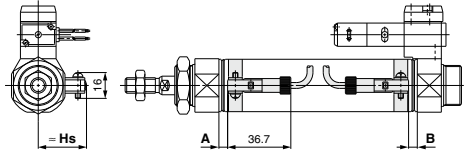
D-H7□/H7□W/H7NF



D-G5NT



D-H7C



**Auto Switch Proper Mounting Position (Detection at Stroke End)
and Its Mounting Height: Single Acting, Spring Return (S)/Spring Extend (T)**

**Auto Switch Proper Mounting Position: Standard, Spring Return (S)
Non-Rotating, Spring Return (S)** (mm)

| Auto switch model | Bore size | A dimension | | | | | B |
|------------------------------------|-----------|---------------------|-------------------------|--------------------------|--------------------------|--------------------------|------|
| | | to 15 st | 51 to 100 st | 101 to 150 st | 151 to 200 st | 201 to 250 st | |
| D-A9□(V) | 20 | 31.5 | 56.5 | 81.5 | — | — | 5.5 |
| | 25 | 31.5 | 56.5 | 81.5 | — | — | 5.5 |
| | 32 | 32.5 | 57.5 | 82.5 | 107.5 | — | 6.5 |
| | 40 | 38.5 | 63.5 | 88.5 | 113.5 | 138.5 | 11.5 |
| D-M9□(V) D-M9□W(V) D-M9□A(V) | 20 | 35.5 | 60.5 | 85.5 | — | — | 9.5 |
| | 25 | 35.5 | 60.5 | 85.5 | — | — | 9.5 |
| | 32 | 36.5 | 61.5 | 86.5 | 111.5 | — | 10.5 |
| | 40 | 42.5 | 67.5 | 92.5 | 117.5 | 142.5 | 15.5 |
| D-B5□ D-B64 | 20 | 26 | 51 | 76 | — | — | 0 |
| | 25 | 26 | 51 | 76 | — | — | 0 |
| | 32 | 27 | 52 | 77 | 102 | — | 1 |
| | 40 | 32 | 57 | 82 | 107 | 132 | 6 |
| D-C7□ D-C80 D-C73C D-C80C | 20 | 32 | 57 | 82 | — | — | 6 |
| | 25 | 32 | 57 | 82 | — | — | 6 |
| | 32 | 33 | 58 | 83 | 108 | — | 7 |
| | 40 | 38 | 63 | 88 | 113 | 138 | 12 |
| D-B59W | 20 | 29 | 54 | 79 | — | — | 3 |
| | 25 | 29 | 54 | 79 | — | — | 3 |
| | 32 | 30 | 55 | 80 | 105 | — | 4 |
| | 40 | 35 | 60 | 85 | 110 | 135 | 9 |
| D-H7□ D-H7C D-H7□W D-H7NF | 20 | 31 | 56 | 81 | — | — | 5 |
| | 25 | 31 | 56 | 81 | — | — | 5 |
| | 32 | 32 | 57 | 82 | 107 | — | 6 |
| | 40 | 37 | 62 | 87 | 112 | 137 | 11 |
| D-G5NT | 20 | 27.5 | 52.5 | 77.5 | — | — | 1.5 |
| | 25 | 27.5 | 52.5 | 77.5 | — | — | 1.5 |
| | 32 | 28.5 | 53.5 | 78.5 | 103.5 | — | 2.5 |
| | 40 | 33.5 | 58.5 | 83.5 | 108.5 | 133.5 | 7.5 |

**Auto Switch Proper Mounting Position: Standard, Spring Extend (T)
Non-Rotating, Spring Extend (T)** (mm)

| Auto switch model | Bore size | A | B dimension | | | | |
|------------------------------------|-----------|------|---------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| | | | to 15 st | 51 to 100 st | 101 to 150 st | 151 to 200 st | 201 to 250 st |
| D-A9□(V) | 20 | 6.5 | 30.5 | 55.5 | 80.5 | — | — |
| | 25 | 6.5 | 30.5 | 55.5 | 80.5 | — | — |
| | 32 | 7.5 | 31.5 | 56.5 | 81.5 | 106.5 | — |
| | 40 | 13.5 | 36.5 | 61.5 | 86.5 | 111.5 | 136.5 |
| D-M9□(V) D-M9□W(V) D-M9□A(V) | 20 | 10.5 | 34.5 | 59.5 | 84.5 | — | — |
| | 25 | 10.5 | 34.5 | 59.5 | 84.5 | — | — |
| | 32 | 11.5 | 35.5 | 60.5 | 85.5 | 110.5 | — |
| | 40 | 17.5 | 40.5 | 65.5 | 90.5 | 115.5 | 140.5 |
| D-B5□ D-B64 | 20 | 1 | 25 | 50 | 75 | — | — |
| | 25 | 1 | 25 | 50 | 75 | — | — |
| | 32 | 2 | 26 | 51 | 76 | 101 | — |
| | 40 | 7 | 31 | 56 | 81 | 106 | 131 |
| D-C7□ D-C80 D-C73C D-C80C | 20 | 7 | 31 | 56 | 81 | — | — |
| | 25 | 7 | 31 | 56 | 81 | — | — |
| | 32 | 8 | 32 | 57 | 82 | 107 | — |
| | 40 | 13 | 37 | 62 | 87 | 112 | 137 |
| D-B59W | 20 | 4 | 28 | 53 | 78 | — | — |
| | 25 | 4 | 28 | 53 | 78 | — | — |
| | 32 | 5 | 29 | 54 | 79 | 104 | — |
| | 40 | 10 | 34 | 59 | 84 | 109 | 134 |
| D-H7□ D-H7C D-H7□W D-H7NF | 20 | 6 | 30 | 55 | 80 | — | — |
| | 25 | 6 | 30 | 55 | 80 | — | — |
| | 32 | 7 | 31 | 56 | 81 | 106 | — |
| | 40 | 12 | 36 | 61 | 86 | 111 | 136 |
| D-G5NT | 20 | 2.5 | 26.5 | 51.5 | 76.5 | — | — |
| | 25 | 2.5 | 26.5 | 51.5 | 76.5 | — | — |
| | 32 | 3.5 | 27.5 | 52.5 | 77.5 | 102.5 | — |
| | 40 | 8.5 | 32.5 | 57.5 | 81.5 | 107.5 | 132.5 |

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

Auto Switch Mounting 2

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Auto Switch Mounting Height

(mm)

| Auto switch model Bore size (mm) | D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V) | D-B5□ D-B64 D-B59W D-G5NT D-H7C | D-C7□ D-C80 D-H7□ D-H7□W D-H7NF | D-C73C D-C80C |
|-------------------------------------|--|---|---|------------------|
| | Hs | Hs | Hs | Hs |
| 20 | 23 | 25.5 | 22.5 | 25 |
| 25 | 25.5 | 28 | 25 | 27.5 |
| 32 | 29 | 31.5 | 28.5 | 31 |
| 40 | 33 | 35.5 | 32.5 | 35 |

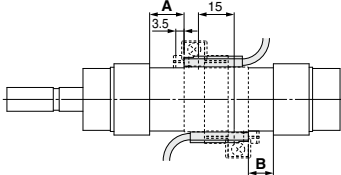
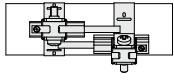
Minimum Auto Switch Mounting Stroke

n: No. of auto switches (mm)

| Auto switch model | No. of auto switch mounted | | | | |
|---------------------------|----------------------------|--------------------------|--------------------------|--|---|
| | 1 | 2 | | n | |
| | | Different surfaces | Same surface | Different surfaces | Same surface |
| D-A9□ D-M9□ D-M9□W | 10 | 15 <small>Note 1</small> | 45 <small>Note 1</small> | $15 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 2</small> | $45 + 45 (n-2)$ <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 2</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 2</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 2</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 2</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 2</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 2</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 2</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 2</small> | $75 + 55 (n-2)$ <small>(n = 2, 3, 4, 5...)</small> |

Note 2) 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 (The adjustment as shown in the figures below is required with the following stroke ranges.)

| Auto switch model | With 2 auto switches | |
|-------------------|---|---|
| | Different surfaces <small>Note 1</small> | Same surface <small>Note 1</small> |
| |  <p>The proper auto switch mounting position is 6 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-A93 | — | 45 to less than 50 stroke |
| D-M9□ D-M9□W | 15 to less than 20 stroke | 45 to less than 55 stroke |

Operating Range

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

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA4: For D-C7/C8/H7 types

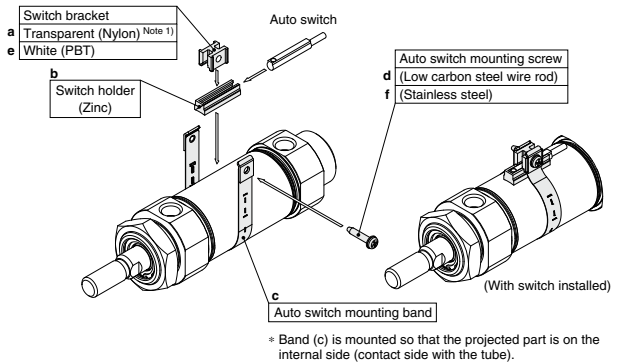
Note) Refer to page 1440 for the details of BBA4.

Auto Switch Mounting Bracket: Part No.

| Auto switch mounting | Bore size (mm) | | | |
|---|---|---|---|---|
| | φ20 | φ25 | φ32 | φ40 |
| 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) Note 2) | 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) |
| 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-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) |

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

Besides the models listed in How to Order, the following auto switches are applicable. Refer to pages 1341 to 1435 for detailed specifications.

| Auto switch type | Part no. | Electrical entry (Fetching direction) | Features |
|------------------|--------------------|---------------------------------------|---------------------------------|
| Reed | D-B53, C73, C76 | Grommet (In-let) | — |
| | D-C80 | | Without indicator light |
| Solid state | D-H7A1, H7A2, H7B | | — |
| | D-H7NW, H7PW, H7BW | | Diagnostic indication (2-color) |
| | D-G5NT | With timer | |

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

Valve Mounted Cylinder

Double Acting

CV3 Series

∅40, ∅50, ∅63, ∅80, ∅100

How to 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) CDV3LN50-100-1

Suffix for cylinder

| | |
|-----|------------------------------|
| NII | Rod extended when energized |
| B | Rod retracted when energized |

* Symbol "B" is not required for double solenoid.

Electrical entry

| | |
|-----|--------------|
| NII | Grommet |
| D | DIN terminal |

Solenoid valve

| | |
|-----|-------------------|
| NII | 2 position single |
| W | 2 position double |

Solenoid valve voltage

Refer to page 1217 for solenoid valve voltage.

Cylinder stroke (mm)

Refer to page 1217 for standard strokes.

CV3 L N50-100

1

With auto switch

CDV3 L N50-100

M9BW

1

With Auto Switch (Built-in magnet)

Mounting type

| | |
|----|----------------------|
| B | Basic type |
| L | Axial foot type |
| F | Rod side flange type |
| C* | Single clevis type |
| D* | Double clevis type |
| T | Center trunnion type |

Type

| | |
|-----|---------------|
| NII | Aluminum tube |
| F* | Steel tube |

* Not available with auto switch.

Bore size

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

Auto switch

| | |
|-----|---------------------|
| NII | Without auto switch |
|-----|---------------------|

* For the applicable auto switch model, refer to the table below.

Suffix for cylinder

| | | |
|----------|-----|---------------------------|
| Rod boot | J | Nylon tarpaulin |
| | K | Heat resistant tarpaulin |
| Cushion | N | Without cushion |
| | R | With cushion on rod end |
| | H | With cushion on head end |
| | NII | With cushion on both ends |

Number of auto switches

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

Made to Order
Refer to page 1217 for details.

* Except tubing I.D. ∅40 * When specifying symbol more than one, combine symbols alphabetically.

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

| Type | Special function | Electrical entry | 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 (NII) | 1 (M) | 3 (L) | 5 (Z) | | | | | | |
| Solid state auto switch | — | Grommet | 3-wire (NPN) | 24 V | 5 V, 12 V | M9N | G59** | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | | | |
| | | | 3-wire (PNP) | | | M9P | G5P** | ● | ● | ● | ○ | | | | | | |
| | | | 2-wire | M9B | K59** | ● | ● | ● | ○ | | | | | | | | |
| | | Terminal conduit | 3-wire (NPN) | 24 V | 12 V | G39C | G39 | ● | ● | ● | ○ | IC circuit | | | | | |
| | | | 2-wire | | | K39C | K39 | ● | ● | ● | ○ | | | | | | |
| | | | 3-wire (NPN) | | | M9NW | G59W** | ● | ● | ● | ○ | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 24 V | 5 V, 12 V | M9PW | G5PW** | ● | ● | ● | ○ | IC circuit | Relay, PLC | | | |
| | | | | 2-wire | | | M9BW | K59W** | ● | ● | ● | ○ | | | | | |
| | | | | 3-wire (NPN) | | | M9NA*1 | — | ○ | ○ | ○ | ○ | | | IC circuit | | |
| | | | | 3-wire (PNP) | | | M9PA*1 | — | ○ | ○ | ○ | ○ | | | | | |
| Reed auto switch | — | Grommet | 2-wire | 24 V | 12 V | M9BA*1 | — | ○ | ○ | ○ | ○ | IC circuit | Relay, PLC | | | | |
| | | | | | | F59F | G59F** | ● | ● | ● | ○ | | | | | | |
| | | | | | | — | A59W | B59W** | ● | ● | ● | | | ○ | | | |
| | | Terminal conduit | Yes | | | 2-wire | 24 V | 12 V | A96 [Z76]** | — | — | — | | — | — | IC circuit | Relay, PLC |
| | | | | | | | | | A93 [Z73]** | — | — | — | | — | IC circuit | | |
| | | | | | | | | | A90 [Z80]** | — | — | — | | — | | | |
| DIN terminal | Yes | 2-wire | 24 V | 12 V | 100 V or less | A54 | B54** | ● | ● | ● | ○ | — | PLC | | | | |
| | | | | | 100 V, 200 V | A64 | B64** | ● | ● | ● | ○ | | | | | | |
| | | | | | 200 V or less | A33C | A33 | — | — | — | — | | | | | | |
| Grommet | Yes | 2-wire | 24 V | 12 V | 100 V, 200 V | A34C | A34 | — | — | — | — | — | Relay, PLC | | | | |
| | | | | | — | A44C | A44 | — | — | — | — | | | | | | |
| | | | | | — | A59W | B59W** | ● | ● | ● | ○ | | | | | | |

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

*2 Consult with SMC regarding water resistant types with the above model numbers.

*3 Lead wire length symbols: 0.5 m.....NII (Example) M9NW
1 m.....M (Example) M9MWW
3 m.....L (Example) M9NWL
5 m.....Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.
** D-B5□/B64/G5/K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

*** D-A9□ cannot be mounted on ∅50. Select auto switches in brackets.

* Since there are other applicable auto switches than listed, refer to page 1236 for details.

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

* D-A9□/M9□/M9□/M9□/M9□/□ A auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

- **Ease of maintenance and inspection.**

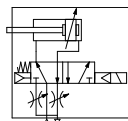
The solenoid valve can be separated easily and the cylinder can also be disassembled.

- **A manual operation mechanism is provided as standard equipment (non-locking).**



Symbol

Air cushion



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

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XC4 | With heavy duty scraper |
| -XC15 | Change of tie-rod length |
| -XC29 | Double knuckle joint with spring pin |
| -XC65 | Made of stainless steel (Combination of XC7 and XC68) |

⚠ Precautions

Minimum stroke for auto switch mounting

⚠ Caution

- Each switch and mounting type of cylinder has different minimum mountable stroke. Be careful especially of the center trunnion type. (For details, refer to pages 1234 and 1235.)

Refer to pages 1232 to 1236 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Bore size (mm) | 40 | 50 | 63 | 80 | 100 | |
|--------------------------------|--|--------------------|------|------|----------------|-----|
| Fluid | Air | | | | | |
| Action | Double acting | | | | | |
| Proof pressure | 1.35 MPa | | | | | |
| Maximum operating pressure | 0.9 MPa | | | | | |
| Ambient and fluid temperature | -10 to 50°C*1 | | | | | |
| Minimum operating pressure | 0.15 MPa | | | | | |
| Piston speed | 50 to 500 mm/s | | | | 50 to 350 mm/s | |
| Cushion | Air cushion | | | | | |
| Stroke length tolerance | Up to 250 st: $^{+1.0}_0$ 251 to 1000 st: $^{+1.4}_0$ | | | | | |
| Lubrication | Not required (Non-lube) | | | | | |
| Mounting | Basic, Foot, Rod flange, Single clevis Double clevis, Center trunnion | | | | | |
| Port size | Rc1/4 | | | | | |
| Allowable kinetic energy (J)*2 | Air cushion | When activated | 2.8 | 4.6 | 16 | 29 |
| | | When not activated | 0.33 | 0.56 | 0.91 | 1.5 |

*1 No freezing

*2 Activate the air cushion when operating the cylinder. If this is not done, the piston rod assembly or the tie-rods will be damaged when the allowable kinetic energy exceeds the values shown in the above table.

Solenoid Valve Specifications

| | | | |
|---------------------------------|--|---------|------------------------------|
| Applicable solenoid valve model | V3□08 | | |
| Coil rated voltage | Refer to the solenoid valve voltage shown below. | | |
| Electrical entry | Grommet, DIN terminal | | |
| Allowable voltage | -15 to 10% of the rated voltage | | |
| Coil insulation | Class B or equivalent (130°C) | | |
| Apparent power ^{Note)} | AC | Inrush | 50 Hz 8.5 VA 60 Hz 7.5 VA |
| | | Holding | 50 Hz 7.0 VA 60 Hz 5.5 VA |
| | DC | | 6 W |

Note) At the rated voltage.

* Refer to page 1226 for solenoid valve replacement methods and part numbers.

Solenoid valve voltage

| | |
|---|--------------------|
| 1 | 100 VAC (50/60 Hz) |
| 2 | 200 VAC (50/60 Hz) |
| 3 | 110 VAC (50/60 Hz) |
| 4 | 220 VAC (50/60 Hz) |
| 5 | 24 VDC |
| 6 | 12 VDC |
| 7 | 240 VAC (50/60 Hz) |
| 8 | 48 VAC (50/60 Hz) |
| B | 24 VAC (50/60 Hz) |
| P | 100 VDC |
| V | 6 VDC |
| Y | 48 VDC |
| Z | 110 VDC |

* For other rated voltages, please contact SMC.

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C* |

* Maximum ambient temperature for the rod boot itself.

Standard Strokes

| Bore size | Standard stroke | |
|-----------|--|----------------|
| | Stroke range ① | Stroke range ② |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500 | Up to 1000 |
| 50, 63 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600 | |
| 80, 100 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700 | |

Note 1) Intermediate strokes not listed above are produced upon receipt of order.

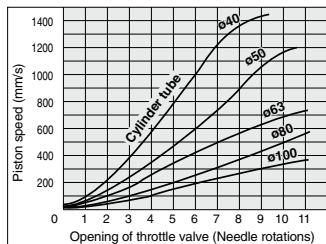
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the stroke range ① might not be able to fulfill the specifications due to the deflection etc.

Note 3) Please consult with SMC for manufacturability and the part numbers when exceeding the stroke range ②.

Note 4) The minimum stroke length is different in the trunnion type and types with auto switch. Refer to pages 1234 and 1235.

CV3 Series

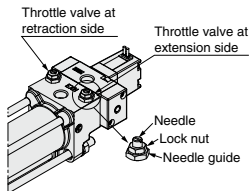
Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa, Horizontal mounting, No load, Spring return side
 • Driving speeds indicated above are for reference.

Piston Speed Adjustment

1. To slow down the piston speed, screw in the needle of the silencer exhaust throttle valve clockwise, to reduce the amount of air that is discharged.
2. The throttle valve needle opens fully when it is loosened 11 turns from its fully closed position.



3. After the specified speed has been set, secure the needle with the lock nut.

Weight

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 |
|--|---------------------------|-------------|-------------|-------------|-------------|-------------|
| Basic weight | Basic type | 1.17 (1.27) | 1.47 (1.60) | 2.25 (2.45) | 3.96 (4.27) | 5.55 (5.95) |
| | Axial foot type | 1.34 (1.44) | 1.67 (1.80) | 2.54 (2.74) | 4.75 (5.06) | 6.48 (6.88) |
| | Rod side flange type | 1.43 (1.53) | 1.88 (2.01) | 2.87 (3.07) | 5.06 (5.37) | 6.94 (7.34) |
| | Single clevis type | — | 2.20 (2.33) | 3.36 (3.56) | 5.90 (6.21) | 8.20 (8.60) |
| | Double clevis type | — | 2.25 (2.38) | 3.41 (3.61) | 5.96 (6.27) | 8.27 (8.67) |
| | Trunnion type | 1.82 (1.97) | 2.26 (2.35) | 3.64 (4.00) | 6.34 (6.79) | 9.12 (9.71) |
| Additional weight per each 50 mm of stroke | | 0.20 (0.28) | 0.25 (0.35) | 0.31 (0.43) | 0.46 (0.70) | 0.58 (0.87) |
| Accessory bracket | Single knuckle | 0.23 | 0.26 | 0.26 | 0.60 | 0.83 |
| | Double knuckle (with pin) | 0.37 | 0.43 | 0.43 | 0.87 | 1.27 |

Calculation: (Example) CV3L40-100-1

- Basic weight:.....1.33 (kg)
- Additional weight.....0.20 (kg/50 st)
- Cylinder stroke.....100 (st) $1.33 + 0.20 \times 100 \div 50 = 1.73$ kg

*(): Steel tube type.

Accessory

| Mounting | | Basic type | Foot type | Rod side flange type | Single clevis type | Double [*] clevis type | Center trunnion type |
|--------------------|--|------------|-----------|----------------------|--------------------|---------------------------------|----------------------|
| Standard equipment | Rod end nut | ● | ● | ● | ● | ● | ● |
| | Clevis pin | — | — | — | — | ● | — |
| Option | Single knuckle joint | ● | ● | ● | ● | ● | ● |
| | Double knuckle joint [*] (with pin) | ● | ● | ● | ● | ● | ● |
| | With rod boot | ● | ● | ● | ● | ● | ● |

* Pin, plain washer and cotter pin are packaged together with double clevis and double knuckle joint.

* Refer to page 1225 for dimensions and part numbers of the option.
 Refer to page 1220 for dimensions of the rod boot.

Mounting Bracket Part No.

Mounting Bracket Part No.

| Bore size (mm) | 40 | 50 | 63 | 80 | 100 |
|-----------------------------|---------|---------|---------|---------|---------|
| Axial foot [*] | CA1-L04 | CA1-L05 | CA1-L06 | CA1-L08 | CA1-L10 |
| Flange | CA1-F04 | CA1-F05 | CA1-F06 | CA1-F08 | CA1-F10 |
| Single clevis | — | CV3-C05 | CV3-C06 | CV3-C08 | CV3-C10 |
| Double clevis ^{**} | — | CV3-D05 | CV3-D06 | CV3-D08 | CV3-D10 |

* Order two foot brackets per cylinder.

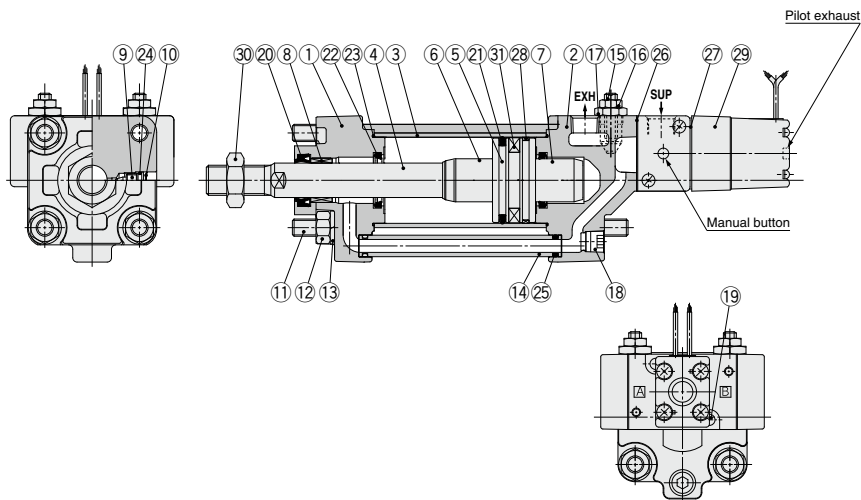
** Accessories for each mounting bracket are as follows.

Foot, Flange: Body mounting bolts, Spring washer

Single clevis: Body mounting bolts, Nut, Spring washer

Double clevis: Body mounting bolts, Nut, Spring washer, Clevis pin, Flat washer, Cotter pin

Construction



Component Parts

| No. | Description | Material | Q'ty | Note |
|-----|------------------------------------|---------------------------|------|--------------------------------|
| 1 | Rod cover | Aluminum die-casted | 1 | Black painted |
| 2 | Head cover | Aluminum die-casted | 1 | Black painted |
| 3 | Cylinder tube | Aluminum alloy | 1 | Hard anodized |
| 4 | Piston rod | Carbon steel | 1 | Hard chrome plating |
| 5 | Piston | Aluminum alloy | 1 | |
| 6 | Cushion ring | Aluminum alloy | 1 | Anodized |
| 7 | Cushion ring B | Aluminum alloy | 1 | Anodized |
| 8 | Bushing | Special friction material | 1 | |
| 9 | Cushion valve | Steel wire | 2 | Trivalent zinc chromated |
| 10 | Retaining ring | Spring steel | 2 | Phosphate coating |
| 11 | Tie-rod | Carbon steel | 4 | Trivalent zinc chromated |
| 12 | Tie-rod nut | Rolled steel | 6 | Trivalent black zinc chromated |
| 13 | Spring washer | Steel wire | 6 | Trivalent black zinc chromated |
| 14 | Pipe | Carbon steel tube | 1 | Trivalent zinc chromated |
| 15 | Needle | Free-cutting steel | 2 | Electroless nickel plating |
| 16 | Lock nut | Carbon steel | 2 | Trivalent zinc chromated |
| 17 | Needle guide | Free-cutting steel | 2 | Electroless nickel plating |
| 18 | Plug | Chromium molybdenum steel | 1 | Trivalent black zinc chromated |
| 19 | Hex. socket head cap screw with SW | Carbon steel | 2 | Trivalent black zinc chromated |
| 20 | Rod seal | NBR | 1 | |
| 21 | Piston seal | NBR | 1 | |

| No. | Description | No. of solenoids | Rod extended when energized | Rod retracted when energized |
|-----|----------------|------------------|-----------------------------|------------------------------|
| 29 | Solenoid valve | Single | (1) | (2) |
| | | Double | (3) | |

* How to order solenoid valves

Note 1) V3108-00 [Voltage] [Electrical entry]

Note 2) V3108-00 [Voltage] [Electrical entry]-X23

Note 3) V3208-00 [Voltage] [Electrical entry]

Component Parts

| No. | Description | Material | Q'ty | Note |
|-----|----------------------|--------------|------|---------------------|
| 22 | Cushion seal | Urethane | 2 | |
| 23 | Cylinder tube gasket | NBR | 2 | |
| 24 | Cushion valve seal | NBR | 2 | |
| 25 | Pipe gasket | NBR | 2 | |
| 26 | Head cover gasket | NBR | 1 | |
| 27 | Solenoid gasket | NBR | 1 | For single solenoid |
| | | | 2 | For double solenoid |
| 28 | Wear ring | Resin | 1 | |
| 30 | Rod end nut | Rolled steel | 1 | Zinc chromated |
| 31 | Magnet | — | (1) | |

* Not replaceable.

Replacement Parts: Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|---|
| 40 | CV3N40-PS | Set of nos. above 20, 21, 22, 23, 25, 26 |
| 50 | CV3N50-PS | |
| 63 | CV3N63-PS | |
| 80 | CV3N80-PS | |
| 100 | CV3N100-PS | |

* Seal kit includes 20, 21, 22, 23, 25, 26. Order the seal kit, based on each bore size.

(The parts indicated with number 24 is not replaceable.)

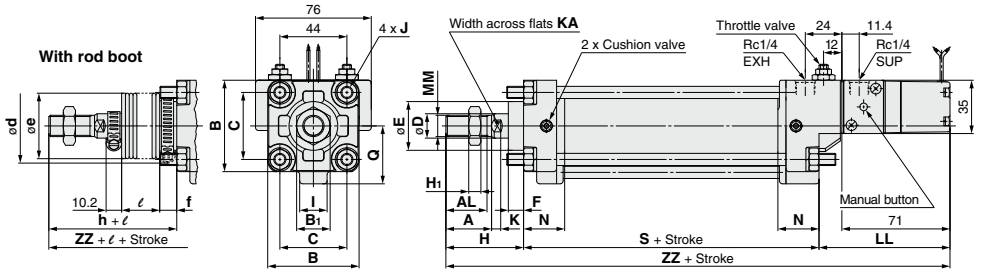
* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g), GR-S-020 (20 g)

For the dimensions of DIN terminal, refer to page 1225.

CV3 Series

Basic Type: CV3B

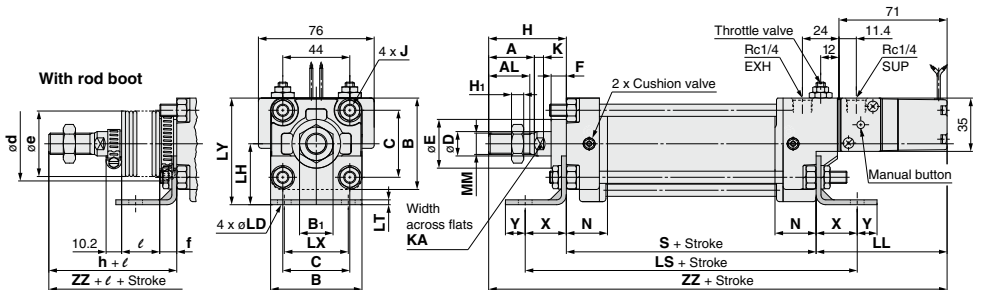


| Bore size (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | I | J | K | KA | LL | MM | N | Q | S |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|----|------------|----|----|----|-----------|----|------|-----|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | 18 | M8 x 1.25 | 6 | 14 | 86 | M14 x 1.5 | 27 | 38 | 84 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | 18 | M8 x 1.25 | 7 | 18 | 83 | M18 x 1.5 | 30 | 43.5 | 90 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | 18 | M10 x 1.25 | 7 | 18 | 83 | M18 x 1.5 | 31 | 49 | 98 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | 20 | M12 x 1.75 | 10 | 22 | 84 | M22 x 1.5 | 37 | 63 | 116 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | 20 | M12 x 1.75 | 10 | 26 | 85 | M26 x 1.5 | 40 | 73 | 126 |

| Bore size (mm) | Without rod boot | | With rod boot | | | | | |
|----------------|------------------|-----|---------------|----|------|----|------------|-----|
| | H | ZZ | d | e | f | h | ℓ | ZZ |
| 40 | 51 | 221 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 229 |
| 50 | 58 | 231 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 239 |
| 63 | 58 | 239 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 247 |
| 80 | 71 | 271 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 280 |
| 100 | 72 | 283 | 76 | 65 | 14 | 81 | 1/4 stroke | 292 |

* The minimum stroke of the one with rod boot is 20 mm or more.

Axial Foot Type: CV3L

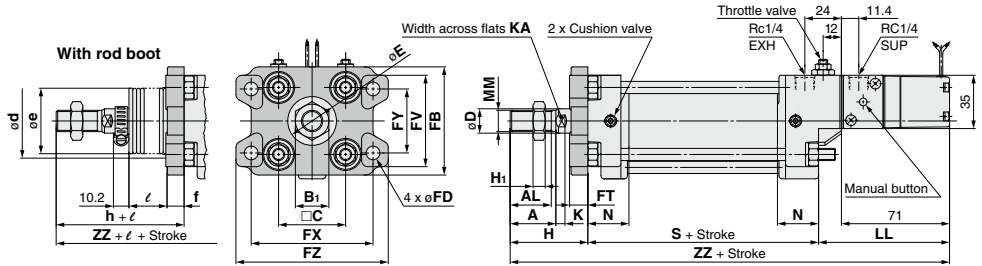


| Bore size (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | J | K | KA | LD | LH | LL | LS | LT | LX | LY |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|------------|----|----|------|----|----|-----|-----|----|-----|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | M8 x 1.25 | 6 | 14 | 9 | 40 | 86 | 138 | 3.2 | 42 | 70 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | M8 x 1.25 | 7 | 18 | 9 | 45 | 83 | 144 | 3.2 | 50 | 80 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | M10 x 1.25 | 7 | 18 | 11.5 | 50 | 83 | 166 | 3.2 | 59 | 93 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | M12 x 1.75 | 10 | 22 | 13.5 | 65 | 84 | 204 | 4.5 | 76 | 116 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | M12 x 1.75 | 10 | 26 | 13.5 | 75 | 85 | 212 | 6 | 92 | 133 |

| Bore size (mm) | MM | N | S | X | Y | Without rod boot | | With rod boot | | | | | |
|----------------|-----------|----|-----|----|----|------------------|-----|---------------|----|------|----|------------|-----|
| | | | | | | H | ZZ | d | e | f | h | ℓ | ZZ |
| 40 | M14 x 1.5 | 27 | 84 | 27 | 13 | 51 | 221 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 229 |
| 50 | M18 x 1.5 | 30 | 90 | 27 | 13 | 58 | 231 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 239 |
| 63 | M18 x 1.5 | 31 | 98 | 34 | 16 | 58 | 239 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 247 |
| 80 | M22 x 1.5 | 37 | 116 | 44 | 16 | 71 | 271 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 280 |
| 100 | M26 x 1.5 | 40 | 126 | 43 | 17 | 72 | 283 | 76 | 65 | 14 | 81 | 1/4 stroke | 292 |

The minimum stroke of the one with rod boot is 20 mm or more. * Long stroke

Rod Side Flange Type: CV3F



| Bore size (mm) | | | | | | | | | | | | | | | | | | | (mm) | |
|----------------|--------------------|----|----|-----|----------------|----|----|----|-----|------|----|-----|-----|----|-----|----------------|----|------------|------|----|
| Bore size (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | D | E | FB | FD | FT | FV | FX | FY | FZ | H ₁ | I | J | K | KA |
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 71 | 9 | 12 | 60 | 80 | 42 | 100 | 8 | 18 | M8 x 1.25 | 6 | 14 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 81 | 9 | 12 | 70 | 90 | 50 | 110 | 11 | 18 | M8 x 1.25 | 7 | 18 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 101 | 11.5 | 15 | 86 | 105 | 59 | 130 | 11 | 18 | M10 x 1.25 | 7 | 18 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 119 | 13.5 | 18 | 102 | 130 | 76 | 160 | 13 | 20 | M12 x 1.75 | 10 | 22 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 133 | 13.5 | 18 | 116 | 150 | 92 | 180 | 16 | 20 | M12 x 1.75 | 10 | 26 |

| Bore size (mm) | LL | MM | N | Q | S | Without rod boot | | With rod boot | | | | | | |
|----------------|----|-----------|----|------|-----|------------------|-----|---------------|----|------|----|---|------------|-----|
| | | | | | | H | ZZ | ★d | e | f | h | ℓ | ZZ | |
| 40 | 86 | M14 x 1.5 | 27 | 38 | 84 | 51 | 221 | 56 | 43 | 11.2 | 59 | | 1/4 stroke | 229 |
| 50 | 83 | M18 x 1.5 | 30 | 43.5 | 90 | 58 | 231 | 64 | 52 | 11.2 | 66 | | 1/4 stroke | 239 |
| 63 | 83 | M18 x 1.5 | 31 | 49 | 98 | 58 | 239 | 64 | 52 | 11.2 | 66 | | 1/4 stroke | 247 |
| 80 | 84 | M22 x 1.5 | 37 | 63 | 116 | 71 | 271 | 76 | 65 | 12.5 | 80 | | 1/4 stroke | 280 |
| 100 | 85 | M26 x 1.5 | 40 | 73 | 126 | 72 | 283 | 76 | 65 | 14 | 81 | | 1/4 stroke | 292 |

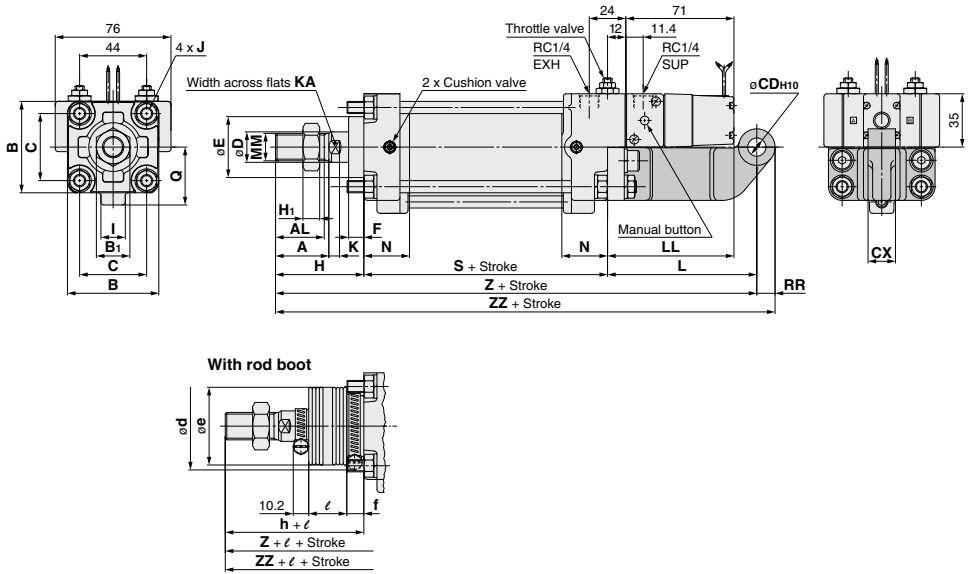
* The minimum stroke of the one with rod boot is 20 mm or more. ★ When drilling holes to get through the rod boot for the purpose of mounting, make the holes larger than the outer diameter (ød) of the rod boot mounting bracket.

** Long stroke

CV3 Series

Single Clevis Type: CV3C

Bore size $\phi 40$ is not available.



** Bore size $\phi 40$ is not available.

(mm)

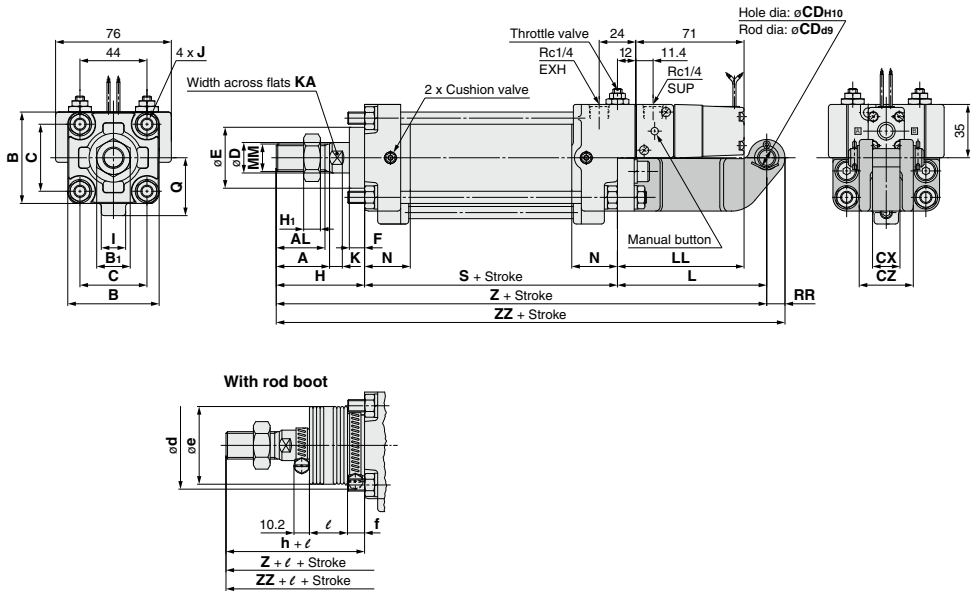
| Bore size** (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | CDH10 | CX | D | E | F | H ₁ | I | J | K | KA | L | LL |
|---------------------|-----------------------|----|----|-----|----------------|----|-----------------------------------|--------------------------------------|----|----|----|----------------|----|------------|----|----|-----|----|
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 12 ^{+0.070} ₀ | 18 ^{-0.1} _{-0.3} | 20 | 40 | 10 | 11 | 18 | M8 x 1.25 | 7 | 18 | 98 | 83 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 16 ^{+0.070} ₀ | 25 ^{-0.1} _{-0.3} | 20 | 40 | 10 | 11 | 18 | M10 x 1.25 | 7 | 18 | 100 | 83 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 20 ^{+0.084} ₀ | 31.5 ^{-0.1} _{-0.3} | 25 | 52 | 14 | 13 | 20 | M12 x 1.75 | 10 | 22 | 105 | 84 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 25 ^{+0.084} ₀ | 35.5 ^{-0.1} _{-0.3} | 30 | 52 | 14 | 16 | 20 | M12 x 1.75 | 10 | 26 | 110 | 85 |

| Bore size (mm) | MM | N | Q | RR | S | Without rod boot | | | With rod boot | | | | | |
|-------------------|-----------|----|------|----|-----|------------------|-----|-----|---------------|----|------|----|------------|-----|
| | | | | | | H | Z | ZZ | d | e | f | h | ℓ | ZZ |
| 50 | M18 x 1.5 | 30 | 43.5 | 12 | 90 | 58 | 246 | 258 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 266 |
| 63 | M18 x 1.5 | 31 | 49 | 16 | 98 | 58 | 256 | 272 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 280 |
| 80 | M22 x 1.5 | 37 | 63 | 20 | 116 | 71 | 292 | 312 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 321 |
| 100 | M26 x 1.5 | 40 | 73 | 25 | 126 | 72 | 308 | 333 | 76 | 65 | 14 | 81 | 1/4 stroke | 342 |

* The minimum stroke of the one with rod boot is 20 mm or more.

Double Clevis Type: CV3D

Bore size $\phi 40$ is not available.



** Bore size $\phi 40$ is not available.

(mm)

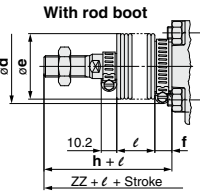
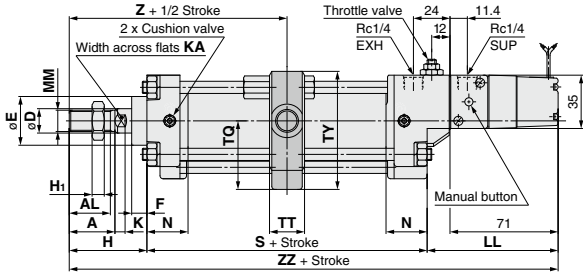
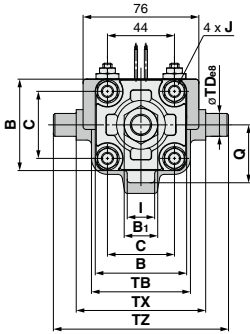
| Bore size** (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | CD | CX | CZ | D | E | F | H ₁ | I | J | K | KA | L |
|------------------|--------------------|----|----|-----|----------------|----|----|--------------------------------------|------|----|----|----|----------------|----|------------|----|----|-----|
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 12 | 18 ^{+0.3} _{-0.1} | 35.5 | 20 | 40 | 10 | 11 | 18 | M8 x 1.25 | 7 | 18 | 98 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 16 | 25 ^{+0.3} _{-0.1} | 50 | 20 | 40 | 10 | 11 | 18 | M10 x 1.25 | 7 | 18 | 100 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 20 | 31.5 ^{+0.3} _{-0.1} | 63 | 25 | 52 | 14 | 13 | 20 | M12 x 1.75 | 10 | 22 | 105 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 25 | 35.5 ^{+0.3} _{-0.1} | 71 | 30 | 52 | 14 | 16 | 20 | M12 x 1.75 | 10 | 26 | 110 |

| Bore size** (mm) | LL | MM | N | Q | RR | S | Without rod boot | | | With rod boot | | | | | |
|------------------|----|-----------|----|------|----|-----|------------------|-----|-----|---------------|----|------|----|------------|-----|
| | | | | | | | H | Z | ZZ | d | e | f | h | ℓ | ZZ |
| 50 | 83 | M18 x 1.5 | 30 | 43.5 | 12 | 90 | 58 | 246 | 258 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 266 |
| 63 | 83 | M18 x 1.5 | 31 | 49 | 16 | 98 | 58 | 256 | 272 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 280 |
| 80 | 84 | M22 x 1.5 | 37 | 63 | 20 | 116 | 71 | 292 | 312 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 321 |
| 100 | 85 | M26 x 1.5 | 40 | 73 | 25 | 126 | 72 | 308 | 333 | 76 | 65 | 14 | 81 | 1/4 stroke | 342 |

* Clevis pin, flat washer and cotter pin are shipped together. The minimum stroke with rod boot is 20 mm or more.

CV3 Series

Center Trunnion Type: CV3T



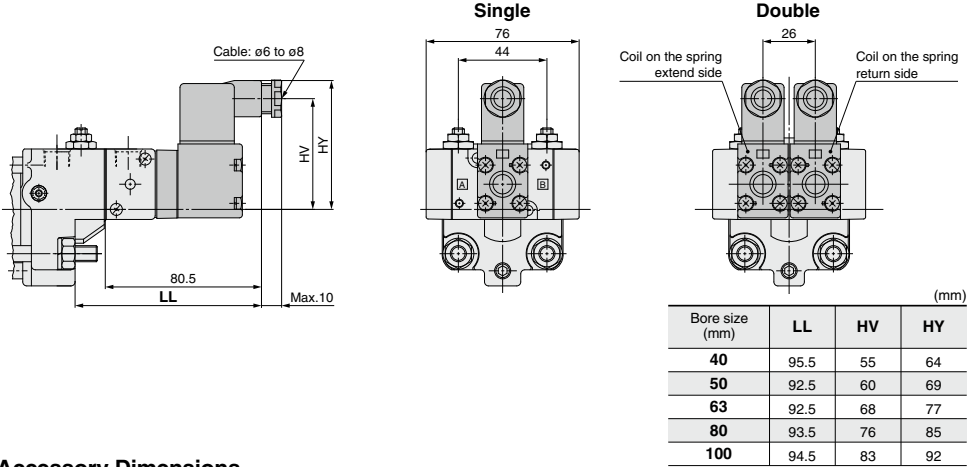
| Bore size (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | I | J | K | KA | LL | MM | N | Q |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|----|------------|----|----|----|-----------|----|------|
| 40 | 25 to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | 18 | M8 x 1.25 | 6 | 14 | 86 | M14 x 1.5 | 27 | 38 |
| 50 | 25 to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | 18 | M8 x 1.25 | 7 | 18 | 83 | M18 x 1.5 | 30 | 43.5 |
| 63 | 50 to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | 18 | M10 x 1.25 | 7 | 18 | 83 | M18 x 1.5 | 31 | 49 |
| 80 | 50 to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | 20 | M12 x 1.75 | 10 | 22 | 84 | M22 x 1.5 | 37 | 63 |
| 100 | 50 to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | 20 | M12 x 1.75 | 10 | 26 | 85 | M26 x 1.5 | 40 | 73 |

(mm)

| Bore size (mm) | S | TB | øTD ₈₈ | TI | TQ | TT | TX | TY | TZ | Without rod boot | | | With rod boot | | | | | |
|----------------|-----|-----|--|----|------|----|-----|-------|-----|------------------|-----|-----|---------------|----|------|----|------------|-----|
| | | | | | | | | | | H | Z | ZZ | d | e | f | h | ℓ | ZZ |
| 40 | 84 | 65 | 15 ^{-0.032} _{-0.059} | 20 | 45 | 23 | 85 | 77.5 | 115 | 51 | 93 | 221 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 229 |
| 50 | 90 | 75 | 15 ^{-0.032} _{-0.059} | 20 | 50 | 23 | 95 | 87.5 | 125 | 58 | 103 | 231 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 239 |
| 63 | 98 | 90 | 18 ^{-0.032} _{-0.059} | 20 | 57 | 28 | 110 | 102 | 146 | 58 | 107 | 239 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 247 |
| 80 | 116 | 110 | 25 ^{-0.040} _{-0.073} | 24 | 69.5 | 35 | 140 | 124.5 | 190 | 71 | 129 | 271 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 280 |
| 100 | 126 | 130 | 25 ^{-0.040} _{-0.073} | 24 | 79.5 | 43 | 162 | 144.5 | 212 | 72 | 135 | 283 | 76 | 65 | 14 | 81 | 1/4 stroke | 292 |

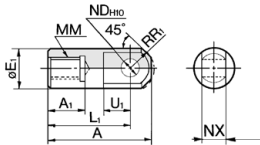
* The minimum stroke of the one with rod boot is 20 mm or more.

Electrical Entry: Dimensions for DIN Terminal



Accessory Dimensions

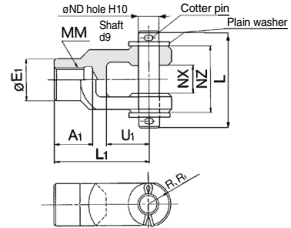
I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

| Part no. | Applicable bore size (mm) | A | A ₁ | øE ₁ | L ₁ | MM | R ₁ | U ₁ | øND _{H10} | NX |
|-------------|---------------------------|-----|----------------|-----------------|----------------|-----------|----------------|----------------|-----------------------------------|------------------------------------|
| I-04 | 40 | 69 | 22 | 24 | 55 | M14 x 1.5 | 15.5 | 20 | 12 ^{+0.070} ₀ | 16 ^{-0.1} _{-0.2} |
| I-05 | 50, 63 | 74 | 27 | 28 | 60 | M18 x 1.5 | 15.5 | 20 | 12 ^{+0.070} ₀ | 16 ^{-0.1} _{-0.2} |
| I-08 | 80 | 91 | 37 | 36 | 71 | M22 x 1.5 | 22.5 | 26 | 18 ^{+0.070} ₀ | 28 ^{-0.1} _{-0.3} |
| I-10 | 100 | 105 | 37 | 40 | 83 | M26 x 1.5 | 24.5 | 28 | 20 ^{+0.084} ₀ | 30 ^{-0.1} _{-0.2} |

Y Type Double Knuckle Joint

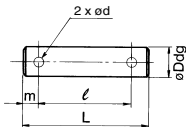


Material: Cast iron (mm)

| Part no. | Applicable bore size (mm) | A ₁ | U ₁ | E ₁ | Li | MM | R ₁ | U ₁ | ND | NX | NZ | L | Cotter pin size | Plain washer size |
|--------------|---------------------------|----------------|----------------|----------------|-----------|----|----------------|----------------|------------------------------------|----|------|-----------|-------------------|-------------------|
| Y-04D | 40 | 22 | 24 | 55 | M14 x 1.5 | 13 | 25 | 12 | 16 ^{+0.03} _{0.1} | 38 | 55.5 | ø3 x 18 L | Polished round 12 | |
| Y-05D | 50, 63 | 27 | 28 | 60 | M18 x 1.5 | 15 | 27 | 12 | 16 ^{+0.03} _{0.1} | 38 | 55.5 | ø3 x 18 L | Polished round 12 | |
| Y-08D | 80 | 37 | 36 | 71 | M22 x 1.5 | 19 | 28 | 18 | 28 ^{+0.03} _{0.1} | 55 | 76.5 | ø4 x 25 L | Polished round 18 | |
| Y-10D | 100 | 37 | 40 | 83 | M26 x 1.5 | 21 | 38 | 20 | 30 ^{+0.03} _{0.1} | 61 | 83 | ø4 x 30 L | Polished round 20 | |

* Knuckle pin, cotter pin, and plain washer are shipped together.

Clevis Pin

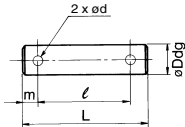


Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | øDd9 | L | ød | ℓ | m | Applicable plain washer | Applicable cotter pin |
|---------------|---------------------------|--|------|----|------|-----|-------------------------|-----------------------|
| CDP-3A | 50 | 12 ^{+0.060} _{-0.090} | 55.5 | 3 | 47.5 | 4.0 | Polished round 12 | 3 x 18 |
| CVD-06 | 63 | 16 ^{+0.060} _{-0.090} | 75 | 4 | 65 | 5.0 | Polished round 16 | 4 x 22 |
| CVD-08 | 80 | 20 ^{+0.060} _{-0.117} | 94 | 5 | 79 | 7.5 | Polished round 20 | 5 x 30 |
| CVD-10 | 100 | 25 ^{+0.060} _{-0.117} | 105 | 5 | 90 | 7.5 | Polished round 24 | 5 x 35 |

* Cotter pins and flat washers are included.

Knuckle Pin

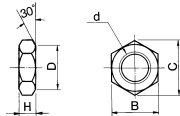


Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | øDd9 | L | ℓ | m | ød (Drill through) | Applicable cotter pin | Applicable plain washer |
|---------------|---------------------------|--|------|------|---|--------------------|-----------------------|-------------------------|
| CDP-3A | 40, 50, 63 | 12 ^{+0.060} _{-0.090} | 55.5 | 47.5 | 4 | 3 | ø3 x 18 L | Polished round 12 |
| CDP-5A | 80 | 18 ^{+0.060} _{-0.090} | 76.5 | 66.5 | 5 | 4 | ø4 x 25 L | Polished round 18 |
| CDP-6A | 100 | 20 ^{+0.060} _{-0.117} | 83 | 73 | 5 | 4 | ø4 x 30 L | Polished round 20 |

* Cotter pins and flat washers are included.

Rod End Nut



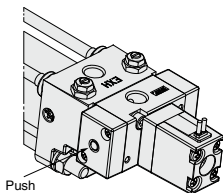
Material: Rolled steel (mm)

| Part no. | Applicable bore size (mm) | d | H | 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 | 31 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | 47.3 | 39 |

CV3 Series

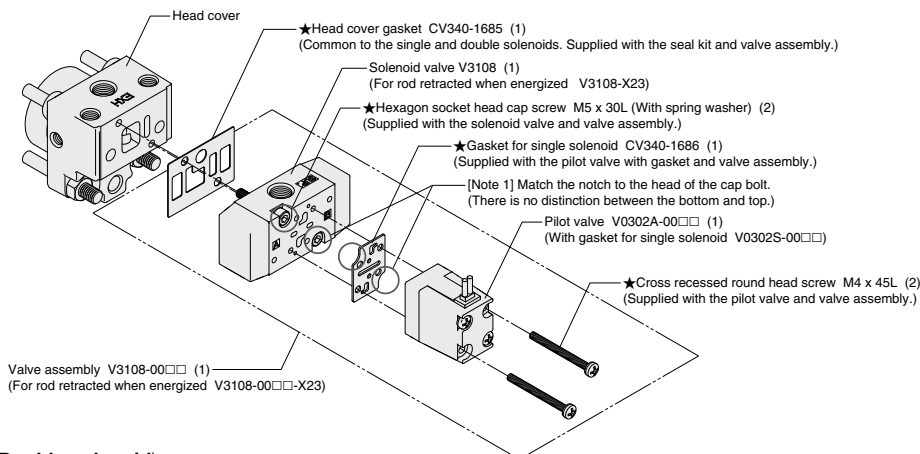
Manual Operation

Manual operation (non-locking) is possible by pushing the manual button about 3 mm.

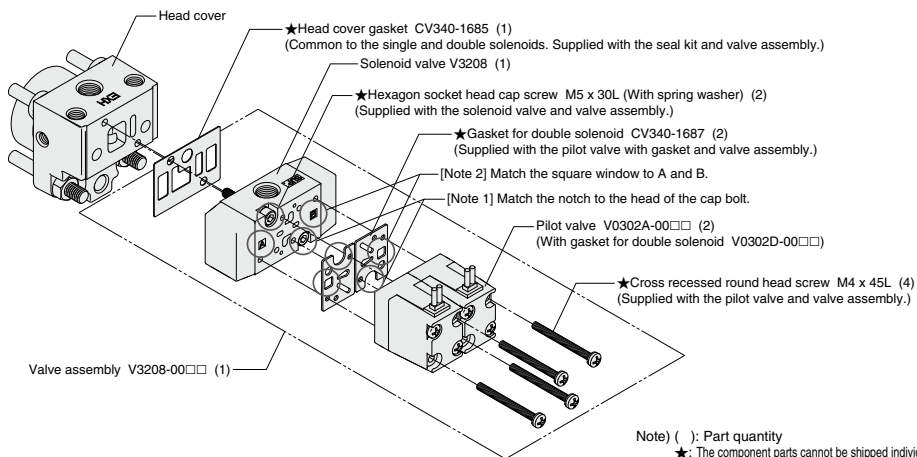


Solenoid Valve Replacement and Order No.

<Single solenoid>



<Double solenoid>



Note) () : Part quantity

★: The component parts cannot be shipped individually.



CV3 Series Specific Product Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5-port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Handling

⚠ Caution

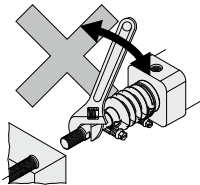
1. Do not open the cushion valve beyond the stopper.
A retaining ring is installed as a cushion valve retention mechanism. Do not open the cushion valve beyond it. If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.

| Bore size (mm) | Width across flats | Socket wrench |
|----------------|--------------------|-----------------------------------|
| 40, 50 | 2.5 | JIS 4648 Hexagonal wrench key 2.5 |
| 63, 80, 100 | 4 | JIS 4648 Hexagonal wrench key 4 |

2. Use the air cushion at the end of cylinder stroke.
Otherwise, the tie-rod or piston rod assembly will be damaged.

⚠ 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.



Selection

⚠ Warning

1. Confirm the specifications.
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)
2. Energizing continuously for a long period of time
When the valve is continuously energized for a long period of time, the performance may deteriorate or effect peripheral equipment adversely since temperature rises when coils generate heat.

Disassembly/Replacement

⚠ Caution

1. Use a socket wrench when the bracket is replaced.
If other tools are used, the nut or other parts may be deformed or the work efficiency may decrease.
For applicable sockets, refer to the table below.

| Bore size (mm) | Nut | Width across flats | Socket | Tightening torque (N·m) |
|----------------|-----------------------------------|--------------------|-----------------------|-------------------------|
| 40, 50 | DA00180 | 13 | JIS B4636 | 7.4 |
| | (M8 x 1.25, Hexagon nut 3 types) | | + Two-angle socket 13 | |
| 63 | DA00008 | 17 | JIS B4636 | 20 |
| | (M10 x 1.25, Hexagon nut 3 types) | | + Two-angle socket 17 | |
| 80, 100 | DA00013 | 19 | JIS B4636 | 29 |
| | (M12 x 1.75, Hexagon nut 3 types) | | + Two-angle socket 19 | |

2. Do not replace the bushing.
As the bushing is press-fit, replace the cover assembly when the bushing must be replaced.
3. When a seal is replaced, apply grease to the new seal before it is assembled.
Operation of the cylinder without greasing will result in extreme abrasion of the seal, causing premature air leakage.
4. Do not disassemble the trunnion type cylinder because the mounting precision is required.
It is difficult to align the axial center of the trunnion with the axial center of the cylinder. Thus, if this type of cylinder is disassembled and reassembled, the required dimensional accuracy cannot be attained, which may lead to malfunctions.

Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting

CV3K Series

ø40, ø50, ø63

How to 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) CDV3KL40-100-1

| | | Suffix for cylinder | |
|----------|-----|---------------------------|--|
| Rod boot | J | Nylon tarpaulin | |
| | K | Heat resistant tarpaulin | |
| Cushion | N | Without cushion | |
| | R | With cushion on rod end | |
| | H | With cushion on head end | |
| | Nil | With cushion on both ends | |

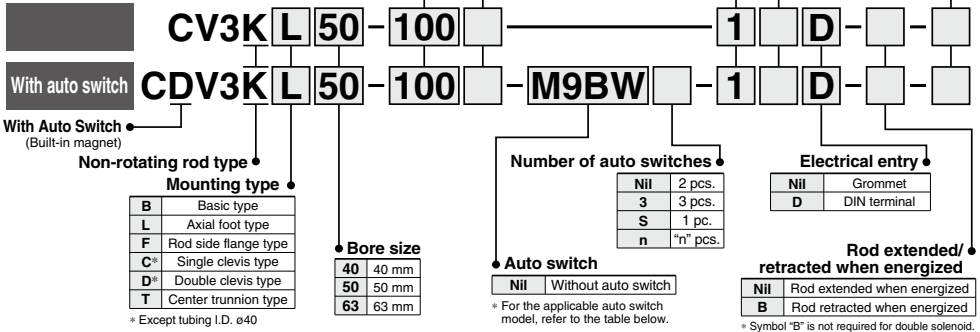
* When specifying symbol more than one, combine symbols alphabetically.

| Solenoid valve | |
|----------------|-------------------|
| Nil | 2 position single |
| W | 2 position double |

Made to Order
Refer to page 1229 for details.

Solenoid valve voltage
Refer to page 1229 for solenoid valve voltage.

Cylinder stroke (mm)
Refer to page 1229 for standard strokes.



Applicable Auto Switches

Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | 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) | | | | G59** | ● | ● | ● | ○ | ○ | | | |
| | | | 2-wire | | | | G5P** | ● | ● | ● | ○ | ○ | | | |
| | | Terminal conduit | 3-wire (NPN) | | | | M9B | ● | ● | ● | ○ | ○ | | | |
| | | | 2-wire | | | | K59** | ● | ● | ● | ○ | ○ | | | |
| | | | 3-wire (NPN) | | | | G39C | ● | ● | ● | ○ | ○ | | | |
| | Diagnostic indication (2-color indicator) | Grommet | 2-wire | K39C | ● | ● | ● | ○ | ○ | | | | | | |
| | | | 3-wire (NPN) | M9NW | ● | ● | ● | ○ | ○ | | | | | | |
| | | | 3-wire (PNP) | G59W** | ● | ● | ● | ○ | ○ | | | | | | |
| | | Terminal conduit | 2-wire | M9PW | ● | ● | ● | ○ | ○ | | | | | | |
| | | | 3-wire (NPN) | G59W** | ● | ● | ● | ○ | ○ | | | | | | |
| | | | 3-wire (PNP) | M9BW | ● | ● | ● | ○ | ○ | | | | | | |
| Water resistant (2-color indicator) | Grommet | 2-wire | K59W** | ● | ● | ● | ○ | ○ | | | | | | | |
| | | 3-wire (NPN) | M9NA*1 | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| | | 3-wire (PNP) | M9PA*1 | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| | Terminal conduit | 2-wire | M9BA*1 | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| | | 3-wire (NPN) | F59F | ● | ● | ● | ○ | ○ | | | | | | | |
| | | 4-wire (NPN) | G59F** | ● | ● | ● | ○ | ○ | | | | | | | |
| Reed auto switch | — | Grommet | 2-wire (NPN equivalent) | 24 V | 12 V | — | A96 Z76*** | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | |
| | | | 2-wire | | | | A93 Z73** | ● | ● | ● | ○ | ○ | | | |
| | | | 2-wire | | | | A90 Z80*** | ● | ● | ● | ○ | ○ | | | |
| | | Terminal conduit | 2-wire | | | | A54 | B54** | ● | ● | ● | ○ | | | ○ |
| | | | 2-wire | | | | A64 | B64** | ● | ● | ● | ○ | | | ○ |
| | | | 2-wire | | | | A33C | A33 | — | — | — | — | | | — |
| | Diagnostic indication (2-color indicator) | Terminal conduit | 2-wire | A34C | A34 | — | — | — | — | | | | | | |
| | | | 2-wire | A44C | A44 | — | — | — | — | | | | | | |
| | | | 2-wire | A59W | B59W** | ● | ● | ● | ○ | ○ | | | | | |
| | | DIN terminal | 2-wire | A44C | A44 | — | — | — | — | | | | | | |
| | | | 2-wire | A59W | B59W** | ● | ● | ● | ○ | ○ | | | | | |
| | | | 2-wire | A44C | A44 | — | — | — | — | | | | | | |

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

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

*3 2 1 m type lead wire is only applicable to D-A93.

*4 Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NZ

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

** D-B5C/B64/G5/K5C□ types are mountable only upon a receipt of order.

(Not mountable after the time of shipment)

*** D-A9□ cannot be mounted on ø50. Select auto switches in brackets.

*6 Since there are other applicable auto switches than listed, refer to page 1236 for details.

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

*8 D-A9□/M9□/M9□/WM9□/A auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Adjustable speed.

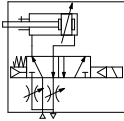
Built-in throttle valves are provided to enable speed adjustments in each direction.

A manual operation mechanism is provided as standard equipment (non-locking).

An auto switch cylinder with the switch installed can also be manufactured.



Symbol
Air cushion



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

| Symbol | Specifications |
|--------|--------------------------|
| -XA□ | Change of rod end shape |
| -XC15 | Change of tie-rod length |

Refer to pages 1232 to 1236 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Bore size (mm) | | 40 | 50 | 63 |
|-------------------------------|--------------------------------------|--|------|------|
| Fluid | | Air | | |
| Proof pressure | | 1.35 MPa | | |
| Maximum operating pressure | | 0.9 MPa | | |
| Minimum operating pressure | | 0.15 MPa | | |
| Ambient and fluid temperature | | -10 to 50°C | | |
| Piston speed | | 50 to 500 mm/s | | |
| Cushion | | Air cushion | | |
| Stroke length tolerance | | Up to 250 st: $^{+1.0}_0$, 251 to 600 st: $^{+1.4}_0$ | | |
| Rod non-rotating accuracy | | $\pm 0.8^\circ$ | | |
| Allowable rotational torque | | 0.44 N·m or less | | |
| Lubrication | | Not required (Non-lube) | | |
| Mounting | | Basic, Axial foot, Rod flange, Single clevis Double clevis, Center trunnion | | |
| Allowable kinetic energy (J) | Air cushion | 2.8 | 4.6 | 7.8 |
| | When activated When not activated | 0.33 | 0.56 | 0.91 |

* No freezing

Solenoid Valve Specifications

| Applicable solenoid valve model | | V3□08 | |
|------------------------------------|---------|--|--------------|
| Coil rated voltage | | Refer to the solenoid valve voltage shown below. | |
| Electrical entry | | Grommet, DIN terminal | |
| Allowable voltage | | -15 to 10% of the rated voltage | |
| Coil insulation | | Class B or equivalent (130°C) | |
| Apparent power ^{Note)} | AC | Inrush | 50 Hz 8.5 VA |
| | | 60 Hz 7.5 VA | |
| | Holding | 50 Hz 7.0 VA | |
| | | 60 Hz 5.5 VA | |
| Power consumption ^{Note)} | DC | 6 W | |

Note) At the rated voltage.

Solenoid valve voltage

| | |
|---|--------------------|
| 1 | 100 VAC (50/60 Hz) |
| 2 | 200 VAC (50/60 Hz) |
| 3 | 110 VAC (50/60 Hz) |
| 4 | 220 VAC (50/60 Hz) |
| 5 | 24 VDC |
| 6 | 12 VDC |
| 7 | 240 VAC (50/60 Hz) |
| 8 | 48 VAC (50/60 Hz) |
| B | 24 VAC (50/60 Hz) |
| P | 100 VDC |
| V | 6 VDC |
| Y | 48 VDC |
| Z | 110 VDC |

* For other rated voltages, please contact SMC.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Standard Stroke

| Bore size (mm) | Standard stroke (mm) |
|----------------|--|
| 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500* |
| 50, 63 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600* |

Note) The cylinders with the standard strokes indicated above can be delivered in a short term. Intermediate stroke except mentioned above is manufactured upon receipt of order.

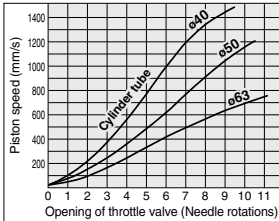
- When the auto switch is attached, the minimum stroke is going to be different. Refer to pages 1234 and 1235.

The minimum stroke length is different in the trunnion type. Refer to pages 1234 and 1235 for further information.

Please consult with SMC for longer strokes than the strokes marked with *.

CV3K Series

Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa, Horizontal mounting, No load, Spring return side
 • The speeds shown in the graph are for reference.

Weight

| Bore size (mm) | | 40 | 50 | 63 |
|--|---------------------------|------|------|------|
| Basic weight | Basic type | 1.20 | 1.52 | 2.36 |
| | Axial foot type | 1.37 | 1.72 | 2.65 |
| | Rod side flange type | 1.46 | 1.93 | 2.98 |
| | Single clevis type | — | 2.25 | 3.47 |
| | Double clevis type | — | 2.30 | 3.52 |
| | Trunnion type | 1.85 | 2.31 | 3.75 |
| Additional weight per each 50 mm of stroke | | 0.20 | 0.25 | 0.31 |
| Accessory bracket | Single knuckle | 0.23 | 0.26 | 0.26 |
| | Double knuckle (with pin) | 0.37 | 0.43 | 0.43 |

Calculation: (Example) CV3KL40-100-1

- Basic weight.....1.36 (kg)
- Additional weight.....0.20 (kg/50 st)
- Cylinder stroke.....100 (st) $1.36 + 0.20 \times 100 \div 50 = 1.76$ kg

Accessory

| Mounting | | Basic type | Foot type | Rod side flange type | Single clevis type | Double * clevis type | Center trunnion type |
|--------------------|----------------------------------|------------|-----------|----------------------|--------------------|----------------------|----------------------|
| Standard equipment | Rod end nut | ● | ● | ● | ● | ● | ● |
| | Clevis pin | — | — | — | — | ● | — |
| Option | Single knuckle joint | ● | ● | ● | ● | ● | ● |
| | Double knuckle joint* (with pin) | ● | ● | ● | ● | ● | ● |
| | With rod boot | ● | ● | ● | ● | ● | ● |

- * Pin, plain washer and cotter pin are shipped together with double clevis and double knuckle joint.
- * Refer to page 1225 for dimensions and part numbers of the option.
- Refer to page 1231 for dimensions of the rod boot.

Handling

1. Adjusting of the piston speed
2. Change of voltage specifications
3. Manual operation
4. Changing between rod extended when energized and rod retracted when energized.

Since the operations above 1. to 4. are the same as the CV3 series, refer to pages 1218 and 1226.

⚠ Precautions

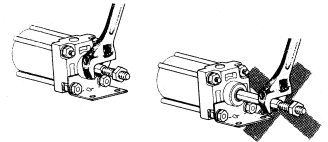
Be sure to read this before handling the products. Refer to page 9 for safety instructions and pages 1126 to 1128 for common precautions.

Operating Precautions

⚠ Caution

1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.

If rotational torque is applied, the non-rotating guide will become deformed, causing a loss of non-rotating accuracy. Also, to screw a bracket or a nut onto the threaded portion at the end of the piston rod, make sure the retract the piston rod entirely, and place a wrench on the parallel sections of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.



Disassembly/Replacement

⚠ Caution

1. When replacing rod seals, please contact SMC.
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.
2. Do not replace the non-rotating guide.
Since the non-rotating guide is press fitted, the entire cover assembly needs be replaced instead of a single part.

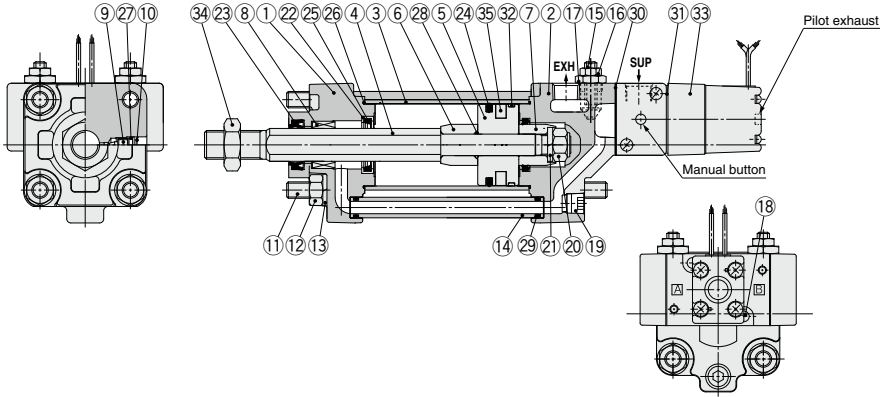
Selection

⚠ Warning

1. Confirm the specifications.
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)
2. Energizing continuously for a long period of time
When the valve is continuously energized for a long period of time, the performance may deteriorate or effect peripheral equipment adversely since temperature rises when coils generate heat.

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting **CV3K Series**

Construction



Component Parts

| No. | Description | Material | Qty | Note |
|-----|---|---------------------------|-----|--------------------------------|
| 1 | Rod cover | Aluminum die-casted | 1 | Black painted |
| 2 | Head cover | Aluminum die-casted | 1 | Black painted |
| 3 | Cylinder tube | Aluminum alloy | 1 | Hard anodized |
| 4 | Piston rod | Carbon steel | 1 | Hard chrome plated |
| 5 | Piston | Aluminum alloy | 1 | Trivalent zinc chromated |
| 6 | Cushion ring A | Rolled steel | 1 | Trivalent zinc chromated |
| 7 | Cushion ring B | Rolled steel | 1 | Trivalent zinc chromated |
| 8 | Non-rotating guide | Special friction material | 1 | |
| 9 | Cushion valve | Steel wire | 2 | Trivalent zinc chromated |
| 10 | Retaining ring | Spring steel | 2 | Phosphate coating |
| 11 | Tie-rod | Carbon steel | 4 | Trivalent zinc chromated |
| 12 | Tie-rod nut | Rolled steel | 6 | Trivalent black zinc chromated |
| 13 | Spring washer | Steel wire | 6 | Trivalent black zinc chromated |
| 14 | Pipe | Carbon steel tube | 1 | Trivalent zinc chromated |
| 15 | Needle | Free-cutting steel | 2 | Electroless nickel plated |
| 16 | Lock nut | Carbon steel | 2 | Trivalent zinc chromated |
| 17 | Needle guide | Free-cutting steel | 2 | Electroless nickel plated |
| 18 | Hex. socket head cap screw with SW | Carbon steel | 2 | Trivalent black zinc chromated |

| No. | Description | Material | Qty | Note |
|-----|-----------------------------|---------------------------|-----|--------------------------------|
| 19 | Plug | Chromium molybdenum steel | 1 | Trivalent black zinc chromated |
| 20 | Piston nut | Rolled steel | 1 | |
| 21 | Spring washer | Steel wire | 1 | |
| 22 | Cushion seal holder | Aluminum alloy | 1 | |
| 23 | Rod seal | NBR | 1 | |
| 24 | Piston seal | NBR | 1 | |
| 25 | Cushion seal | Urethane | 2 | |
| 26 | Cylinder tube gasket | NBR | 2 | |
| 27* | Cushion valve seal | NBR | 2 | |
| 28* | Piston gasket | NBR | 1 | |
| 29 | Pipe gasket | NBR | 2 | |
| 30 | Head cover gasket | NBR | 1 | |
| 31 | Solenoid gasket | NBR | 1 | For single solenoid |
| 32 | Wear ring | Resin | 1 | For double solenoid |
| 33 | Solenoid valve | — | 1 | |
| 34 | Rod end nut | Rolled steel | 1 | Zinc chromated |
| 35 | Magnet | — | (1) | |

* Not replaceable.

Replacement Parts: Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-----------|-------------------|
| 40 | CV3K40-PS | Set of nos. above |
| 50 | CV3K50-PS | 23, 24, 25, |
| 63 | CV3K63-PS | 25, 29, 30 |

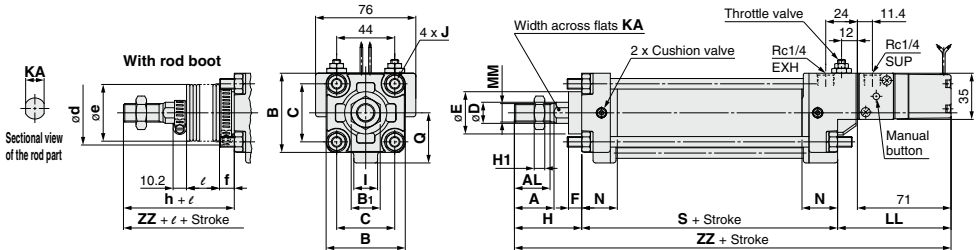
* Seal kit includes 23, 24, 25, 26, 29, 30. Order the seal kit, based on each bore size. (The parts indicated with numbers 27 and 28 are not replaceable.)

* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g).

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

Grease pack part no.: GR-S-010 (10 g),
GR-S-020 (20 g)

Basic Type: CV3KB□



| Bore size (mm) | Stroke range* (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | I | J | KA | LL | MM | N | Q | S |
|----------------|--------------------|----|----|----|----------------|----|----|----|----|----------------|----|------------|----|----|-----------|----|------|----|
| 40 | Up to 500 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | 18 | M8 x 1.25 | 14 | 86 | M14 x 1.5 | 27 | 38 | 84 |
| 50 | Up to 600 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | 18 | M8 x 1.25 | 18 | 83 | M18 x 1.5 | 30 | 43.5 | 90 |
| 63 | Up to 800 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | 18 | M10 x 1.25 | 18 | 83 | M18 x 1.5 | 31 | 49 | 98 |

| Bore size (mm) | Without rod boot | | With rod boot | | | | | |
|----------------|------------------|-----|---------------|----|------|----|------------|-----|
| | H | ZZ | d | e | f | h | l | ZZ |
| 40 | 51 | 221 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 229 |
| 50 | 58 | 231 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 239 |
| 63 | 58 | 239 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 247 |

* The minimum stroke of the one with rod boot is 20 mm or more.
** For dimensions of DIN terminal, refer to page 1225.

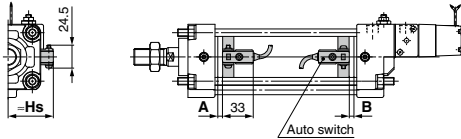
- External dimensions of each mounting bracket other than basic type are the same, except KA dimension. Refer to pages 1220 to 1225.
- For accessory, refer to page 1225.

Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

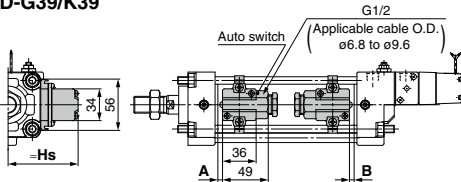
<Band mounting type>

D-B5□/B64/B59W



D-A3□

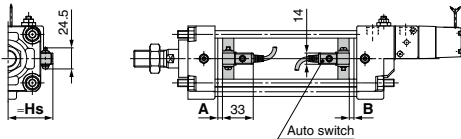
D-G39/K39



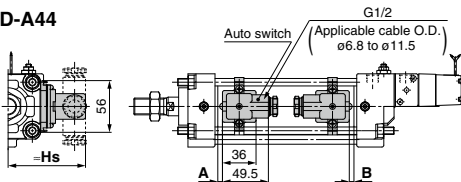
D-G5□/K59

D-G5□W/K59W

D-G59F/G5NT



D-A44



<Tie-rod mounting type>

D-A9□/A9□V

D-M9□/M9□V

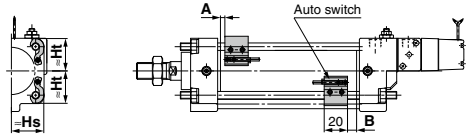
D-M9□W/M9□WV

D-M9□A/M9□AV

D-Z7□/Z80

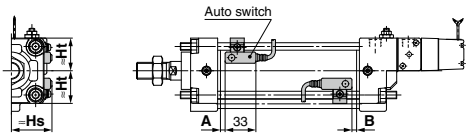
D-Y59□/Y69□/Y7P/Y7PV

D-Y7□W/Y7□WV



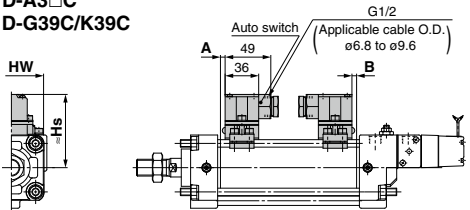
D-A5□/A6□

D-A59W



D-A3□C

D-G39C/K39C

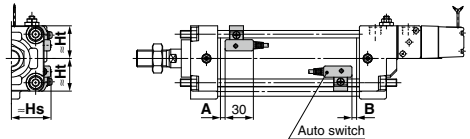


D-F5□/J59

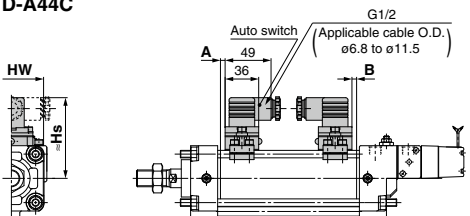
D-F5NT

D-F5□W/J59W

D-F59F



D-A44C



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-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA D-B59W D-Z7□ D-Z80 | | 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 | | D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA | | D-F5NT | | D-A59W | |
|-------------------|---|------|-----------------|------|--|-----|--|-----|--|-----|----------------|-----|--|------|--------|------|--------|------|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 40 | 10 | 8 | 6 | 4 | 3.5 | 1.5 | 0 | 0 | 2 | 0 | 0.5 | 0 | 6.5 | 4.5 | 11.5 | 9.5 | 4 | 2 |
| 50 | 10 | 8 | — | — | 3.5 | 1.5 | 0 | 0 | 2 | 0 | 0.5 | 0 | 6.5 | 4.5 | 11.5 | 9.5 | 4 | 2 |
| 63 | 12.5 | 11.5 | 8.5 | 7.5 | 6 | 5 | 2.5 | 1.5 | 4.5 | 3.5 | 3 | 2 | 9 | 8 | 14 | 13 | 6.5 | 5.5 |
| 80 | 16 | 14 | 12 | 10 | 9.5 | 7.5 | 6 | 4 | 8 | 6 | 6.5 | 4.5 | 12.5 | 10.5 | 17.5 | 15.5 | 10 | 8 |
| 100 | 17.5 | 16.5 | 13.5 | 12.5 | 11 | 10 | 7.5 | 6.5 | 9.5 | 8.5 | 8 | 7 | 14 | 13 | 19 | 18 | 11.5 | 10.5 |

Note 1) D-B5□, D-G5□ and D-K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

Note 2) D-A9□ and D-A9□V types cannot be mounted on ø50

Note 3) 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□W D-M9□A D-A9□ | | D-M9□V D-M9□WV D-M9□AV | | D-A9□V | | D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z80 | | D-Y69□ D-Y7PV D-Y7□WV | | D-G5□ D-K59 D-G5□W D-K59W D-G59F D-G5BA D-G5NT D-B5□ D-B64 D-B59W | | D-G39 D-K39 D-A3□ | | D-A44 | | D-J59 D-F5□W D-J59W D-F59F D-F5BA D-F5NT | | D-A5□ D-A6□ D-A59W | | D-G39C D-K39C D-A3□C | | D-A44C | |
|-------------------|------------------------------------|----|------------------------------|----|--------|----|---|------|-----------------------------|------|--|-------|-------------------------|------|-------|------|---|------|--------------------------|-----|----------------------------|-----|--------|----|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 40 | 30 | 30 | 34 | 30 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 37 | 71.5 | 81.5 | 38 | 31.5 | 38.5 | 31.5 | 73 | 69 | 81 | 69 | | |
| 50 | 34 | 34 | 38 | 34 | — | — | 34 | 34 | 34 | 34 | 34 | 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 | 41 | 41 | 49 | 83.5 | 93 | 47 | 43 | 46.5 | 43 | 85.5 | 91 | 93.5 | 91 | | |
| 80 | 49.5 | 49 | 52.5 | 49 | 50 | 49 | 49.5 | 49 | 49.5 | 49 | 49.5 | 57.5 | 92 | 102 | 53.5 | 51 | 53.5 | 51 | 94 | 107 | 102 | 107 | | |
| 100 | 56.5 | 56 | 61 | 56 | 58.5 | 56 | 58.5 | 55.5 | 57.5 | 55.5 | 68 | 102.5 | 112.5 | 61 | 57.5 | 61.5 | 57.5 | 104 | 121 | 112 | 121 | | | |

* D-A9□ and D-A9□V types cannot be mounted on ø50

CV3 Series

Minimum Stroke For Auto Switch Mounting

| | | n: Number of auto switches (mm) | | | | | |
|--|---|--|---|---|---|---|---|
| Auto switch model | No. of auto switches mounted | Mounting brackets other than center trunnion | Center trunnion | | | | |
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-A9□ | 2 (Different surfaces, Same surface), 1 | 15 | 80 | — | 90 | 105 | 115 |
| | 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} | | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} |
| D-A9□V | 2 (Different surfaces, Same surface), 1 | 10 | 80 | — | 90 | 105 | 115 |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1} | $80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | | $90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $105 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $115 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} |
| D-M9□ D-M9□W D-M9□A | 2 (Different surfaces, Same surface), 1 | 15 | 85 | 100 | 115 | 120 | |
| | n | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $120 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | |
| D-M9□V D-M9□WV D-M9□AV | 2 (Different surfaces, Same surface), 1 | 10 | 85 | 100 | 115 | 120 | |
| | n | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1} | $85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $100 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $115 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | $120 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2} | |
| D-A5□/A6□ D-F5□/J59 D-F5□W/J59W D-F59F | 2 (Different surfaces, 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, Same surface) | 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, 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-G59F D-G5NT | 2 | Different surfaces | 15 | 90 | 100 | 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, 4, 6, 8...) | $90 + 50 (n-2)$ (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 | |
| | | 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 | |
| D-A3□ D-G39 D-K39 | 2 | Different surfaces | 35 | 100 | 100 | 110 | |
| | | Same surface | 100 | | | | |
| | n | Different surfaces | $35 + 30 (n-2)$ (n = 2, 3, 4, ...) | $100 + 30 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | $100 + 30 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | $110 + 30 (n-2)$ (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} | $100 + 100 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | $110 + 100 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | |
| 1 | 10 | 100 | 100 | 110 | | | |
| D-A44 | 2 | Different surfaces | 35 | 90 | 100 | 110 | |
| | | Same surface | 55 | | | | |
| | n | Different surfaces | $35 + 30 (n-2)$ (n = 2, 3, 4, ...) | $90 + 30 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | $100 + 30 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | $110 + 30 (n-2)$ (n = 2, 4, 6, 8...) ^{Note 1} | |
| | | Same surface | $55 + 50 (n-2)$ (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 | |

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 | No. of auto switches mounted | Mounting brackets other than center trunnion | Center trunnion | | | | |
|--|---|---|---|---|---|---|--|
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-A3□C D-G39C D-K39C | 2 | Different surfaces | 20 | | 100 | | |
| | | Same surface | 100 | | 110 | | |
| | n | Different surfaces | $20 + 35(n-2)$ (n = 2, 3, 4, ...) | $100 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $100 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $110 + 35(n-2)$ (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)} | | $110 + 100(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | 1 | | 10 | 100 | 100 | 110 | |
| D-A44C | 2 | Different surfaces | 20 | | 90 | | |
| | | Same surface | 55 | | 110 | | |
| | n | Different surfaces | $25 + 35(n-2)$ (n = 2, 3, 4, ...) | $90 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $100 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $110 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | | Same surface | $55 + 50(n-2)$ (n = 2, 3, 4, ...) | $90 + 50(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $100 + 35(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | $110 + 50(n-2)$ (n = 2, 4, 6, 8...) ^{Note 1)} | |
| | 1 | | 10 | 90 | 100 | 110 | |
| D-Z7□/Z80 D-Y59□/Y7P D-Y7□W | 2 (Different surfaces, 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, 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)} |

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

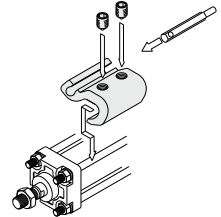
| Auto switch model | Bore size (mm) | | | | |
|-------------------|----------------|----|-----|-----|------|
| | 40 | 50 | 63 | 80 | 100 |
| D-A9□/A9□V | 7 | — | 9 | 9 | 9 |
| D-M9□/M9□V | 4.5 | 5 | 5.5 | 5 | 6 |
| D-M9□W/M9□WV | | | | | |
| D-M9□A/M9□AV | | | | | |
| D-Z7□/Z80 | 8 | 7 | 9 | 9.5 | 10.5 |
| D-A3□/A44 | 9 | 10 | 11 | 11 | 11 |
| D-A3□C/A44C | | | | | |
| D-A5□/A6□ | | | | | |
| D-B5□/B64 | 13 | 13 | 14 | 14 | 15 |
| D-A59W | | | | | |
| D-B59W | | | | | |
| D-Y59□/Y69□ | 8 | 7 | 5.5 | 6.5 | 6.5 |
| D-Y7P/Y7PV | | | | | |
| D-Y7□W/Y7□WV | | | | | |
| D-F5□/J59 | 4 | 4 | 4.5 | 4.5 | 4.5 |
| D-F5□W/J59W | | | | | |
| D-F5NT/F59F | | | | | |
| D-G5□/K59 | 5 | 6 | 6.5 | 6.5 | 7 |
| D-G5□W/K59W | | | | | |
| D-G5NT/G59F | | | | | |
| D-G39/K39 | 9 | 9 | 10 | 10 | 11 |
| D-G39C/K39C | | | | | |

* D-A9□ and D-A9□V types cannot be mounted on ø50.
 * Since this is a guideline including hysteresis, not meant to be guaranteed.
 (Assuming approximately ±30% dispersion.)
 There may be the case it will vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket Part No.

<Tie-rod mounting type>

| Auto switch model | Bore size (mm) | | | | |
|-------------------|----------------|---------|---------|---------|---------|
| | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V | BA7-040 | BA7-040 | BA7-063 | BA7-080 | BA7-080 |
| D-M9□W/M9□WV | | | | | |
| D-M9□A/M9□AV | | | | | |
| D-A9□/A9□V | | | | | |
| D-F5□/J59 | BT-04 | BT-04 | BT-06 | BT-08 | BT-08 |
| D-F5□W/J59W | | | | | |
| D-F59F/F59T | | | | | |
| D-A5□/A6□ | | | | | |
| D-A59W | | | | | |
| D-G39C/K39C | BA3-040 | BA3-050 | BA3-063 | BA3-080 | BA3-100 |
| D-A3□C/A44C | | | | | |
| D-Y59□/Y69□ | BA4-040 | BA4-040 | BA4-063 | BA4-080 | BA4-080 |
| D-Y7P/Y7PV | | | | | |
| D-Y7□W/Y7□WV | | | | | |
| D-Y7BA | | | | | |
| D-Z7□/Z80 | | | | | |



Mounting example of D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V)

<Band mounting type>

| Auto switch model | Bore size (mm) | | | | |
|-------------------|----------------|---------|---------|---------|---------|
| | 40 | 50 | 63 | 80 | 100 |
| D-G39/K39 | BD1-04M | BD1-05M | BD1-06M | BD1-08M | BD1-10M |
| D-A3□/A44 | | | | | |
| D-G5□/K59 | BA-04 | BA-05 | BA-06 | BA-08 | BA-10 |
| D-G5□W/K59W | | | | | |
| D-G59F | | | | | |
| D-G5NT | | | | | |
| D-B5□/B64 | | | | | |
| D-B59W | | | | | |

Note) 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.
 Ex.) 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

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

For detailed specifications, refer to pages 1341 to 1435.

| Auto switch type | Model | Electrical entry (Fetching direction) | 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 | | Diagnostic indication (2-color indicator) |
| | D-M9NWV, M9PWV, M9BWW | | |
| | D-Y7NWV, Y7PWV, Y7BWW | | — |
| | D-M9NAV, M9PAV, M9BAV | | Grommet (In-line) |
| | D-Y59A, Y59B, Y7P | Diagnostic indication (2-color indicator) | |
| | D-F59, F5P, J59 | | |
| | D-Y7NW, Y7PW, Y7BW | — | |
| | D-F59W, F5PW, J59W | — | |
| | D-F5NT, G5NT | — | |

* With pre-wired connector is also available in solid state auto switches.

For details, refer to pages 1410 and 1411.

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

Valve Mounted Cylinder Double Acting CVS1 Series

ø40, ø50, ø63, ø80, ø100

How to Order

Mounting type

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

Cylinder stroke (mm)

Refer to page 1239 for standard strokes.

Bore size

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

Electrical entry

| | |
|-----|--|
| Nil | Grommet |
| T | Conduit terminal |
| D | DIN terminal |
| DL | DIN terminal with indicator light |
| TZ | Conduit terminal with surge voltage suppressor |

Made to Order

Refer to page 1239 for details.

CVS1 L N 40 - 100 - 1 W D -

With auto switch **CDVS1** L N 40 - 100 - M9BW - 1 W D -

With Auto Switch

(Built-in magnet)

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) CDVS1LN40-100-1

Type

| | |
|-----|---------------|
| Nil | Aluminum tube |
| F* | Steel tube |

* Not available with auto switch.

Suffix for cylinder

| | | |
|----------|-----|---------------------------|
| Rod boot | J | Nylon tarpaulin |
| | K | Heat resistant tarpaulin |
| | N | Rubber bumper |
| Cushion | R | With cushion on rod end |
| | H | With cushion on head end |
| | Nil | With cushion on both ends |

* When specifying symbol more than one, combine symbols alphabetically.

Number of auto switches

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

Auto switch

Nil | Without auto switch

* For the applicable auto switch model, refer to the table below.

Solenoid valve voltage

Refer to page 1239 for the solenoid valve voltage.

Applicable Auto Switches

Refer to pages 1341 to 1435 for further information on auto switches.

| Type | Special function | Electrical entry | 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 | | | |
| | | | | | | | — | G59** | ● | — | ● | ○ | | | ○ | | |
| | | | 3-wire (PNP) | M9P | ● | ● | ● | ○ | ○ | | | | | | | | |
| | | — | | G5P** | ● | — | ● | ○ | ○ | | | | | | | | |
| | | 2-wire | M9B | ● | ● | ● | ○ | ○ | | | | | | | | | |
| | | | — | K59** | ● | — | ● | ○ | ○ | | | | | | | | |
| | Diagnostic indication (2-color indicator) | Terminal conduit | Yes | 3-wire (NPN) | 24 V | 12 V | — | G39C | G39 | — | — | — | — | | IC circuit | | |
| | | | | | | | | K39C | K39 | — | — | — | — | | | | |
| | | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | — | M9NW | ● | ● | ● | ○ | | ○ | IC circuit | |
| | | | | | | | | | — | G59W** | ● | — | ● | | ○ | | ○ |
| 2-wire | M9PW | ● | ● | ● | ○ | ○ | | | | | | | | | | | |
| | — | G5PW** | ● | — | ● | ○ | ○ | | | | | | | | | | |
| Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9BW | ● | ● | ● | ○ | ○ | — | | | | |
| | | | | | | | — | K59W** | ● | — | ● | ○ | | ○ | | | |
| | | | | | | | 2-wire | M9NA*1 | — | ○ | ○ | ● | | ○ | ○ | IC circuit | |
| | M9PA*1 | — | ○ | ○ | ● | ○ | | ○ | | | | | | | | | |
| | M9BA*1 | — | ○ | ○ | ● | ○ | | ○ | | | | | | | | | |
| | With diagnostic output (2-color indicator) | Grommet | Yes | 4-wire (NPN) | 24 V | 5 V, 12 V | — | F59F | G59F** | ● | ● | ● | ○ | ○ | IC circuit | | |
| — | | | | | | | | — | — | — | — | — | | | | | |
| — | | | | | | | | — | — | — | — | — | | | | | |
| Reed auto switch | — | Grommet | 2-wire (NPN equivalent) | 24 V | 12 V | — | A96 Z761** | — | ● | ● | — | — | IC circuit | Relay, PLC | | | |
| | | | | | | | 100 V | A93 Z73** | — | ● | ● | — | | | — | | |
| | | | | | | | 100 V or less | A90 Z80** | — | ● | ● | — | | | — | | |
| | | | | | | | 100 V, 200 V | A54 | B54** | ● | — | ● | | | — | — | |
| | | | | | | | 200 V or less | A64 | B64** | ● | — | ● | | | — | — | |
| | | Terminal conduit | Yes | 2-wire | 24 V | 12 V | — | — | A33C | A33 | — | — | — | | — | — | |
| | | | | | | | | | A34C | A34 | — | — | — | | — | | |
| | | | | | | | | | A44C | A44 | — | — | — | | — | | |
| | | | | | | | | | 100 V, 200 V | A44C | A44 | — | — | | — | | — |
| | | | | | | | | | — | A59W | B59W** | ● | — | | ● | | — |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
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) M9NW
5 m.....Z (Example) M9NW

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

** D-B5□/G5□/K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

*** D-A9□ cannot be mounted on ø50. Select auto switches in brackets.

* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
* D-A9□/M9□/W9□/A auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped).

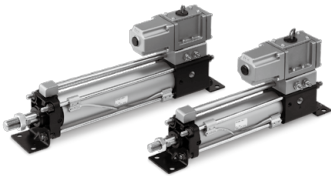
Speed controller installed

Operation type can be changed to rod extended when energized or rod retracted when energized.

A selection of solenoid valves is possible.

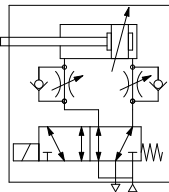
Single, double and 3 position solenoid valves are mountable.

An auto switch cylinder with the switch installed can also be manufactured.



Symbol

Air cushion



Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XC4 | With heavy duty scraper |
| -XC6 | Made of stainless steel |
| -XC14 | Change of trunnion bracket mounting position |
| -XC15 | Change of tie-rod length |

Refer to pages 1246 to 1251 for cylinders with auto switches.

- Proper auto switch mounting position (detection at stroke end) and mounting height
- Minimum auto switch mounting stroke
- Operating range
- Auto switch mounting bracket: Part no.

Specifications

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 |
|---------------------------------|---------------|--|------|------|------|------|
| Fluid | | Air | | | | |
| Action | | Double acting | | | | |
| Proof pressure | | 1.5 MPa | | | | |
| Maximum operating pressure | | 1.0 MPa | | | | |
| Ambient and fluid temperatures | | -10 to 60°C *1 | | | | |
| Minimum operating pressure | | 0.05 MPa | | | | |
| Piston speed | | 50 to 500 mm/s *3 | | | | |
| Cushion | | Air cushion or Rubber bumper | | | | |
| Stroke length tolerance | | Up to 250 ^{+0.10} , 251 to 1000 ^{+0.14} | | | | |
| Lubrication | | Not required (Non-lube) | | | | |
| Mounting | | Basic type, Foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type, Center trunnion type | | | | |
| Port size | | Rc 1/4 | | | | |
| Allowable kinetic energy (J) *2 | Air cushion | When activated | | | | |
| | | 2.8 | 4.6 | 7.8 | 16 | 29 |
| | Rubber bumper | 0.33 | 0.56 | 0.91 | 1.5 | 2.68 |
| | | 1.8 | 3.6 | 6.0 | 12.0 | 12.0 |

*1 No freezing

*2 Activate the air cushion when operating the cylinder. If this is not done, the piston rod assembly or the tie-rods will be damaged when the allowable kinetic energy exceeds the values shown in the above table.

*3 For operating piston speed for each size, refer to page 1240.

Solenoid Valve Specifications

| Applicable solenoid valve model | | VS4□24 | | |
|------------------------------------|----|--|-------|--------|
| Coil rated voltage | | Refer to the solenoid valve voltage shown below. | | |
| Electrical entry | | Grommet, Conduit terminal, DIN terminal, DIN terminal with indicator light, Conduit terminal with surge voltage suppressor | | |
| Allowable voltage | | -15 to 10% of the rated voltage | | |
| Coil insulation | | Class B or equivalent (130°C) | | |
| Apparent power ^{Note)} | AC | Inrush | 50 Hz | 100 VA |
| | | | 60 Hz | 90 VA |
| | | Holding | 50 Hz | 20 VA |
| | | | 60 Hz | 14 VA |
| Power consumption ^{Note)} | DC | 13.2 W | | |

Note) At the rated voltage.

Solenoid valve voltage

| | |
|---|--------------------|
| 1 | 100 VAC (50/60 Hz) |
| 2 | 200 VAC (50/60 Hz) |
| 3 | 110 VAC (50/60 Hz) |
| 4 | 220 VAC (50/60 Hz) |
| 5 | 24 VDC |
| 6 | 12 VDC |
| B | 24 VAC (50/60 Hz) |
| P | 100 VDC |
| W | 32 VDC |
| Y | 48 VDC |
| Z | 110 VDC |

For other rated voltages, please contact SMC.

Standard Strokes

| Bore size | Standard stroke (mm) | |
|-----------|--|----------------|
| | Stroke range ① | Stroke range ② |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500 | Up to 1000 |
| 50, 63 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600 | |
| 80, 100 | 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700 | |

Note 1) Intermediate strokes not listed above are produced upon receipt of order.

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 stroke range ① might not be able to fulfill the specifications due to the deflection etc.

Note 3) Please consult with SMC for manufacturability and the part numbers when exceeding the stroke range ②.

Note 4) The minimum stroke length is different in the trunnion type and types with auto switch. Refer to pages 1248 and 1249.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

CVS1 Series

Accessory

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

* Pin, plain washer and cotter pin are packaged together with double clevis and double knuckle joint.

* Refer to page 1245 for dimensions and part numbers of the option.
Refer to page 1242 for dimensions of the rod boot.

Weight

(kg)

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 |
|--|---------------------------|------------|------------|------------|------------|--------------|
| Basic weight | Basic type | 2.32(2.42) | 2.73(2.86) | 3.67(3.88) | 5.25(5.56) | 6.81(7.21) |
| | Axial foot type | 2.49(2.59) | 2.93(3.06) | 3.96(4.17) | 6.04(6.35) | 7.74(8.14) |
| | Rod side flange type | 2.72(2.82) | 3.33(3.46) | 4.63(4.84) | 7.09(7.40) | 9.13(9.53) |
| | Head side flange type | 2.82(2.92) | 3.47(3.60) | 4.63(4.84) | 7.09(7.40) | 9.13(9.53) |
| | Single clevis type | 2.58(2.68) | 3.17(3.30) | 4.42(4.63) | 6.63(6.94) | 9.11(9.51) |
| | Double clevis type | 2.57(2.67) | 3.15(3.28) | 4.44(4.65) | 6.62(6.93) | 9.13(9.53) |
| | Trunnion type | 2.92(3.07) | 3.47(3.66) | 5.01(5.38) | 7.58(8.03) | 10.33(10.92) |
| Additional weight per each 50 mm of stroke | | 0.20(0.28) | 0.25(0.35) | 0.31(0.43) | 0.46(0.70) | 0.58(0.87) |
| Accessory bracket | Single knuckle | 0.23 | 0.26 | 0.26 | 0.60 | 0.83 |
| | Double knuckle (with pin) | 0.37 | 0.43 | 0.43 | 0.87 | 1.27 |

Calculation: (Example) **CVS1L40-100-1**

- Basic weight.....2.48 (kg)
- Additional weight.....0.20 (kg/50 st)
- Cylinder stroke.....100 (st) $2.48 + 0.20 \times 100 = 2.88$ kg

* (): Steel tube type

Mounting Bracket Part No.

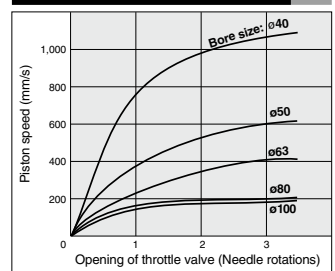
| Bore size (mm) | 40 | 50 | 63 | 80 | 100 |
|-----------------|---------|---------|---------|---------|---------|
| Axial foot* | CA1-L04 | CA1-L05 | CA1-L06 | CA1-L08 | CA1-L10 |
| Flange | CA1-F04 | CA1-F05 | CA1-F06 | CA1-F08 | CA1-F10 |
| Single clevis | CA1-C04 | CA1-C05 | CA1-C06 | CA1-C08 | CA1-C10 |
| Double clevis** | CA1-D04 | CA1-D05 | CA1-D06 | CA1-D08 | CA1-D10 |

* Order two foot brackets per cylinder.

** Accessories for each mounting bracket are as follows.

Foot, Flange, Single clevis: Body mounting bolts, Spring washer
Double clevis: Body mounting bolts, Spring washer, Clevis pin, Flat washer, Cotter pin.

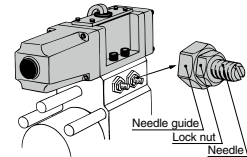
Opening Range of Throttle Valve and Piston Speed



Conditions: Operating pressure 0.5 MPa,
Horizontal mounting, No load, Extending stroke
• The speed shown above are for reference.

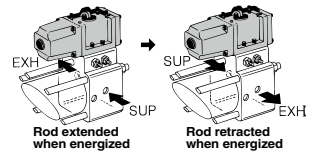
Piston Speed Adjustment Procedure

- To slow down the piston speed, screw in the speed controller needle clockwise, which reduces the amount of air that is discharged.
- The speed controller needle opens fully when it is loosened 3 1/2 turns from its fully closed position. After the specified speed has been set, secure the needle with the lock nut.

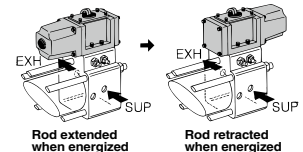


Changing between Rod Extended when Energized and Rod Retracted when Energized

- This is possible by reversing the SUP port and EXH port piping.



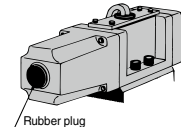
- This is possible by inverting the solenoid valve direction 180°.



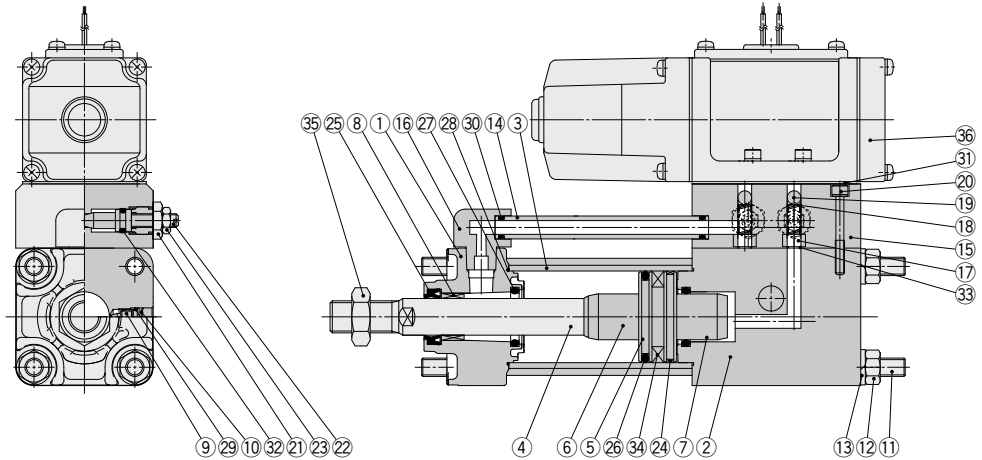
Manual Operation

Using a screwdriver or its equivalent, push the center of the rubber plug on the head of the solenoid cap of the solenoid valve.

(It is not necessary to remove the rubber plug.)



Construction



Component Parts

| No. | Description | Material | Qty | Note |
|-----|--------------------|---------------------|-----|--------------------------------|
| 1 | Rod cover | Aluminum die-casted | 1 | Black painted |
| 2 | Head cover | Aluminum alloy | 1 | Black painted |
| 3 | Cylinder tube | Aluminum alloy | 1 | Hard anodized |
| 4 | Piston rod | Carbon steel | 1 | Hard chrome plating |
| 5 | Piston | Aluminum alloy | 1 | |
| 6 | Cushion ring A | Aluminum alloy | 1 | Anodized |
| 7 | Cushion ring B | Aluminum alloy | 1 | Anodized |
| 8* | Bushing | Bearing alloy | 1 | |
| 9 | Cushion valve | Steel wire | 2 | Trivalent zinc chromated |
| 10 | Retaining ring | Spring steel | 2 | Phosphate coating |
| 11 | Tie-rod | Carbon steel | 4 | Trivalent zinc chromated |
| 12 | Tie-rod nut | Rolled steel | 8 | Trivalent black zinc chromated |
| 13 | Spring washer | Steel wire | 8 | Trivalent black zinc chromated |
| 14 | Pipe | Carbon steel tube | 1 | Trivalent zinc chromated |
| 15 | Sub-plate | Aluminum die-casted | 1 | Platinum silver |
| 16* | Guide tube fitting | Aluminum die-casted | 1 | Platinum silver |
| 17* | Valve port | Rolled steel | 2 | Electroless nickel plating |
| 18* | Check spring | Spring steel | 2 | Trivalent zinc chromated |

| No. | Description | Material | Qty | Note |
|-----|------------------------------------|---------------------------|-----|----------------------------|
| 19* | Check ball | Polyurethane rubber | 2 | Ball 9/32 |
| 20 | Hex. socket head cap screw with SW | Chromium molybdenum steel | 4 | Trivalent zinc chromated |
| 21 | Needle guide | Carbon steel | 2 | Trivalent zinc chromated |
| 22 | Speed adjustment needle | Rolled steel | 2 | Electroless nickel plating |
| 23 | Lock nut | Carbon steel | 2 | Trivalent zinc chromated |
| 24 | Wear ring | Resin | 1 | |
| 25 | Rod seal | NBR | 1 | |
| 26 | Piston seal | NBR | 1 | |
| 27* | Cushion seal | Urethane | 2 | |
| 28 | Cylinder tube gasket | NBR | 2 | |
| 29* | Cushion valve seal | NBR | 2 | |
| 30 | Pipe gasket | NBR | 2 | |
| 31 | Gasket | NBR | 1 | |
| 32 | Speed adjustment needle seal | NBR | 2 | |
| 33 | Valve port gasket | NBR | 4 | |
| 34 | Magnet | — | (1) | |
| 35 | Rod end nut | Rolled steel | 1 | Trivalent zinc chromated |
| 36 | Solenoid valve | — | 1 | VS4124-00□-X46 |

Note) Add “-X46” to the end of the part numbers for single solenoid type.

* How to order solenoid valves/VS4□24-00 [Voltage] [Electrical entry]

* Not replaceable.

Replacement Parts: Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|---|
| 40 | CVS1N40-PS | Set of nos. above 25, 26, 28, 30, 33 |
| 50 | CVS1N50-PS | |
| 63 | CVS1N63-PS | |
| 80 | CVS1N80-PS | |
| 100 | CVS1N100-PS | |

* Seal kit includes 25, 26, 28, 30, and 33. Order the seal kit based on each bore size. (The parts indicated with numbers 27 and 29 are not replaceable.)

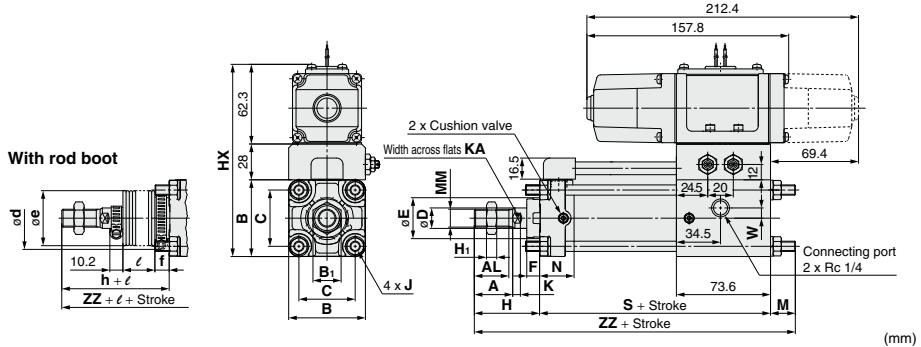
* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).

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

Grease pack part no.: GR-S-010 (10 g), GR-S-020 (20 g)

CVS1 Series

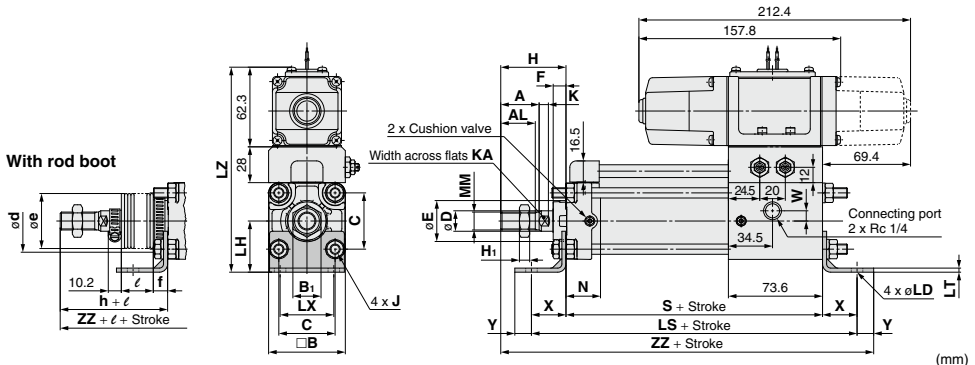
Basic Type: CVS1B



| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | HX | J | K | KA | M | MM | N | S |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|-----|------------|----|----|------|-----------|----|-------|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | 150 | M8 x 1.25 | 6 | 14 | 19.4 | M14 x 1.5 | 27 | 130.6 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | 160 | M8 x 1.25 | 7 | 18 | 16.4 | M18 x 1.5 | 30 | 133.6 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | 175 | M10 x 1.25 | 7 | 18 | 18.4 | M18 x 1.5 | 31 | 140.6 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | 192 | M12 x 1.75 | 10 | 22 | 21.4 | M22 x 1.5 | 37 | 152.6 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | 206 | M12 x 1.75 | 10 | 26 | 21.4 | M26 x 1.5 | 40 | 159.6 |

| Bore size (mm) | W | Without rod boot | | With rod boot | | | | | | ZZ | * The minimum stroke of the one with rod boot is 20 mm or more. |
|----------------|---|------------------|-----|---------------|----|------|----|------------|-----|----|---|
| | | H | ZZ | d | e | f | h | l | | | |
| 40 | 8 | 51 | 201 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 209 | | |
| 50 | 8 | 58 | 208 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 216 | | |
| 63 | 8 | 58 | 217 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 225 | | |
| 80 | 0 | 71 | 245 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 254 | | |
| 100 | 0 | 72 | 253 | 76 | 65 | 14 | 81 | 1/4 stroke | 262 | | |

Axial Foot Type: CVS1L

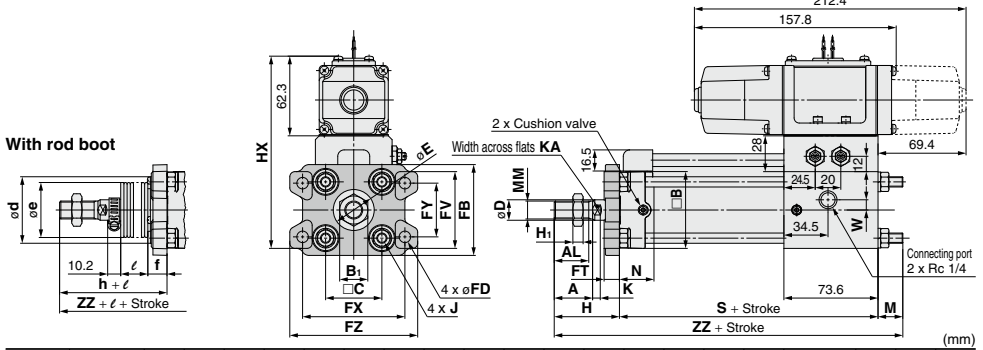


| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | D | E | F | H ₁ | J | K | KA | LD | LH | LS | LT | LX | LZ | MM |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|------------|----|----|------|----|-------|-----|----|-----|-----------|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | M8 x 1.25 | 6 | 14 | 9 | 40 | 184.6 | 3.2 | 42 | 160 | M14 x 1.5 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | M8 x 1.25 | 7 | 18 | 9 | 45 | 187.6 | 3.2 | 50 | 170 | M18 x 1.5 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | M10 x 1.25 | 7 | 18 | 11.5 | 50 | 208.6 | 3.2 | 59 | 182 | M18 x 1.5 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | M12 x 1.75 | 10 | 22 | 13.5 | 65 | 240.6 | 4.5 | 76 | 206 | M22 x 1.5 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | M12 x 1.75 | 10 | 26 | 13.5 | 75 | 245.6 | 6 | 92 | 223 | M26 x 1.5 |

| Bore size (mm) | N | S | W | X | Y | Without rod boot | | With rod boot | | | | | |
|----------------|----|-------|---|----|----|------------------|-------|---------------|----|------|----|------------|-------|
| | | | | | | H | ZZ | d | e | f | h | l | ZZ |
| 40 | 27 | 130.6 | 8 | 27 | 13 | 51 | 221.6 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 229.6 |
| 50 | 30 | 133.6 | 8 | 27 | 13 | 58 | 231.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 239.6 |
| 63 | 31 | 140.6 | 8 | 34 | 16 | 58 | 248.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 256.6 |
| 80 | 37 | 152.6 | 0 | 44 | 16 | 71 | 283.6 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 292.6 |
| 100 | 40 | 159.6 | 0 | 43 | 17 | 72 | 291.6 | 76 | 65 | 14 | 81 | 1/4 stroke | 300.6 |

* The minimum stroke of the one with rod boot is 20 mm or more.
** Long stroke

Rod Side Flange Type: CVS1F

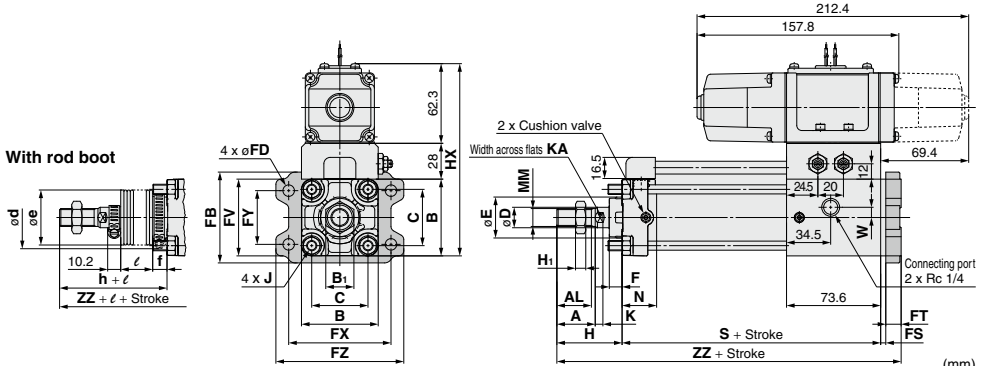


| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | D | E | FB | FD | FT | FV | FX | FY | FZ | H ₁ | HX | J | K | KA | M |
|----------------|--------------------|----|----|-----|----------------|----|----|----|-----|------|----|-----|-----|----|-----|----------------|-----|------------|----|----|------|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 71 | 9 | 12 | 60 | 80 | 42 | 100 | 8 | 150 | M8 x 1.25 | 6 | 14 | 19.4 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 81 | 9 | 12 | 70 | 90 | 50 | 110 | 11 | 160 | M8 x 1.25 | 7 | 18 | 16.4 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 101 | 11.5 | 15 | 86 | 105 | 59 | 130 | 11 | 175 | M10 x 1.25 | 7 | 18 | 18.4 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 119 | 13.5 | 18 | 102 | 130 | 76 | 160 | 13 | 192 | M12 x 1.75 | 10 | 22 | 21.4 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 133 | 13.5 | 18 | 116 | 150 | 92 | 180 | 16 | 206 | M12 x 1.75 | 10 | 26 | 21.4 |

| Bore size (mm) | MM | N | S | W | Without rod boot | | With rod boot | | | | | | |
|----------------|-----------|----|-------|---|------------------|-----|-----------------|----|------|----|---|------------|-----|
| | | | | | H | ZZ | d ^{**} | e | f | h | l | ZZ | |
| 40 | M14 x 1.5 | 27 | 130.6 | 8 | 51 | 201 | 52 | 43 | 15 | 59 | | 1/4 stroke | 209 |
| 50 | M18 x 1.5 | 30 | 133.6 | 8 | 58 | 208 | 58 | 52 | 15 | 66 | | 1/4 stroke | 216 |
| 63 | M18 x 1.5 | 31 | 140.6 | 8 | 58 | 217 | 58 | 52 | 17.5 | 66 | | 1/4 stroke | 225 |
| 80 | M22 x 1.5 | 37 | 152.6 | 0 | 71 | 245 | 80 | 65 | 21.5 | 80 | | 1/4 stroke | 254 |
| 100 | M26 x 1.5 | 40 | 159.6 | 0 | 72 | 253 | 80 | 65 | 21.5 | 81 | | 1/4 stroke | 262 |

* The minimum stroke of the one with rod boot is 20 mm or more.
 ** Long stroke
 *** Machine larger holes than the outside diameter ϕd of the mounting bracket for rod boot when mounting the rod boot part to the through for mounting.

Head Side Flange Type: CVS1G



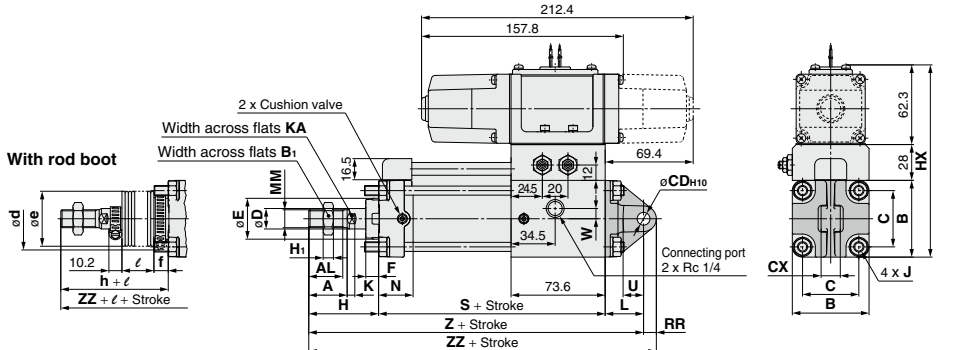
| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | D | E | F | FB | FD | FT | FV | FX | FY | FZ | H ₁ | HX | J | K |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|-----|------|----|-----|-----|----|-----|----------------|-----|------------|----|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 71 | 9 | 12 | 60 | 80 | 42 | 100 | 8 | 150 | M8 x 1.25 | 6 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 81 | 9 | 12 | 70 | 90 | 50 | 110 | 11 | 160 | M8 x 1.25 | 7 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 101 | 11.5 | 15 | 86 | 105 | 59 | 130 | 11 | 175 | M10 x 1.25 | 7 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 119 | 13.5 | 18 | 102 | 130 | 76 | 160 | 13 | 192 | M12 x 1.75 | 10 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 133 | 13.5 | 18 | 116 | 150 | 92 | 180 | 16 | 206 | M12 x 1.75 | 10 |

| Bore size (mm) | KA | MM | N | S | W | Without rod boot | | With rod boot | | | | | | |
|----------------|----|-----------|----|-------|---|------------------|-------|---------------|----|------|----|---|------------|-------|
| | | | | | | H | ZZ | d | e | f | h | l | ZZ | |
| 40 | 14 | M14 x 1.5 | 27 | 130.6 | 8 | 51 | 197.6 | 56 | 43 | 11.2 | 59 | | 1/4 stroke | 205.6 |
| 50 | 18 | M18 x 1.5 | 30 | 133.6 | 8 | 58 | 207.6 | 64 | 52 | 11.2 | 66 | | 1/4 stroke | 215.6 |
| 63 | 18 | M18 x 1.5 | 31 | 140.6 | 8 | 58 | 213.6 | 64 | 52 | 11.2 | 66 | | 1/4 stroke | 221.6 |
| 80 | 22 | M22 x 1.5 | 37 | 152.6 | 0 | 71 | 241.6 | 76 | 65 | 12.5 | 80 | | 1/4 stroke | 250.6 |
| 100 | 26 | M26 x 1.5 | 40 | 159.6 | 0 | 72 | 249.6 | 76 | 65 | 14 | 81 | | 1/4 stroke | 258.6 |

* The minimum stroke of the one with rod boot is 20 mm or more.

CVS1 Series

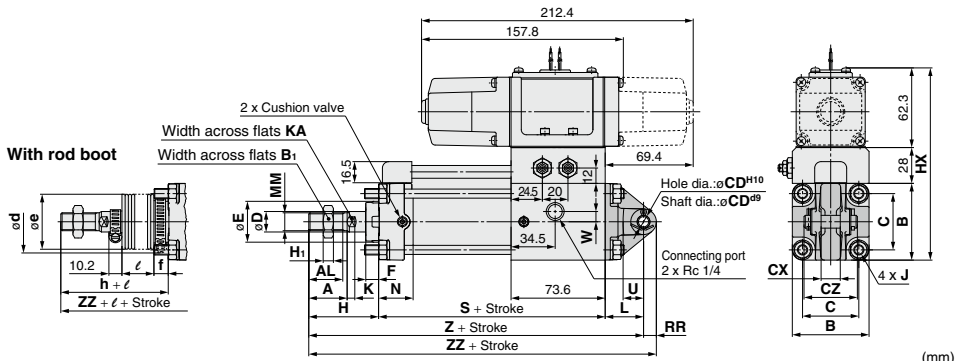
Single Clevis Type: CVS1C



| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | CD _{H10} | CX | D | E | F | H ₁ | HX | J | K | KA | L | MM |
|----------------|--------------------|----|----|-----|----------------|----|---------------------------------------|--------------------------------------|----|----|----|----------------|-----|------------|----|----|----|-----------|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 10 ^{+0.058} _{-0.03} | 15 ^{-0.1} _{-0.3} | 16 | 32 | 10 | 8 | 150 | M8 x 1.25 | 6 | 14 | 30 | M14 x 1.5 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 12 ^{+0.070} _{-0.04} | 18 ^{-0.1} _{-0.3} | 20 | 40 | 10 | 11 | 160 | M8 x 1.25 | 7 | 18 | 35 | M18 x 1.5 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 16 ^{+0.070} _{-0.04} | 25 ^{-0.1} _{-0.3} | 20 | 40 | 10 | 11 | 175 | M10 x 1.25 | 7 | 18 | 40 | M18 x 1.5 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 20 ^{+0.084} _{-0.05} | 31.5 ^{-0.1} _{-0.3} | 25 | 52 | 14 | 13 | 192 | M12 x 1.75 | 10 | 22 | 48 | M22 x 1.5 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 25 ^{+0.084} _{-0.05} | 35.5 ^{-0.1} _{-0.3} | 30 | 52 | 14 | 16 | 206 | M12 x 1.75 | 10 | 26 | 58 | M26 x 1.5 |

| Bore size (mm) | N | RR | S | U | W | Without rod boot | | | With rod boot | | | | | | | * The minimum stroke of the one with rod boot is 20 mm or more. |
|----------------|----|----|-------|----|---|------------------|-------|-------|---------------|----|------|----|------------|-------|-------|---|
| | | | | | | H | Z | ZZ | d | e | f | h | ℓ | Z | ZZ | |
| 40 | 27 | 10 | 130.6 | 16 | 8 | 51 | 211.6 | 221.6 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 219.6 | 229.6 | |
| 50 | 30 | 12 | 133.6 | 19 | 8 | 58 | 266.6 | 238.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 234.6 | 246.6 | |
| 63 | 31 | 16 | 140.6 | 23 | 8 | 58 | 238.6 | 254.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 246.6 | 262.6 | |
| 80 | 37 | 20 | 152.6 | 28 | 0 | 71 | 271.6 | 291.6 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 280.6 | 300.6 | |
| 100 | 40 | 25 | 159.6 | 36 | 0 | 72 | 289.6 | 314.6 | 76 | 65 | 14 | 81 | 1/4 stroke | 298.6 | 323.6 | |

Double Clevis Type: CVS1D

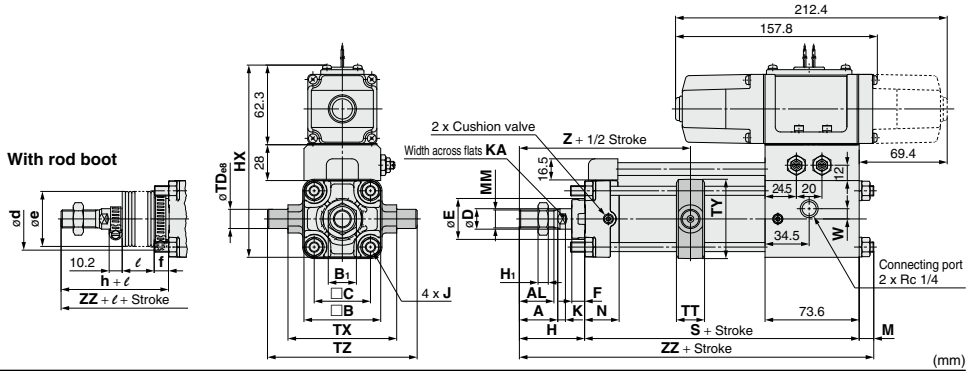


| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | CD _{H10} | CX | CZ | D | E | F | H ₁ | HX | J | K | KA | L |
|----------------|--------------------|----|----|-----|----------------|----|---------------------------------------|--------------------------------------|------|----|----|----|----------------|-----|------------|----|----|----|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 10 ^{+0.058} _{-0.03} | 15 ^{+0.3} _{-0.1} | 29.5 | 16 | 32 | 10 | 8 | 150 | M8 x 1.25 | 6 | 14 | 30 |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 12 ^{+0.070} _{-0.04} | 18 ^{+0.3} _{-0.1} | 38 | 20 | 40 | 10 | 11 | 160 | M8 x 1.25 | 7 | 18 | 35 |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 16 ^{+0.070} _{-0.04} | 25 ^{+0.3} _{-0.1} | 49 | 20 | 40 | 10 | 11 | 175 | M10 x 1.25 | 7 | 18 | 40 |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 20 ^{+0.084} _{-0.05} | 31.5 ^{+0.3} _{-0.1} | 61 | 25 | 52 | 14 | 13 | 192 | M12 x 1.75 | 10 | 22 | 48 |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 25 ^{+0.084} _{-0.05} | 35.5 ^{+0.3} _{-0.1} | 64 | 30 | 52 | 14 | 16 | 206 | M12 x 1.75 | 10 | 26 | 58 |

| Bore size (mm) | MM | N | RR | S | U | W | Without rod boot | | | With rod boot | | | | | | | * The minimum stroke of the one with rod boot is 20 mm or more. |
|----------------|-----------|----|----|-------|----|---|------------------|-------|-------|---------------|----|------|----|------------|-------|-------|---|
| | | | | | | | H | Z | ZZ | d | e | f | h | ℓ | Z | ZZ | |
| 40 | M14 x 1.5 | 27 | 10 | 130.6 | 16 | 8 | 51 | 211.6 | 221.6 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 219.6 | 229.6 | |
| 50 | M18 x 1.5 | 30 | 12 | 133.6 | 19 | 8 | 58 | 266.6 | 238.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 234.6 | 246.6 | |
| 63 | M18 x 1.5 | 31 | 16 | 140.6 | 23 | 8 | 58 | 238.6 | 254.6 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 246.6 | 262.6 | |
| 80 | M22 x 1.5 | 37 | 20 | 152.6 | 28 | 0 | 71 | 271.6 | 291.6 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 280.6 | 300.6 | |
| 100 | M26 x 1.5 | 40 | 25 | 159.6 | 36 | 0 | 72 | 289.6 | 314.6 | 76 | 65 | 14 | 81 | 1/4 stroke | 298.6 | 323.6 | |

* Clevis pin, flat washer and cotter pin are shipped together.

Center Trunnion Type: CVS1T

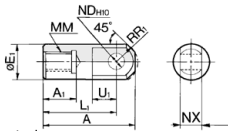


| Bore size (mm) | Stroke* range (mm) | A | AL | B | B ₁ | C | D | E | F | H _i | HX | J | K | KA | M | MM | N | S | TD _{e8} |
|----------------|--------------------|----|----|-----|----------------|----|----|----|----|----------------|-----|------------|----|----|------|-----------|----|-------|--|
| 40 | Up to 1000 | 30 | 27 | 60 | 22 | 44 | 16 | 32 | 10 | 8 | 150 | M8 x 1.25 | 6 | 14 | 11.4 | M14 x 1.5 | 27 | 130.6 | 15 ^{+0.032} / _{-0.069} |
| 50 | Up to 1000 | 35 | 32 | 70 | 27 | 52 | 20 | 40 | 10 | 11 | 160 | M8 x 1.25 | 7 | 18 | 11.4 | M18 x 1.5 | 30 | 133.6 | 15 ^{+0.032} / _{-0.069} |
| 63 | Up to 1000 | 35 | 32 | 85 | 27 | 64 | 20 | 40 | 10 | 11 | 175 | M10 x 1.25 | 7 | 18 | 13.4 | M18 x 1.5 | 31 | 140.6 | 18 ^{+0.032} / _{-0.069} |
| 80 | Up to 1000 | 40 | 37 | 102 | 32 | 78 | 25 | 52 | 14 | 13 | 192 | M12 x 1.75 | 10 | 22 | 18.4 | M22 x 1.5 | 37 | 152.6 | 25 ^{+0.040} / _{-0.079} |
| 100 | Up to 1000 | 40 | 37 | 116 | 41 | 92 | 30 | 52 | 14 | 16 | 206 | M12 x 1.75 | 10 | 26 | 16.4 | M26 x 1.5 | 40 | 159.6 | 25 ^{+0.040} / _{-0.079} |

| Bore size (mm) | TT | TX | TY | TZ | W | Without rod boot | | | With rod boot | | | | | | | * The minimum stroke of the one with rod boot is 20 mm or more. |
|----------------|----|-----|-----|-----|---|------------------|-----|-----|---------------|----|------|----|------------|-----|-----|---|
| | | | | | | H | Z | ZZ | d | e | f | h | ℓ | Z | ZZ | |
| 40 | 22 | 85 | 62 | 117 | 8 | 51 | 93 | 193 | 56 | 43 | 11.2 | 59 | 1/4 stroke | 101 | 201 | |
| 50 | 22 | 95 | 74 | 127 | 8 | 58 | 103 | 203 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 111 | 211 | |
| 63 | 28 | 110 | 90 | 148 | 8 | 58 | 107 | 212 | 64 | 52 | 11.2 | 66 | 1/4 stroke | 115 | 220 | |
| 80 | 34 | 140 | 110 | 192 | 0 | 71 | 129 | 242 | 76 | 65 | 12.5 | 80 | 1/4 stroke | 138 | 251 | |
| 100 | 40 | 162 | 130 | 214 | 0 | 72 | 135 | 248 | 76 | 65 | 14 | 81 | 1/4 stroke | 144 | 257 | |

Accessory Dimensions

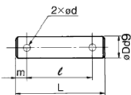
I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

| Part no. | Applicable bore size (mm) | A | A ₁ | øE ₁ | L ₁ | MM | R ₁ | U ₁ | øND _{H10} | NX |
|----------|---------------------------|-----|----------------|-----------------|----------------|-----------|----------------|----------------|--------------------------------------|--------------------------------------|
| I-04 | 40 | 69 | 22 | 24 | 55 | M14 x 1.5 | 15.5 | 20 | 12 ^{+0.070} / ₋₀ | 16 ^{+0.1} / _{-0.3} |
| I-05 | 50, 63 | 74 | 27 | 28 | 60 | M18 x 1.5 | 15.5 | 20 | 12 ^{+0.070} / ₋₀ | 16 ^{+0.1} / _{-0.3} |
| I-08 | 80 | 91 | 37 | 36 | 71 | M22 x 1.5 | 22.5 | 26 | 18 ^{+0.070} / ₋₀ | 28 ^{+0.1} / _{-0.3} |
| I-10 | 100 | 105 | 37 | 40 | 83 | M26 x 1.5 | 24.5 | 28 | 20 ^{+0.084} / ₋₀ | 30 ^{+0.1} / _{-0.3} |

Knuckle Pin, Clevis Pin



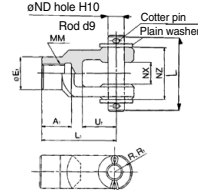
Material: Carbon steel (mm)

| Part no. | Applicable bore size (mm) | | øD ₉ | L | ℓ | m | ød (Drill through) | Applicable cotter pin |
|----------|---------------------------|------------|--|------|------|---|--------------------|-----------------------|
| | Clevis | Knuckle | | | | | | |
| CDP-2A | 40 | — | 10 ^{+0.046} / _{-0.078} | 46 | 38 | 4 | 3 | ø3 x 18 ℓ |
| CDP-3A | 50 | 40, 50, 63 | 12 ^{+0.050} / _{-0.099} | 55.5 | 47.5 | 4 | 3 | ø3 x 18 ℓ |
| CDP-4A | 63 | — | 16 ^{+0.050} / _{-0.093} | 71 | 61 | 5 | 4 | ø4 x 25 ℓ |
| CDP-5A | — | 80 | 18 ^{+0.050} / _{-0.093} | 76.5 | 66.5 | 5 | 4 | ø4 x 25 ℓ |
| CDP-6A | 80 | 100 | 20 ^{+0.050} / _{-0.117} | 83 | 73 | 5 | 4 | ø4 x 30 ℓ |
| CDP-7A | 100 | — | 25 ^{+0.050} / _{-0.117} | 88 | 78 | 6 | 4 | ø4 x 36 ℓ |

* Cotter pin and plain washer are shipped together.

Y Type Double Knuckle Joint

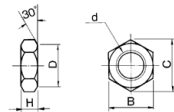
* Knuckle pin, cotter pin and plain washer are shipped together.



Material: Cast iron (mm)

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

Rod End Nut



Material: Rolled steel (mm)

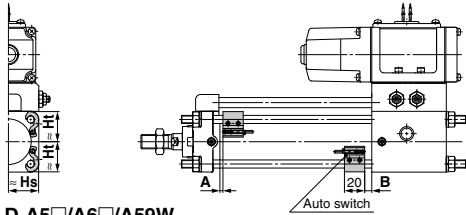
| Part no. | Applicable bore size (mm) | d | H | B | C | D |
|----------|---------------------------|-----------|----|----|------|----|
| NT-04 | 40 | M14 x 1.5 | 8 | 22 | 25.4 | 21 |
| NT-05 | 50, 63 | M18 x 1.5 | 11 | 27 | 31.2 | 26 |
| NT-08 | 80 | M22 x 1.5 | 13 | 32 | 37 | 31 |
| NT-10 | 100 | M26 x 1.5 | 16 | 41 | 47.3 | 39 |

Auto Switch Mounting

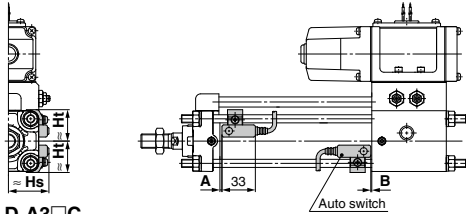
Auto Switch Proper Mounting Position (Detection at Stroke End) and Mounting Height

<Tie-rod mounting type>

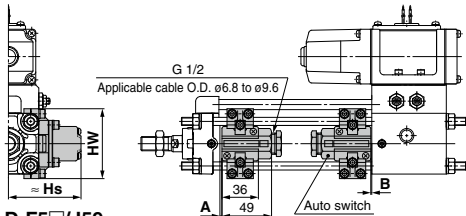
- D-M9□/M9□V D-Z7□/Z80
- D-M9□W/M9□WV D-Y59□/Y69□/Y7P/Y7PV
- D-M9□A/M9□AV D-Y7□W/Y7□WV
- D-A9□/A9□V



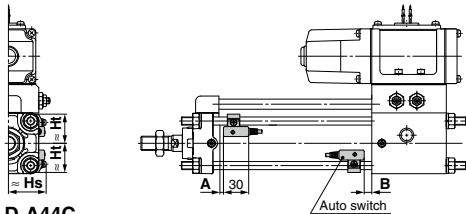
D-A5□/A6□/A59W



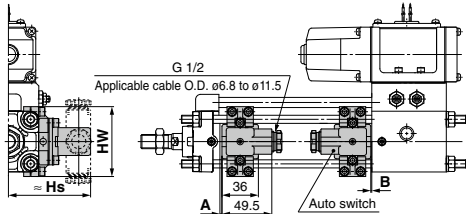
D-A3□C
D-G39C/K39C



D-F5□/J59
D-F5NT
D-F5□W/J59W/F59F

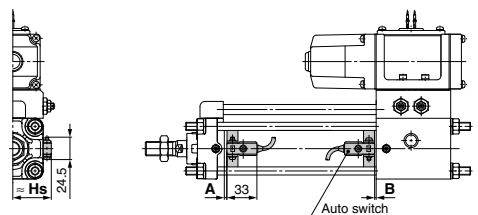


D-A44C

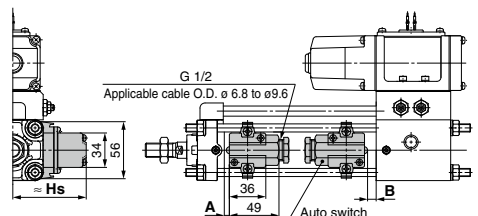


<Band mounting type>

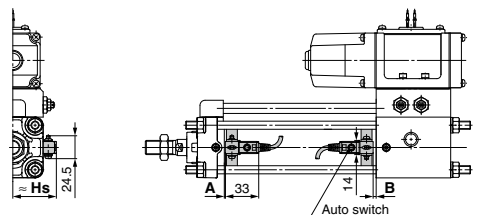
- D-B5□/B64/B59W



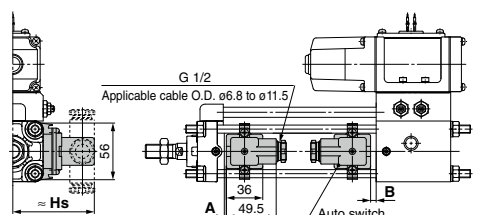
D-A3□/G39/K39



D-G5□/K59/G5□W/K59W
D-G59F/G5NT



D-A44



Auto Switch Proper Mounting position (Detection at Stroke End) and Mounting Height

Auto Switch Proper Mounting Position (Standard type)

(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-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7BA D-Z7□ D-Z80 D-B59W | | D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA | | D-F5NT | | D-A59W | | 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 |
| 40 | 9 | 9 | 5 | 5 | 2.5 | 2.5 | 5.5 | 5.5 | 10.5 | 10.5 | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | | |
| 50 | 9.5 | 8.5 | 5.5 | 4.5 | 3 | 2 | 6 | 5 | 11 | 10 | 3.5 | 2.5 | 0 | 0 | 1.5 | 0.5 | 0 | 0 | | |
| 63 | 12.5 | 11.5 | 8.5 | 7.5 | 6 | 5 | 9 | 8 | 14 | 13 | 6.5 | 5.5 | 2.5 | 1.5 | 4.5 | 3.5 | 3 | 2 | | |
| 80 | 16.5 | 13.5 | 12.5 | 9.5 | 10 | 7 | 13 | 10 | 18 | 15 | 10.5 | 7.5 | 6.5 | 3.5 | 8.5 | 5.5 | 7 | 4 | | |
| 100 | 18 | 16 | 14 | 12 | 11.5 | 9.5 | 14.5 | 12.5 | 19.5 | 17.5 | 12 | 10 | 8 | 6 | 10 | 8 | 8.5 | 6.5 | | |

Note 1) D-B5□ type, D-G5□ type, D-K5□ type are mountable only upon a receipt of order. (Not mountable after the time of shipment)

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

Auto Switch Mounting Height (Standard type)

(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-Y59□ D-Y7P D-Y7BA D-Y7□W D-Z7□ D-Z80 | | D-Y69□ D-Y7PV D-Y7□WV | | D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F D-B5□ D-B64 D-B59W | | D-G39 D-K39 D-A3□ | | D-A44 | | D-F5□ D-J59 D-F5□W D-J59W D-F5BA D-F59F D-F5NT | | D-A6□ D-A59W | | D-G39C D-K39C D-A3□C | | D-A44C | |
|-------------------|------------------------------------|----|------------------------------|----|--------|----|---|------|-----------------------------|------|--|-------|-------------------------|------|-------|------|--|------|-----------------|------|----------------------------|----|--------|----|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 40 | 30 | 30 | 34 | 30 | 31 | 30 | 30 | 30 | 30 | 30 | 37 | 71.5 | 81.5 | 38 | 31.5 | 38.5 | 31.5 | 73 | 69 | 81 | 69 | | | |
| 50 | 34 | 34 | 38 | 34 | 35 | 34 | 34 | 34 | 34 | 34 | 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 | 41 | 49 | 83.5 | 93.5 | 47 | 43 | 46.5 | 43 | 85.5 | 91 | 93.5 | 91 | | | |
| 80 | 49.5 | 49 | 52.5 | 49 | 50 | 49 | 49.5 | 49 | 49.5 | 49 | 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 | 55.5 | 68 | 102.5 | 112.5 | 61 | 57.5 | 61.5 | 57.5 | 104 | 121 | 112 | 121 | | | |

Minimum Stroke for Auto Switch Mounting (Standard Type)

| | | n: Number of auto switches (mm) | | | | | |
|--|---|---|--|---|--|--|--|
| Auto switch model | Number of auto switches | 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-F5□/J59 D-F5□W/J59W D-F5BA/F59F D-A5□/A6 | 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-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-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-G5□/K59 D-G5□W D-K59W D-G5BA D-G59F D-G5NT D-B5□/B64 | 2 Different surfaces | 15 | 90 | 100 | 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 | | |
| | 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, 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 (Standard Type)

n: Number of auto switches (mm)

| Auto switch model | Number of auto switches | Brackets other than center trunnion | Center trunnion | | | | |
|-----------------------------------|---|---|---|--|--|--|--|
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-G39 D-K39 D-A3□ | 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-G39C D-K39C D-A3□C | 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-Y59□/Y7P D-Y7□W D-Z7□/Z80 | 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)} | |

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.

CVS1 Series

Operating Range

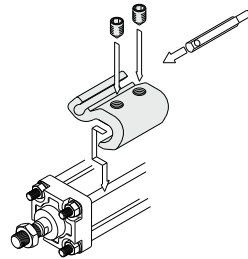
| Auto switch model | Bore size (mm) | | | | |
|--|----------------|----|-----|-----|------|
| | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 4.5 | 5 | 5.5 | 5 | 6 |
| D-A9□/A9□V | 7 | — | 9 | 9 | 9 |
| D-Z7□/Z80 | 8 | 7 | 9 | 9.5 | 10.5 |
| D-A3□/A44 D-A3□C/A44C | 9 | 10 | 11 | 11 | 11 |
| D-A5□/A6□ | | | | | |
| D-B5□/B64 | | | | | |
| D-A59W | 13 | 13 | 14 | 14 | 15 |
| D-B59W | 14 | 14 | 17 | 16 | 18 |
| D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV | 8 | 7 | 5.5 | 6.5 | 6.5 |
| D-F5□/J59 D-F5□W/J59W D-F5NT/F59F | 4 | 4 | 4.5 | 4.5 | 4.5 |
| D-G5□/K59 D-G5□W/K59W D-G5NT/G59F | 5 | 6 | 6.5 | 6.5 | 7 |
| D-G39/K39 D-G39C/K39C | 9 | 9 | 10 | 10 | 11 |

* D-A9□ and D-A9□V types cannot be mounted on ø50
 * Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)
 There may be the case it will vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket Part No.

<Tie-rod mounting type>

| 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-F5□/J59 D-F5□W/J59W D-F59F/F5NT D-A5□/A6□ D-A59W | BT-04 | BT-04 | BT-06 | BT-08 | BT-08 |
| D-G39C/K39C D-A3□C/A44C | BA3-040 | BA3-050 | BA3-063 | BA3-080 | BA3-100 |
| D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA D-Z7□/Z80 | BA4-040 | BA4-040 | BA4-063 | BA4-080 | BA4-080 |



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

<Band mounting type>

Standard

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

Note 1) Auto switch brackets are 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

Other than the models listed in "How to Order", the following auto switches are applicable.
For detailed specifications, refer to pages 1341 to 1435.

| Auto switch type | Model | Electrical entry (Fetching direction) | 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 | | Diagnostic indication (2-color indicator) | |
| | D-M9NWW, M9PWV, M9BWW | | Water resistant (2-color indicator) | |
| | D-Y7NWW, Y7PWV, Y7BWW | | | |
| | D-M9NAV, M9PAV, M9BAV | | — | |
| | D-Y59A, Y59B, Y7P | | Grommet (In-line) | — |
| | D-F59, F5P, J59 | Diagnostic indication (2-color indicator) | | |
| | D-Y7NW, Y7PW, Y7BW | With timer | | |
| | D-F59W, F5PW, J59W | | | |
| | D-F5NT, G5NT | | | |

* With pre-wired connector is also available in 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.



CVS1 Series Specific Product Precautions

Be sure to read this before handling the products. Refer to page 9 for safety instructions, pages 10 to 19 for actuator and auto switch precautions, and 3/4/5-port solenoid valve precautions on the SMC website: <https://www.smcworld.com>

Selection

⚠ Warning

1. Confirm the specifications.

Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time

When the valve is continuously energized for a long period of time, the performance may deteriorate or effect peripheral equipment adversely since temperature rises when coils generate heat.

3. Mounting orientation

Metal seal: For single solenoids, mounting orientation is flexible. For double solenoids and 3 position valves, mount a spool valve horizontally.

Handling

⚠ Warning

1. Do not open the cushion valve beyond the stopper.

A retaining ring is installed as a cushion valve retention mechanism. Do not open the cushion valve beyond it. If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.

| Bore size (mm) | Width across flats | Socket wrench |
|----------------|--------------------|-----------------------------------|
| 40, 50 | 2.5 | JIS 4648 Hexagonal wrench key 2.5 |
| 63, 80, 100 | 4 | JIS 4648 Hexagonal wrench key 4 |

2. Use the air cushion at the end of cylinder stroke.

Otherwise, the tie-rod or piston rod assembly will be damaged.

Handling

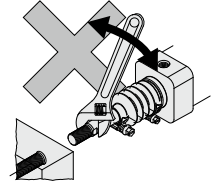
⚠ Caution

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.



Disassembly/Replacement

⚠ Caution

1. Use a socket wrench when the bracket is replaced.

If other tools are used, the nut or other parts may be deformed or the work efficiency may decrease. For applicable sockets, refer to the table below.

| Bore size (mm) | Nut | Width across flats | Socket | Tightening torque (N·m) |
|----------------|-----------------------------------|--------------------|-----------------------|-------------------------|
| 40, 50 | DA00040 | 13 | JIS B4636 | 7.4 |
| | (M8 x 1.25, Hexagon nut 3 types) | | + Two-angle socket 13 | |
| 63 | DA00010 | 17 | JIS B4636 | 20 |
| | (M10 x 1.25, Hexagon nut 3 types) | | + Two-angle socket 17 | |
| 80, 100 | DA00131 | 19 | JIS B4636 | 29 |
| | (M12 x 1.75, Hexagon nut 3 types) | | + Two-angle socket 19 | |

2. Do not replace the bushing.

As the bushing is press-fit, replace the cover assembly when the bushing must be replaced.

3. When a seal is replaced, apply grease to the new seal before it is assembled.

Operation of the cylinder without greasing will result in extreme abrasion of the seal, causing premature air leakage.

4. Do not disassemble the trunnion type cylinder because the mounting precision is required.

It is difficult to align the axial center of the trunnion with the axial center of the cylinder. Thus, if this type of cylinder is disassembled and reassembled, the required dimensional accuracy cannot be attained, which may lead to malfunctions.