

# Free Mount Cylinder

## CU Series

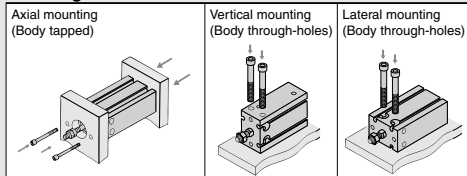
A space-saving air cylinder with multiple surfaces capable of mounting directly. Offered in rich variations.



### Space-saving

The multiple surface direct mounting with a square body and no brackets allows the freedom of the mounting surface. This enables space-saving designs for equipment.

### Mounting



### Series Variations

| Series   | Action        | Rod        | Bore size (mm)        | Page               |     |
|--|---------------|------------|-----------------------|--------------------|-----|
| Standard<br>CU Series                          | Double acting | Single rod | 6, 10, 16, 20, 25, 32 | 727                |     |
|  | Single acting | Double rod |                       | 734                |     |
| Non-rotating<br>CUK Series                     | Double acting | Single rod |                       | 739                |     |
|  | Single acting | Double rod |                       | 746                |     |
| Long stroke<br>CU Series                       | Double acting | Single rod |                       | 750                |     |
|  | Double acting | Single rod |                       | 754                |     |
| Long stroke,<br>Non-rotating rod<br>CUK Series | Double acting | Single rod |                       | 760                |     |
|  | Double acting | Single rod |                       | 764                |     |
| With air cushion<br>CU-A Series                | Double acting | Single rod |                       | 20, 25, 32         | 768 |
| For vacuum<br>ZCUK Series                      | Double acting | Single rod |                       | 10, 16, 20, 25, 32 | 777 |

# Combinations of Standard Products and Made

## CU Series

|   |
|---|
| ●: Standard                                   |
| ⊙: Made to Order specifications               |
| ○: Special product (Contact SMC for details.) |
| —: Not available                              |

| Series | CU<br>(Standard) |            |               | CUK<br>(Non-rotating) |            |               |
|--------|------------------|------------|---------------|-----------------------|------------|---------------|
|        | Double acting    |            | Single acting | Double acting         |            | Single acting |
|        | Single rod       | Double rod | Single rod    | Single rod            | Double rod | Single rod    |

| Symbol                    | Specification   | Applicable bore size | ø6 to ø32 |   |   |   |   |   |
|---------------------------|---|----------------------|-----------|---|---|---|---|---|
| <b>Standard</b>           | Standard  | ø6 to ø32            | ●         | ● | ● | ● | ● | ● |
| <b>D</b>                  | Built-in magnet                                       |                      | ●         | ● | ● | ● | ● | ● |
| <b>10-, 11-, 21-, 22-</b> | Clean series  | ø6 to ø25            | ●         | — | — | — | — | — |
| <b>25A-</b>               | Copper (Cu) and zinc (Zn)-free <sup>Note 3)</sup>     | ø10 to ø32           | ●         | ○ | ○ | ● | ○ | ○ |
| <b>20-</b>                | Copper <sup>Note 2)</sup> and Fluorine-free           | ø6 to ø32            | ●         | ○ | ○ | ● | ○ | ○ |
| <b>XB6</b>                | Heat-resistant cylinder (–10 to 150 °C)               | ø6 to ø32            | ⊙         | ○ | — | ⊙ | ○ | — |
| <b>XB7</b>                | Cold-resistant cylinder (–40 to 70 °C)                |                      | ⊙         | ○ | — | ⊙ | ○ | — |
| <b>XB9</b>                | Low-speed cylinder (10 to 50 mm/s) <sup>Note 1)</sup> |                      | ⊙         | ○ | — | ⊙ | ○ | — |
| <b>XB13</b>               | Low-speed cylinder (5 to 50 mm/s) <sup>Note 1)</sup>  |                      | ⊙         | ○ | — | ⊙ | ○ | — |
| <b>XC8</b>                | Adjustable stroke cylinder/Adjustable extension type  | ø10 to ø32           | ⊙         | — | — | — | — | — |
| <b>XC19</b>               | Intermediate stroke (5 mm spacer)                     | ø6 to ø32            | ⊙         | ○ | — | ⊙ | ○ | — |
| <b>XC22</b>               | Fluororubber seals                                    |                      | ⊙         | ○ | ⊙ | ⊙ | ○ | ⊙ |
| <b>XC34</b>               | Rod not extending beyond non-rotating plate           |                      | —         | — | — | ⊙ | ○ | ⊙ |

Note 1) Refer to the **Web Catalog** for low-speed cylinders.

Note 2) Copper-free for the externally exposed part. For details, refer to the **Web Catalog**.

Note 3) For details, refer to the SMC website.

Note 4) The "XC8" stroke settings cover part of the long stroke specification's range. For details, refer to the **Web Catalog**.

# to Order Specifications

**CU Series**

| CU<br>(Long stroke)       |            | CUK<br>(Long stroke, Non-rotating) |            | CU-A<br>(Air cushion) | ZCUK<br>(For vacuum) | CUX<br>(Low-speed cylinder) <small>(Note)</small> |  |
|---------------------------|------------|------------------------------------|------------|-----------------------|----------------------|---|--|
| Double acting             |            | Double acting                      |            | Double acting         | Double acting        | Double acting                                     |  |
| Single rod                | Double rod | Single rod                         | Double rod | Single rod            | Single rod           | Single rod  |  |
| ø6 to ø32                 |            |                                    |            | ø20 to ø32            | ø10 to ø32           |   |  |
| ●                         | ●          | ●                                  | ●          | ●                     | ●                    | ●   |  |
| ●                         | ●          | ●                                  | ●          | ●                     | ●                    | ●   |  |
| —                         | —          | —                                  | —          | —                     | —                    | ○<br>(ø16 or more)                                |  |
| ●                         | ○          | ●                                  | ○          | ○                     | ○                    | —   |  |
| ●                         | ○          | ●                                  | ○          | ○                     | ○                    | —   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | —   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | —   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | —   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | —   |  |
| ◎ <small>(Note 4)</small> | —          | —                                  | —          | —                     | —                    | —   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | ○   |  |
| ◎                         | ○          | ◎                                  | ○          | —                     | ○                    | —   |  |
| —                         | —          | ◎                                  | ○          | —                     | ○                    | —   |  |

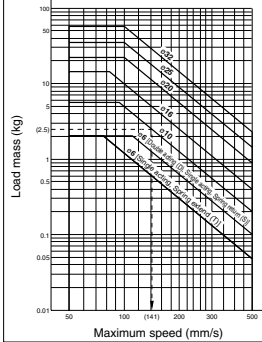
## Precautions on Free Mount

### 1. Operating speed

Make sure to connect a speed controller to the cylinder and adjust its speed to 500 mm/s or less.

If a load is to be attached to the end of the rod, adjust the speed to the maximum speed shown in Graph (1) or less, in accordance with the added mass.

Graph (1) Load Mass and Maximum Speed



How to read the graph

- Using the CU10 to drive a load weighing 2.5 kg: From the vertical axis in the graph on the left, extend the horizontally from 2.5 kg., and drop down from the point at which it intersects with the tube bore φ10. The maximum speed will be 141 mm/s.

### 2. Rod end allowable lateral load

Make sure that the lateral load that is applied to the rod end will be no more than the values shown in the tables.

The tables show the value for a single rod. For double rods, please contact SMC.

### Standard Double Acting, Single Rod

Without auto switch: CU□-□D

| Model | Stroke (mm) |       |       |       |       |       |       |       |       |      |      |      |      |
|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
|       | 5           | 10    | 15    | 20    | 25    | 30    | 40    | 50    | 60    | 70   | 80   | 90   | 100  |
| CU6   | 0.085       | 0.075 | 0.068 | 0.061 | 0.056 | 0.052 | 0.045 | 0.039 | 0.035 | —    | —    | —    | —    |
| CU10  | 0.34        | 0.30  | 0.27  | 0.25  | 0.23  | 0.21  | 0.18  | 0.16  | 0.15  | —    | —    | —    | —    |
| CU16  | 0.69        | 0.61  | 0.55  | 0.50  | 0.46  | 0.43  | 0.37  | 0.33  | 0.29  | —    | —    | —    | —    |
| CU20  | 2.2         | 2.0   | 1.8   | 1.6   | 1.5   | 1.4   | 1.2   | 1.1   | 1.0   | 0.92 | 0.85 | 0.78 | 0.73 |
| CU25  | 3.5         | 3.2   | 3.0   | 2.7   | 2.6   | 2.4   | 2.1   | 1.9   | 1.7   | 1.6  | 1.4  | 1.3  | 1.2  |
| CU32  | 5.4         | 4.9   | 4.6   | 4.3   | 4.0   | 3.8   | 3.3   | 3.0   | 2.8   | 2.5  | 2.3  | 2.2  | 2.0  |

With auto switch: CDU□-□D

| Model | Stroke (mm) |       |       |       |       |       |       |       |       |     |     |     |     |
|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|
|       | 5           | 10    | 15    | 20    | 25    | 30    | 40    | 50    | 60    | 70  | 80  | 90  | 100 |
| CDU6  | 0.085       | 0.075 | 0.068 | 0.061 | 0.056 | 0.052 | 0.045 | 0.039 | 0.035 | —   | —   | —   | —   |
| CDU10 | 0.30        | 0.27  | 0.25  | 0.23  | 0.21  | 0.20  | 0.17  | 0.15  | 0.14  | —   | —   | —   | —   |
| CDU16 | 0.99        | 0.89  | 0.81  | 0.74  | 0.69  | 0.64  | 0.56  | 0.50  | 0.45  | —   | —   | —   | —   |
| CDU20 | 3.0         | 2.7   | 2.5   | 2.3   | 2.1   | 2.0   | 1.8   | 1.6   | 1.4   | 1.3 | 1.2 | 1.1 | 1.0 |
| CDU25 | 4.7         | 4.3   | 4.0   | 3.7   | 3.5   | 3.2   | 2.9   | 2.6   | 2.4   | 2.2 | 2.0 | 1.9 | 1.7 |
| CDU32 | 7.1         | 6.6   | 6.1   | 5.7   | 5.4   | 5.1   | 4.6   | 4.1   | 3.8   | 3.5 | 3.2 | 3.0 | 2.8 |

### Non-rotating Rod Type

Without auto switch: CUK□-□D

| Model | Stroke (mm) |       |       |       |       |       |       |       |       |      |      |      |      |
|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
|       | 5           | 10    | 15    | 20    | 25    | 30    | 40    | 50    | 60    | 70   | 80   | 90   | 100  |
| CUK6  | 0.075       | 0.068 | 0.061 | 0.056 | 0.052 | 0.048 | 0.042 | 0.037 | 0.033 | —    | —    | —    | —    |
| CUK10 | 0.30        | 0.27  | 0.25  | 0.23  | 0.21  | 0.20  | 0.17  | 0.15  | 0.14  | —    | —    | —    | —    |
| CUK16 | 0.55        | 0.50  | 0.46  | 0.43  | 0.40  | 0.37  | 0.33  | 0.29  | 0.26  | —    | —    | —    | —    |
| CUK20 | 1.8         | 1.6   | 1.5   | 1.4   | 1.3   | 1.2   | 1.1   | 1.0   | 0.92  | 0.85 | 0.78 | 0.73 | 0.68 |
| CUK25 | 3.0         | 2.7   | 2.6   | 2.4   | 2.2   | 2.1   | 1.9   | 1.7   | 1.6   | 1.4  | 1.3  | 1.2  | 1.2  |
| CUK32 | 4.3         | 4.0   | 3.8   | 3.5   | 3.3   | 3.2   | 2.9   | 2.6   | 2.4   | 2.2  | 2.1  | 2.0  | 1.8  |

With auto switch: CDUK□-□D

| Model  | Stroke (mm) |       |       |       |       |       |       |       |       |     |     |     |     |
|--------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|
|        | 5           | 10    | 15    | 20    | 25    | 30    | 40    | 50    | 60    | 70  | 80  | 90  | 100 |
| CDUK6  | 0.075       | 0.068 | 0.061 | 0.056 | 0.052 | 0.048 | 0.042 | 0.037 | 0.033 | —   | —   | —   | —   |
| CDUK10 | 0.30        | 0.27  | 0.25  | 0.23  | 0.21  | 0.20  | 0.17  | 0.15  | 0.14  | —   | —   | —   | —   |
| CDUK16 | 0.81        | 0.74  | 0.69  | 0.64  | 0.60  | 0.56  | 0.50  | 0.45  | 0.41  | —   | —   | —   | —   |
| CDUK20 | 2.5         | 2.3   | 2.1   | 2.0   | 1.9   | 1.8   | 1.6   | 1.4   | 1.3   | 1.2 | 1.1 | 1.0 | 1.0 |
| CDUK25 | 4.0         | 3.7   | 3.5   | 3.2   | 3.1   | 2.9   | 2.6   | 2.4   | 2.2   | 2.0 | 1.9 | 1.7 | 1.6 |
| CDUK32 | 5.7         | 5.4   | 5.1   | 4.8   | 4.6   | 4.4   | 4.0   | 3.6   | 3.4   | 3.1 | 2.9 | 2.7 | 2.6 |

### Single Acting, Spring Return (S)

Without auto switch: CU□-□S (N)

| Model | Stroke (mm) |      |      |
|-------|-------------|------|------|
|       | 5           | 10   | 15   |
| CU6   | 0.19        | 0.17 | 0.15 |
| CU10  | 0.66        | 0.59 | 0.60 |
| CU16  | 1.4         | 1.3  | 1.3  |
| CU20  | 4.7         | 4.2  | 4.4  |
| CU25  | 6.8         | 6.2  | 6.5  |
| CU32  | 10          | 9.8  | 10   |

### Single Acting, Spring Extend (T)

Without auto switch: CU□-□T (N)

| Model | Stroke (mm) |       |       |
|-------|-------------|-------|-------|
|       | 5           | 10    | 15    |
| CU6   | 0.067       | 0.059 | 0.052 |
| CU10  | 0.29        | 0.26  | 0.24  |
| CU16  | 0.99        | 0.89  | 0.81  |
| CU20  | 2.2         | 2.0   | 1.8   |
| CU25  | 3.5         | 3.2   | 3.0   |
| CU32  | 5.4         | 4.9   | 4.6   |

With auto switch: CDU□-□S (N)

| Model | Stroke (mm) |      |      |
|-------|-------------|------|------|
|       | 5           | 10   | 15   |
| CDU6  | 0.17        | 0.15 | 0.13 |
| CDU10 | 0.66        | 0.59 | 0.60 |
| CDU16 | 1.6         | 1.5  | 1.5  |
| CDU20 | 5.3         | 4.8  | 4.9  |
| CDU25 | 7.6         | 7.0  | 7.2  |
| CDU32 | 12          | 11   | 11   |

With auto switch: CDU□-□T (N)

| Model | Stroke (mm) |       |       |
|-------|-------------|-------|-------|
|       | 5           | 10    | 15    |
| CDU6  | 0.062       | 0.055 | 0.049 |
| CDU10 | 0.29        | 0.26  | 0.24  |
| CDU16 | 0.99        | 0.89  | 0.81  |
| CDU20 | 3.0         | 2.7   | 2.5   |
| CDU25 | 4.7         | 4.3   | 4.0   |
| CDU32 | 7.1         | 6.6   | 6.1   |

### Non-rotating Rod Type

Single Acting, Spring Return (S)

Without auto switch: CUK□-□S (N)

| Model | Stroke (mm) |      |      |
|-------|-------------|------|------|
|       | 5           | 10   | 15   |
| CUK6  | 0.17        | 0.15 | 0.14 |
| CUK10 | 0.59        | 0.54 | 0.56 |
| CUK16 | 1.1         | 1.0  | 1.1  |
| CUK20 | 3.9         | 3.6  | 3.8  |
| CUK25 | 5.7         | 5.3  | 5.7  |
| CUK32 | 8.5         | 7.9  | 8.6  |

### Non-rotating Rod Type

Single Acting, Spring Extend (T)

Without auto switch: CUK□-□T (N)

| Model | Stroke (mm) |       |       |
|-------|-------------|-------|-------|
|       | 5           | 10    | 15    |
| CUK6  | 0.059       | 0.052 | 0.047 |
| CUK10 | 0.26        | 0.24  | 0.22  |
| CUK16 | 0.81        | 0.74  | 0.69  |
| CUK20 | 1.8         | 1.6   | 1.5   |
| CUK25 | 3.0         | 2.7   | 2.6   |
| CUK32 | 4.3         | 4.0   | 3.8   |

# Free Mount Cylinder Double Acting, Single Rod

## CU Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**CU 6 [ ] - 30 D - [ ]**

**With auto switch CDU 6 [ ] - 30 D - M9BW [ ] - [ ]**

**Built-in magnet**

**Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

**Port thread type**

| Symbol | Type     | Bore size              |
|--------|----------|------------------------|
| Nil    | M5 x 0.8 | ø6, ø10, ø16, ø20, ø25 |
|        | Rc 1/8   | ø32                    |
| TN     | NPT 1/8  | ø32                    |
| TF     | G 1/8    | ø32                    |

**Action**

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

**Standard stroke (mm)**

|               |                               |
|---------------|-------------------------------|
| ø6, ø10, ø16  | 5, 10, 15, 20, 25, 30         |
| ø20, ø25, ø32 | 5, 10, 15, 20, 25, 30, 40, 50 |

**Auto switch**

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

**Number of auto switches**

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

**Made to Order**  
\* Refer to page 728 for the Made to Order specifications.

**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): CDU20-25D

### Applicable Auto Switches/Refer to pages 1271 to 1365 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) | IC circuit |                     | Relay, PLC      |            |   |            |   |
| Solid state auto switch | —                | Grommet          | Yes             | 3-wire (NPN)            | 5 V, 12 V     | —  | M9NV                | M9N                | ●                    | ●                  | ○     | ○     | ○          | —                   | —               | Relay, PLC |   |            |   |
|                         |                  |                  |                 | 3-wire (PNP)            |               |    | M9PV                | M9P                | ●                    | ●                  | ○     | ○     |            |                     |                 |            |   |            |   |
|                         |                  |                  |                 | 2-wire                  | M9BV          |    | M9B                 | ●                  | ●                    | ○                  | ○     |       |            |                     |                 |            |   |            |   |
|                         | 3-wire (NPN)     |                  |                 | 5 V, 12 V               | M9NWX         |    | M9NW                | ●                  | ●                    | ○                  | ○     | ○     | IC circuit |                     |                 |            |   |            |   |
|                         | 3-wire (PNP)     |                  |                 | 12 V                    | M9PWX         |    | M9PW                | ●                  | ●                    | ○                  | ○     | ○     | IC circuit |                     |                 |            |   |            |   |
|                         | 2-wire           |                  |                 | 12 V                    | M9BWX         |    | M9BW                | ●                  | ●                    | ○                  | ○     | ○     | —          |                     |                 |            |   |            |   |
| Reed auto switch        | —                | Grommet          | Yes             | 3-wire (NPN equivalent) | —             | —  | A96V                | A96                | ●                    | —                  | ●     | —     | —          | —                   | —               | Relay, PLC |   |            |   |
|                         |                  |                  |                 | 2-wire                  |               |    | 24 V                | 12 V               | 100 V                | A93V <sup>*2</sup> | A93   | ●     | ●          |                     |                 |            | ● | ●          | — |
|                         |                  |                  |                 | 3-wire (NPN)            | 5 V, 12 V     |    | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup> | ○                    | ○                  | ●     | ○     | ○          |                     |                 |            | ○ | IC circuit |   |
|                         |                  |                  |                 | 3-wire (PNP)            | 12 V          |    | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup> | ○                    | ○                  | ●     | ○     | ○          |                     |                 |            | ○ | IC circuit |   |
|                         |                  |                  |                 | 2-wire                  | 12 V          |    | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                    | ○                  | ●     | ○     | ○          |                     |                 |            | ○ | —          |   |
|                         |                  |                  |                 | 2-wire                  | 100 V or less |    | A90V                | A90                | ●                    | —                  | ●     | —     | —          |                     |                 |            | — | IC circuit |   |

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

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

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

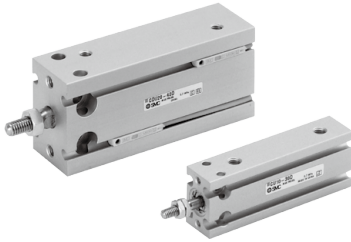
\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWX

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

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

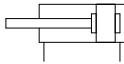
\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.



### Symbol

Double acting, Single rod, Rubber bumper



### Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications                                       |
|--------|--|
| -XB6   | Heat resistant (-10 to 150°C)                        |
| -XB7   | Cold resistant (-40 to 70°C)                         |
| -XB9   | Low speed (10 to 50 mm/s)                            |
| -XB13  | Low speed (5 to 50 mm/s)                             |
| -XC8   | Adjustable stroke cylinder/Adjustable extension type |
| -XC19  | Intermediate stroke (5 mm spacer)                    |
| -XC22  | Fluororubber seals                                   |

For clean room specifications, refer to the [Web Catalog](#).

### Tightening Torque/

When mounting the CU series, refer to the below table.

| Bore size (mm) | Hexagon socket head cap screw dia. | Proper tightening torque (N·m) |
|----------------|------------------------------------|--------------------------------|
| 6, 10          | M3                                 | 1.08 ±10%                      |
| 16             | M4                                 | 2.45 ±10%                      |
| 20, 25         | M5                                 | 5.10 ±10%                      |
| 32             | M6                                 | 8.04 ±10%                      |

### Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

### Specifications

| Bore size (mm)                | 6   | 10       | 16       | 20 | 25 | 32 |
|-------------------------------|---|----------|----------|----|----|----|
| Fluid                         | Air   |          |          |    |    |    |
| Proof pressure                | 1.05 MPa  |          |          |    |    |    |
| Maximum operating pressure    | 0.7 MPa   |          |          |    |    |    |
| Minimum operating pressure    | 0.12 MPa  | 0.06 MPa | 0.05 MPa |    |    |    |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |          |    |    |    |
| Lubrication                   | Non-lube  |          |          |    |    |    |
| Piston speed                  | 50 to 500 mm/s  |          |          |    |    |    |
| Cushion                       | Rubber bumper   |          |          |    |    |    |
| Rod end thread                | Male thread   |          |          |    |    |    |
| Stroke length tolerance       | +1.0<br>0 mm  |          |          |    |    |    |

### Standard Stroke

| Bore size (mm) | Standard stroke (mm)          |
|----------------|-------------------------------|
| 6, 10, 16      | 5, 10, 15, 20, 25, 30         |
| 20, 25, 32     | 5, 10, 15, 20, 25, 30, 40, 50 |

For "Long Stroke", refer to page 760.

### Theoretical Output

(N)

| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm <sup>2</sup> ) | Operating pressure (MPa) |      |      |
|----------------|---------------|---------------------|--------------------------------|--------------------------|------|------|
|                |               |                     |                                | 0.3                      | 0.5  | 0.7  |
| 6              | 3             | OUT                 | 28.3                           | 8.49                     | 14.2 | 19.8 |
|                |               | IN                  | 21.2                           | 6.36                     | 10.6 | 14.8 |
| 10             | 4             | OUT                 | 78.5                           | 23.6                     | 39.3 | 55.0 |
|                |               | IN                  | 66.0                           | 19.8                     | 33.0 | 46.2 |
| 16             | 6             | OUT                 | 201                            | 60.3                     | 101  | 141  |
|                |               | IN                  | 172                            | 51.6                     | 86.0 | 121  |
| 20             | 8             | OUT                 | 314                            | 94.2                     | 157  | 220  |
|                |               | IN                  | 264                            | 79.2                     | 132  | 185  |
| 25             | 10            | OUT                 | 491                            | 147                      | 246  | 344  |
|                |               | IN                  | 412                            | 124                      | 206  | 288  |
| 32             | 12            | OUT                 | 804                            | 241                      | 402  | 563  |
|                |               | IN                  | 691                            | 207                      | 346  | 454  |

### Weight/( )

Denotes the values with D-A93. (g)

| Model      | Cylinder stroke (mm) |              |              |              |              |              |              |              |
|------------|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|            | 5                    | 10           | 15           | 20           | 25           | 30           | 40           | 50           |
| C(D)U6-□D  | 22<br>(27)           | 25<br>(35)   | 28<br>(38)   | 31<br>(41)   | 34<br>(44)   | 37<br>(47)   | —            | —            |
| C(D)U10-□D | 36<br>(41)           | 40<br>(50)   | 44<br>(54)   | 48<br>(58)   | 52<br>(62)   | 56<br>(66)   | —            | —            |
| C(D)U16-□D | 50<br>(75)           | 56<br>(86)   | 62<br>(92)   | 68<br>(98)   | 74<br>(104)  | 80<br>(110)  | —            | —            |
| C(D)U20-□D | 95<br>(128)          | 106<br>(143) | 117<br>(154) | 128<br>(165) | 139<br>(176) | 150<br>(187) | 172<br>(209) | 194<br>(231) |
| C(D)U25-□D | 176<br>(230)         | 193<br>(252) | 210<br>(269) | 227<br>(286) | 244<br>(303) | 261<br>(320) | 295<br>(354) | 329<br>(388) |
| C(D)U32-□D | 262<br>(335)         | 286<br>(364) | 310<br>(388) | 334<br>(412) | 358<br>(436) | 382<br>(460) | 430<br>(508) | 478<br>(556) |

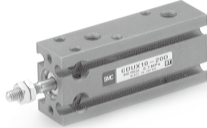
\* For the auto switch weight, refer to page 1271.

## Low-speed Cylinder

CU X **Mounting bracket** **Bore size** — **Stroke**

↓ Low-speed Cylinder

Smooth operation with a little sticking and slipping at low speed.  
Can start smoothly with a little ejection even after being rendered for hours.



### Specifications

| Bore size (mm)                | 10  | 16 | 20 | 25 | 32 |
|-------------------------------|---|----|----|----|----|
| Fluid                         | Air   |    |    |    |    |
| Proof pressure                | 1.05 MPa  |    |    |    |    |
| Max. operating pressure       | 0.7 MPa   |    |    |    |    |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |    |    |    |    |
| Lubricant                     | Not applicable (Non-lube)   |    |    |    |    |
| Piston speed                  | ø10, ø16: 1 to 300 mm/s<br>ø20 to ø32: 0.5 to 300 mm/s  |    |    |    |    |
| Cushion                       | Rubber bumper on both ends  |    |    |    |    |
| Rod end thread                | Male thread   |    |    |    |    |
| Stroke length tolerance       | +10<br>0  |    |    |    |    |

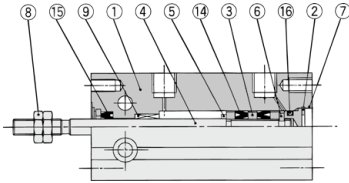
### Minimum Operating Pressure

| Bore size (mm)                   | 10   | 16   | 20   | 25   | 32   |
|----------------------------------|------|------|------|------|------|
| Minimum Operating Pressure (MPa) | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 |

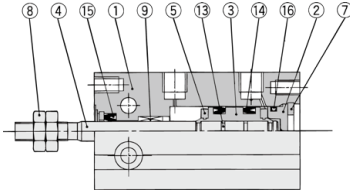
The dimensions are the same as the double acting, single rod type.  
Refer to the **Web Catalog** for details.

## Construction

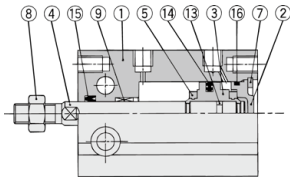
ø6



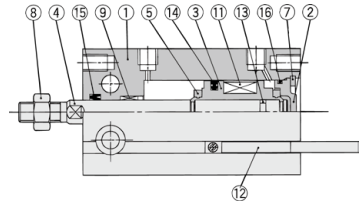
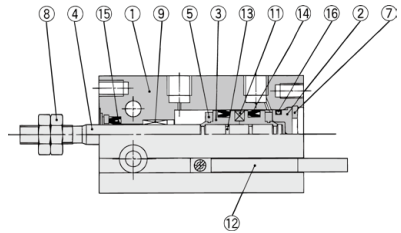
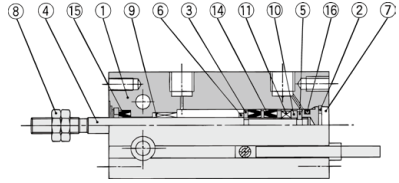
ø10



ø16 to ø32



With auto switch



### Component Parts

| No. | Description    | Material          | Note                                 |
|-----|----------------|-------------------|--------------------------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized                        |
| 2   | Head cover     | Brass             | ø6 to ø10, Electroless nickel plated |
|     |                | Aluminum alloy    | ø16 to ø32, Chromated                |
| 3   | Piston         | Brass             | ø6                                   |
|     |                | Aluminum alloy    | ø10 to ø32, Chromated                |
| 4   | Piston rod     | Stainless steel   |                                      |
| 5   | Bumper A       | Urethane          |                                      |
| 6   | Bumper B       | Urethane          |                                      |
| 7   | Retaining ring | Carbon tool steel | Phosphate coated                     |

### Component Parts

| No. | Description   | Material      | Note      |
|-----|---------------|---------------|-----------|
| 8   | Rod end nut   | Carbon steel  | Chromated |
| 9   | Bushing       | Bearing alloy |           |
| 10  | Magnet holder | Brass         | ø6        |
| 11  | Magnet        | —             |           |
| 12  | Auto switch   | —             |           |
| 13  | Piston gasket |               |           |
| 14* | Piston seal   | NBR           |           |
| 15* | Rod seal      |               |           |
| 16* | Gasket        |               |           |
|     |               |               |           |

### Replacement Parts: Seal Kit

| Bore size (mm) | Kit no.  | Contents                     |
|----------------|----------|------------------------------|
| 10             | CU10D-PS | Set of nos. above 13, 15, 16 |
| 16             | CU16D-PS |                              |
| 20             | CU20D-PS |                              |
| 25             | CU25D-PS |                              |
| 32             | CU32D-PS |                              |

\* Seal kit includes 13, 15, 16. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

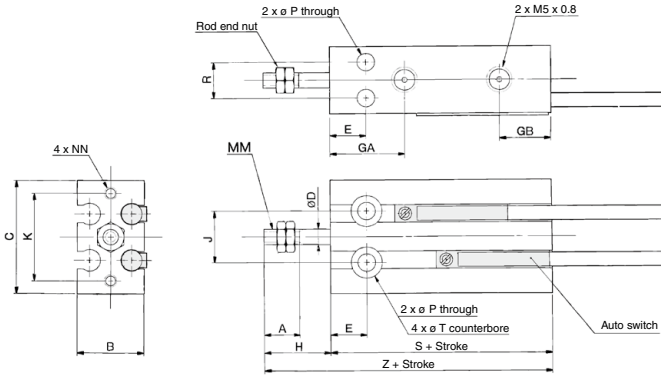
Order with the following part number when only the grease pack is needed.

Grease pack part number: GR-S-010 (10 g)

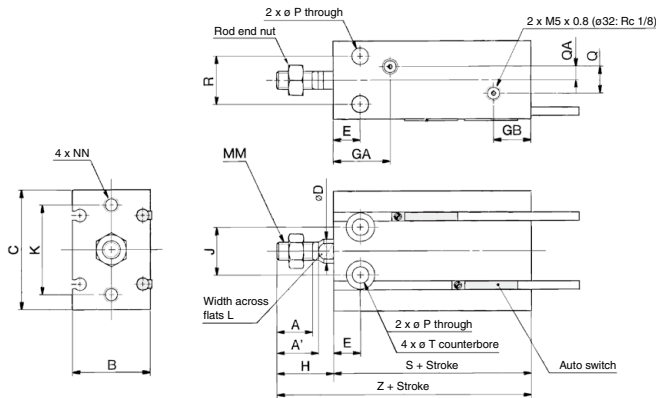


**Dimensions: Double Acting, Single Rod**

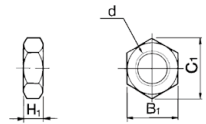
ø6, ø10



ø16 to ø32



**Rod End Nut/Accessory**



Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|----------------|----------------|----------------|
| NTP-006  | 6                         | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| NTP-010  | 10                        | M4 x 0.7   | 2.4            | 7              | 8.1            |
| NTJ-015C | 16                        | M5 x 0.8   | 4              | 8              | 9.2            |
| NT-015A  | 20                        | M6 x 1.0   | 5              | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |

| Bore size (mm) | A    | A'   | B  | C  | D  | E  | GA                    | GB   | H  | J  | K  | L  | MM         | NN               | P                | Q    | QA  |
|----------------|------|------|----|----|----|----|-----------------------|------|----|----|----|----|------------|------------------|------------------|------|-----|
|                | 6    | 7    | —  | 13 | 22 | 3  | 7                     | 15   | 10 | 13 | 10 | 17 | —          | M3 x 0.5         | M3 x 0.5 depth 5 | 3.2  | —   |
| 10             | 10   | —    | 15 | 24 | 4  | 7  | 16.5                  | 10   | 16 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 | 3.2              | —    | —   |
| 16             | 11   | 12.5 | 20 | 32 | 6  | 7  | 16.5 <sup>(max)</sup> | 11.5 | 16 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 | 4.5              | 4    | 2   |
| 20             | 12   | 14   | 26 | 40 | 8  | 9  | 19                    | 12.5 | 19 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5              | 9    | 4.5 |
| 25             | 15.5 | 18   | 32 | 50 | 10 | 10 | 21.5                  | 13   | 23 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5              | 9    | 4.5 |
| 32             | 19.5 | 22   | 40 | 62 | 12 | 11 | 23                    | 12.5 | 27 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6              | 13.5 | 4.5 |

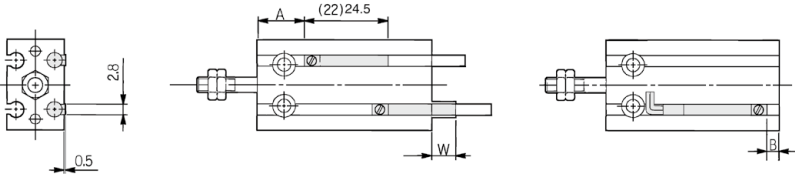
Note) 5 stroke (CU16-5D): 14.5 mm

| Bore size (mm) | R  | T             | Without auto switch |    | With auto switch |    |
|----------------|----|---------------|---------------------|----|------------------|----|
|                |    |               | S                   | Z  | S                | Z  |
| 6              | 7  | 6 depth 4.8   | 33                  | 46 | 33               | 46 |
| 10             | 9  | 6 depth 5     | 36                  | 52 | 36               | 52 |
| 16             | 12 | 7.6 depth 6.5 | 30                  | 46 | 40               | 56 |
| 20             | 16 | 9.3 depth 8   | 36                  | 55 | 46               | 65 |
| 25             | 20 | 9.3 depth 9   | 40                  | 63 | 50               | 73 |
| 32             | 24 | 11 depth 11.5 | 42                  | 69 | 52               | 79 |

# Auto Switch Mounting

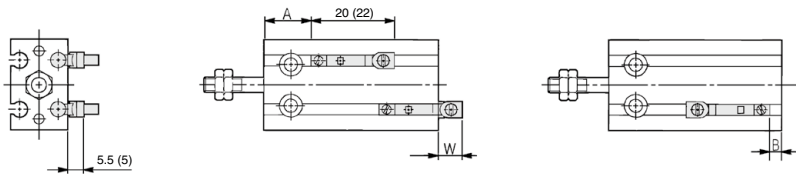
## Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□  
 D-M9□  
 D-M9□W  
 D-M9□A



( ) : Denotes the values of D-A96.

D-A9□V  
 D-M9□V  
 D-M9□WV  
 D-M9□AV



( ) : Denotes the values of D-A9□V.

| Bore size (mm) | D-A9□, D-A9□V |      |           | D-M9□, D-M9□W |      |      | D-M9□V, D-M9□WV |      |      | D-M9□A |      |      | D-M9□AV |      |      |
|----------------|---------------|------|-----------|---------------|------|------|-----------------|------|------|--------|------|------|---------|------|------|
|                | A             | B    | W         | A             | B    | W    | A               | B    | W    | A      | B    | W    | A       | B    | W    |
| 6              | 13.5          | -0.5 | 2.5 (5)   | 17.5          | 3.5  | 6.5  | 17.5            | 3.5  | 4.5  | 17.5   | 3.5  | 8.5  | 17.5    | 3.5  | 6.5  |
| 10             | 12.5          | 3.5  | -1.5 (1)  | 16.5          | 7.5  | 2.5  | 16.5            | 7.5  | 0.5  | 16.5   | 7.5  | 4.5  | 16.5    | 7.5  | 2.5  |
| 16             | 16            | 4    | -2 (0.5)  | 20            | 8    | 1.5  | 20              | 8    | -0.5 | 20     | 8    | 3.5  | 20      | 8    | 1.5  |
| 20             | 20            | 6    | -4 (-1.5) | 24            | 10   | 0    | 24              | 10   | -2   | 24     | 10   | 2    | 24      | 10   | 0    |
| 25             | 22.5          | 7    | -5.5 (-3) | 26.5          | 11   | -1.5 | 26.5            | 11   | -3.5 | 26.5   | 11   | 0.5  | 26.5    | 11   | -1.5 |
| 32             | 23.5          | 8.5  | -6.5 (-4) | 27.5          | 12.5 | -2.5 | 27.5            | 12.5 | -4.5 | 27.5   | 12.5 | -0.5 | 27.5    | 12.5 | -2.5 |

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

Note 2) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.

Note 3) In the case of the 5 stroke or the 10 stroke, there are times in which the auto switch will not turn OFF or 2 auto switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the auto switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 auto switches are used, make sure that both auto switches turn ON).

Note 4) ( ) in column W is the dimensions of D-A90 and A93.

## Operating Range

| Auto switch model | Bore size (mm) |    |     |    |      |     |
|-------------------|----------------|----|-----|----|------|-----|
|                   | 6              | 10 | 16  | 20 | 25   | 32  |
| D-A9□, A9□V       | 5              | 6  | 9   | 11 | 12.5 | 14  |
| D-M9□, M9□V       |                |    |     |    |      |     |
| D-M9□W, M9□WV     | 3              | 4  | 5.5 | 7  | 7    | 7.5 |
| D-M9□A, M9□AV     |                |    |     |    |      |     |

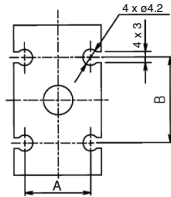
\* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

### Minimum Stroke for Auto Switch Mounting

| No. of auto switches mounted | Applicable auto switch |               |                                    |
|------------------------------|------------------------|---------------|------------------------------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□WV<br>D-M9□A, D-M9□AV |
| 1 pc.                        | 5                      | 5             | 5                                  |
| 2 pcs.                       | 10                     | 5             | 10                                 |

(mm)

### Auto Switch Groove Position

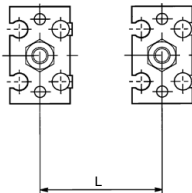


| Bore size (mm) | A    | B  |
|----------------|------|----|
| 6              | 8.2  | 9  |
| 10             | 10.3 | 13 |
| 16             | 15   | 18 |
| 20             | 21   | 23 |
| 25             | 27   | 25 |
| 32             | 35   | 27 |

(mm)

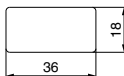
### Caution on Proximity Installation

When free mounting cylinders equipped with auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimensions shown in the table. Therefore, make sure to provide a greater clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shield plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) Auto switches may malfunction if a shield plate is not used.



| Bore size (mm) | Mounting pitch L (mm) |
|----------------|-----------------------|
| 6              | 18                    |
| 10             | 20                    |
| 16             | 33                    |
| 20             | 40                    |
| 25             | 46                    |
| 32             | 56                    |

Dimensions of shield plate (MU-S025) that is sold separately are indicated as reference.



Material: Ferrite stainless steel, Thickness: 0.3 mm  
The product can be attached to the cylinder since the bottom side is a seal type.

# Free Mount Cylinder Double Acting, Double Rod **CUW Series** ø6, ø10, ø16, ø20, ø25, ø32

## How to Order

**CUW 6 [ ] - 30 D**

**With auto switch** **CDUW 6 [ ] - 30 D - M9BW [ ]**

**Built-in magnet**

**Double rod**

**Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

**Port thread type**

| Symbol | Type     | Bore size              |
|--------|----------|------------------------|
| Nil    | M5 x 0.8 | ø6, ø10, ø16, ø20, ø25 |
|        | Rc 1/8   | ø32                    |
| TN     | NPT 1/8  | ø32                    |
| TF     | G 1/8    | ø32                    |

**Number of auto switches**

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

**Auto switch**

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

\* Refer to the table below for applicable auto switches.

**Action**

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

**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): CDUW20-30D

**Standard stroke (mm)**

|               |  |
|---------------|--|
| ø6, ø10, ø16  | 5, 10, 15, 20, 25, 30, 40, 50, 60                  |
| ø20, ø25, ø32 | 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 |

## Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

| Type                                | Special function                          | Electrical entry | Polarity/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)           | IC circuit | Relay, PLC |            |            |            |            |            |
| Solid state auto switch             | —   | Grommet          | Yes                     | 3-wire (NPN)    | 24 V         | 5 V, 12 V | —                 | M9NV                | M9N                  | ●                  | ●                  | ○                   | ○               |            |            | IC circuit | Relay, PLC |            |            |            |
|                                     |   |                  |                         | 3-wire (PNP)    |              |           |                   | M9PV                | M9P                  | ●                  | ●                  | ○                   | ○               |            |            |            |            |            |            |            |
|                                     |   |                  |                         | 2-wire          |              |           |                   | M9BV                | M9B                  | ●                  | ●                  | ○                   | ○               |            |            |            |            |            |            |            |
|                                     |   |                  |                         | 3-wire (NPN)    |              |           |                   | M9NVW               | M9NW                 | ●                  | ●                  | ○                   | ○               |            |            |            |            |            |            |            |
|                                     | Diagnostic indication (2-color indicator) | Grommet          | Yes                     | 3-wire (PNP)    | 24 V         | 5 V, 12 V | —                 | —                   | M9PWV                | M9PW               | ●                  | ●                   | ○               | ○          | IC circuit | Relay, PLC |            |            |            |            |
|                                     |   |                  |                         | 2-wire          |              |           |                   |                     | M9BWW                | M9BW               | ●                  | ●                   | ○               | ○          |            |            |            |            |            |            |
|                                     |   |                  |                         | 3-wire (NPN)    |              |           |                   |                     | M9NAV <sup>*1</sup>  | M9NA <sup>*1</sup> | ○                  | ○                   | ●               | ○          |            |            | IC circuit | Relay, PLC |            |            |
|                                     |   |                  |                         | 3-wire (PNP)    |              |           |                   |                     | M9PAV <sup>*1</sup>  | M9PA <sup>*1</sup> | ○                  | ○                   | ●               | ○          |            |            |            |            |            |            |
| Water resistant (2-color indicator) | Grommet                                   | Yes              | 2-wire                  | 24 V            | 12 V         | —         | —                 | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup>   | ○                  | ○                  | ●                   | ○               | IC circuit | Relay, PLC |            |            |            |            |            |
|                                     |   |                  | 3-wire (NPN equivalent) |                 |              |           |                   | A96V                | A96                  | ●                  | —                  | ●                   | —               |            |            |            |            |            |            |            |
|                                     |   |                  | 2-wire                  |                 |              |           |                   | 24 V                | 12 V                 | 100 V              | A93V <sup>*2</sup> | A93                 | ●               |            |            | ●          | ●          | ●          | IC circuit | Relay, PLC |
|                                     |   |                  |                         |                 |              |           |                   |                     |                      |                    | 100 V or less      | A90V                | A90             |            |            | ●          | —          | ●          |            |            |

\*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 \* Solid state auto switches marked with "○" are produced upon receipt of order.  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NZZ

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.

# Free Mount Cylinder **CUW Series**

## Specifications



| Bore size (mm)                       | 6   | 10       | 16 | 20 | 25       | 32 |
|--------------------------------------|---|----------|----|----|----------|----|
| <b>Fluid</b>                         | Air   |          |    |    |          |    |
| <b>Proof pressure</b>                | 1.05 MPa  |          |    |    |          |    |
| <b>Maximum operating pressure</b>    | 0.7 MPa   |          |    |    |          |    |
| <b>Minimum operating pressure</b>    | 0.15 MPa  | 0.10 MPa |    |    | 0.08 MPa |    |
| <b>Ambient and fluid temperature</b> | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |    |    |          |    |
| <b>Lubrication</b>                   | Non-lube  |          |    |    |          |    |
| <b>Piston speed</b>                  | 50 to 500 mm/s  |          |    |    |          |    |
| <b>Cushion</b>                       | Rubber bumper   |          |    |    |          |    |
| <b>Rod end thread</b>                | Male thread   |          |    |    |          |    |
| <b>Stroke length tolerance</b>       | $+1.0$<br>0 mm  |          |    |    |          |    |

## Standard Stroke

| Bore size (mm)    | Standard stroke (mm)                               |
|-------------------|--|
| <b>6, 10, 16</b>  | 5, 10, 15, 20, 25, 30, 40, 50, 60                  |
| <b>20, 25, 32</b> | 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 |

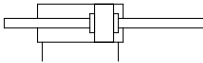
## Theoretical Output

(N)

| Bore size (mm) | Rod size (mm) | Piston area (mm <sup>2</sup> ) | Operating pressure (MPa) |      |      |
|----------------|---------------|--------------------------------|--------------------------|------|------|
|                |               |                                | 0.3                      | 0.5  | 0.7  |
| <b>6</b>       | 3             | 21.2                           | 6.36                     | 10.6 | 14.8 |
| <b>10</b>      | 4             | 66.0                           | 19.8                     | 33.0 | 46.2 |
| <b>16</b>      | 6             | 172                            | 51.6                     | 86.0 | 121  |
| <b>20</b>      | 8             | 264                            | 79.2                     | 132  | 185  |
| <b>25</b>      | 10            | 412                            | 124                      | 206  | 288  |
| <b>32</b>      | 12            | 691                            | 207                      | 346  | 484  |

### Symbol

Double acting, Single rod, Rubber bumper



**Weight**( ): Denotes the values with D-A93.

(g)

| Model               | Stroke (mm)  |              |              |              |              |              |              |              |              |              |              |              |              |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                     | 5            | 10           | 15           | 20           | 25           | 30           | 40           | 50           | 60           | 70           | 80           | 90           | 100          |
| <b>C(D)JUW6-□D</b>  | 27<br>(32)   | 30<br>(40)   | 34<br>(44)   | 37<br>(47)   | 40<br>(50)   | 44<br>(54)   | 51<br>(61)   | 58<br>(68)   | 65<br>(75)   | —            | —            | —            | —            |
| <b>C(D)JUW10-□D</b> | 44<br>(49)   | 49<br>(59)   | 53<br>(63)   | 58<br>(68)   | 62<br>(72)   | 67<br>(77)   | 76<br>(86)   | 85<br>(95)   | 94<br>(104)  | —            | —            | —            | —            |
| <b>C(D)JUW16-□D</b> | 74<br>(99)   | 81<br>(111)  | 88<br>(118)  | 95<br>(125)  | 102<br>(132) | 109<br>(139) | 123<br>(153) | 137<br>(167) | 151<br>(181) | —            | —            | —            | —            |
| <b>C(D)JUW20-□D</b> | 132<br>(165) | 145<br>(182) | 158<br>(195) | 171<br>(208) | 184<br>(221) | 197<br>(234) | 223<br>(260) | 250<br>(287) | 275<br>(312) | 301<br>(338) | 327<br>(364) | 353<br>(390) | 379<br>(416) |
| <b>C(D)JUW25-□D</b> | 240<br>(294) | 260<br>(319) | 280<br>(339) | 300<br>(359) | 321<br>(380) | 341<br>(400) | 381<br>(440) | 421<br>(480) | 461<br>(520) | 501<br>(560) | 541<br>(600) | 581<br>(640) | 621<br>(680) |
| <b>C(D)JUW32-□D</b> | 365<br>(438) | 394<br>(472) | 422<br>(500) | 451<br>(529) | 479<br>(557) | 508<br>(586) | 586<br>(664) | 622<br>(700) | 679<br>(757) | 736<br>(814) | 793<br>(871) | 850<br>(928) | 907<br>(985) |

\* For the auto switch weight, refer to page 1271.

## Tightening Torque

When mounting the CUW series, refer to page 728.

### Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

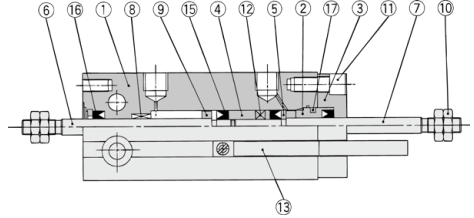
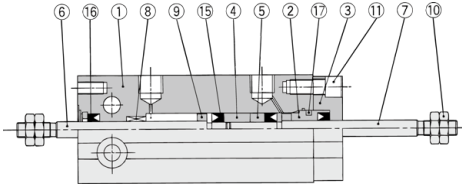
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

# CUW Series

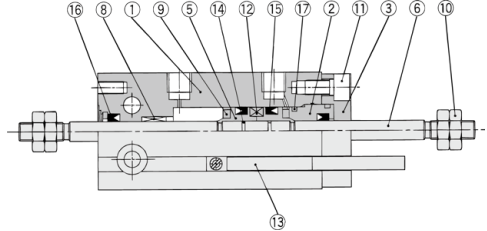
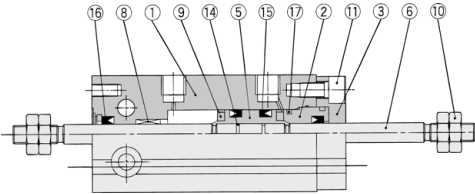
## Construction

ø6

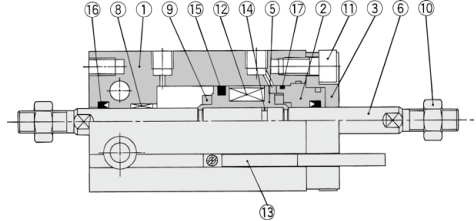
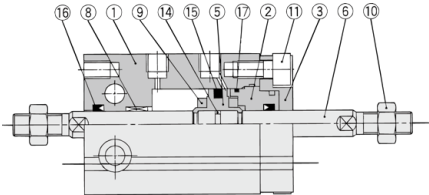
With auto switch



ø10



ø16 to ø32



### Component Parts

| No. | Description        | Material        | Note                  |
|-----|--------------------|-----------------|-----------------------|
| 1   | Cylinder tube      | Aluminum alloy  | Hard anodized         |
| 2   | Rod cover          | Aluminum alloy  | Chromated             |
| 3   | Rod cover retainer | Aluminum alloy  | Hard anodized         |
| 4   | Piston             | Brass           | ø6                    |
| 5   | Piston             | Brass           | ø6                    |
| 5   | Piston             | Aluminum alloy  | ø10 to ø32, Chromated |
| 6   | Piston rod         | Stainless steel |                       |
| 7   | Piston rod         | Stainless steel | ø6                    |
| 8   | Bushing            | Bearing alloy   |                       |

### Component Parts

| No. | Description                   | Material     | Note      |
|-----|-------------------------------|--------------|-----------|
| 9   | Bumper                        | Urethane     |           |
| 10  | Rod end nut                   | Carbon steel | Chromated |
| 11  | Hexagon socket head cap screw | Carbon steel | Chromated |
| 12  | Magnet                        | —            |           |
| 13  | Auto switch                   | —            |           |
| 14  | Piston gasket                 | NBR          |           |
| 15* | Piston seal                   |              |           |
| 16* | Rod seal                      |              |           |
| 17* | Gasket                        |              |           |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |           |           |           |           |
|---------|---------------------------|-----------|-----------|-----------|-----------|
|         | 10                        | 16        | 20        | 25        | 32        |
|         | CUW10D-PS                 | CUW16D-PS | CUW20D-PS | CUW25D-PS | CUW32D-PS |

\* Seal kit includes (15, 16, 17). Order the seal kit, based on each bore size.

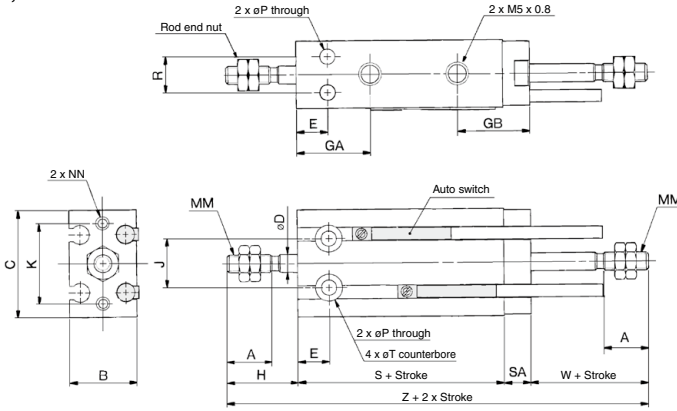
\* Seal kit includes a grease pack (10 g).

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

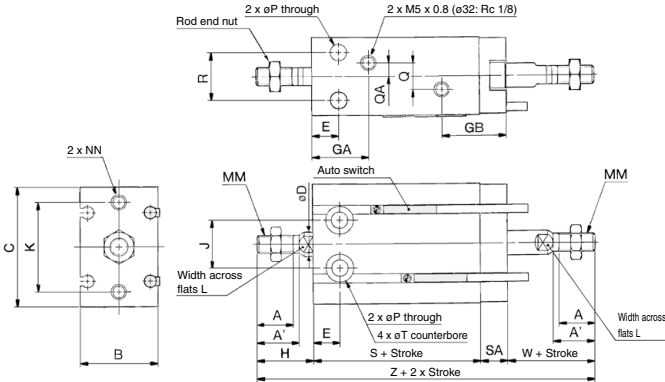
Grease pack part number: GR-S-010 (10 g)

**Dimensions: Double Acting, Double Rod**

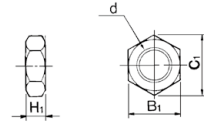
ø6, ø10



ø16 to ø32



**Rod End Nut/Accessory**



Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|----------------|----------------|----------------|
| NTP-006  | 6                         | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| NTP-010  | 10                        | M4 x 0.7   | 2.4            | 7              | 8.1            |
| NTJ-015C | 16                        | M5 x 0.8   | 4              | 8              | 9.2            |
| NT-015A  | 20                        | M6 x 1.0   | 5              | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |

| Bore size (mm) | A    | A'   | B  | C  | D  | E  | GA                  | GB   | H  | J  | K  | L  | MM         | NN               | P   | Q    | QA  |
|----------------|------|------|----|----|----|----|---------------------|------|----|----|----|----|------------|------------------|-----|------|-----|
| 6              | 7    | —    | 13 | 22 | 3  | 7  | 15                  | 16   | 13 | 10 | 17 | —  | M3 x 0.5   | M3 x 0.5 depth 5 | 3.2 | —    | —   |
| 10             | 10   | —    | 15 | 24 | 4  | 7  | 16.5                | 16   | 16 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 | 3.2 | —    | —   |
| 16             | 11   | 12.5 | 20 | 32 | 6  | 7  | 16.5 <sup>max</sup> | 19   | 16 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 | 4.5 | 4    | 2   |
| 20             | 12   | 14   | 26 | 40 | 8  | 9  | 19                  | 21.5 | 19 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 |
| 25             | 15.5 | 18   | 32 | 50 | 10 | 10 | 21.5                | 22   | 23 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 |
| 32             | 19.5 | 22   | 40 | 62 | 12 | 11 | 23                  | 22.5 | 27 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6 | 13.5 | 4.5 |

| Bore size (mm) | R  | SA  | T             | W  | Without auto switch |      | With auto switch |      |
|----------------|----|-----|---------------|----|---------------------|------|------------------|------|
|                |    |     |               |    | S                   | Z    | S                | Z    |
| 6              | 7  | 6   | 6 depth 4.8   | 13 | 38                  | 70   | 38               | 70   |
| 10             | 9  | 6   | 6 depth 5     | 16 | 36                  | 74   | 36               | 74   |
| 16             | 12 | 7.5 | 7.6 depth 6.5 | 16 | 30                  | 69.5 | 40               | 79.5 |
| 20             | 16 | 9   | 9.3 depth 8   | 19 | 36                  | 83   | 46               | 93   |
| 25             | 20 | 9   | 9.3 depth 9   | 23 | 40                  | 95   | 50               | 105  |
| 32             | 24 | 10  | 11 depth 11.5 | 27 | 42                  | 106  | 52               | 116  |

Note 1) 5 stroke (CUW16-5D): GA = 14.5

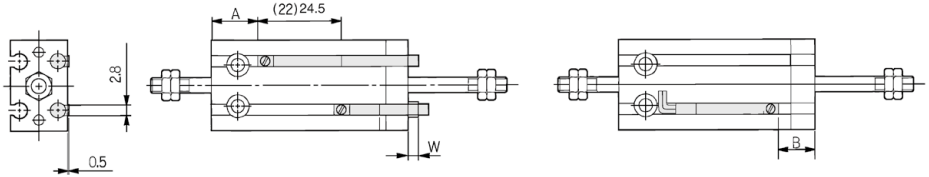
Note 2) The two chamfered positions for the double rod type are not identical.

# C UW Series

# Auto Switch Mounting

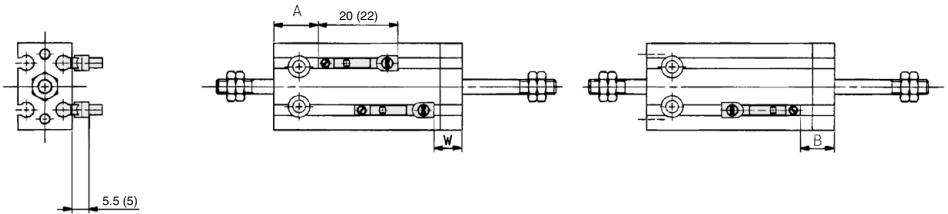
## Proper Auto Switch Mounting Position (Detection at stroke end) and Mounting Height

D-A9□  
D-M9□  
D-M9□W  
D-M9□A



( ): Denotes the values of D-A96.

D-A9□V  
D-M9□V  
D-M9□WV  
D-M9□AV



( ): Denotes the values of D-A9□V.

| Bore size (mm) | D-A9□, D-A9□V |      |             | D-M9□, D-M9□W |      |       | D-M9□V, D-M9□WV |      |       | D-M9□A |      |       | D-M9□AV |      |       |
|----------------|---------------|------|-------------|---------------|------|-------|-----------------|------|-------|--------|------|-------|---------|------|-------|
|                | A             | B    | W           | A             | B    | W     | A               | B    | W     | A      | B    | W     | A       | B    | W     |
| 6              | 13.5          | 5.5  | -3.5 (-1)   | 17.5          | 9.5  | 0.5   | 17.5            | 9.5  | -1.5  | 17.5   | 9.5  | 2.5   | 17.5    | 9.5  | 0.5   |
| 10             | 12.5          | 9.5  | -7.5 (-5)   | 16.5          | 13.5 | -3.5  | 16.5            | 13.5 | -5.5  | 16.5   | 13.5 | -1.5  | 16.5    | 13.5 | -3.5  |
| 16             | 16            | 11.5 | -9.5 (-7)   | 20            | 15.5 | -5.5  | 20              | 15.5 | -7.5  | 20     | 15.5 | -3.5  | 20      | 15.5 | -5.5  |
| 20             | 20            | 15   | -13 (-10.5) | 24            | 19   | -9    | 24              | 19   | -11   | 24     | 19   | -7    | 24      | 19   | -9    |
| 25             | 22.5          | 16   | -14.5 (-12) | 26.5          | 20   | -10.5 | 26.5            | 20   | -12.5 | 26.5   | 20   | -8.5  | 26.5    | 20   | -10.5 |
| 32             | 23.5          | 18.5 | -16.5 (-14) | 27.5          | 22.5 | -12.5 | 27.5            | 22.5 | -14.5 | 27.5   | 22.5 | -10.5 | 27.5    | 22.5 | -12.5 |

(mm)

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

Note 2) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.

Note 3) In the case of the 5 stroke or the 10 stroke, there are times in which the auto switch will not turn OFF or 2 auto switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the auto switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 auto switches are used, make sure that both auto switches turn ON).

Note 4) ( ) in column W is the dimensions of D-A90 and A93.

## Operating Range

| Auto switch model | Bore size (mm) |    |     |    |      |     |
|-------------------|----------------|----|-----|----|------|-----|
|                   | 6              | 10 | 16  | 20 | 25   | 32  |
| D-A9□, A9□V       | 5              | 6  | 9   | 11 | 12.5 | 14  |
| D-M9□, M9□V       |                |    |     |    |      |     |
| D-M9□W, M9□WV     | 3              | 4  | 5.5 | 7  | 7    | 7.5 |
| D-M9□A, M9□AV     |                |    |     |    |      |     |

\* 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.

## Minimum Stroke for Auto Switch Mounting

| No. of auto switches mounted | Applicable auto switch |               |                                    |
|------------------------------|------------------------|---------------|------------------------------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□WV<br>D-M9□A, D-M9□AV |
| 1 pc.                        | 5                      | 5             | 5                                  |
| 2 pcs.                       | 10                     | 5             | 10                                 |



# Free Mount Cylinder

## Single Acting, Single Rod, Spring Return/Extend

# CU Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**CU 10** - **15** **S** -

**With auto switch** **CDU 10** - **15** **S** - **M9BW** -

**Built-in magnet**

**Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

**Port thread type**

| Symbol | Type     | Bore size              |
|--------|----------|------------------------|
| Nil    | M5 x 0.8 | ø6, ø10, ø16, ø20, ø25 |
|        | Rc 1/8   | ø32                    |
| TN     | NPT 1/8  | ø32                    |
| TF     | G 1/8    | ø32                    |

**Action**

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

**Standard stroke (mm)**

|               |           |
|---------------|-----------|
| ø6, ø10, ø16  | 5, 10, 15 |
| ø20, ø25, ø32 |           |

**Number of auto switches**

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

**Auto switch**

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

\* Refer to the table below for applicable auto switches.

**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): CDU20-10S

\* Made to Order  
\* Refer to page 740 for the Made to Order specifications.

### Applicable Auto Switches

Refer to pages 1271 to 1365 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) |                     |                 |            |            |
| Solid state auto switch             | —   | Grommet          | Yes                     | 3-wire (NPN)    | 24 V         | 5 V, 12 V | —                   | M9NV                | M9N                  | ●     | ●     | ●     | ○                   | ○               | IC circuit |            |
|                                     |   |                  |                         | 3-wire (PNP)    |              |           |                     | M9PV                | M9P                  | ●     | ●     | ●     | ○                   | ○               |            |            |
|                                     |   |                  |                         | 2-wire          |              |           |                     | M9BV                | M9B                  | ●     | ●     | ●     | ○                   | ○               |            |            |
|                                     |   |                  |                         | 3-wire (NPN)    |              |           |                     | M9NWX               | M9NWX                | ●     | ●     | ●     | ○                   | ○               |            |            |
|                                     | Diagnostic indication (2-color indicator) | Grommet          | Yes                     | 3-wire (PNP)    | 24 V         | 5 V, 12 V | —                   | M9PWV               | M9PW                 | ●     | ●     | ●     | ○                   | ○               | IC circuit |            |
|                                     |   |                  |                         | 2-wire          |              |           |                     | M9BWX               | M9BWX                | ●     | ●     | ●     | ○                   | ○               |            |            |
|                                     |   |                  |                         | 3-wire (NPN)    |              |           |                     | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup>   | ○     | ○     | ○     | ○                   | ○               |            | IC circuit |
|                                     |   |                  |                         | 3-wire (PNP)    |              |           |                     | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup>   | ○     | ○     | ●     | ○                   | ○               |            |            |
| Water resistant (2-color indicator) | Grommet                                   | Yes              | 2-wire                  | 24 V            | 12 V         | —         | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup>  | ○                    | ○     | ●     | ○     | ○                   | —               |            |            |
|                                     |   |                  | 3-wire (NPN equivalent) |                 |              |           | A96V                | A96                 | ●                    | —     | ●     | —     | —                   |                 | IC circuit |            |
| Reed auto switch                    | —   | Grommet          | No                      | 2-wire          | 24 V         | 12 V      | —                   | A93V <sup>*2</sup>  | A93                  | ●     | —     | ●     | ●                   | —               |            | Relay, PLC |
|                                     |   |                  |                         |                 |              |           |                     | 100 V or less       | A90V                 | A90   | ●     | —     | ●                   | —               | —          |            |

\*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) M9NWX  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

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

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.



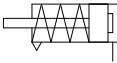
## Specifications

| Bore size (mm)                | 6   | 10       | 16 | 20 | 25       | 32 |
|-------------------------------|---|----------|----|----|----------|----|
| Fluid                         | Air   |          |    |    |          |    |
| Proof pressure                | 1.05 MPa  |          |    |    |          |    |
| Maximum operating pressure    | 0.7 MPa   |          |    |    |          |    |
| Minimum operating pressure    | 0.2 MPa   | 0.15 MPa |    |    | 0.13 MPa |    |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |    |    |          |    |
| Lubrication                   | Non-lube  |          |    |    |          |    |
| Piston speed                  | 50 to 500 mm/s  |          |    |    |          |    |
| Cushion                       | Rubber bumper   |          |    |    |          |    |
| Rod end thread                | Male thread   |          |    |    |          |    |
| Stroke length tolerance       | +1.0<br>0 mm  |          |    |    |          |    |

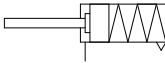
(Note) ø6 with auto switch type: One side rubber bumper

## Symbol

Single acting,  
Spring return



Single acting,  
Spring extend



Rubber bumper

## Standard Stroke

| Bore size (mm)        | Standard stroke (mm) |
|-----------------------|----------------------|
| 6, 10, 16, 20, 25, 32 | 5, 10, 15            |

## Theoretical Output

(N)

| Action            | Bore size (mm) | Operating pressure (MPa) |      |      |
|-------------------|----------------|--------------------------|------|------|
|                   |                | 0.3                      | 0.5  | 0.7  |
| Spring return (S) | ø6             | 4.99                     | 10.7 | 16.3 |
|                   | ø10            | 16.7                     | 32.4 | 48.1 |
|                   | ø16            | 45.6                     | 86.3 | 126  |
|                   | ø20            | 73                       | 136  | 199  |
|                   | ø25            | 119                      | 218  | 316  |
|                   | ø32            | 207                      | 368  | 529  |
| Spring extend (T) | ø6             | 2.86                     | 7.10 | 11.3 |
|                   | ø10            | 12.9                     | 26.1 | 39.3 |
|                   | ø16            | 37.2                     | 71.8 | 106  |
|                   | ø20            | 58                       | 111  | 164  |
|                   | ø25            | 95                       | 178  | 260  |
|                   | ø32            | 173                      | 312  | 450  |

For the reactive force of spring return, refer to page 1572.



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

| Symbol | Specifications     |
|--------|--------------------|
| -XC22  | Fluororubber seals |

## Weight/(g): Denotes the values with D-A93.

(g)

| Model        | Stroke (mm) |           |           |
|--------------|-------------|-----------|-----------|
|              | 5           | 10        | 15        |
| C(D)U6-□S,T  | 22 (27)     | 25 (35)   | 28 (38)   |
| C(D)U10-□S,T | 36 (41)     | 40 (50)   | 48 (58)   |
| C(D)U16-□S,T | 50 (75)     | 56 (86)   | 71 (101)  |
| C(D)U20-□S,T | 95 (128)    | 106 (143) | 133 (170) |
| C(D)U25-□S,T | 176 (230)   | 193 (252) | 235 (294) |
| C(D)U32-□S,T | 262 (335)   | 286 (364) | 347 (425) |

## Tightening Torque

When mounting a CU single acting series, refer to page 728.

## Spring reaction force

Refer to page 1572 (Table (3): Spring Reaction Force).

## Moisture Control Tube IDK Series

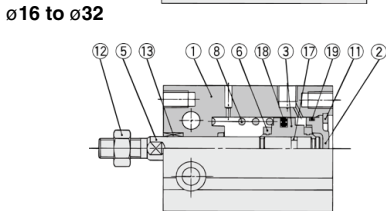
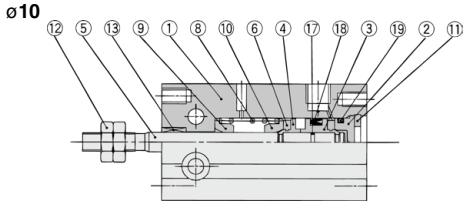
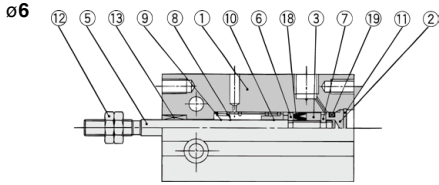


When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

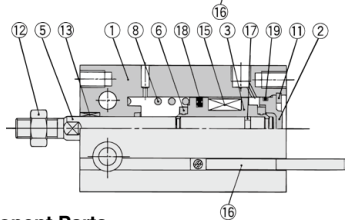
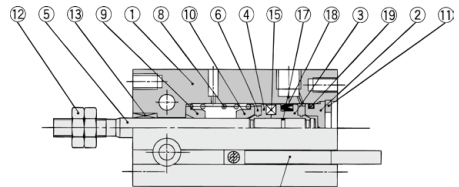
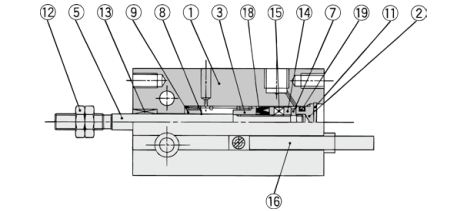
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

## Construction

### Single acting, Spring return



### With auto switch



### Component Parts

| No. | Description   | Material        | Note                                 |
|-----|---------------|-----------------|--------------------------------------|
| 1   | Cylinder tube | Aluminum alloy  | Hard anodized                        |
| 2   | Head cover    | Brass           | ø6 to ø10, Electroless nickel plated |
|     |               | Aluminum alloy  | ø16 to ø32, Chromated                |
| 3   | Piston        | Brass           | ø6                                   |
| 4   | Piston        | Aluminum alloy  | ø10 to ø32, Chromated                |
| 5   | Piston rod    | Stainless steel |                                      |
| 6   | Bumper A      | Urethane        |                                      |
| 7   | Bumper B      | Urethane        |                                      |
| 8   | Return spring | Piano wire      | Zinc chromated                       |

### Component Parts

| No. | Description    | Material          | Note             |
|-----|----------------|-------------------|------------------|
| 9   | Spring seat    | Brass             |                  |
| 10  | Spring seat    | Brass             |                  |
| 11  | Retaining ring | Carbon tool steel | Phosphate coated |
| 12  | Rod end nut    | Carbon steel      | Chromated        |
| 13  | Bushing        | Bearing alloy     |                  |
| 14  | Magnet holder  | Brass             | ø6               |
| 15  | Magnet         | —                 |                  |
| 16  | Auto switch    | —                 |                  |
| 17  | Piston gasket  | NBR               |                  |
| 18* | Piston seal    |                   |                  |
| 19* | Gasket         |                   |                  |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |          |          |          |          |
|---------|---------------------------|----------|----------|----------|----------|
|         | 10                        | 16       | 20       | 25       | 32       |
|         | CU10S-PS                  | CU16S-PS | CU20S-PS | CU25S-PS | CU32S-PS |

\* Seal kit includes 18, 19. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

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

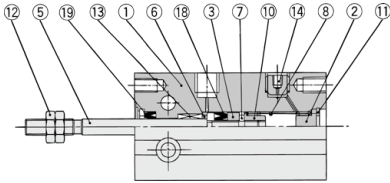
**Grease pack part number: GR-S-010 (10 g)**

# CU Series

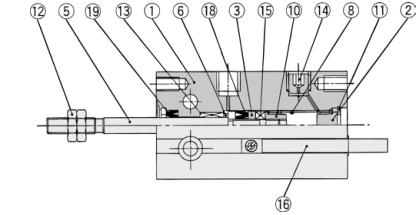
## Construction

### Single acting, Spring extend

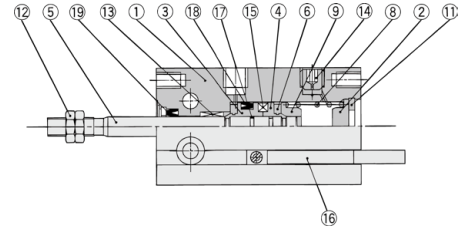
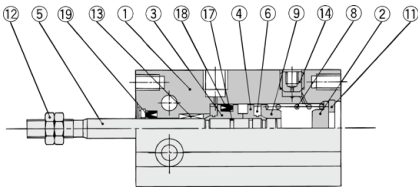
ø6



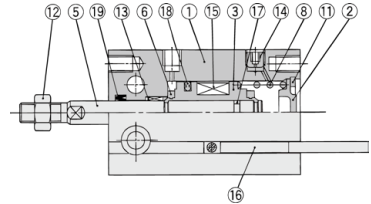
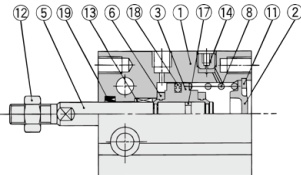
### With auto switch



ø10



ø16 to ø32



### Component Parts

| No. | Description   | Material        | Note                                 |
|-----|---------------|-----------------|--------------------------------------|
| 1   | Cylinder tube | Aluminum alloy  | Hard anodized                        |
| 2   | Head cover    | Brass           | ø6 to ø10, Electroless nickel plated |
|     |               | Aluminum alloy  | ø16 to ø32, Chromated                |
| 3   | Piston        | Brass           | ø6                                   |
|     |               | Aluminum alloy  | ø10 to ø32, Chromated                |
| 4   | Piston        | Aluminum alloy  | ø10, Chromated                       |
| 5   | Piston rod    | Stainless steel |                                      |
| 6   | Bumper A      | Urethane        |                                      |
| 7   | Bumper B      | Urethane        |                                      |
| 8   | Return spring | Piano wire      | Zinc chromated                       |

### Component Parts

| No. | Description             | Material          | Note             |
|-----|-------------------------|-------------------|------------------|
| 9   | Spring seat             | Brass             |                  |
| 10  | Stopper                 | Brass             | ø6               |
| 11  | Retaining ring          | Carbon tool steel | Phosphate coated |
| 12  | Rod end nut             | Carbon steel      | Chromated        |
| 13  | Bushing                 | Bearing alloy     |                  |
| 14  | Plug with fixed orifice | Alloy steel       | Black dyed       |
| 15  | Magnet                  | —                 |                  |
| 16  | Auto switch             | —                 |                  |
| 17  | Piston gasket           |                   |                  |
| 18* | Piston seal             | NBR               |                  |
| 19* | Rod seal                |                   |                  |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |          |          |          |          |
|---------|---------------------------|----------|----------|----------|----------|
|         | 10                        | 16       | 20       | 25       | 32       |
|         | CU10T-PS                  | CU16T-PS | CU20T-PS | CU25T-PS | CU32T-PS |

\* Seal kit includes 18, 19. Order the seal kit, based on each bore size.

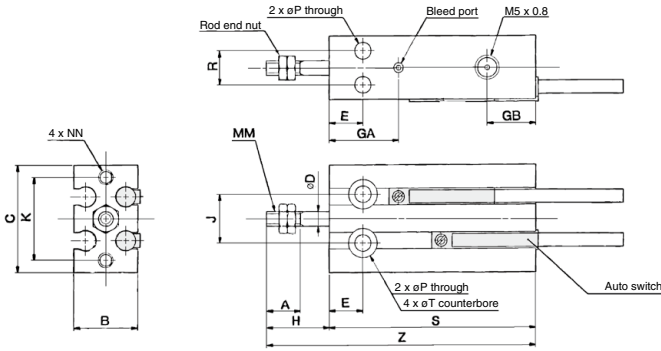
\* Seal kit includes a grease pack (10 g).

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

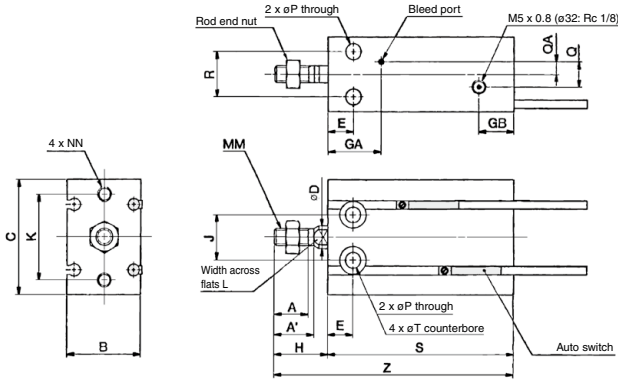
Grease pack part number: GR-S-010 (10 g)

**Dimensions: Single Acting, Spring Return**

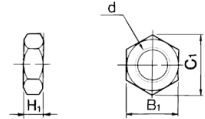
ø6, ø10



ø16 to ø32



**Rod End Nut/Accessory**



Material: Carbon steel

| Part no.        | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|-----------------|---------------------------|------------|----------------|----------------|----------------|
| <b>NTP-006</b>  | <b>6</b>                  | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| <b>NTP-010</b>  | <b>10</b>                 | M4 x 0.7   | 2.4            | 7              | 8.1            |
| <b>NTJ-015C</b> | <b>16</b>                 | M5 x 0.8   | 4              | 8              | 9.2            |
| <b>NT-015A</b>  | <b>20</b>                 | M6 x 1.0   | 5              | 10             | 11.5           |
| <b>NT-02</b>    | <b>25</b>                 | M8 x 1.25  | 5              | 13             | 15.0           |
| <b>NT-03</b>    | <b>32</b>                 | M10 x 1.25 | 6              | 17             | 19.6           |

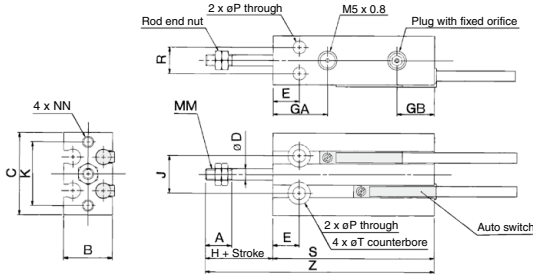
(mm)

| Bore size (mm) | A    | A'   | B  | C  | D  | E  | GA   | GB   | H  | J  | K  | L  | MM         | NN               | P   | Q    | QA  | R  | T             |
|----------------|------|------|----|----|----|----|------|------|----|----|----|----|------------|------------------|-----|------|-----|----|---------------|
| <b>6</b>       | 7    | —    | 13 | 22 | 3  | 7  | 15   | 10   | 13 | 10 | 17 | —  | M3 x 0.5   | M3 x 0.5 depth 5 | 3.2 | —    | —   | 7  | 6 depth 4.8   |
| <b>10</b>      | 10   | —    | 15 | 24 | 4  | 7  | 16.5 | 10   | 16 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 | 3.2 | —    | —   | 9  | 6 depth 5     |
| <b>16</b>      | 11   | 12.5 | 20 | 32 | 6  | 7  | 16.5 | 11.5 | 16 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 |
| <b>20</b>      | 12   | 14   | 26 | 40 | 8  | 9  | 19   | 12.5 | 19 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   |
| <b>25</b>      | 15.5 | 18   | 32 | 50 | 10 | 10 | 21.5 | 13   | 23 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   |
| <b>32</b>      | 19.5 | 22   | 40 | 62 | 12 | 11 | 23   | 12.5 | 27 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 |

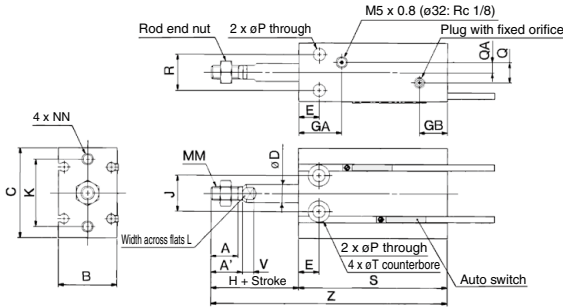
| Bore size (mm) | Without auto switch |       |       |      |       |       | With auto switch |       |       |      |       |       |
|----------------|---------------------|-------|-------|------|-------|-------|------------------|-------|-------|------|-------|-------|
|                | S                   |       | Z     |      | S     |       | Z                |       | S     |      | Z     |       |
|                | 5 st                | 10 st | 15 st | 5 st | 10 st | 15 st | 5 st             | 10 st | 15 st | 5 st | 10 st | 15 st |
| <b>6</b>       | 38                  | 43    | 48    | 51   | 56    | 61    | 38               | 43    | 48    | 51   | 56    | 61    |
| <b>10</b>      | 41                  | 46    | 56    | 57   | 62    | 72    | 41               | 46    | 56    | 57   | 62    | 72    |
| <b>16</b>      | 35                  | 40    | 50    | 51   | 56    | 66    | 45               | 50    | 60    | 61   | 66    | 76    |
| <b>20</b>      | 41                  | 46    | 56    | 60   | 65    | 75    | 51               | 56    | 66    | 70   | 75    | 85    |
| <b>25</b>      | 45                  | 50    | 60    | 68   | 73    | 83    | 55               | 60    | 70    | 78   | 83    | 93    |
| <b>32</b>      | 47                  | 52    | 62    | 74   | 79    | 89    | 57               | 62    | 72    | 84   | 89    | 99    |

## Dimensions: Single Acting, Spring Extend

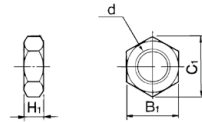
ø6, ø10



ø16 to ø32



### Rod End Nut/Accessory



Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H   | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|-----|----------------|----------------|
| NTP-006  | 6                         | M3 x 0.5   | 1.8 | 5.5            | 6.4            |
| NTP-010  | 10                        | M4 x 0.7   | 2.4 | 7              | 8.1            |
| NTJ-015A | 16                        | M5 x 0.8   | 4   | 8              | 9.2            |
| NT-015A  | 20                        | M6 x 1.0   | 5   | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5   | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6   | 17             | 19.6           |

(mm)

| Bore size (mm) | A    | A'   | B  | C  | D  | E  | GA   | GB   | H  | J  | K  | L  | MM         | NN               | P   | Q    | QA  | R  | T             | V   |
|----------------|------|------|----|----|----|----|------|------|----|----|----|----|------------|------------------|-----|------|-----|----|---------------|-----|
| 6              | 7    | —    | 13 | 22 | 3  | 7  | 15   | 10   | 13 | 10 | 17 | —  | M3 x 0.5   | M3 x 0.5 depth 5 | 3.2 | —    | —   | 7  | 6 depth 4.8   | —   |
| 10             | 10   | —    | 15 | 24 | 4  | 7  | 16.5 | 10   | 16 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 | 3.2 | —    | —   | 9  | 6 depth 5     | —   |
| 16             | 11   | 12.5 | 20 | 32 | 6  | 7  | 16.5 | 11.5 | 16 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 | 3.5 |
| 20             | 12   | 14   | 26 | 40 | 8  | 9  | 19   | 12.5 | 19 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   | 5   |
| 25             | 15.5 | 18   | 32 | 50 | 10 | 10 | 21.5 | 13   | 23 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   | 5   |
| 32             | 19.5 | 22   | 40 | 62 | 12 | 11 | 23   | 12.5 | 27 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 | 5   |

| Bore size (mm) | Without auto switch |       |       |      |       |       | With auto switch |       |       |      |       |       |
|----------------|---------------------|-------|-------|------|-------|-------|------------------|-------|-------|------|-------|-------|
|                | S                   |       |       | Z    |       |       | S                |       |       | Z    |       |       |
|                | 5 st                | 10 st | 15 st | 5 st | 10 st | 15 st | 5 st             | 10 st | 15 st | 5 st | 10 st | 15 st |
| 6              | 38                  | 43    | 48    | 56   | 66    | 76    | 38               | 43    | 48    | 56   | 66    | 76    |
| 10             | 41                  | 46    | 56    | 62   | 72    | 87    | 41               | 46    | 56    | 62   | 72    | 87    |
| 16             | 45                  | 50    | 60    | 66   | 76    | 91    | 45               | 50    | 60    | 66   | 76    | 91    |
| 20             | 41                  | 46    | 56    | 65   | 75    | 90    | 51               | 56    | 66    | 75   | 85    | 100   |
| 25             | 45                  | 50    | 60    | 73   | 83    | 98    | 55               | 60    | 70    | 83   | 93    | 108   |
| 32             | 47                  | 52    | 62    | 79   | 89    | 104   | 57               | 62    | 72    | 89   | 99    | 114   |

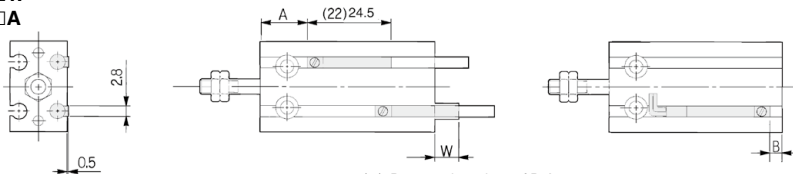
# Auto Switch Mounting

## Minimum Stroke for Auto Switch Mounting

| No. of auto switches mounted | Applicable auto switch |               |                                    |
|------------------------------|------------------------|---------------|------------------------------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□WV<br>D-M9□A, D-M9□AV |
| 1 pc.                        | 5                      | 5             | 5                                  |
| 2 pcs.                       | 10                     | 5             | 10                                 |

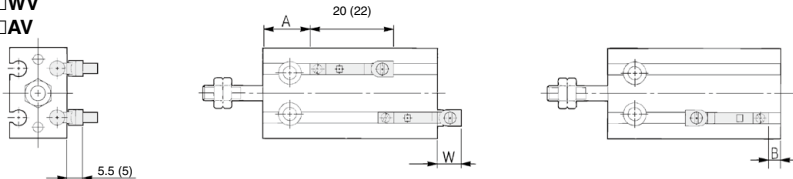
## Proper Auto Switch Mounting Position (Detection at Stroke End) and Mounting Height: Single Acting, Spring Return

D-A9□  
D-M9□  
D-M9□W  
D-M9□A



( ) : Denotes the values of D-A93.

D-A9□V  
D-M9□V  
D-M9□WV  
D-M9□AV



( ) : Denotes the values of D-A9□V.

## Single Acting, Spring Return

| Bore size (mm) | Stroke     | D-A9□, D-A9□V |      |           | D-M9□, D-M9□W |      |      | D-M9□V, D-M9□WV |      |      | D-M9□A |      |      | D-M9□AV |      |      |
|----------------|------------|---------------|------|-----------|---------------|------|------|-----------------|------|------|--------|------|------|---------|------|------|
|                |            | A             | B    | W         | A             | B    | W    | A               | B    | W    | A      | B    | W    | A       | B    | W    |
| 6              | All stroke | 13.5          | 0    | 2.5 (5)   | 17.5          | 4    | 6.5  | 17.5            | 4    | 4.5  | 17.5   | 4    | 8.5  | 17.5    | 4    | 6.5  |
|                |            | 15            | 17.5 | 3.5       | -1.5 (1)      | 16.5 | 7.5  | 2.5             | 16.5 | 7.5  | 0.5    | 16.5 | 7.5  | 4.5     | 16.5 | 7.5  |
| 10             | 5, 10      | 12.5          | 3.5  | -1.5 (1)  | 16.5          | 7.5  | 2.5  | 16.5            | 7.5  | 0.5  | 16.5   | 7.5  | 4.5  | 16.5    | 7.5  | 2.5  |
|                |            | 15            | 17.5 | 3.5       | -1.5 (1)      | 21.5 | 7.5  | 2.5             | 21.5 | 7.5  | 0.5    | 21.5 | 7.5  | 4.5     | 21.5 | 7.5  |
| 16             | 5, 10      | 16            | 4    | -2 (0.5)  | 20            | 8    | 2    | 20              | 8    | -0.5 | 20     | 8    | 4    | 20      | 8    | 1.5  |
|                |            | 15            | 21   | 4         | -2 (0.5)      | 25   | 8    | 2               | 25   | 8    | -0.5   | 25   | 8    | 4       | 25   | 8    |
| 20             | 5, 10      | 20            | 6    | -4 (-1.5) | 24            | 10   | 0    | 24              | 10   | -2   | 24     | 10   | 2    | 24      | 10   | 0    |
|                |            | 15            | 25   | 6         | -4 (-1.5)     | 29   | 10   | 0               | 29   | 10   | -2     | 29   | 10   | 2       | 29   | 10   |
| 25             | 5, 10      | 22.5          | 7    | -5.5 (-3) | 26.5          | 11   | -1.5 | 26.5            | 11   | -3.5 | 26.5   | 11   | 0.5  | 26.5    | 11   | -1.5 |
|                |            | 15            | 27.5 | 7         | -5.5 (-3)     | 31.5 | 11   | -1.5            | 31.5 | 11   | -3.5   | 31.5 | 11   | 0.5     | 31.5 | 11   |
| 32             | 5, 10      | 23.5          | 8.5  | -6.5 (-4) | 27.5          | 12.5 | -2.5 | 27.5            | 12.5 | -4.5 | 27.5   | 12.5 | -0.5 | 27.5    | 12.5 | -2.5 |
|                |            | 15            | 28.5 | 8.5       | -6.5 (-4)     | 32.5 | 12.5 | -2.5            | 32.5 | 12.5 | -4.5   | 32.5 | 12.5 | -0.5    | 32.5 | 12.5 |

## Single Acting, Spring Extend

| Bore size (mm) | Stroke     | D-A9□, D-A9□V |      |           | D-M9□, D-M9□W |      |      | D-M9□V, D-M9□WV |      |      | D-M9□A |      |      | D-M9□AV |      |      |
|----------------|------------|---------------|------|-----------|---------------|------|------|-----------------|------|------|--------|------|------|---------|------|------|
|                |            | A             | B    | W         | A             | B    | W    | A               | B    | W    | A      | B    | W    | A       | B    | W    |
| 6              | All stroke | 10.5          | 1.5  | 0.5 (3)   | 14.5          | 5.5  | 4.5  | 14.5            | 5.5  | 2.5  | 14.5   | 5.5  | 6.5  | 14.5    | 5.5  | 4.5  |
|                |            | 15            | 12.5 | 3.5       | -1.5 (1)      | 16.5 | 7.5  | 2.5             | 16.5 | 7.5  | 0.5    | 16.5 | 7.5  | 4.5     | 16.5 | 7.5  |
| 10             | 5, 10      | 12.5          | 3.5  | -1.5 (1)  | 16.5          | 7.5  | 2.5  | 16.5            | 7.5  | 0.5  | 16.5   | 7.5  | 4.5  | 16.5    | 7.5  | 2.5  |
|                |            | 15            | 17.5 | 8.5       | -6.5 (-4)     | 21.5 | 12.5 | -2.5            | 21.5 | 12.5 | -4.5   | 21.5 | 12.5 | -0.5    | 21.5 | 12.5 |
| 16             | 5, 10      | 16            | 4    | -2 (0.5)  | 20            | 8    | 2    | 20              | 8    | 0    | 20     | 8    | 4    | 20      | 8    | 2    |
|                |            | 15            | 21   | 9         | -7 (-4.5)     | 25   | 13   | -3              | 25   | 13   | -5     | 25   | 13   | -1      | 25   | 13   |
| 20             | 5, 10      | 20            | 6    | -4 (-1.5) | 24            | 10   | 0    | 24              | 10   | -2   | 24     | 10   | 2    | 24      | 10   | 0    |
|                |            | 15            | 25   | 11        | -9 (-6.5)     | 29   | 15   | -5              | 29   | 15   | -7     | 29   | 15   | -3      | 29   | 15   |
| 25             | 5, 10      | 22.5          | 7    | -5.5 (-3) | 26.5          | 11   | -1.5 | 26.5            | 11   | -3.5 | 26.5   | 11   | 0.5  | 26.5    | 11   | -1.5 |
|                |            | 15            | 27.5 | 12        | -10.5 (-8)    | 31.5 | 16   | -6.5            | 31.5 | 16   | -8.5   | 31.5 | 16   | -4.5    | 31.5 | 16   |
| 32             | 5, 10      | 23.5          | 8.5  | -6.5 (-4) | 27.5          | 12.5 | -2.5 | 27.5            | 12.5 | -4.5 | 27.5   | 12.5 | -0.5 | 27.5    | 12.5 | -2.5 |
|                |            | 15            | 28.5 | 13.5      | -11.5 (-9)    | 32.5 | 17.5 | -7.5            | 32.5 | 17.5 | -9.5   | 32.5 | 17.5 | -5.5    | 32.5 | 17.5 |

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

Note 2) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.

Note 3) In the case of the 5 stroke or the 10 stroke, there are times in which the auto switch will not turn OFF or 2 auto switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the auto switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 auto switches are used, make sure that both auto switches turn ON).

Note 4) ( ) in column W is the dimensions of D-A90 and A93.

# Free Mount Cylinder: Non-rotating Rod Type Double Acting, Single Rod

## CUK Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**CUK 6 [ ] - 30 D - [ ]**

**With auto switch** **CDUK 6 [ ] - 30 D - M9BW [ ] - [ ]**

- Built-in magnet**
- Non-rotating rod type**
- Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
- Auto switch**

|     |        |
|-----|--------|
| Nil | 2 pcs. |
| S   | 1 pc.  |
- Number of auto switches**

|     |        |
|-----|--------|
| Nil | 2 pcs. |
| S   | 1 pc.  |
- Auto switch**

|     |                     |
|-----|---------------------|
| Nil | Without auto switch |
|-----|---------------------|
- Action**

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|
- Standard stroke (mm)**

|               |                               |
|---------------|-------------------------------|
| ø6, ø10, ø16  | 5, 10, 15, 20, 25, 30         |
| ø20, ø25, ø32 | 5, 10, 15, 20, 25, 30, 40, 50 |
- Port thread type**

| Symbol | Type               | Bore size                     |
|--------|--------------------|-------------------------------|
| Nil    | M5 x 0.8<br>Rc 1/8 | ø6, ø10, ø16, ø20, ø25<br>ø32 |
| TN     | NPT 1/8            | ø32                           |
| TF     | G 1/8              | ø32                           |

**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): CDUK20-25D

**Made to Order**  
\* Refer to page 747 for the Made to Order specifications.

\* Refer to the table below for applicable auto switches.

### Applicable Auto Switches

Refer to pages 1271 to 1365 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) |                     | IC circuit      | Relay, PLC |            |   |   |   |   |   |            |   |            |
| Solid state auto switch             | —                | Grommet          | Yes             | 3-wire (NPN)    | 24 V         | 5 V, 12 V | —                 | M9NV                | M9N                     | ●     | ●     | ○     | ○                   | —               | IC circuit |            |   |   |   |   |   |            |   |            |
|                                     |                  |                  |                 | 3-wire (PNP)    |              |           |                   | M9PV                | M9P                     | ●     | ●     | ○     | ○                   |                 |            |            |   |   |   |   |   |            |   |            |
|                                     |                  |                  |                 | 2-wire          |              |           |                   | M9BV                | M9B                     | ●     | ●     | ○     | ○                   |                 |            |            |   |   |   |   |   |            |   |            |
|                                     | 3-wire (NPN)     |                  |                 | M9NWV           |              |           |                   | M9NW                | ●                       | ●     | ○     | ○     | —                   |                 |            | IC circuit |   |   |   |   |   |            |   |            |
|                                     | 3-wire (PNP)     |                  |                 | M9PWW           |              |           |                   | M9PW                | ●                       | ●     | ○     | ○     |                     |                 |            |            |   |   |   |   |   |            |   |            |
|                                     | 2-wire           |                  |                 | M9BWW           |              |           |                   | M9BW                | ●                       | ●     | ○     | ○     |                     |                 |            |            |   |   |   |   |   |            |   |            |
| Water resistant (2-color indicator) | Grommet          | Yes              | No              | 3-wire (NPN)    | 24 V         | 5 V, 12 V | —                 | M9NAV <sup>#1</sup> | M9NA <sup>#1</sup>      | ○     | ○     | ●     | ○                   | —               | IC circuit |            |   |   |   |   |   |            |   |            |
|                                     |                  |                  |                 | 3-wire (PNP)    |              |           |                   | M9PAV <sup>#1</sup> | M9PA <sup>#1</sup>      | ○     | ○     | ●     | ○                   |                 |            |            |   |   |   |   |   |            |   |            |
|                                     |                  |                  |                 | 2-wire          |              |           |                   | M9BAV <sup>#1</sup> | M9BA <sup>#1</sup>      | ○     | ○     | ●     | ○                   |                 |            |            |   |   |   |   |   |            |   |            |
| —                                   | Grommet          |                  |                 | Yes             |              |           |                   | No                  | 3-wire (NPN equivalent) | 24 V  | 12 V  | 100 V | A96V                |                 |            | A96        | ● | — | ● | — | — | IC circuit |   |            |
|                                     |                  |                  |                 |                 |              |           |                   |                     | 2-wire                  |       |       |       | A93V <sup>#2</sup>  |                 |            | A93        | ● | ● | ● | — |   |            | — | Relay, PLC |
|                                     |                  |                  |                 |                 |              |           |                   |                     |                         |       |       |       | A90V                |                 |            | A90        | ● | — | ● | — |   |            |   |            |

\* 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) M9NWL  
5 m ..... Z (Example) M9NWX

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

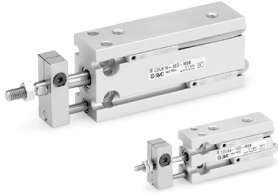
\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.

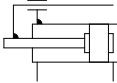


# Free Mount Cylinder: Non-rotating Rod Type Double Acting, Single Rod **CUK Series**



## Symbol

Double acting, Single rod, Rubber bumper



## Standard Stroke

| Bore size (mm)    | Standard stroke (mm)          |
|-------------------|-------------------------------|
| <b>6, 10, 16</b>  | 5, 10, 15, 20, 25, 30         |
| <b>20, 25, 32</b> | 5, 10, 15, 20, 25, 30, 40, 50 |

Note) For long stroke, refer to page 764.



## Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications   |
|--------|--|
| -XB6   | Heat resistant (-10 to 150°C)  |
| -XB7   | Cold resistant (-40 to 70°C)   |
| -XB9   | Low speed (10 to 50 mm/s)  |
| -XB13  | Low speed (5 to 50 mm/s)   |
| -XC19  | Intermediate stroke (5 mm spacer)  |
| -XC22  | Fluororubber seals   |
| -XC34  | Non-rotating plate with workpiece mounting screw (No extended part on the rod end) |

## Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

## Specifications

| Bore size (mm)                             | 6   | 10       | 16 | 20              | 25       | 32 |
|--|---|----------|----|-----------------|----------|----|
| Fluid                                      | Air   |          |    |                 |          |    |
| Proof pressure                             | 1.05 MPa  |          |    |                 |          |    |
| Maximum operating pressure                 | 0.7 MPa   |          |    |                 |          |    |
| Minimum operating pressure                 | 0.15 MPa  | 0.10 MPa |    |                 | 0.08 MPa |    |
| Ambient and fluid temperature              | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |    |                 |          |    |
| Lubrication                                | Non-lube  |          |    |                 |          |    |
| Piston speed                               | 50 to 500 mm/s  |          |    |                 |          |    |
| Cushion                                    | Rubber bumper   |          |    |                 |          |    |
| Rod end thread                             | Male thread   |          |    |                 |          |    |
| Stroke length tolerance                    | $\begin{matrix} +1.0 \\ 0 \end{matrix}$ mm  |          |    |                 |          |    |
| Rod non-rotating accuracy <sup>Note)</sup> | $\pm 0.8^\circ$   |          |    | $\pm 0.5^\circ$ |          |    |

Note) No load: Rod at retracted

## Minimum Stroke for Auto Switch Mounting

(mm)

| No. of auto switches mounted | Applicable auto switch |               |                 |
|------------------------------|------------------------|---------------|-----------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□VW |
| 1 pc.                        | 5                      | 5             | 5               |
| 2 pcs.                       | 10                     | 5             | 10              |

## Weight/( ): Denotes the values with D-A93.

(g)

| Bore size (mm) | Stroke (mm)  |              |              |              |              |              |              |              |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                | 5            | 10           | 15           | 20           | 25           | 30           | 40           | 50           |
| C(D)UK6-□D     | 28<br>(33)   | 31<br>(41)   | 34<br>(44)   | 37<br>(47)   | 40<br>(50)   | 43<br>(53)   | —            | —            |
| C(D)UK10-□D    | 43<br>(48)   | 47<br>(57)   | 51<br>(61)   | 55<br>(65)   | 59<br>(69)   | 63<br>(73)   | —            | —            |
| C(D)UK16-□D    | 60<br>(85)   | 66<br>(96)   | 72<br>(102)  | 78<br>(108)  | 84<br>(114)  | 90<br>(120)  | —            | —            |
| C(D)UK20-□D    | 113<br>(147) | 124<br>(164) | 136<br>(176) | 148<br>(188) | 160<br>(200) | 172<br>(211) | 195<br>(235) | 219<br>(260) |
| C(D)UK25-□D    | 212<br>(266) | 229<br>(288) | 246<br>(305) | 263<br>(322) | 280<br>(339) | 297<br>(356) | 335<br>(390) | 370<br>(424) |
| C(D)UK32-□D    | 331<br>(404) | 357<br>(435) | 383<br>(461) | 409<br>(487) | 435<br>(513) | 461<br>(539) | 513<br>(591) | 565<br>(643) |

\* For the auto switch weight, refer to page 1271.

## Allowable Rotational Torque

| Bore size (mm)                    | 6      | 10   | 16   | 20   | 25   | 32   |
|-----------------------------------|--------|------|------|------|------|------|
| Allowable rotational torque (N·m) | 0.0015 | 0.02 | 0.04 | 0.10 | 0.15 | 0.20 |

## Tightening Torque

When mounting the CUK series, refer to page 732.

## Theoretical Output

Specifications are the same as CU series double acting, single rod. Refer to page 728.

## Auto Switch Mounting Position

For the auto switch mounting position of the CDUK series, refer to page 732, since specifications are the same as standard type, double acting, single rod type.

## ⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

## Operating Precautions

### ⚠ Caution

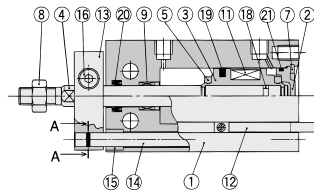
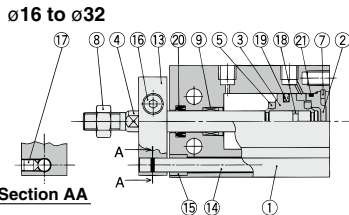
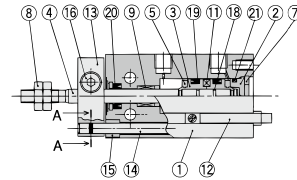
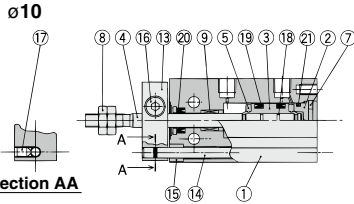
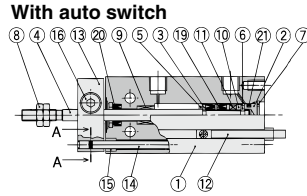
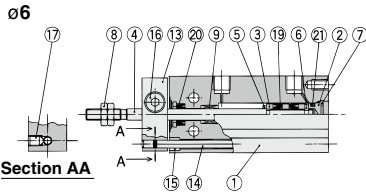
- Do not place your fingers in the clearance between the non-rotating plate and the cylinder tube.

Your fingers could get caught between the non-rotating plate and the cylinder tube when the piston rod retracts. Therefore, never place your finger in this area.

Because the cylinder outputs a great force, it could lead to injury if precautions are not taken to prevent your fingers from getting caught.

- When using the non-rotating type, make sure that rotational torque is not applied to the piston rod. If rotational torque must be applied due to unavoidable circumstances, make sure to use it at the allowable rotational torque or less, which is shown in the table on the right.

## Construction



### Component Parts

| No. | Description    | Material                       | Note                                 |
|-----|----------------|--------------------------------|--------------------------------------|
| 1   | Cylinder tube  | Aluminum alloy                 | Hard anodized                        |
| 2   | Head cover     | Brass                          | ø6 to ø10, Electroless nickel plated |
|     |                | Aluminum alloy                 | ø16 to ø32, Chromated                |
| 3   | Piston         | Brass                          | ø6                                   |
|     |                | Aluminum alloy                 | ø10 to ø32, Chromated                |
| 4   | Piston rod     | Stainless steel                |                                      |
| 5   | Bumper A       | Urethane                       |                                      |
| 6   | Bumper B       | Urethane                       |                                      |
| 7   | Retaining ring | Carbon tool steel              | Phosphate coated                     |
| 8   | Rod end nut    | Carbon steel                   | Chromated                            |
| 9   | Bushing        | Oil-impregnated sintered alloy |                                      |
| 10  | Magnet holder  | Brass                          | ø6                                   |

### Component Parts

| No. | Description                   | Material        | Note          |
|-----|-------------------------------|-----------------|---------------|
| 11  | Magnet                        | —               |               |
| 12  | Auto switch                   | —               |               |
| 13  | Non-rotating plate            | Aluminum alloy  | Nickel plated |
| 14  | Guide rod                     | Stainless steel |               |
| 15  | Bushing                       | Bearing alloy   |               |
| 16  | Hexagon socket head cap screw | Carbon steel    | Chromated     |
| 17  | Hexagon socket head set screw | Carbon steel    | Chromated     |
| 18  | Piston gasket                 | NBR             |               |
| 19* | Piston seal                   |                 |               |
| 20* | Rod seal                      |                 |               |
| 21* | Gasket                        |                 |               |

### Replacement Parts: Seal Kit

| Bore size (mm) | Kit no.  | Contents                      |
|----------------|----------|-------------------------------|
| 10             | CU10D-PS | Set of nos. above 19, 20, 21. |
| 16             | CU16D-PS |                               |
| 20             | CU20D-PS |                               |
| 25             | CU25D-PS |                               |
| 32             | CU32D-PS |                               |

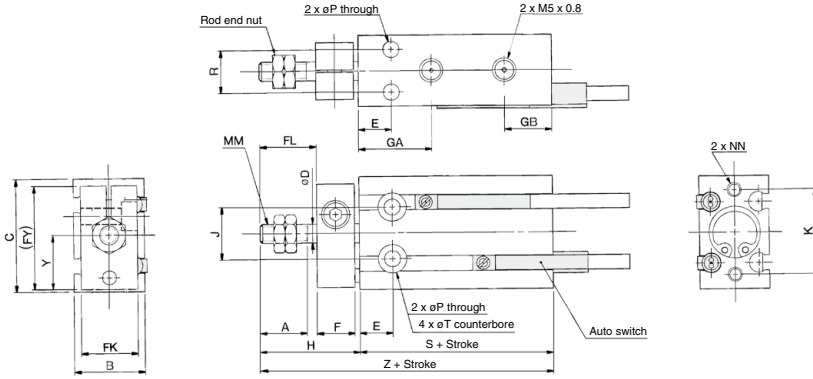
\* Seal kit includes 19, 20, 21. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

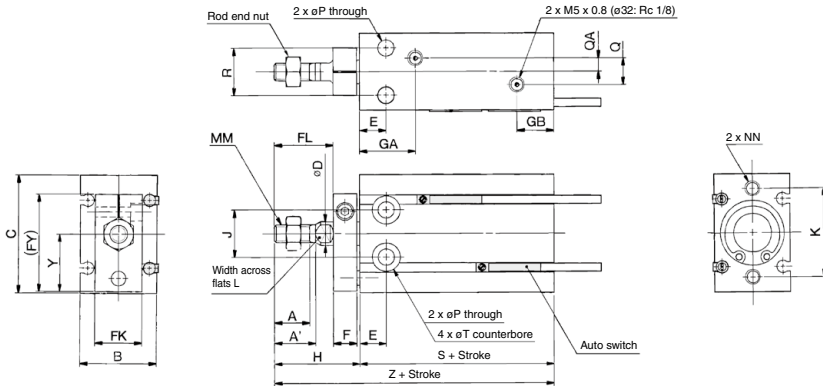
Order with the following part number when only the grease pack is needed.  
**Grease pack part number: GR-S-010 (10 g)**

**Dimensions: Non-rotating Rod Type; Double Acting, Single Rod**

ø6, ø10

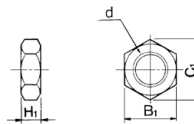


ø16 to ø32



**Rod End Nut/Accessory** Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|----------------|----------------|----------------|
| NTP-006  | 6                         | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| NTP-010  | 10                        | M4 x 0.7   | 2.4            | 7              | 8.1            |
| NTJ-015C | 16                        | M5 x 0.8   | 4              | 8              | 9.2            |
| NT-015A  | 20                        | M6 x 1.0   | 5              | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |



| Bore size (mm) | A    | A'   | B  | C  | D  | E  | F  | FL | FK | FY   | GA                   | GB   | H  | J  | K  | L  | MM         |
|----------------|------|------|----|----|----|----|----|----|----|------|----------------------|------|----|----|----|----|------------|
|                | 6    | 7    | —  | 13 | 22 | 3  | 7  | 8  | 9  | 11   | 20.5                 | 15   | 10 | 18 | 10 | 17 | —          |
| 10             | 10   | —    | 15 | 24 | 4  | 7  | 8  | 12 | 12 | 22   | 16.5                 | 10   | 21 | 11 | 18 | —  | M4 x 0.7   |
| 16             | 11   | 12.5 | 20 | 32 | 6  | 7  | 8  | 17 | 13 | 28   | 16.5 <sup>Note</sup> | 11.5 | 26 | 14 | 25 | 5  | M5 x 0.8   |
| 20             | 12   | 14   | 26 | 40 | 8  | 9  | 8  | 20 | 16 | 33   | 19                   | 12.5 | 29 | 16 | 30 | 6  | M6 x 1.0   |
| 25             | 15.5 | 18   | 32 | 50 | 10 | 10 | 10 | 22 | 20 | 43.5 | 21.5                 | 13   | 33 | 20 | 38 | 8  | M8 x 1.25  |
| 32             | 19.5 | 22   | 40 | 62 | 12 | 11 | 12 | 29 | 24 | 51.5 | 23                   | 12.5 | 42 | 24 | 48 | 10 | M10 x 1.25 |

| Bore size (mm) | NN               | P   | Q    | QA  | R  | T             | Y    | Without auto switch |    | With auto switch |    |
|----------------|------------------|-----|------|-----|----|---------------|------|---------------------|----|------------------|----|
|                |                  |     |      |     |    |               |      | S                   | Z  | S                | Z  |
| 6              | M3 x 0.5 depth 5 | 3.2 | —    | —   | 7  | 6 depth 4.8   | 10.5 | 33                  | 51 | 33               | 51 |
| 10             | M3 x 0.5 depth 5 | 3.2 | —    | —   | 9  | 6 depth 5     | 11.5 | 36                  | 57 | 36               | 57 |
| 16             | M4 x 0.7 depth 6 | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 | 15.5 | 30                  | 56 | 40               | 66 |
| 20             | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   | 19.5 | 36                  | 65 | 46               | 75 |
| 25             | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   | 24.5 | 40                  | 73 | 50               | 83 |
| 32             | M6 x 1.0 depth 9 | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 | 30.5 | 42                  | 84 | 52               | 94 |

Note) 5 stroke (CUK16-5D); GA = 14.5

# Free Mount Cylinder: Non-rotating Rod Type

## Double Acting, Double Rod

# CUKW Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**With auto switch**

**CUKW 6 - 30 D**

**CDUKW 6 - 30 D - M9BW**

● Built-in magnet

● Non-rotating rod type

● Double rod

● Bore size

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

● Port thread type

| Symbol | Type     | Bore size              |
|--------|----------|------------------------|
| NII    | M5 x 0.8 | ø6, ø10, ø16, ø20, ø25 |
|        | Rc 1/8   | ø32                    |
| TN     | NPT 1/8  | ø32                    |
| TF     | G 1/8    | ø32                    |

● Number of auto switches

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

● Auto switch

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

\* Refer to the table below for applicable auto switches.

● Action

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

● Standard stroke (mm)

|               |  |
|---------------|--|
| ø6, ø10, ø16  | 5, 10, 15, 20, 25, 30, 40, 50, 60                  |
| ø20, ø25, ø32 | 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 |

**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): CDUKW20-25D

### Applicable Auto Switches/Refer to pages 1271 to 1365 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) | IC         |                     | Relay, PLC      |            |
| Solid state auto switch             | —                | Grommet             | Yes                | 3-wire (NPN)            | 24 V          | 5 V, 12 V | —                 | M9NV               | M9N                  | ●          | ●     | ●     | ○          | ○                   | —               | IC circuit |
|                                     |                  |                     |                    | 3-wire (PNP)            |               |           |                   | M9PV               | M9P                  | ●          | ●     | ●     | ○          | ○                   |                 |            |
|                                     | 2-wire           |                     |                    | 5 V, 12 V               | —             | M9BV      | M9B               | ●                  | ●                    | ●          | ○     | ○     | —          | —                   |                 |            |
|                                     | 3-wire (NPN)     |                     |                    |                         |               | M9NWV     | M9NW              | ●                  | ●                    | ●          | ○     | ○     |            |                     |                 |            |
|                                     | 3-wire (PNP)     |                     |                    |                         |               | M9PWW     | M9PW              | ●                  | ●                    | ●          | ○     | ○     |            |                     |                 |            |
|                                     | 2-wire           |                     |                    |                         |               | M9BWW     | M9BW              | ●                  | ●                    | ●          | ○     | ○     |            |                     |                 |            |
| Water resistant (2-color indicator) | 2-wire           | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup> | ○                       | ○             | ●         | ○                 | ○                  | —                    | IC circuit |       |       |            |                     |                 |            |
|                                     |                  | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup> | ○                       | ○             | ●         | ○                 | ○                  |                      |            |       |       |            |                     |                 |            |
|                                     |                  | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                       | ○             | ●         | ○                 | ○                  |                      |            |       |       |            |                     |                 |            |
|                                     |                  | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                       | ○             | ●         | ○                 | ○                  |                      |            |       |       |            |                     |                 |            |
| Reed auto switch                    | —                | Grommet             | Yes                | 3-wire (NPN equivalent) | 24 V          | 12 V      | —                 | A96V               | A96                  | ●          | —     | ●     | —          | —                   | IC circuit      |            |
|                                     |                  |                     |                    | 2-wire                  |               |           |                   | A93V <sup>*2</sup> | A93                  | ●          | ●     | ●     | ●          |                     |                 | —          |
|                                     |                  |                     |                    | No                      | 100 V or less | A90V      | A90               | ●                  | —                    | ●          | —     | —     | IC circuit |                     |                 |            |

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

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

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWX

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

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

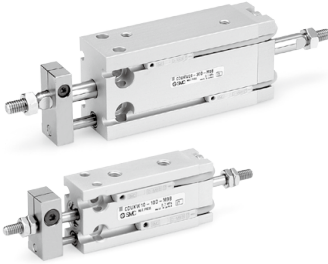
\* Auto switches are shipped together but not assembled.

# Free Mount Cylinder: Non-rotating Rod Type Double Acting, Double Rod **CUKW Series**

## Specifications

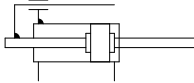
| Bore size (mm)                          | 6   | 10       | 16 | 20 | 25       | 32 |
|---|---|----------|----|----|----------|----|
| <b>Fluid</b>                            | Air   |          |    |    |          |    |
| <b>Proof pressure</b>                   | 1.05 MPa  |          |    |    |          |    |
| <b>Maximum operating pressure</b>       | 0.7 MPa   |          |    |    |          |    |
| <b>Minimum operating pressure</b>       | 0.18 MPa  | 0.13 MPa |    |    | 0.11 MPa |    |
| <b>Ambient and fluid temperature</b>    | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |    |    |          |    |
| <b>Lubrication</b>                      | Non-lube  |          |    |    |          |    |
| <b>Piston speed</b>                     | 50 to 500 mm/s  |          |    |    |          |    |
| <b>Cushion</b>                          | Rubber bumper   |          |    |    |          |    |
| <b>Rod end thread</b>                   | Male thread   |          |    |    |          |    |
| <b>Stroke length tolerance</b>          | ±1.0<br>0 mm  |          |    |    |          |    |
| <b>Rod non-rotating accuracy</b> (Note) | ±0.8°   |          |    |    | ±0.5°    |    |

Note) No load: Rod in the non-rotating plate side at retracted



## Symbol

Non-rotating rod, Rubber bumper



## Standard Stroke

| Bore size (mm)    | Standard stroke (mm)                               |
|-------------------|--|
| <b>6, 10, 16</b>  | 5, 10, 15, 20, 25, 30, 40, 50, 60                  |
| <b>20, 25, 32</b> | 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100 |

## Minimum Stroke for Auto Switch Mounting

(mm)

| No. of auto switches mounted | Applicable auto switch |               |                 |
|------------------------------|------------------------|---------------|-----------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□WV |
| 1 pc.                        | 5                      | 5             | 5               |
| 2 pcs.                       | 10                     | 5             | 10              |

**Weight** ( ): Denotes the values with D-A93.

(g)

| Model               | Stroke (mm)  |              |              |              |              |              |              |              |              |              |              |               |                |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|----------------|
|                     | 5            | 10           | 15           | 20           | 25           | 30           | 40           | 50           | 60           | 70           | 80           | 90            | 100            |
| <b>C(D)UKW6-□D</b>  | 33<br>(38)   | 36<br>(46)   | 40<br>(50)   | 43<br>(53)   | 46<br>(56)   | 50<br>(60)   | 57<br>(67)   | 64<br>(74)   | 71<br>(81)   | —            | —            | —             | —              |
| <b>C(D)UKW10-□D</b> | 51<br>(56)   | 56<br>(66)   | 60<br>(70)   | 65<br>(75)   | 69<br>(79)   | 74<br>(84)   | 83<br>(93)   | 92<br>(102)  | 101<br>(111) | —            | —            | —             | —              |
| <b>C(D)UKW16-□D</b> | 84<br>(109)  | 91<br>(121)  | 98<br>(128)  | 105<br>(135) | 112<br>(142) | 119<br>(149) | 133<br>(163) | 147<br>(177) | 161<br>(191) | —            | —            | —             | —              |
| <b>C(D)UKW20-□D</b> | 150<br>(185) | 163<br>(203) | 177<br>(217) | 191<br>(231) | 205<br>(245) | 219<br>(259) | 247<br>(286) | 275<br>(315) | 303<br>(343) | 331<br>(371) | 359<br>(399) | 387<br>(427)  | 415<br>(455)   |
| <b>C(D)UKW25-□D</b> | 276<br>(330) | 296<br>(355) | 316<br>(375) | 336<br>(395) | 357<br>(416) | 377<br>(436) | 421<br>(476) | 462<br>(516) | 500<br>(559) | 541<br>(600) | 582<br>(641) | 623<br>(682)  | 664<br>(723)   |
| <b>C(D)UKW32-□D</b> | 434<br>(507) | 465<br>(543) | 495<br>(573) | 526<br>(604) | 556<br>(634) | 587<br>(665) | 669<br>(747) | 709<br>(787) | 770<br>(848) | 831<br>(909) | 892<br>(970) | 953<br>(1031) | 1014<br>(1092) |

\* For the auto switch weight, refer to page 1271.

## Theoretical Output

Specifications are the same as double acting, double rod (CUW series). Refer to page 735.

## Tightening Torque

When mounting the CUKW series, refer to page 728.

## Allowable Rotational Torque

Ensure that rotational torque is not applied to the piston rod of the CUKW series. If rotational torque are applied unavoidably, refer to page 747.

## Auto Switch Mounting Position

For the auto switch mounting position of the CUKW series, refer to page 738, since specifications are the same as double acting, double rod type.

## Moisture Control Tube IDK Series



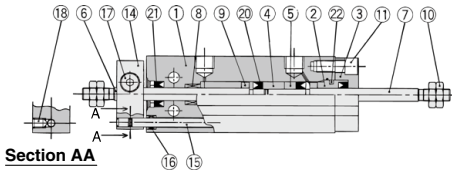
When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

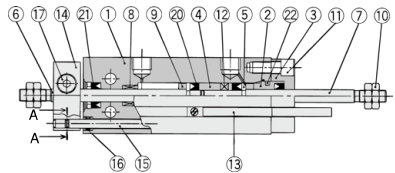
# CUKW Series

## Construction

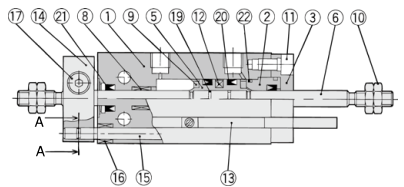
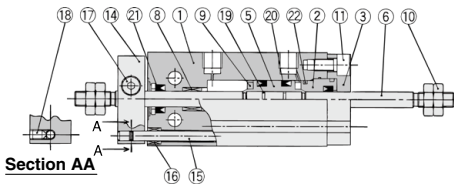
ø6



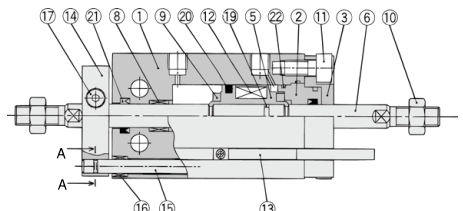
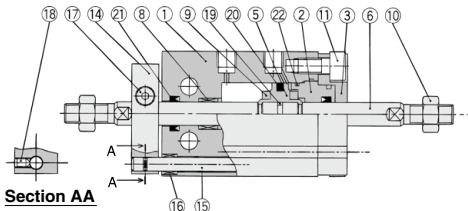
With auto switch



ø10



ø16 to ø32



### Component Parts

| No. | Description                   | Material        | Note                  |
|-----|-------------------------------|-----------------|-----------------------|
| 1   | Cylinder tube                 | Aluminum alloy  | Hard anodized         |
| 2   | Rod cover                     | Aluminum alloy  | Chromated             |
| 3   | Rod cover retainer            | Aluminum alloy  | Hard anodized         |
| 4   | Piston                        | Brass           | ø6                    |
| 5   | Piston                        | Brass           | ø6                    |
|     | Piston                        | Aluminum alloy  | ø10 to ø32, Chromated |
| 6   | Piston rod                    | Stainless steel |                       |
| 7   | Piston rod                    | Stainless steel | ø6                    |
| 8   | Bushing                       | Bearing alloy   |                       |
| 9   | Bumper                        | Urethane        |                       |
| 10  | Rod end nut                   | Carbon steel    | Chromated             |
| 11  | Hexagon socket head cap screw | Carbon steel    | Chromated             |

### Component Parts

| No. | Description                   | Material        | Note          |
|-----|-------------------------------|-----------------|---------------|
| 12  | Magnet                        | —               |               |
| 13  | Auto switch                   | —               |               |
| 14  | Non-rotating plate            | Aluminum alloy  | Nickel plated |
| 15  | Guide rod                     | Stainless steel |               |
| 16  | Bushing                       | Bearing alloy   |               |
| 17  | Hexagon socket head cap screw | Carbon steel    | Chromated     |
| 18  | Hexagon socket head set screw | Carbon steel    | Chromated     |
| 19  | Piston gasket                 | NBR             |               |
| 20* | Piston seal                   |                 |               |
| 21* | Rod seal                      |                 |               |
| 22* | Gasket                        |                 |               |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |           |           |           |           |
|---------|---------------------------|-----------|-----------|-----------|-----------|
|         | 10                        | 16        | 20        | 25        | 32        |
|         | CUW10D-PS                 | CUW16D-PS | CUW20D-PS | CUW25D-PS | CUW32D-PS |

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

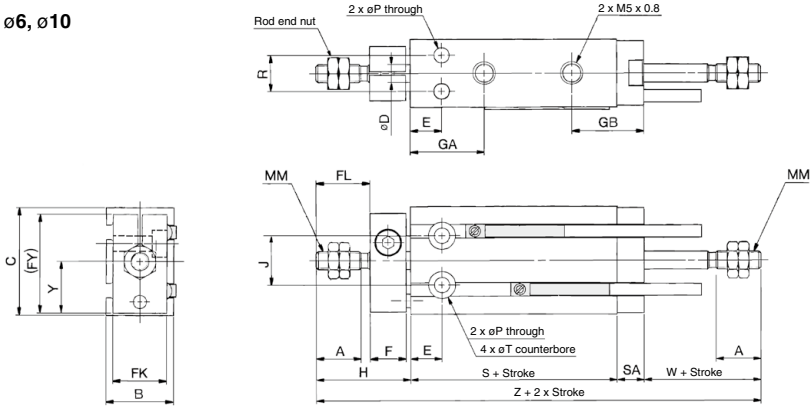
\* Seal kit includes a grease pack (10 g).

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

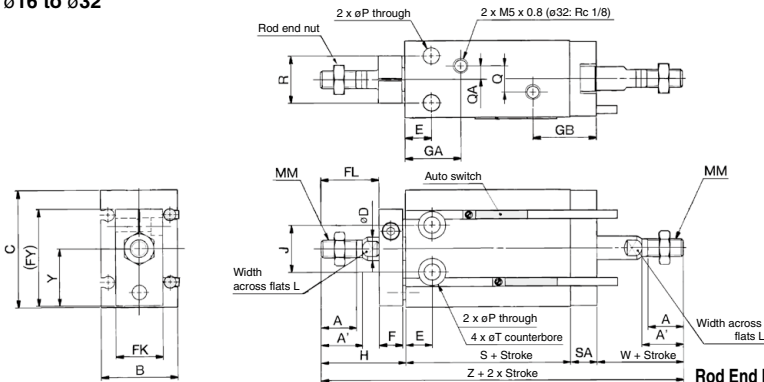
Grease pack part number: GR-S-010 (10 g)

**Dimensions: Non-rotating Rod Type; Double Acting, Double Rod**

ø6, ø10

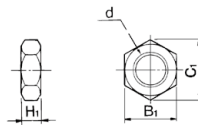


ø16 to ø32



**Rod End Nut/Accessory** Material: Carbon steel

| Part no.        | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|-----------------|---------------------------|------------|----------------|----------------|----------------|
| <b>NTP-006</b>  | <b>6</b>                  | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| <b>NTP-010</b>  | <b>10</b>                 | M4 x 0.7   | 2.4            | 7              | 8.1            |
| <b>NTJ-015C</b> | <b>16</b>                 | M5 x 0.8   | 4              | 8              | 9.2            |
| <b>NT-015A</b>  | <b>20</b>                 | M6 x 1.0   | 5              | 10             | 11.5           |
| <b>NT-02</b>    | <b>25</b>                 | M8 x 1.25  | 5              | 13             | 15.0           |
| <b>NT-03</b>    | <b>32</b>                 | M10 x 1.25 | 6              | 17             | 19.6           |



| Bore size (mm) | A    | A'   | B  | C  | D  | E  | F  | FL | FK | FY   | GA          | GB   | H  | J  | L  | MM         |
|----------------|------|------|----|----|----|----|----|----|----|------|-------------|------|----|----|----|------------|
| <b>6</b>       | 7    | —    | 13 | 22 | 3  | 7  | 8  | 9  | 11 | 20.5 | 15          | 16   | 18 | 10 | —  | M3 x 0.5   |
| <b>10</b>      | 10   | —    | 15 | 24 | 4  | 7  | 8  | 12 | 12 | 22   | 16.5        | 16   | 21 | 11 | —  | M4 x 0.7   |
| <b>16</b>      | 11   | 12.5 | 20 | 32 | 6  | 7  | 8  | 17 | 13 | 28   | 16.5 (Note) | 19   | 26 | 14 | 5  | M5 x 0.8   |
| <b>20</b>      | 12   | 14   | 26 | 40 | 8  | 9  | 8  | 20 | 16 | 33   | 19          | 21.5 | 29 | 16 | 6  | M6 x 1.0   |
| <b>25</b>      | 15.5 | 18   | 32 | 50 | 10 | 10 | 10 | 22 | 20 | 43.5 | 21.5        | 22   | 33 | 20 | 8  | M8 x 1.25  |
| <b>32</b>      | 19.5 | 22   | 40 | 62 | 12 | 11 | 12 | 29 | 24 | 51.5 | 23          | 22.5 | 42 | 24 | 10 | M10 x 1.25 |

| Bore size (mm) | P   | Q    | QA  | R  | SA  | T             | W  | Y    | Without auto switch |      | With auto switch |      |
|----------------|-----|------|-----|----|-----|---------------|----|------|---------------------|------|------------------|------|
|                |     |      |     |    |     |               |    |      | S                   | Z    | S                | Z    |
| <b>6</b>       | 3.2 | —    | —   | 7  | 6   | 6 depth 4.8   | 13 | 10.5 | 38                  | 75   | 38               | 75   |
| <b>10</b>      | 3.2 | —    | —   | 9  | 6   | 6 depth 5     | 16 | 11.5 | 36                  | 79   | 36               | 79   |
| <b>16</b>      | 4.5 | 4    | 2   | 12 | 7.5 | 7.6 depth 6.5 | 16 | 15.5 | 30                  | 79.5 | 40               | 89.5 |
| <b>20</b>      | 5.5 | 9    | 4.5 | 16 | 9   | 9.3 depth 8   | 19 | 19.5 | 36                  | 93   | 46               | 103  |
| <b>25</b>      | 5.5 | 9    | 4.5 | 20 | 9   | 9.3 depth 9   | 23 | 24.5 | 40                  | 105  | 50               | 115  |
| <b>32</b>      | 6.6 | 13.5 | 4.5 | 24 | 10  | 11 depth 11.5 | 27 | 30.5 | 42                  | 121  | 52               | 131  |

Note 1 ) 5 stroke (CUKW16-5D): GA = 14.5

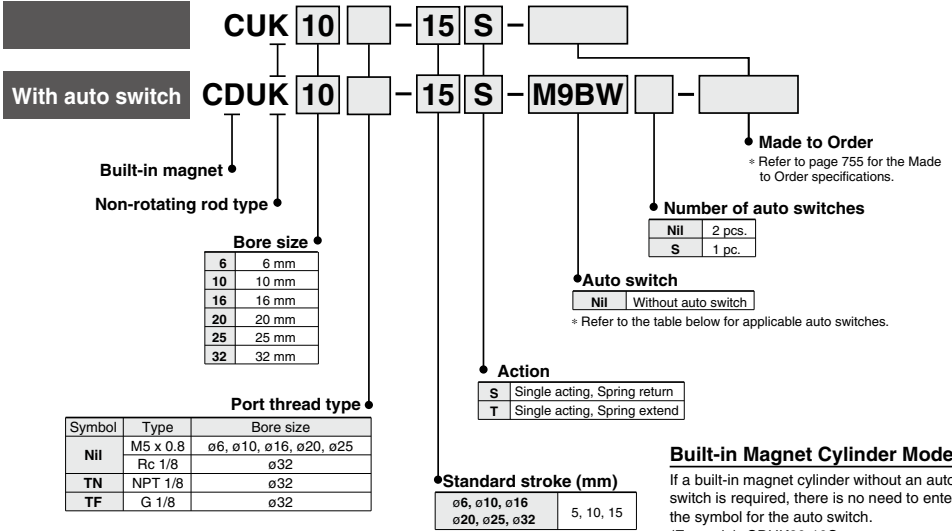
Note 2 ) The two chamfered positions for the double rod type are not identical.

# Free Mount Cylinder: Non-rotating Rod Type Single Acting, Spring Return/Extend

## CUK Series

ø6, ø10, ø16, ø20, ø25, ø32

### 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): CDUK20-10S

### Applicable Auto Switches/Refer to pages 1271 to 1365 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) |                     |                 |            |   |   |            |
| Solid state auto switch             | —   | Grommet             | Yes                | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV       | M9N                  | ●     | ●          | ○     | ○                   | IC circuit      | Relay, PLC |   |   |            |
|                                     |   |                     |                    | 3-wire (PNP)            |              |           |                   | M9PV       | M9P                  | ●     | ●          | ○     | ○                   |                 |            | — |   |            |
|                                     |   |                     |                    | 2-wire                  |              |           |                   | M9BV       | M9B                  | ●     | ●          | ○     | ○                   |                 |            |   |   |            |
|                                     | Diagnostic indication (2-color indicator) |                     |                    | 3-wire (NPN)            | M9NWX        | M9NW      | ●                 | ●          | ○                    | ○     | IC circuit |       |                     |                 |            |   |   |            |
|                                     |   |                     |                    | 3-wire (PNP)            | M9PWX        | M9PW      | ●                 | ●          | ○                    | ○     |            | —     |                     |                 |            |   |   |            |
|                                     |   |                     |                    | 2-wire                  | M9BWX        | M9BW      | ●                 | ●          | ○                    | ○     |            |       |                     |                 |            |   |   |            |
| Water resistant (2-color indicator) | 3-wire (NPN)                              | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup> | ○                       | ○            | ○         | ○                 | IC circuit |                      |       |            |       |                     |                 |            |   |   |            |
|                                     | 3-wire (PNP)                              | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup> | ○                       | ○            | ●         | ○                 |            | —                    |       |            |       |                     |                 |            |   |   |            |
|                                     | 2-wire                                    | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                       | ○            | ●         | ○                 |            |                      |       |            |       |                     |                 |            |   |   |            |
| Reed auto switch                    | —   | Grommet             | Yes                | 3-wire (NPN equivalent) | 24 V         | 12 V      | —                 | A96V       | A96                  | ●     | ●          | ○     | ○                   | IC circuit      | —          |   |   |            |
|                                     |   |                     |                    | No                      |              |           |                   | 2-wire     | A93V <sup>*2</sup>   | A93   | ●          | ●     | ●                   |                 |            | — | — | Relay, PLC |
|                                     |   |                     |                    |                         |              |           |                   | 2-wire     | A90V                 | A90   | ●          | —     | ●                   |                 |            | — |   |            |

\*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) M9NWL  
5 m ..... Z (Example) M9NWX

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

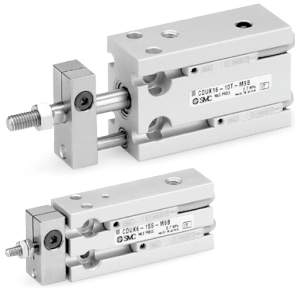
\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.



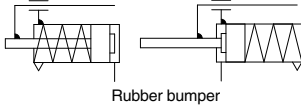
# Free Mount Cylinder: Non-rotating Rod Type Single Acting, Spring Return/Extend **CUK Series**



## Symbol

Single acting,  
Spring return

Single acting,  
Spring extend



Rubber bumper



## Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications   |
|--------|--|
| -XC22  | Fluororubber seals   |
| -XC34  | Non-rotating plate with workpiece mounting screw (No extended part on the rod end) |

## Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

## Specifications

| Bore size (mm)                               | 6   | 10       | 16       | 20 | 25    | 32 |
|--|---|----------|----------|----|-------|----|
| Fluid  | Air   |          |          |    |       |    |
| Proof pressure                               | 1.05 MPa  |          |          |    |       |    |
| Maximum operating pressure                   | 0.7 MPa   |          |          |    |       |    |
| Minimum operating pressure                   | 0.23 MPa  | 0.18 MPa | 0.16 MPa |    |       |    |
| Ambient and fluid temperature                | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |          |    |       |    |
| Lubrication                                  | Non-lube  |          |          |    |       |    |
| Piston speed                                 | 50 to 500 mm/s  |          |          |    |       |    |
| Cushion <sup>Note 1)</sup>                   | Rubber bumper on both ends  |          |          |    |       |    |
| Rod end thread                               | Male thread   |          |          |    |       |    |
| Stroke length tolerance                      | $\begin{matrix} +1.0 \\ 0 \end{matrix}$ mm  |          |          |    |       |    |
| Rod non-rotating accuracy <sup>Note 2)</sup> | ±0.8°   |          |          |    | ±0.5° |    |

Note 1) ø6: With auto switch, single rubber bumper

Note 2) No load: Rod at retracted

## Standard Stroke

(mm)

| Bore size (mm)        | Standard stroke (mm) |
|-----------------------|----------------------|
| 6, 10, 16, 20, 25, 32 | 5, 10, 15            |

## Minimum Stroke for Auto Switch Mounting

(mm)

| No. of auto switches mounted | Applicable auto switch |               |                 |
|------------------------------|------------------------|---------------|-----------------|
|                              | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□VW |
| 1 pc.                        | 5                      | 5             | 5               |
| 2 pcs.                       | 10                     | 5             | 10              |

## Weight/( ) : Denotes the values with D-A93.

(g)

| Model   | Stroke (mm)  |              |              |
|---|--------------|--------------|--------------|
|   | 5            | 10           | 15           |
| C(D)UK6-□ $\begin{matrix} S \\ T \end{matrix}$  | 28<br>(33)   | 31<br>(41)   | 34<br>(44)   |
| C(D)UK10-□ $\begin{matrix} S \\ T \end{matrix}$ | 43<br>(48)   | 47<br>(57)   | 55<br>(65)   |
| C(D)UK16-□ $\begin{matrix} S \\ T \end{matrix}$ | 60<br>(85)   | 66<br>(90)   | 81<br>(111)  |
| C(D)UK20-□ $\begin{matrix} S \\ T \end{matrix}$ | 113<br>(147) | 124<br>(164) | 153<br>(193) |
| C(D)UK25-□ $\begin{matrix} S \\ T \end{matrix}$ | 212<br>(266) | 229<br>(288) | 271<br>(330) |
| C(D)UK32-□ $\begin{matrix} S \\ T \end{matrix}$ | 331<br>(404) | 357<br>(435) | 422<br>(500) |

\* For the auto switch weight, refer to page 1271.

## Tightening Torque

When mounting a CUK single acting series, refer to page 728.

## Theoretical Output

Specifications are the same as single acting, spring return/spring extend type (CU series). Refer to page 740.

## Spring Reaction Force

Refer to page 1572 (Table (3): Spring Reaction Force).

## Auto Switch Mounting Position

For the auto switch mounting position of CDUK series single acting, spring return/spring extend, refer to page 745, since specification are the same as standard type, single acting, spring return/spring extend type.

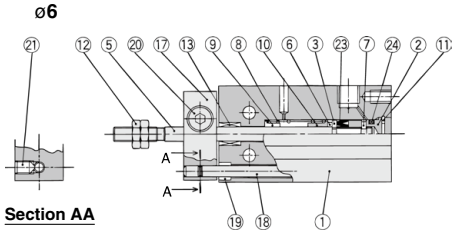
## Allowable Rotational Torque

Make sure that rotational torque is not applied to the piston rod of the CUK series single acting type cylinder. If the rotation torque were applied unavoidably, refer to page 747.

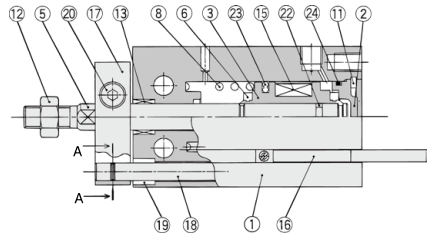
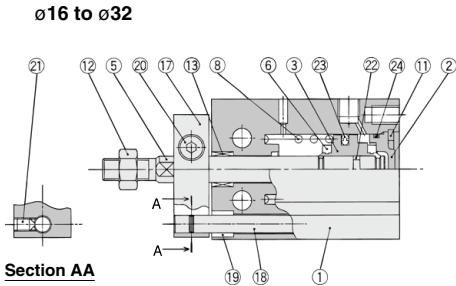
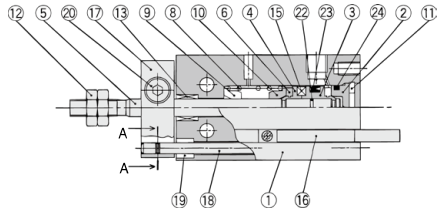
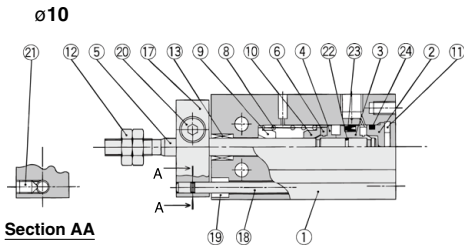
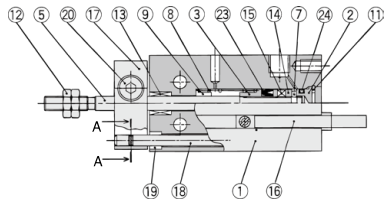
# CUK Series

## Construction

### Single acting, Spring return



### With auto switch



### Component Parts

| No. | Description   | Material        | Note                                 |
|-----|---------------|-----------------|--------------------------------------|
| 1   | Cylinder tube | Aluminum alloy  | Hard anodized                        |
| 2   | Head cover    | Brass           | ø6 to ø10, Electroless nickel plated |
|     |               | Aluminum alloy  | ø16 to ø32, Chromated                |
| 3   | Piston        | Brass           | ø6                                   |
| 4   | Piston        | Aluminum alloy  | ø10 to ø32, Chromated                |
|     |               | Aluminum alloy  | ø10                                  |
| 5   | Piston rod    | Stainless steel |                                      |
| 6   | Bumper A      | Urethane        |                                      |
| 7   | Bumper B      | Urethane        |                                      |
| 8   | Return spring | Piano wire      | Zinc chromated                       |
| 9   | Spring seat   | Brass           |                                      |
| 10  | Spring seat   | Brass           |                                      |

### Component Parts

| No. | Description                   | Material          | Note             |
|-----|-------------------------------|-------------------|------------------|
| 11  | Retaining ring                | Carbon tool steel | Phosphate coated |
| 12  | Rod end nut                   | Carbon steel      | Chromated        |
| 13  | Bushing                       | Bearing alloy     |                  |
| 14  | Magnet holder                 | Brass             | ø6               |
| 15  | Magnet                        | —                 |                  |
| 16  | Auto switch                   | —                 |                  |
| 17  | Non-rotating plate            | Aluminum alloy    | Nickel plated    |
| 18  | Guide rod                     | Stainless steel   |                  |
| 19  | Bushing                       | Bearing alloy     |                  |
| 20  | Hexagon socket head cap screw | Carbon steel      | Chromated        |
| 21  | Hexagon socket head set screw | Carbon steel      | Chromated        |
| 22  | Piston gasket                 | NBR               |                  |
| 23* | Piston seal                   |                   |                  |
| 24* | Gasket                        |                   |                  |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |          |          |          |          |
|---------|---------------------------|----------|----------|----------|----------|
|         | 10                        | 16       | 20       | 25       | 32       |
|         | CU10S-PS                  | CU16S-PS | CU20S-PS | CU25S-PS | CU32S-PS |

\* Seal kit includes 23, 24. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

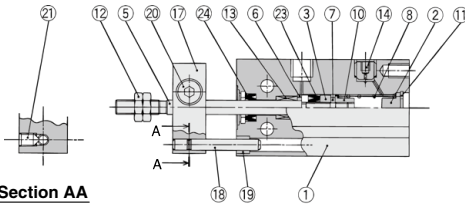
Order with the following part number when only the grease pack is needed.

Grease pack part number: GR-S-010 (10 g)

## Construction

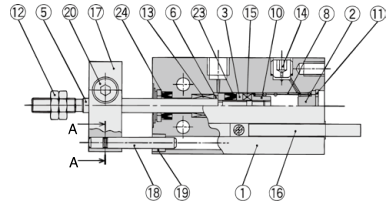
### Single acting, Spring extend

ø6

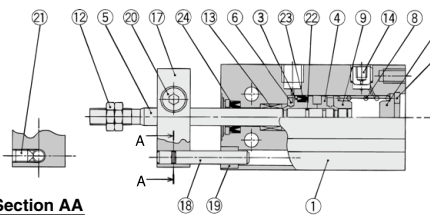


Section AA

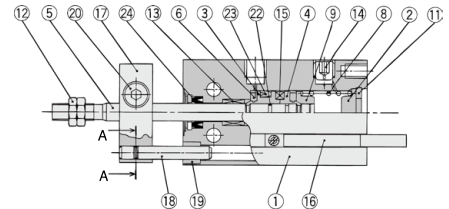
### With auto switch



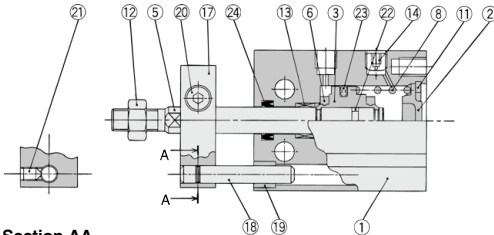
ø10



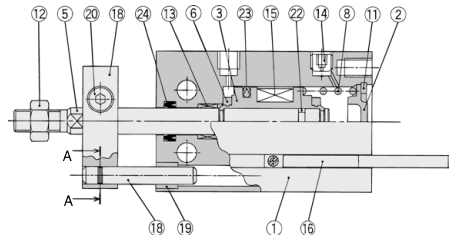
Section AA



ø16 to ø32



Section AA



### Component Parts

| No. | Description    | Material          | Note                                 |
|-----|----------------|-------------------|--------------------------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized                        |
| 2   | Head cover     | Brass             | ø6 to ø10, Electroless nickel plated |
|     |                | Aluminum alloy    | ø16 to ø32, Chromated                |
| 3   | Piston         | Brass             | ø6                                   |
|     |                | Aluminum alloy    | ø10 to ø32, Chromated                |
| 4   | Piston         | Aluminum alloy    | ø10, Chromated                       |
| 5   | Piston rod     | Stainless steel   |                                      |
| 6   | Bumper A       | Urethane          |                                      |
| 7   | Bumper B       | Urethane          |                                      |
| 8   | Return spring  | Piano wire        | Zinc chromated                       |
| 9   | Spring seat    | Brass             |                                      |
| 10  | Stopper        | Brass             | ø6                                   |
| 11  | Retaining ring | Carbon tool steel | Phosphate coated                     |

### Component Parts

| No. | Description                   | Material        | Note                 |
|-----|-------------------------------|-----------------|----------------------|
| 12  | Rod end nut                   | Carbon steel    | Chromated            |
| 13  | Bushing                       | Bearing alloy   |                      |
| 14  | Plug with fixed orifice       | Alloy steel     | Black dyed           |
| 15  | Magnet                        | —               |                      |
| 16  | Auto switch                   | —               |                      |
| 17  | Non-rotating plate            | Aluminum alloy  | Nickel plated        |
| 18  | Guide rod                     | Stainless steel |                      |
| 19  | Bushing                       | Bearing alloy   |                      |
| 20  | Hexagon socket head cap screw | Carbon steel    | Black zinc chromated |
| 21  | Hexagon socket head set screw | Carbon steel    | Black zinc chromated |
| 22  | Piston gasket                 |                 |                      |
| 23* | Piston seal                   | NBR             |                      |
| 24* | Rod seal                      |                 |                      |

### Replacement Parts: Seal Kit

| Kit no. | Bore size (mm) / Part no. |          |          |          |          |
|---------|---------------------------|----------|----------|----------|----------|
|         | 10                        | 16       | 20       | 25       | 32       |
|         | CU10T-PS                  | CU16T-PS | CU20T-PS | CU25T-PS | CU32T-PS |

\* Seal kit includes 23, 24. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

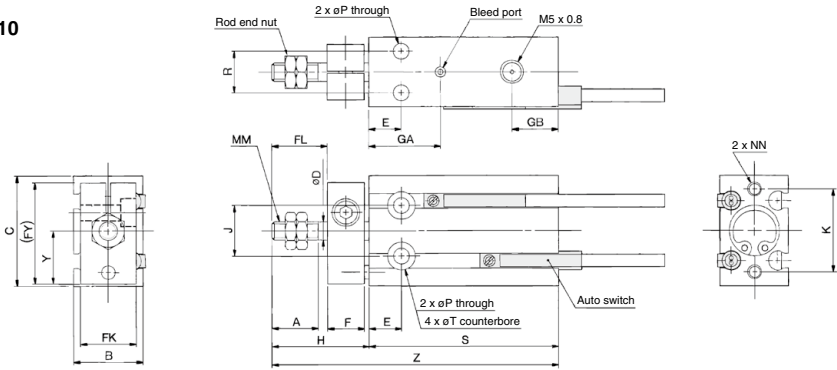
Order with the following part number when only the grease pack is needed.

Grease pack part number: GR-S-010 (10 g)

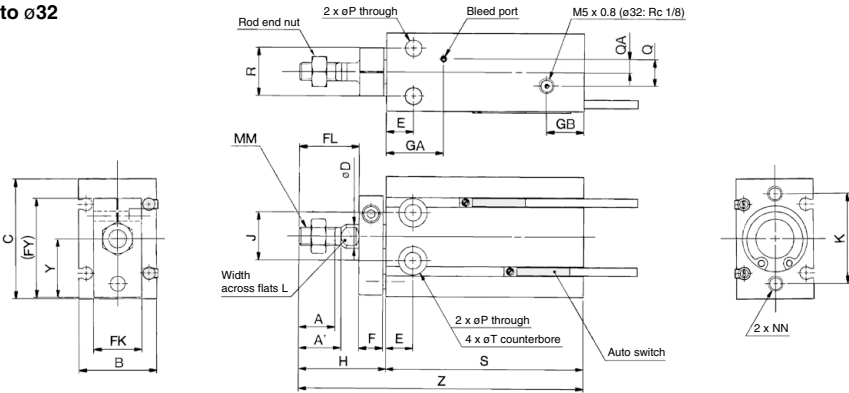
# CUK Series

## Dimensions: Non-rotating Rod Type; Single Acting, Spring Return

ø6, ø10

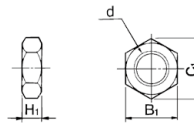


ø16 to ø32



### Rod End Nut/Accessory Material: Carbon steel

| Part no.        | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|-----------------|---------------------------|------------|----------------|----------------|----------------|
| <b>NTP-006</b>  | <b>6</b>                  | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| <b>NTP-010</b>  | <b>10</b>                 | M4 x 0.7   | 2.4            | 7              | 8.1            |
| <b>NTJ-015C</b> | <b>16</b>                 | M5 x 0.8   | 4              | 8              | 9.2            |
| <b>NT-015A</b>  | <b>20</b>                 | M6 x 1.0   | 5              | 10             | 11.5           |
| <b>NT-02</b>    | <b>25</b>                 | M8 x 1.25  | 5              | 13             | 15.0           |
| <b>NT-03</b>    | <b>32</b>                 | M10 x 1.25 | 6              | 17             | 19.6           |

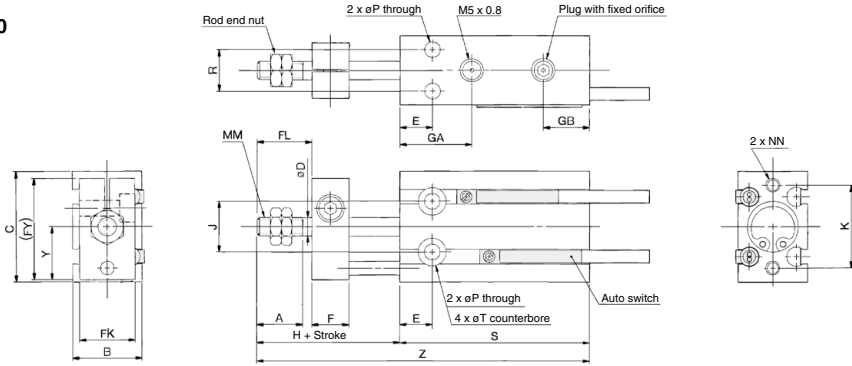


| Bore size (mm) | A    | A'   | B  | C  | D  | E  | F  | FL | FK | FY   | GA   | GB   | H  | J  | K  | L  | MM         | NN               |
|----------------|------|------|----|----|----|----|----|----|----|------|------|------|----|----|----|----|------------|------------------|
| <b>6</b>       | 7    | —    | 13 | 22 | 3  | 7  | 8  | 9  | 11 | 20.5 | 15   | 10   | 18 | 10 | 17 | —  | M3 x 0.5   | M3 x 0.5 depth 5 |
| <b>10</b>      | 10   | —    | 15 | 24 | 4  | 7  | 8  | 12 | 12 | 22   | 16.5 | 10   | 21 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 |
| <b>16</b>      | 11   | 12.5 | 20 | 32 | 6  | 7  | 8  | 17 | 13 | 28   | 16.5 | 11.5 | 26 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 |
| <b>20</b>      | 12   | 14   | 26 | 40 | 8  | 9  | 8  | 20 | 16 | 33   | 19   | 12.5 | 29 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 |
| <b>25</b>      | 15.5 | 18   | 32 | 50 | 10 | 10 | 10 | 22 | 20 | 43.5 | 21.5 | 13   | 33 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 |
| <b>32</b>      | 19.5 | 22   | 40 | 62 | 12 | 11 | 12 | 29 | 24 | 51.5 | 23   | 12.5 | 42 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 |

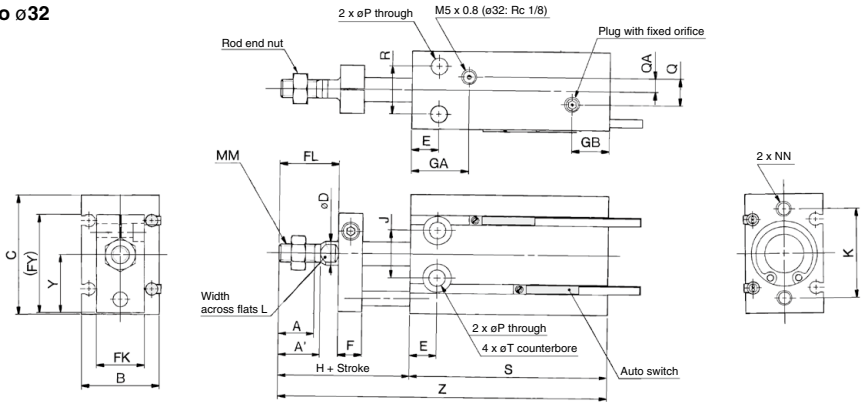
| Bore size (mm) | P   | Q    | QA  | R  | T             | Y    | Without auto switch |       |       |      |       |       | With auto switch |       |       |      |       |       |
|----------------|-----|------|-----|----|---------------|------|---------------------|-------|-------|------|-------|-------|------------------|-------|-------|------|-------|-------|
|                |     |      |     |    |               |      | S                   |       |       | Z    |       |       | S                |       |       | Z    |       |       |
|                |     |      |     |    |               |      | 5 st                | 10 st | 15 st | 5 st | 10 st | 15 st | 5 st             | 10 st | 15 st | 5 st | 10 st | 15 st |
| <b>6</b>       | 3.2 | —    | —   | 7  | 6 depth 4.8   | 10.5 | 38                  | 43    | 48    | 56   | 61    | 66    | 38               | 43    | 48    | 56   | 61    | 66    |
| <b>10</b>      | 3.2 | —    | —   | 9  | 6 depth 5     | 11.5 | 41                  | 46    | 56    | 62   | 67    | 77    | 41               | 46    | 56    | 62   | 67    | 77    |
| <b>16</b>      | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 | 15.5 | 35                  | 40    | 50    | 61   | 66    | 76    | 45               | 50    | 60    | 71   | 76    | 86    |
| <b>20</b>      | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   | 19.5 | 41                  | 46    | 56    | 70   | 75    | 85    | 51               | 56    | 66    | 80   | 85    | 95    |
| <b>25</b>      | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   | 24.5 | 45                  | 50    | 60    | 78   | 83    | 93    | 55               | 60    | 70    | 88   | 93    | 103   |
| <b>32</b>      | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 | 30.5 | 47                  | 52    | 62    | 89   | 94    | 104   | 57               | 62    | 72    | 99   | 104   | 114   |

**Dimensions: Non-rotating Rod Type; Single Acting, Spring Extend**

ø6, ø10

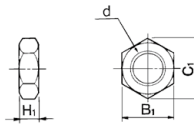


ø16 to ø32



**Rod End Nut/Accessory** Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|----------------|----------------|----------------|
| NTP-006  | 6                         | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| NTP-010  | 10                        | M4 x 0.7   | 2.4            | 7              | 8.1            |
| NTJ-015C | 16                        | M5 x 0.8   | 4              | 8              | 9.2            |
| NT-015A  | 20                        | M5 x 0.8   | 5              | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |



| Bore size (mm) | A    | A'   | B  | C  | D  | E  | F  | FL | FK | FY   | GA   | GB   | H  | J  | K  | L  | MM         | NN               |
|----------------|------|------|----|----|----|----|----|----|----|------|------|------|----|----|----|----|------------|------------------|
| 6              | 7    | —    | 13 | 22 | 3  | 7  | 8  | 9  | 11 | 20.5 | 15   | 10   | 18 | 10 | 17 | —  | M3 x 0.5   | M3 x 0.5 depth 5 |
| 10             | 10   | —    | 15 | 24 | 4  | 7  | 8  | 12 | 12 | 22   | 16.5 | 10   | 21 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 |
| 16             | 11   | 12.5 | 20 | 32 | 6  | 7  | 8  | 17 | 13 | 28   | 16.5 | 11.5 | 26 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 |
| 20             | 12   | 14   | 26 | 40 | 8  | 9  | 8  | 20 | 16 | 33   | 19   | 12.5 | 29 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 |
| 25             | 15.5 | 18   | 32 | 50 | 10 | 10 | 10 | 22 | 20 | 43.5 | 21.5 | 13   | 33 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 |
| 32             | 19.5 | 22   | 40 | 62 | 12 | 11 | 12 | 29 | 24 | 51.5 | 23   | 12.5 | 42 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 |

| Bore size (mm) | P   | Q    | QA  | R  | T             | Y    | Without auto switch |       |       |      |       |       | With auto switch |       |       |      |       |       |
|----------------|-----|------|-----|----|---------------|------|---------------------|-------|-------|------|-------|-------|------------------|-------|-------|------|-------|-------|
|                |     |      |     |    |               |      | S                   |       |       | Z    |       |       | S                |       |       | Z    |       |       |
|                |     |      |     |    |               |      | 5 st                | 10 st | 15 st | 5 st | 10 st | 15 st | 5 st             | 10 st | 15 st | 5 st | 10 st | 15 st |
| 6              | 3.2 | —    | —   | 7  | 6 depth 4.8   | 10.5 | 38                  | 43    | 48    | 61   | 71    | 81    | 38               | 43    | 48    | 61   | 71    | 81    |
| 10             | 3.2 | —    | —   | 9  | 6 depth 5     | 11.5 | 41                  | 46    | 56    | 67   | 77    | 92    | 41               | 46    | 56    | 67   | 77    | 92    |
| 16             | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 | 15.5 | 45                  | 50    | 60    | 76   | 86    | 101   | 45               | 50    | 60    | 76   | 86    | 101   |
| 20             | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   | 19.5 | 41                  | 46    | 56    | 75   | 85    | 100   | 51               | 56    | 66    | 85   | 95    | 110   |
| 25             | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   | 24.5 | 45                  | 50    | 60    | 83   | 93    | 108   | 55               | 60    | 70    | 93   | 103   | 118   |
| 32             | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 | 30.5 | 47                  | 52    | 62    | 94   | 104   | 119   | 57               | 62    | 72    | 104  | 114   | 129   |

# Free Mount Cylinder: Long Stroke Type Double Acting, Single Rod

## CU Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**With auto switch**      **CU 6** [ ] - **60** **D** - [ ]

**Built-in magnet**      **CDU 6** [ ] - **60** **D** - **M9BW** [ ] - [ ]

**Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

**Port thread type**

| Symbol | Type     | Bore size              |
|--------|----------|------------------------|
| Nil    | M5 x 0.8 | ø6, ø10, ø16, ø20, ø25 |
|        | Rc 1/8   | ø32                    |
| TN     | NPT 1/8  | ø32                    |
| TF     | G 1/8    | ø32                    |

**Action**

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

**Long stroke (mm)**

|               |                     |
|---------------|---------------------|
| ø6, ø10, ø16  | 40, 50, 60          |
| ø20, ø25, ø32 | 60, 70, 80, 90, 100 |

**Number of auto switches**

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

**Auto switch**

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

\* Refer to the table below for applicable auto switches.

**Made to Order**  
\* Refer to page 761 for the Made to Order specifications.

**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): CDU20-80D

### Applicable Auto Switches/Refer to pages 1271 to 1365 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) |                     |                 |            |   |
| Solid state auto switch             | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                   | M9NV               | M9N                  | ●     | ●     | ○     | ○                   | IC circuit      | Relay, PLC |   |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                     | M9PV               | M9P                  | ●     | ●     | ○     | ○                   |                 |            |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | M9BV               | M9B                  | ●     | ●     | ○     | ○                   |                 |            |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | M9BV               | M9B                  | ●     | ●     | ○     | ○                   |                 |            |   |
|                                     | Diagnostic indication (2-color indicator) | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                   | M9NWV              | M9NW                 | ●     | ●     | ○     | ○                   | IC circuit      | Relay, PLC |   |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                     | M9P WV             | M9P W                | ●     | ●     | ○     | ○                   |                 |            |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | M9BWV              | M9BW                 | ●     | ●     | ○     | ○                   |                 |            |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | M9BWV              | M9BW                 | ●     | ●     | ○     | ○                   |                 |            |   |
| Water resistant (2-color indicator) | Grommet                                   | Yes              | 3-wire (NPN)    | 24 V                    | 5 V, 12 V    | —         | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup> | ○                    | ○     | ●     | ○     | IC circuit          | Relay, PLC      |            |   |
|                                     |   |                  | 3-wire (PNP)    |                         |              |           | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup> | ○                    | ○     | ●     | ○     |                     |                 |            |   |
|                                     |   |                  | 2-wire          |                         |              |           | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                    | ○     | ●     | ○     |                     |                 |            |   |
|                                     |   |                  | 2-wire          |                         |              |           | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup> | ○                    | ○     | ●     | ○     |                     |                 |            |   |
| Reed auto switch                    | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 12 V      | —                   | A96V               | A96                  | ●     | ●     | —     | —                   | IC circuit      | —          |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | A93V <sup>*2</sup> | A93                  | ●     | —     | ●     | —                   |                 |            | — |
|                                     |   |                  |                 | 2-wire                  |              |           |                     | A90V               | A90                  | ●     | —     | ●     | —                   |                 |            |   |

\*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) M9NWL  
 5 m ..... Z (Example) M9NWX

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

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.

# Free Mount Cylinder: Long Stroke Type Double Acting, Single Rod **CU Series**



## Symbol

Double acting, Spring rod, Rubber bumper



## Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications                                       |
|--------|--|
| -XB6   | Heat resistant (-10 to 150°C)                        |
| -XB7   | Cold resistant (-40 to 70°C)                         |
| -XB9   | Low speed (10 to 50 mm/s)                            |
| -XB13  | Low speed (5 to 50 mm/s)                             |
| -XC8   | Adjustable stroke cylinder/Adjustable extension type |
| -XC19  | Intermediate stroke (5 mm spacer)                    |
| -XC22  | Fluororubber seals                                   |

## Specifications

| Bore size (mm)                | 6   | 10       | 16       | 20 | 25 | 32 |
|-------------------------------|---|----------|----------|----|----|----|
| Fluid                         | Air   |          |          |    |    |    |
| Proof pressure                | 1.05 MPa  |          |          |    |    |    |
| Maximum operating pressure    | 0.7 MPa   |          |          |    |    |    |
| Minimum operating pressure    | 0.12 MPa  | 0.06 MPa | 0.05 MPa |    |    |    |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |          |    |    |    |
| Lubrication                   | Non-lube  |          |          |    |    |    |
| Piston speed                  | 50 to 500 mm/s  |          |          |    |    |    |
| Cushion                       | Rubber bumper   |          |          |    |    |    |
| Rod end thread                | Male thread   |          |          |    |    |    |
| Stroke length tolerance       | $+1.0$<br>$0$ mm  |          |          |    |    |    |

## Standard Stroke

| Bore size (mm) | Standard stroke (mm) |
|----------------|----------------------|
| 6, 10, 16      | 40, 50, 60           |
| 20, 25, 32     | 60, 70, 80, 90, 100  |

## Weight/( ): Denotes the values with D-A93.

(g)

| Model      | Stroke (mm) |              |              |              |              |              |              |
|------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
|            | 40          | 50           | 60           | 70           | 80           | 90           | 100          |
| C(D)U6-□D  | 43<br>(53)  | 49<br>(59)   | 55<br>(65)   | —            | —            | —            | —            |
| C(D)U10-□D | 64<br>(74)  | 72<br>(82)   | 80<br>(90)   | —            | —            | —            | —            |
| C(D)U16-□D | 92<br>(122) | 104<br>(134) | 116<br>(146) | —            | —            | —            | —            |
| C(D)U20-□D | —           | —            | 216<br>(253) | 238<br>(275) | 260<br>(297) | 282<br>(319) | 304<br>(341) |
| C(D)U25-□D | —           | —            | 363<br>(422) | 397<br>(456) | 431<br>(490) | 465<br>(524) | 499<br>(558) |
| C(D)U32-□D | —           | —            | 526<br>(604) | 574<br>(652) | 622<br>(700) | 670<br>(748) | 718<br>(796) |

\* For the auto switch weight, refer to page 1271.

## Auto Switch Mounting Position

For the auto switch mounting position of CDU long stroke series, refer to page 732, since specifications are the same as standard type, double acting, single rod type.

## Tightening Torque

Refer to page 728 for mounting a long stroke type.

## Theoretical Output

Specifications are the same as CU series double acting, single rod. Refer to page 728.

## Moisture Control Tube IDK Series

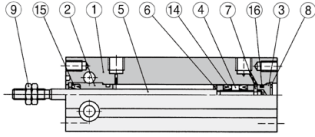


When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

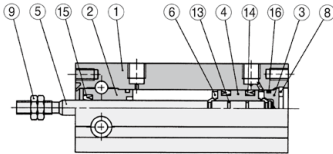
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

## Construction

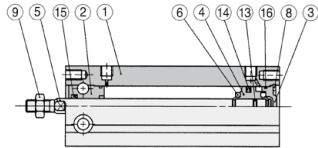
ø6



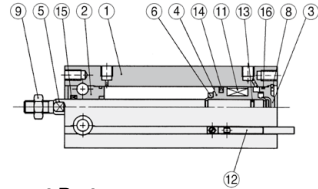
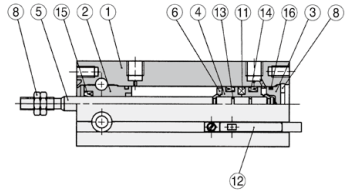
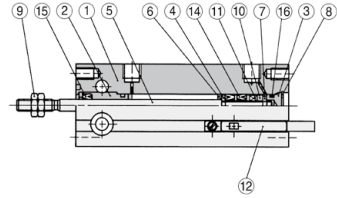
ø10



ø16 to ø32



With auto switch



### Component Parts

| No. | Description   | Material        | Note                                 |
|-----|---------------|-----------------|--------------------------------------|
| 1   | Cylinder tube | Aluminum alloy  | Hard anodized                        |
| 2   | Rod cover     | Aluminum alloy  | Hard anodized                        |
| 3   | Head cover    | Brass           | ø6 to ø10, Electroless nickel plated |
|     |               | Aluminum alloy  | ø16 to ø32, Chromated                |
| 4   | Piston        | Brass           | ø6                                   |
|     |               | Aluminum alloy  | ø10 to ø32, Chromated                |
| 5   | Piston rod    | Stainless steel |                                      |
| 6   | Bumper A      | Urethane        |                                      |
| 7   | Bumper B      | Urethane        |                                      |

### Component Parts

| No. | Description    | Material          | Note             |
|-----|----------------|-------------------|------------------|
| 8   | Retaining ring | Carbon tool steel | Phosphate coated |
| 9   | Rod end nut    | Carbon steel      | Chromated        |
| 10  | Magnet holder  | Brass             | ø6               |
| 11  | Magnet         | —                 |                  |
| 12  | Auto switch    | —                 |                  |
| 13  | Piston gasket  |                   |                  |
| 14* | Piston seal    | NBR               |                  |
| 15* | Rod seal       |                   |                  |
| 16* | Gasket         |                   |                  |

### Replacement Parts: Seal Kit

| Bore size (mm) | Kit no.  | Contents                      |
|----------------|----------|-------------------------------|
| 10             | CU10D-PS | Set of nos. above 14, 15, 16. |
| 16             | CU16D-PS |                               |
| 20             | CU20D-PS |                               |
| 25             | CU25D-PS |                               |
| 32             | CU32D-PS |                               |

\* Seal kit includes 14, 15, 16. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

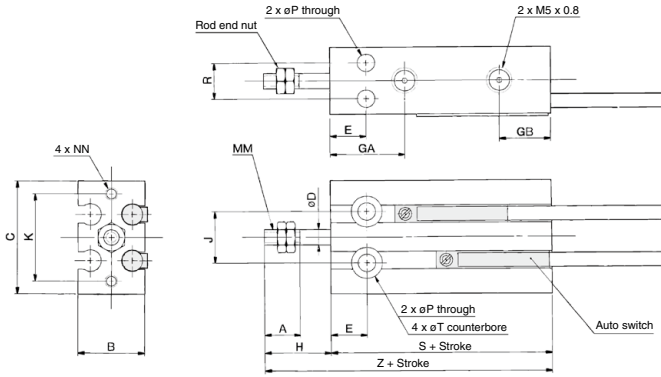
Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010 (10 g)**

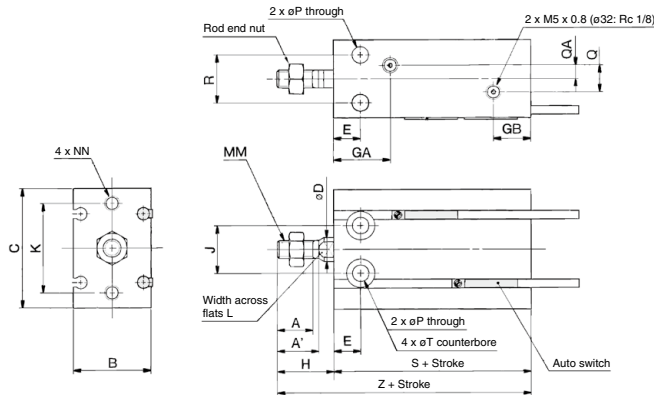


**Dimensions: Double Acting, Single Rod**

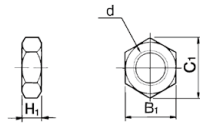
ø6, ø10



ø16 to ø32



**Rod End Nut/Accessory**



Material: Carbon steel

| Part no.        | Applicable bore (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|-----------------|----------------------|------------|----------------|----------------|----------------|
| <b>NTP-006</b>  | <b>6</b>             | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| <b>NTP-010</b>  | <b>10</b>            | M4 x 0.7   | 2.4            | 7              | 8.1            |
| <b>NTJ-015C</b> | <b>16</b>            | M5 x 0.8   | 4              | 8              | 9.2            |
| <b>NT-015A</b>  | <b>20</b>            | M6 x 1.0   | 5              | 10             | 11.5           |
| <b>NT-02</b>    | <b>25</b>            | M8 x 1.25  | 5              | 13             | 15.0           |
| <b>NT-03</b>    | <b>32</b>            | M10 x 1.25 | 6              | 17             | 19.6           |

| Bore size (mm) | A        | A'   | B  | C  | D  | E  | GA   | GB   | H  | J  | K  | L  | MM         | NN               | P                | Q    | QA  |
|----------------|----------|------|----|----|----|----|------|------|----|----|----|----|------------|------------------|------------------|------|-----|
|                | <b>6</b> | 7    | —  | 13 | 22 | 3  | 7    | 15   | 10 | 13 | 10 | 17 | —          | M3 x 0.5         | M3 x 0.5 depth 5 | 3.2  | —   |
| <b>10</b>      | 10       | —    | 15 | 24 | 4  | 7  | 16.5 | 10   | 16 | 11 | 18 | —  | M4 x 0.7   | M3 x 0.5 depth 5 | 3.2              | —    | —   |
| <b>16</b>      | 11       | 12.5 | 20 | 32 | 6  | 7  | 16.5 | 11.5 | 16 | 14 | 25 | 5  | M5 x 0.8   | M4 x 0.7 depth 6 | 4.5              | 4    | 2   |
| <b>20</b>      | 12       | 14   | 26 | 40 | 8  | 9  | 19   | 12.5 | 19 | 16 | 30 | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5              | 9    | 4.5 |
| <b>25</b>      | 15.5     | 18   | 32 | 50 | 10 | 10 | 21.5 | 13   | 23 | 20 | 38 | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5              | 9    | 4.5 |
| <b>32</b>      | 19.5     | 22   | 40 | 62 | 12 | 11 | 23   | 12.5 | 27 | 24 | 48 | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6              | 13.5 | 4.5 |

| Bore size (mm) | R  | T             | Without auto switch |    | With auto switch |    |
|----------------|----|---------------|---------------------|----|------------------|----|
|                |    |               | S                   | Z  | S                | Z  |
| <b>6</b>       | 7  | 6 depth 4.8   | 33                  | 46 | 33               | 46 |
| <b>10</b>      | 9  | 6 depth 5     | 36                  | 52 | 36               | 52 |
| <b>16</b>      | 12 | 7.6 depth 6.5 | 30                  | 46 | 40               | 56 |
| <b>20</b>      | 16 | 9.3 depth 8   | 36                  | 55 | 46               | 65 |
| <b>25</b>      | 20 | 9.3 depth 9   | 40                  | 63 | 50               | 73 |
| <b>32</b>      | 24 | 11 depth 11.5 | 42                  | 69 | 52               | 79 |

# Free Mount Cylinder: Long Stroke Type Non-rotating Rod, Double Acting, Single Rod

## CUK Series

ø6, ø10, ø16, ø20, ø25, ø32

### How to Order

**CUK 6** [ ] - **60** **D** - [ ]

**With auto switch** **CDUK 6** [ ] - **60** **D** - **M9BW** [ ] - [ ]

**Built-in magnet**

**Non-rotating rod type**

**Bore size**

|    |       |
|----|-------|
| 6  | 6 mm  |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |

**Port thread type**

| Symbol | Type               | Bore size              |
|--------|--------------------|------------------------|
| Nil    | M5 x 0.8<br>Rc 1/8 | ø6, ø10, ø16, ø20, ø25 |
| TN     | NPT 1/8            | ø32                    |
| TF     | G 1/8              | ø32                    |

**Action**

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

**Cylinder stroke (mm)**

|               |                     |
|---------------|---------------------|
| ø6, ø10, ø16  | 40, 50, 60          |
| ø20, ø25, ø32 | 60, 70, 80, 90, 100 |

**Auto switch**

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

\* Refer to the table below for applicable auto switches.

**Number of auto switches**

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

**Made to Order**  
\* Refer to page 765 for the Made to Order specifications.

**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): CDUK20-80D

### Applicable Auto Switches/Refer to pages 1271 to 1365 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) |            |
| Solid state auto switch             | —                | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | —    | M9NV                | M9N                 | ●                    | ●     | ○     | ○                   | Relay, PLC      |       |            |
|                                     |                  |                  |                 | 3-wire (PNP)            |              |      | M9PV                | M9P                 | ●                    | ●     | ○     | ○                   |                 |       |            |
|                                     |                  |                  |                 | 2-wire                  |              |      | M9BV                | M9B                 | ●                    | ●     | ○     | ○                   |                 |       |            |
|                                     | 3-wire (NPN)     |                  |                 | M9NWV                   |              |      | M9NW                | ●                   | ●                    | ○     | ○     |                     |                 |       |            |
|                                     | 3-wire (PNP)     |                  |                 | M9PWV                   |              |      | M9PW                | ●                   | ●                    | ○     | ○     |                     |                 |       |            |
|                                     | 2-wire           |                  |                 | M9BWV                   |              |      | M9BW                | ●                   | ●                    | ○     | ○     |                     |                 |       |            |
| Water resistant (2-color indicator) | Grommet          | Yes              | 3-wire (NPN)    | 24 V                    | —            | —    | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup>  | ○                    | ○     | ○     | ○                   | Relay, PLC      |       |            |
|                                     |                  |                  |                 |                         |              |      | 3-wire (PNP)        | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup>   | ○     | ○     | ○                   |                 | ○     |            |
|                                     |                  |                  |                 |                         |              |      | 2-wire              | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup>   | ○     | ○     | ●                   |                 | ○     |            |
| Reed auto switch                    | —                | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 12 V | 100 V               | A96V                | A96                  | ●     | —     | ●                   | —               | —     | Relay, PLC |
|                                     |                  |                  |                 | 2-wire                  |              |      |                     | A93V <sup>*2</sup>  | A93                  | ●     | ●     | ●                   | ●               | —     |            |
|                                     |                  |                  | No              | 2-wire                  | 24 V         | 12 V | 100 V or less       | A90V                | A90                  | ●     | —     | ●                   | —               | —     | IC circuit |

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

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

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

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

\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.

# Free Mount Cylinder: Long Stroke Type Non-rotating Rod, Double Acting, Single Rod **CUK Series**



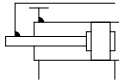
## Specifications

| Bore size (mm)                          | 6   | 10       | 16       | 20       | 25 | 32 |
|---|---|----------|----------|----------|----|----|
| <b>Fluid</b>                            | Air   |          |          |          |    |    |
| <b>Proof pressure</b>                   | 1.05 MPa  |          |          |          |    |    |
| <b>Maximum operating pressure</b>       | 0.7 MPa   |          |          |          |    |    |
| <b>Minimum operating pressure</b>       | 0.15 MPa  | 0.10 MPa | 0.10 MPa | 0.08 MPa |    |    |
| <b>Ambient and fluid temperature</b>    | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |          |          |          |    |    |
| <b>Lubrication</b>                      | Non-lube  |          |          |          |    |    |
| <b>Piston speed</b>                     | 50 to 500 mm/s  |          |          |          |    |    |
| <b>Cushion</b>                          | Rubber bumper   |          |          |          |    |    |
| <b>Rod end thread</b>                   | Male thread   |          |          |          |    |    |
| <b>Stroke length tolerance</b>          | $\begin{matrix} +1.0 \\ 0 \end{matrix}$ mm  |          |          |          |    |    |
| <b>Rod non-rotating accuracy</b> (Note) | ±0.8°   |          |          | ±0.5°    |    |    |

Note) No load: Rod at retracted

## Symbol

Double acting, Single rod, Rubber bumper



## Standard Stroke

(mm)

| Bore size (mm) | Standard stroke (mm) |
|----------------|----------------------|
| 6, 10, 16      | 40, 50, 60           |
| 20, 25, 32     | 60, 70, 80, 90, 100  |

## Weight/( ): Denotes the values with D-A93.

(g)

| Model              | Stroke (mm)  |              |              |              |              |              |              |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                    | 40           | 50           | 60           | 70           | 80           | 90           | 100          |
| <b>C(D)UK6-□D</b>  | 49<br>(59)   | 55<br>(65)   | 61<br>(71)   | —            | —            | —            | —            |
| <b>C(D)UK10-□D</b> | 71<br>(81)   | 79<br>(89)   | 87<br>(97)   | —            | —            | —            | —            |
| <b>C(D)UK16-□D</b> | 102<br>(132) | 114<br>(144) | 126<br>(156) | —            | —            | —            | —            |
| <b>C(D)UK20-□D</b> | —            | —            | 243<br>(284) | 267<br>(308) | 291<br>(332) | 315<br>(356) | 339<br>(380) |
| <b>C(D)UK25-□D</b> | —            | —            | 405<br>(460) | 440<br>(495) | 475<br>(530) | 510<br>(565) | 545<br>(600) |
| <b>C(D)UK32-□D</b> | —            | —            | 617<br>(695) | 669<br>(747) | 721<br>(799) | 773<br>(851) | 825<br>(903) |

\* For the auto switch weight, refer to page 1271.



## Made to Order Specifications

[Click here for details](#)

| Symbol       | Specifications   |
|--------------|--|
| <b>-XB6</b>  | Heat resistant (-10 to 150°C)  |
| <b>-XB7</b>  | Cold resistant (-40 to 70°C)   |
| <b>-XB9</b>  | Low speed (10 to 50 mm/s)  |
| <b>-XB13</b> | Low speed (5 to 50 mm/s)   |
| <b>-XC19</b> | Intermediate stroke (5 mm spacer)  |
| <b>-XC22</b> | Fluororubber seals   |
| <b>-XC34</b> | Non-rotating plate with workpiece mounting screw (No extended part on the rod end) |

## Allowable Rotational Torque

Make sure that rotational torque is not applied to the piston rod of a long stroke type cylinder. If the rotation torque were applied unavoidably, refer to page 747 for details.

## Tightening Torque

When mounting a CUK long stroke series, refer to page 728.

## Theoretical Output

Specifications are the same as CU series double acting, single rod. Refer to page 728.

## Auto Switch Mounting Position

For the auto switch mounting position of CDUK long stroke series, refer to page 732, since specifications are the same as standard type, double acting, single rod type.

## Moisture Control Tube IDK Series



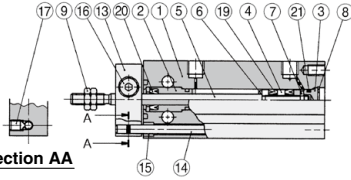
When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

# CUK Series

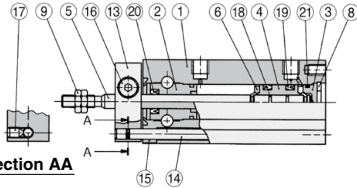
## Construction

ø6



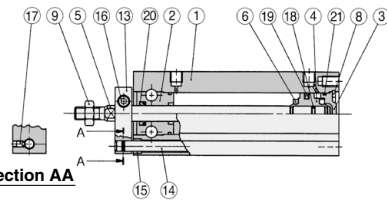
Section AA

ø10



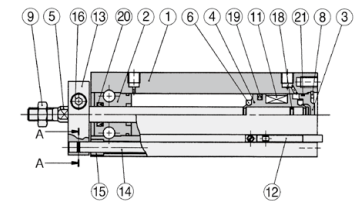
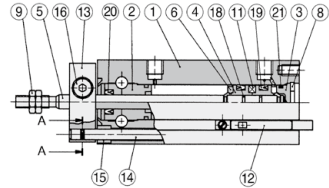
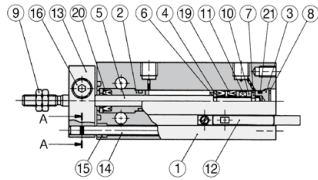
Section AA

ø16 to ø32



Section AA

With auto switch



### Component Parts

| No. | Description    | Material          | Note                                 |
|-----|----------------|-------------------|--------------------------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized                        |
| 2   | Rod cover      | Aluminum alloy    | Hard anodized                        |
| 3   | Head cover     | Brass             | ø6 to ø10, Electroless nickel plated |
|     |                | Aluminum alloy    | ø16 to ø32, Chromated                |
| 4   | Piston         | Brass             | ø6                                   |
|     |                | Aluminum alloy    | ø10 to ø32, Chromated                |
| 5   | Piston rod     | Stainless steel   |                                      |
| 6   | Bumper A       | Urethane          |                                      |
| 7   | Bumper B       | Urethane          |                                      |
| 8   | Retaining ring | Carbon tool steel | Phosphate coated                     |
| 9   | Rod end nut    | Carbon steel      | Chromated                            |
| 10  | Magnet holder  | Brass             | ø6                                   |

### Component Parts

| No. | Description                   | Material        | Note          |
|-----|-------------------------------|-----------------|---------------|
| 11  | Magnet                        | —               |               |
| 12  | Auto switch                   | —               |               |
| 13  | Non-rotating plate            | Aluminum alloy  | Nickel plated |
| 14  | Guide rod                     | Stainless steel |               |
| 15  | Bushing                       | Bearing alloy   |               |
| 16  | Hexagon socket head cap screw | Carbon steel    | Chromated     |
| 17  | Hexagon socket head set screw | Carbon steel    | Chromated     |
| 18  | Piston gasket                 | NBR             |               |
| 19  | Piston seal                   |                 |               |
| 20  | Rod seal                      |                 |               |
| 21  | Gasket                        |                 |               |

### Replacement Parts: Seal Kit

| Bore size (mm) | Kit no.  | Contents                      |
|----------------|----------|-------------------------------|
| 10             | CU10D-PS | Set of nos. above 19, 20, 21. |
| 16             | CU16D-PS |                               |
| 20             | CU20D-PS |                               |
| 25             | CU25D-PS |                               |
| 32             | CU32D-PS |                               |

\* Seal kit includes 19, 20, 21. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).

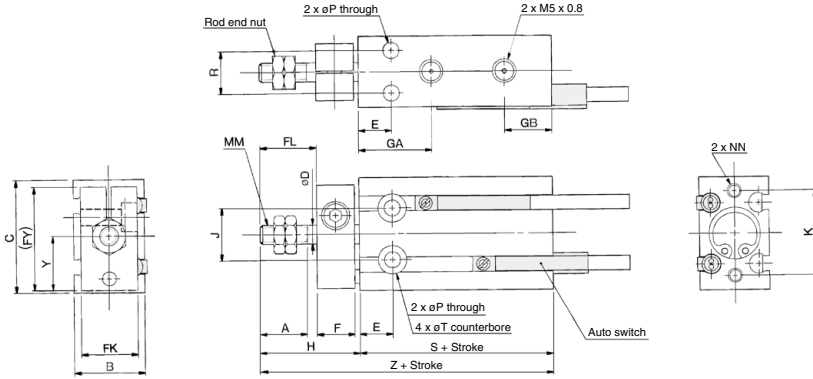
Order with the following part number when only the grease pack is needed.

Grease pack part number: GR-S-010 (10 g)

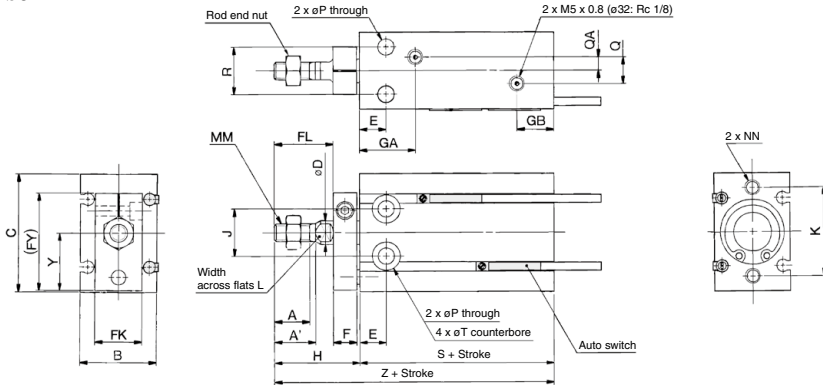
# Free Mount Cylinder: Long Stroke Type Non-rotating Rod, Double Acting, Single Rod **CUK Series**

## Dimensions: Non-rotating Rod Type; Double Acting, Single Rod

ø6, ø10

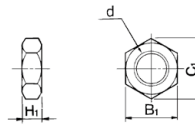


ø16 to ø32



### Rod End Nut/Accessory Material: Carbon steel

| Part no.        | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|-----------------|---------------------------|------------|----------------|----------------|----------------|
| <b>NTP-006</b>  | 6                         | M3 x 0.5   | 1.8            | 5.5            | 6.4            |
| <b>NTP-010</b>  | 10                        | M4 x 0.7   | 2.4            | 7              | 8.1            |
| <b>NTJ-015C</b> | 16                        | M5 x 0.8   | 4              | 8              | 9.2            |
| <b>NT-015A</b>  | 20                        | M6 x 1.0   | 5              | 10             | 11.5           |
| <b>NT-02</b>    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| <b>NT-03</b>    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |



| Bore size (mm) | A    | A'   | B  | C  | D  | E  | F  | FL | FK | FY   | GA   | GB   | H  | J  | K  | L  | MM         |
|----------------|------|------|----|----|----|----|----|----|----|------|------|------|----|----|----|----|------------|
| <b>6</b>       | 7    | —    | 13 | 22 | 3  | 7  | 8  | 9  | 11 | 20.5 | 15   | 10   | 18 | 10 | 17 | —  | M3 x 0.5   |
| <b>10</b>      | 10   | —    | 15 | 24 | 4  | 7  | 8  | 12 | 12 | 22   | 16.5 | 10   | 21 | 11 | 18 | —  | M4 x 0.7   |
| <b>16</b>      | 11   | 12.5 | 20 | 32 | 6  | 7  | 8  | 17 | 13 | 28   | 16.5 | 11.5 | 26 | 14 | 25 | 5  | M5 x 0.8   |
| <b>20</b>      | 12   | 14   | 26 | 40 | 8  | 9  | 8  | 20 | 16 | 33   | 19   | 12.5 | 29 | 16 | 30 | 6  | M6 x 1.0   |
| <b>25</b>      | 15.5 | 18   | 32 | 50 | 10 | 10 | 10 | 22 | 20 | 43.5 | 21.5 | 13   | 33 | 20 | 38 | 8  | M8 x 1.25  |
| <b>32</b>      | 19.5 | 22   | 40 | 62 | 12 | 11 | 12 | 29 | 24 | 51.5 | 23   | 12.5 | 42 | 24 | 48 | 10 | M10 x 1.25 |

| Bore size (mm) | NN               | P   | Q    | QA  | R  | T             | Y    | Without auto switch |    | With auto switch |    |
|----------------|------------------|-----|------|-----|----|---------------|------|---------------------|----|------------------|----|
|                |                  |     |      |     |    |               |      | S                   | Z  | S                | Z  |
| <b>6</b>       | M3 x 0.5 depth 5 | 3.2 | —    | —   | 7  | 6 depth 4.8   | 10.5 | 33                  | 51 | 33               | 51 |
| <b>10</b>      | M3 x 0.5 depth 5 | 3.2 | —    | —   | 9  | 6 depth 5     | 11.5 | 36                  | 57 | 36               | 57 |
| <b>16</b>      | M4 x 0.7 depth 6 | 4.5 | 4    | 2   | 12 | 7.6 depth 6.5 | 15.5 | 30                  | 56 | 40               | 66 |
| <b>20</b>      | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 16 | 9.3 depth 8   | 19.5 | 36                  | 65 | 46               | 75 |
| <b>25</b>      | M5 x 0.8 depth 8 | 5.5 | 9    | 4.5 | 20 | 9.3 depth 9   | 24.5 | 40                  | 73 | 50               | 83 |
| <b>32</b>      | M6 x 1.0 depth 9 | 6.6 | 13.5 | 4.5 | 24 | 11 depth 11.5 | 30.5 | 42                  | 84 | 52               | 94 |

# Free Mount Cylinder with Air Cushion

## CU Series

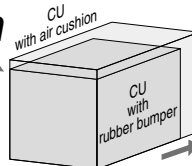
### New air cushion mechanism



**Extended dimensions (compared to the standard CU models) are hardly noticeable.**

(with rubber bumper)

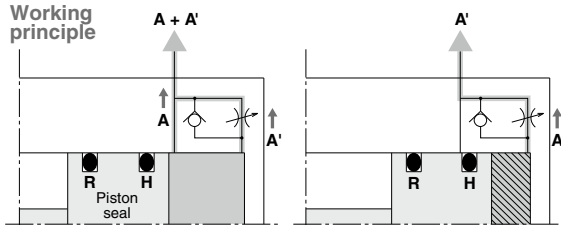
- Overall length: **+1.5 to 7 mm**
- Overall height: **+0 to 2 mm**  
No air cushion protrusion.
- Overall width: not affected



| Bore size | Extended dimensions (mm) |        |
|-----------|--------------------------|--------|
|           | Length                   | Height |
| ø20       | 7                        | 2      |
| ø25       | 1.5                      | 0      |
| ø32       | 4                        | 0      |

### Unique air cushion construction requires no cushion ring.

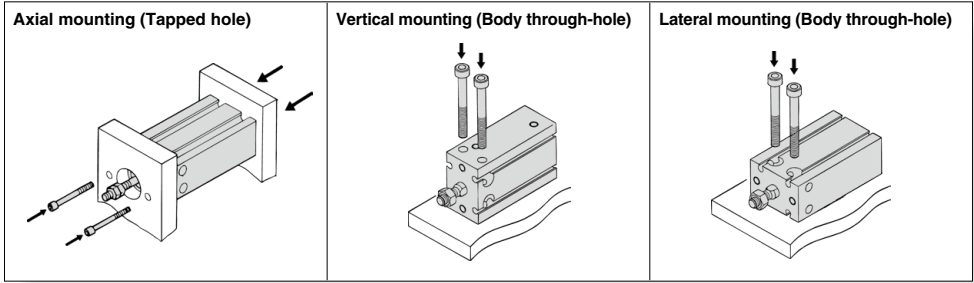
Working principle



- ① When the piston is retracting, air is exhausted through both A and A' until piston seal H passes air passage A.
- ② After piston seal H has passed air passage A, air is exhausted only through A'. The section marked with slanted lines becomes a cushion chamber, and an air cushion effect is achieved.
- ③ When air is supplied for the piston extension, the check valve opens and the piston extends with no delay.

# Free mounting

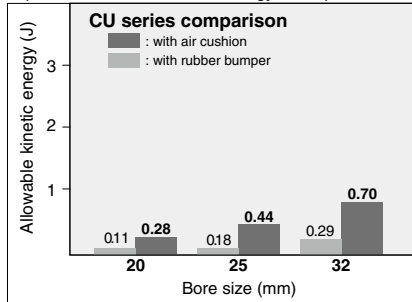
3 types of mounting orientations can be accommodated depending on the installation conditions.



## Approximately 2.4 times of allowable kinetic energy

(Compared to the old CU series with rubber bumper)

Improved allowable kinetic energy absorption.

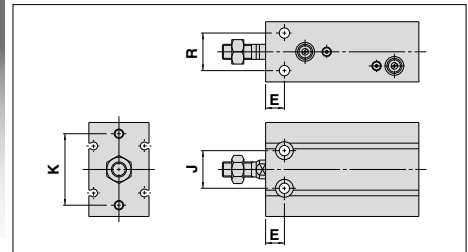


## Improved sound insulation (Reduced impact noise at the stroke end)

- Noise reduction of more than 11 dB is possible (compared to the CU20 series with rubber bumper).

## Interchangeable mounting

Mounting dimensions (J, K, R, and E) are the same as the rubber bumper type CU series.



## Improved repeatability

When compared to rubber bumper type actuators, air cushion type cylinders are less likely to be affected by pressure fluctuations, and therefore better able to achieve a stable and smooth stroke.

## Size Variations

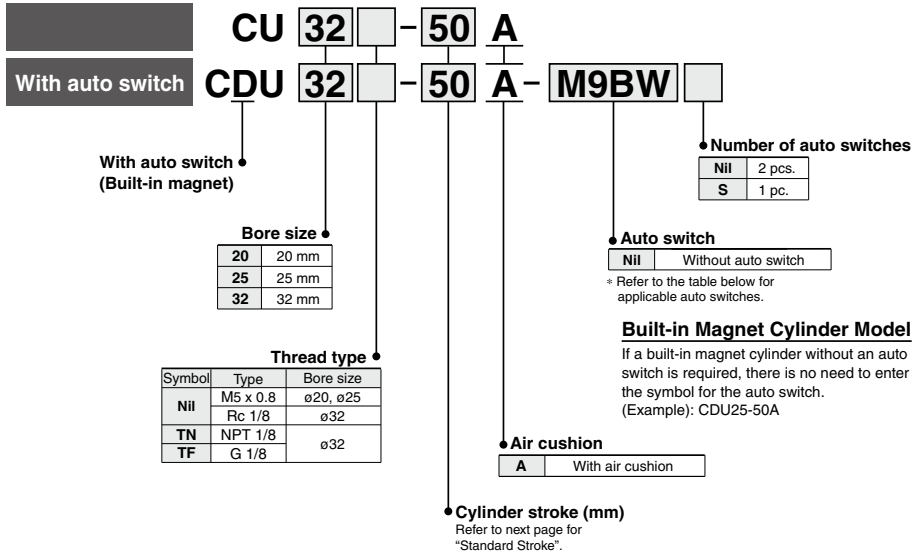
| Model   | Standard stroke |    |    |    |    |    |    |    |     | Auto switch  |
|---------|-----------------|----|----|----|----|----|----|----|-----|--|
|         | 20              | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |  |
| C(D)U20 | ●               | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   | <ul style="list-style-type: none"> <li>• <math>\phi 20</math> to <math>\phi 32</math></li> <li>• Direct mounting type auto switch</li> </ul> |
| C(D)U25 | ●               | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   |  |
| C(D)U32 | ●               | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   |  |

# Free Mount Cylinder with Air Cushion

# CU Series

ø20, ø25, ø32

## 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): CDU25-50A

### Applicable Auto Switches/Refer to pages 1271 to 1403 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) |                     |                 |            |            |
| Solid state auto switch | —   | Grommet          | No              | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV                | M9N                  | ●     | ●     | ●     | ○                   | ○               | IC circuit |            |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PV                | M9P                  | ●     | ●     | ●     | ○                   | ○               |            |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | M9BV                | M9B                  | ●     | ●     | ●     | ○                   | ○               |            |            |
|                         |   |                  |                 | 3-wire (NPN)            |              |           |                   | M9NWV               | M9NW                 | ●     | ●     | ●     | ○                   | ○               |            |            |
|                         | Diagnostic indication (2-color indicator) | Grommet          | Yes             | 3-wire (PNP)            | 24 V         | 5 V, 12 V | —                 | M9PWV               | M9PW                 | ●     | ●     | ●     | ○                   | ○               | IC circuit |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | M9BWW               | M9BW                 | ●     | ●     | ●     | ○                   | ○               |            |            |
|                         | Water resistant (2-color indicator)       | Grommet          | No              | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup>   | ○     | ○     | ○     | ○                   | ○               | IC circuit |            |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup>   | ○     | ○     | ○     | ○                   | ○               |            |            |
| Reed auto switch        | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 12 V      | —                 | A96V                | A96                  | ●     | —     | ●     | —                   | —               | IC circuit |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | A93V <sup>*2</sup>  | A93                  | ●     | ●     | ●     | ●                   | —               |            | Relay, PLC |
|                         |   |                  |                 | 100 V                   |              |           |                   | A90V                | A90                  | ●     | —     | ●     | —                   | —               |            |            |
|                         |   |                  |                 | 100 V or less           |              |           |                   | A90V                | A90                  | ●     | —     | ●     | —                   | —               |            |            |

\*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) M9NWL  
5 m ..... Z (Example) M9NWX

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

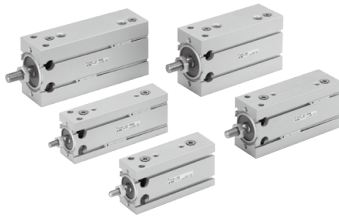
\* Since there are applicable auto switches other than the above, refer to page 782 for details.

\* For detail about auto switches with pre-wired connector, refer to pages 1340 and 1341.

\* Auto switches are shipped together but not assembled.



## Specifications



|                               |   |
|-------------------------------|---|
| Type                          | Pneumatic (Non-lube)  |
| Fluid                         | Air   |
| Proof pressure                | 1.0 MPa   |
| Maximum operating pressure    | 0.7 MPa   |
| Minimum operating pressure    | 0.08 MPa  |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C (No freezing)<br>With auto switch: -10°C to 60°C (No freezing) |
| Rod end thread                | Male thread   |
| Stroke length tolerance       | +1.0<br>0   |
| Piston speed                  | 50 to 500 mm/s  |

## Effective Cushion Length

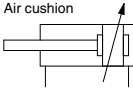
|                               |     |     |     |
|-------------------------------|-----|-----|-----|
| Bore size (mm)                | 20  | 25  | 32  |
| Effective cushion length (mm) | 6.6 | 6.7 | 7.7 |

## Standard Stroke

|                |                                     |
|----------------|-------------------------------------|
| Bore size (mm) | Standard stroke (mm)                |
| 20, 25, 32     | 20, 30, 40, 50, 60, 70, 80, 90, 100 |

\* Intermediate strokes are also available upon receipt of order. Please contact SMC.  
Minimum stroke length is 20 mm.

Symbol  
Air cushion



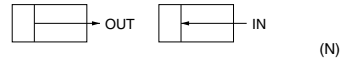
**Tightening Torque** When mounting the CU series refer to the table below.

| Bore size (mm) | Hexagon socket head cap screw size | Proper tightening torque (N·m) |
|----------------|------------------------------------|--------------------------------|
| 20, 25         | M5                                 | 5.10 ±10%                      |
| 32             | M6                                 | 8.04 ±10%                      |

## Allowable Kinetic Energy

Refer to "Selection" on page 776 regarding allowable kinetic energy.

## Theoretical Output



| Bore size (mm) | Operating direction | Operating pressure (MPa) |     |     |
|----------------|---------------------|--------------------------|-----|-----|
|                |                     | 0.3                      | 0.5 | 0.7 |
| 20             | OUT                 | 94.2                     | 157 | 220 |
|                | IN                  | 79.2                     | 132 | 185 |
| 25             | OUT                 | 147                      | 246 | 344 |
|                | IN                  | 124                      | 206 | 288 |
| 32             | OUT                 | 241                      | 402 | 563 |
|                | IN                  | 207                      | 346 | 454 |

## Weight

### Basic Weight (g)

| Bore size (mm) | Standard stroke (mm) |     |     |     |     |     |     |     |     |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|                | 20                   | 30  | 40  | 50  | 60  | 70  | 80  | 90  | 100 |
| 20             | 186                  | 208 | 230 | 252 | 274 | 296 | 318 | 340 | 362 |
| 25             | 289                  | 323 | 357 | 391 | 425 | 459 | 493 | 527 | 561 |
| 32             | 464                  | 512 | 560 | 608 | 656 | 704 | 752 | 800 | 848 |

### Additional Weight (g)

| Bore size (mm) | Magnet |
|----------------|--------|
| 20             | 5      |
| 25             | 6      |
| 32             | 11     |

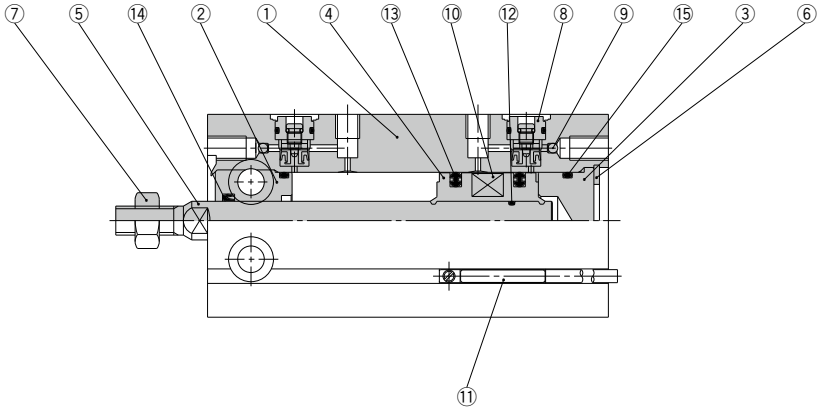
### Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

## Construction



### Component Parts

| No. | Description             | Material          | No. of pcs. | Note             |
|-----|-------------------------|-------------------|-------------|------------------|
| 1   | Cylinder tube           | Aluminum alloy    | 1           | Hard anodized    |
| 2   | Rod cover               | Aluminum alloy    | 1           | Hard anodized    |
| 3   | Head cover              | Aluminum alloy    | 1           | Chromated        |
| 4   | Piston                  | Aluminum alloy    | 1           | Chromated        |
| 5   | Piston rod              | Stainless steel   | 1           |                  |
| 6   | Retaining ring          | Carbon tool steel | 1           | Phosphate coated |
| 7   | Rod end nut             | Carbon steel      | 1           | Chromated        |
| 8   | Cushion needle assembly | —                 | (2)         |                  |
| 9   | Steel ball              | Carbon steel      | 2           |                  |
| 10  | Magnet                  | —                 | 1           |                  |
| 11  | Auto switch             | —                 | (2)         |                  |
| 12  | Piston gasket           | NBR               | 1           |                  |
| 13  | Piston seal             | NBR               | 2           |                  |
| 14  | Rod seal                | NBR               | 1           |                  |
| 15  | Gasket                  | NBR               | 1           |                  |

### Replacement Parts: Seal Kit

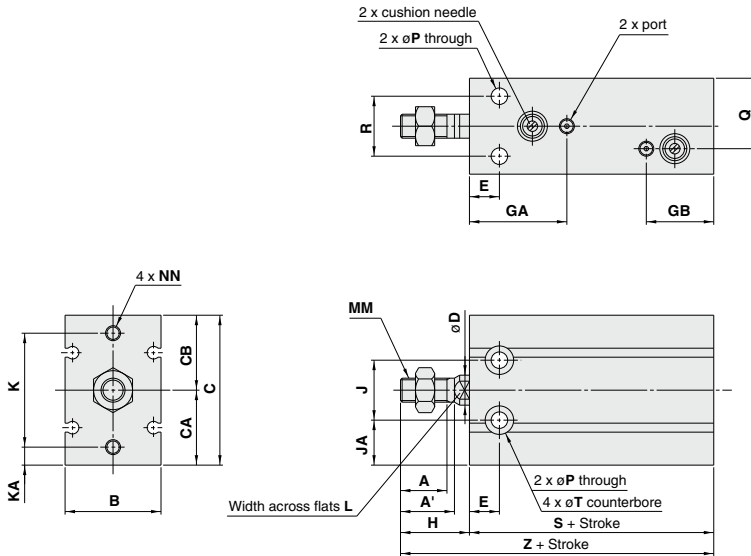
| Bore size (mm) | Kit no.  | Contents                         |
|----------------|----------|----------------------------------|
| ø20            | CU20A-PS | Set of nos. above<br>13, 14, 15. |
| ø25            | CU25A-PS |                                  |
| ø32            | CU32A-PS |                                  |

\* Seal kit includes 13, 14, 15. Order the seal kit, based on each bore size.

\* Seal kit includes a grease pack (10 g).  
Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010 (10 g)**

**Dimensions**

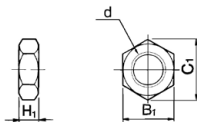


(mm)

| Bore size (mm) | Port size | A    | A' | B  | C  | CA | CB | D  | E  | GA   | GB   | H  | J  | JA |
|----------------|-----------|------|----|----|----|----|----|----|----|------|------|----|----|----|
| 20             | M5 x 0.8  | 12   | 14 | 26 | 42 | 20 | 22 | 8  | 9  | 29   | 27   | 19 | 16 | 12 |
| 25             | M5 x 0.8  | 15.5 | 18 | 32 | 50 | 25 | 25 | 10 | 10 | 32.5 | 22.5 | 23 | 20 | 15 |
| 32             | 1/8       | 19.5 | 22 | 40 | 62 | 31 | 31 | 12 | 11 | 35   | 25   | 27 | 24 | 19 |

| Bore size (mm) | K  | KA | L  | MM         | NN               | P   | Q    | R  | T             | S    | Z    | Standard stroke                     |
|----------------|----|----|----|------------|------------------|-----|------|----|---------------|------|------|-------------------------------------|
| 20             | 30 | 5  | 6  | M6 x 1.0   | M5 x 0.8 depth 8 | 5.5 | 13   | 16 | 9.3 depth 8   | 53   | 72   | 20, 30, 40, 50, 60, 70, 80, 90, 100 |
| 25             | 38 | 6  | 8  | M8 x 1.25  | M5 x 0.8 depth 8 | 5.5 | 23.5 | 20 | 9.3 depth 9   | 51.5 | 74.5 |                                     |
| 32             | 48 | 7  | 10 | M10 x 1.25 | M6 x 1.0 depth 9 | 6.6 | 29   | 24 | 11 depth 11.5 | 56   | 83   |                                     |

**Rod End Nut/Accessory**



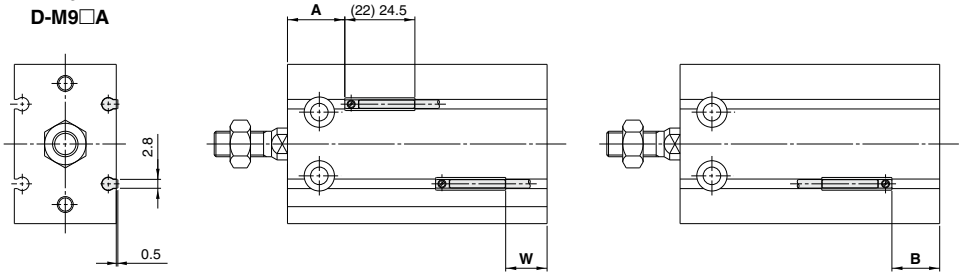
Material: Carbon steel

| Part no. | Applicable bore size (mm) | d          | H <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> |
|----------|---------------------------|------------|----------------|----------------|----------------|
| NT-015A  | 20                        | M6 x 1.0   | 5              | 10             | 11.5           |
| NT-02    | 25                        | M8 x 1.25  | 5              | 13             | 15.0           |
| NT-03    | 32                        | M10 x 1.25 | 6              | 17             | 19.6           |

# Auto Switch Mounting

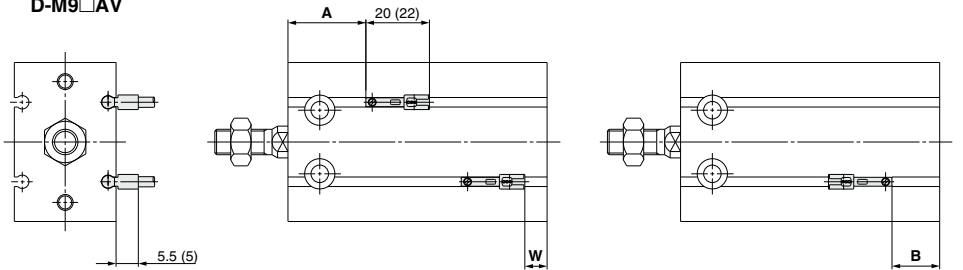
## Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□  
D-M9□  
D-M9□W  
D-M9□A



( ): Denotes the values of D-A96.

D-A9□V  
D-M9□V  
D-M9□WV  
D-M9□AV



( ): Denotes the values of D-M9□V, D-M9□WV.

| Bore size (mm) | D-A9□, D-A9□V |      | D-M9□, D-M9□W |      |      | D-M9□V, D-M9□WV |      |      | D-M9□A |      |      | D-M9□AV |      |      |      |
|----------------|---------------|------|---------------|------|------|-----------------|------|------|--------|------|------|---------|------|------|------|
|                | A             | B    | W             | A    | B    | W               | A    | B    | W      | A    | B    | W       | A    | B    | W    |
| 20             | 18            | 15   | 13(10.5)      | 22   | 19   | 9               | 22   | 19   | 11     | 22   | 19   | 11      | 22   | 19   | 13   |
| 25             | 20            | 11   | 9(6.5)        | 24.5 | 15   | 5               | 24.5 | 15   | 7      | 24.5 | 15   | 7       | 24.5 | 15   | 9    |
| 32             | 22.5          | 13.5 | 11.5(9)       | 26.5 | 17.5 | 7.5             | 26.5 | 17.5 | 9.5    | 26.5 | 17.5 | 9.5     | 26.5 | 17.5 | 11.5 |

(mm)

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection.  
In the case of actually setting the auto switches, adjust them after confirming their operation.

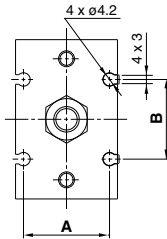
Note 2) Values in ( ) are dimensions for D-A90 and A93 type.

## Operating Range

| Switch model                                  | Bore size (mm) |      |     |
|---|----------------|------|-----|
|   | 20             | 25   | 32  |
| D-A9□, A9□V                                   | 11             | 12.5 | 14  |
| D-M9□, M9□V<br>D-M9□W, M9□WV<br>D-M9□A, M9□AV | 7              | 7    | 7.5 |

\* 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.

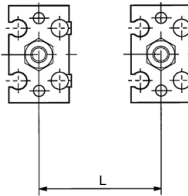
## Auto Switch Rail Position



| (mm)           |    |    |
|----------------|----|----|
| Bore size (mm) | A  | B  |
| <b>20</b>      | 21 | 23 |
| <b>25</b>      | 27 | 25 |
| <b>32</b>      | 35 | 27 |

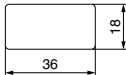
## Caution on Proximity Installation

When free mounting cylinders equipped with auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimensions shown in the table. Therefore, make sure to provide a greater clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shielding plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) Auto switches may malfunction if a shielding plate is not used.



| Bore size (mm) | Mounting pitch L (mm) |
|----------------|-----------------------|
| <b>20</b>      | 40                    |
| <b>25</b>      | 46                    |
| <b>32</b>      | 56                    |

Dimensions of shielding plate (MU-S025) that is sold separately are indicated as reference.



Material: Ferrite stainless steel, Thickness: 0.3 mm  
The product can be attached to the cylinder since the bottom side is a seal type.



# CU Series Specific Product Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

## Installation and Removal of Retaining Rings

### ⚠ Caution

1. Use appropriate pliers (Type C retaining ring installing tool) for installation and removal of retaining rings.
2. Even when using appropriate pliers (Type C retaining ring installing tool), proceed with caution as there is a danger of the retaining ring flying off the end of the pliers (tool) and causing bodily injury or damage to nearby equipment. After installation, make sure that the retaining ring is securely seated into the retaining ring groove before supplying air.

## Mounting

### ⚠ Caution

1. Refer to the below table for mounting cylinders.

#### Tightening Torque

| Bore sizes (mm) | Hexagon socket head cap screw (mm) | Proper tightening torque (N/m) |
|-----------------|------------------------------------|--------------------------------|
| 20, 25          | M5                                 | 5.10 ±10%                      |
| 32              | M6                                 | 8.04 ±10%                      |

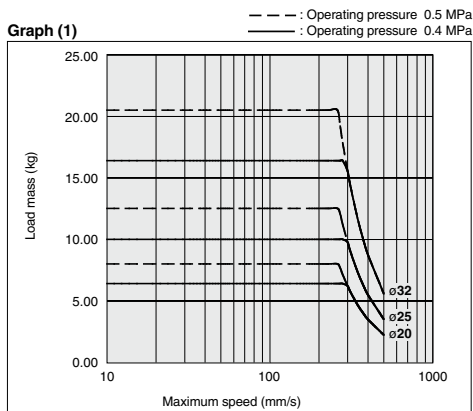
## Selection

### ⚠ Caution

1. Operate the cylinder to the stroke end.  
When the stroke is restricted by an external stopper or a clamped workpiece, sufficient cushioning and noise reduction may not be achieved.
2. Strictly observe the limiting ranges for load mass and maximum speed (Graph (1)). Also, the limiting ranges provided here are based on the condition that the cylinder is operated to the stroke end with a proper cushion needle adjustment.

If operated beyond the limiting ranges, excessive impact will occur and this may cause damage to equipment.

Graph (1)



## Selection

### ⚠ Caution

3. Adjust the cushion needle to reduce excessive kinetic energy from the piston impact at the stroke end by allowing it to absorb sufficient kinetic energy during the cushion stroke.

If due to improper adjustment, the piston impacts the stroke end with excessive kinetic energy (values above those given in Table (1)), an excessive impact will occur and this may cause damages to equipment.

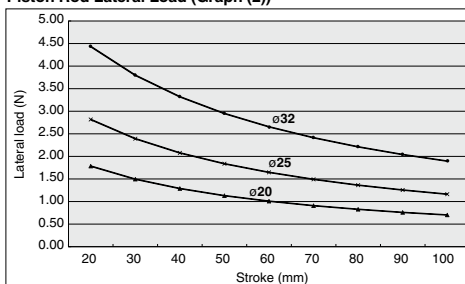
Table (1) Allowable Kinetic Energy at Piston Impact (J)

| Piston speed             | 20             | 25   | 32   |
|--------------------------|----------------|------|------|
|                          | 50 to 500 mm/s |      |      |
| Allowable kinetic energy | 0.055          | 0.09 | 0.15 |

4. Strictly observe the limiting ranges for the piston rod lateral load (Graph (2)).

If operated beyond the limiting ranges, equipment life may be reduced or damage to equipment may occur.

Piston Rod Lateral Load (Graph (2))



## Cushion Needle Adjustment

### ⚠ Caution

1. Keep the adjustment range for the cushion needle between the fully closed position and the rotations shown below.

|            | Rotations             |
|------------|-----------------------|
| ø20 to ø32 | 2.5 rotations or less |

Use a 3 mm flat head watchmakers' screwdriver to adjust the cushion needle. The adjustment range for the cushion needle must be between the fully closed position and the open position ranges indicated in the above table. A retaining mechanism prevents the cushion needle from slipping out; however, it may spring out during operation if it is rotated beyond the ranges shown above.

# Free Mount Cylinder for Vacuum

## ZCUK Series

A free mount cylinder with a vacuum passage in the rod to meet the requirements for **Air cylinder** + **Vacuum pad**.

A vacuum passage has been provided in the rod of the CUK cylinder to enable a vacuum pad to be installed on the end of the rod.



**Not necessary to provide vacuum tubing space at the end of the rod.**

The area around the vacuum pad is uncluttered.

### ● Non-rotating rod ●

A guide is provided as standard equipment

Non-rotating rod accuracy (no load: when the rod is retracted on the detent plate side):  
 $\phi 10, \phi 16$   $\pm 0.8^\circ$   
 $\phi 20, \phi 25, \phi 32$   $\pm 0.5^\circ$

Do not apply a lateral load to the piston rod. Because the piston rod is a hollow rod, a lateral load can cause the piston rod to bend or break.

### ● Auto switch ●

Reed auto switch:

D-A9□ (Heavy-duty cord, in-line entry)  
 D-A9□V (Heavy-duty cord, perpendicular entry)

Solid state auto switch:

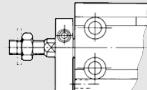
D-M9□, D-M9□W (Heavy-duty cord, in-line entry)  
 D-M9□V, D-M9□WV (Heavy-duty cord, perpendicular entry)

### ● Vacuum pad (Pad diameter: $\phi 2$ to $\phi 50$ ) ●

<Perpendicular female thread>



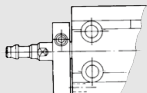
<Male thread>



<Direct mounting>



<Barb fitting>



### ● How to provide piping to the vacuum side

#### Cap piping

The piston rod of the vacuum side does not protrude. Also, the vacuum outlet tube does not move when the piston is operating.

Vacuum port pressure range:  $-101$  kPa to  $0.6$  MPa  
 Pressurize only when releasing the vacuum. At that time, use it under the cylinder operating pressure.

#### Rod piping

Lighter weight than the cap piping.

Can also be used for air blowing.

Vacuum port pressure range:  $-101$  kPa to  $0.6$  MPa



# Free Mount Cylinder for Vacuum

# ZCUK Series

## How to Order

**ZCUK C 16 - 20 D**  
**ZCDUK C 16 - 20 D - M9BW**

**With auto switch**

**Number of auto switches**  
 Nil 2 pcs.  
 S 1 pc.

**Built-in magnet**  
 Type (Tubing method in vacuum side)/(Rod end shape)  
**C** Cap piping/Male thread  
**D** Cap piping/Pad direct mounting  
**Q** Rod piping/Male thread  
**R** Rod piping/Pad direct mounting

**Bore size**  
**10** 10 mm  
**16** 16 mm  
**20** 20 mm  
**25** 25 mm  
**32** 32 mm

**Port thread type**

| Symbol    | Type     | Bore size          |
|-----------|----------|--------------------|
| Nil       | M5 x 0.8 | ø10, ø16, ø20, ø25 |
| Nil       | Rc1/8    | ø32                |
| TN        | NPT1/8   | ø32                |
| TF (Note) | G1/8     | ø32                |

(Note) In the case of rod piping (Q, R), TF (G1/8) is not available.

**Acting**  
**D** Double acting

**Auto switch**  
**Nil** Without auto switch

\* Refer to the table below for applicable auto switches.

**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) ZCDUKC20-20D

**Cylinder standard stroke (mm)**  
**10, 16** 5, 10, 15, 20, 25, 30  
**20, 25, 32** 5, 10, 15, 20, 25, 30, 40, 50

## Applicable Auto Switches/Refer to pages 1271 to 1365 for the detailed specifications 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)           | IC circuit |
| Solid state auto switch             | —   | Grommet          | Yes                 | 3-wire (NPN)            | 5 V, 12 V    | —             | M9NV              | M9N     | ●                    | ●     | ○     | ○                   | IC circuit      | Relay, PLC |
|                                     |   |                  |                     | 3-wire (PNP)            |              |               | M9PV              | M9P     | ●                    | ●     | ○     | ○                   |                 |            |
|                                     |   |                  |                     | 2-wire                  |              |               | M9BV              | M9B     | ●                    | ●     | ○     | ○                   |                 |            |
|                                     | Diagnostic indication (2-color indicator) |                  |                     | 3-wire (NPN)            | 5 V, 12 V    | M9NWW         | M9NW              | ●       | ●                    | ○     | ○     | IC circuit          |                 |            |
|                                     |   |                  |                     | 3-wire (PNP)            |              | M9PWW         | M9PW              | ●       | ●                    | ○     | ○     |                     |                 |            |
|                                     |   |                  |                     | 2-wire                  |              | M9BWW         | M9BW              | ●       | ●                    | ○     | ○     |                     |                 |            |
| Water resistant (2-color indicator) | 3-wire (NPN)                              | 5V,12V           | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup>      | ○            | ○             | ○                 | ○       | IC circuit           |       |       |                     |                 |            |
|                                     | 3-wire (PNP)                              |                  | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup>      | ○            | ○             | ○                 | ○       |                      |       |       |                     |                 |            |
|                                     | 2-wire                                    |                  | M9BAV <sup>*1</sup> | M9BA <sup>*1</sup>      | ○            | ○             | ○                 | ○       |                      |       |       |                     |                 |            |
| Reed auto switch                    | —   | Grommet          | Yes                 | 3-wire (NPN equivalent) | —            | 5 V           | A96V              | A96     | ●                    | ●     | —     | —                   | IC circuit      | Relay, PLC |
|                                     |   |                  |                     | 2-wire                  |              |               | 24 V              | 12 V    | A93V <sup>*2</sup>   | A93   | ●     | ●                   |                 |            |
|                                     |   |                  | No                  | 2-wire                  | 24 V         | 100 V or less | A90V              | A90     | ●                    | ●     | —     | —                   | IC circuit      |            |

- \*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.  
 \*2 1 m type lead wire is only applicable to D-A93.  
 \* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
 1 m..... M (Example) M9NWM  
 3 m..... L (Example) M9NWL  
 5 m..... Z (Example) M9NWZ
- \* Solid state auto switches marked with "○" are produced upon receipt of order.  
 \* Refer to pages 1340 and 1341 for the details on auto switches with a pre-wired connector.  
 \* Auto switches are shipped together but not assembled.

## How to Order Vacuum Pad

(Note) Refer to page 780 for combination of cylinder and pad.

### • In the case of rod end male

**ZPT 02 U N - B4**

**Pad dia. (mm)**

|    |     |
|----|-----|
| 02 | ø2  |
| 04 | ø4  |
| 06 | ø6  |
| 08 | ø8  |
| 10 | ø10 |
| 13 | ø13 |
| 16 | ø16 |
| 20 | ø20 |
| 25 | ø25 |
| 32 | ø32 |
| 40 | ø40 |
| 50 | ø50 |

**Pad type**  
 Application: Refer to "Table (1)".

|   |                |
|---|----------------|
| U | Flat           |
| C | Flat with ribs |
| D | Deep           |
| B | Bellows        |

### • Vacuum entry (Mounting thread diameter)

| Symbol | Thread dia. | ø2 to ø8 | ø10 to ø16 | ø20 to ø32 | ø40, ø50 |
|--------|-------------|----------|------------|------------|----------|
| B4     | M4 x 0.7    | ●        | —          | —          | —        |
| B5     | M5 x 0.8    | ●        | —          | —          | —        |
| B6     | M6 x 1      | —        | ●          | ●          | —        |
| B8     | M8 x 1.25   | —        | —          | ●          | ●        |
| B10    | M10 x 1.25  | —        | —          | ●          | ●        |

**Material**

|    |   |
|----|---|
| N  | NBR   |
| S  | Silicone rubber                             |
| U  | Urethane rubber                             |
| F  | FKM   |
| GN | Conductive NBR (ø2 to ø16 only)             |
| GS | Conductive silicone rubber (ø2 to ø16 only) |

### Table (1) Pad Dia./Pad Type

| Type           | 2 | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 32 | 40 | 50 |
|----------------|---|---|---|---|----|----|----|----|----|----|----|----|
| Flat           | ● | ● | ● | ● | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| Flat with ribs | — | — | — | — | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| Deep           | — | — | — | — | —  | —  | —  | —  | —  | —  | —  | —  |
| Bellows        | — | — | ● | ● | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |

### • In the case of pad direct mounting

**ZP 04 U N - X11**

**Pad dia. (mm)**

|    |     |
|----|-----|
| 02 | ø2  |
| 04 | ø4  |
| 06 | ø6  |
| 08 | ø8  |
| 10 | ø10 |
| 13 | ø13 |
| 16 | ø16 |
| 20 | ø20 |
| 25 | ø25 |
| 32 | ø32 |
| 40 | ø40 |
| 50 | ø50 |

**Pad type**  
 Application: Refer to "Table (1)".

|   |                        |
|---|------------------------|
| U | Flat                   |
| C | Flat with ribs         |
| D | Deep                   |
| B | Bellows (Except "X11") |

### Suffix

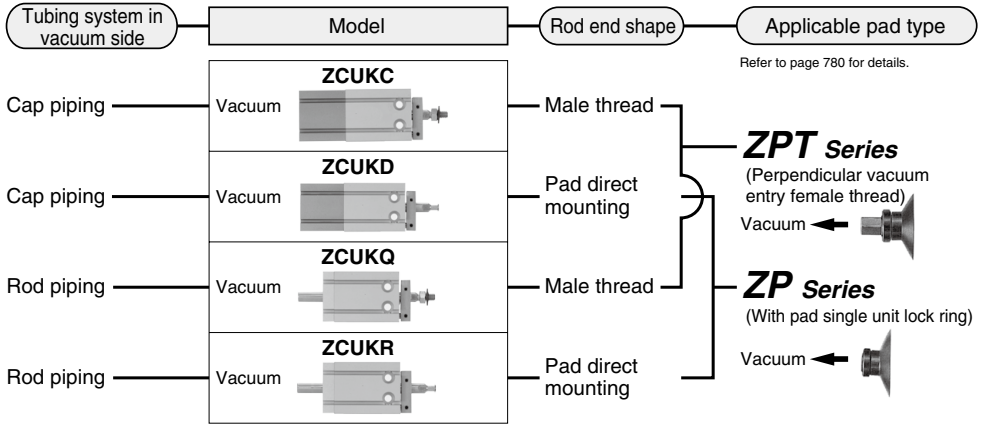
| Symbol | Applicable cylinder model     |
|--------|-------------------------------|
| X11    | ZC(D)UK <sub>R</sub> 10       |
| Nil    | ZC(D)UK <sub>R</sub> 16 to 32 |

(Note) X11 pad: ø2 to ø8 diameter and flat type only.

### Material

|    |   |
|----|---|
| N  | NBR   |
| S  | Silicone rubber                             |
| U  | Urethane rubber                             |
| F  | FKM   |
| GN | Conductive NBR (ø2 to ø16 only)             |
| GS | Conductive silicone rubber (ø2 to ø16 only) |





## Specifications

| Bore size (mm)                       | ø10   | ø16 | ø20      | ø25 | ø32 |
|--------------------------------------|---|-----|----------|-----|-----|
| <b>Fluid</b>                         | Air   |     |          |     |     |
| <b>Proof pressure</b>                | 1.05 MPa  |     |          |     |     |
| <b>Maximum operating pressure</b>    | 0.7 MPa   |     |          |     |     |
| <b>Minimum operating pressure</b>    | 0.13 MPa  |     | 0.11 MPa |     |     |
| <b>Vacuum port pressure</b>          | -101 kPa to 0.6 MPa<br>(At vacuum release 0 to 0.6 MPa) <small>Note</small>                     |     |          |     |     |
| <b>Ambient and fluid temperature</b> | Without auto switch: -10 to +70°C (No freezing)<br>With auto switch: -10 to +60°C (No freezing) |     |          |     |     |
| <b>Lubrication</b>                   | Not required  |     |          |     |     |
| <b>Piston speed</b>                  | 50 to 500 mm/s  |     |          |     |     |
| <b>Cushion</b>                       | Rubber bumper on both sides   |     |          |     |     |
| <b>Stroke allowance</b>              | +1.0<br>0   |     |          |     |     |
| <b>Rod tip screw</b>                 | With or without (Pad direct mounting)   |     |          |     |     |
| <b>Mounting</b>                      | Basic type  |     |          |     |     |
| <b>Applicable pad</b>                | Refer to page 780 for details.  |     |          |     |     |

Note) For a cap type, supply pressure only when vacuum is released. That pressure should be less than the cylinder pressure.

## Non-rotating Rod Accuracy (No load/At retraction of the rod at the locking plate side)

| Bore size (mm)            | ø10   | ø16 | ø20   | ø25 | ø32 |
|---------------------------|-------|-----|-------|-----|-----|
| Non-rotating rod accuracy | ±0.8° |     | ±0.5° |     |     |

## ⚠ Precautions

**Be sure to read this before handling the products.**

**Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.**

### ⚠ Caution

- Do not place your finger in the clearance between the detent plate and the cylinder tube. Never put your finger between the non-rotating plate and cylinder tube. Your finger may be pinched when the piston rod retracts. If your finger is caught, it could injure your finger because the cylinder outputs a considerable amount of force.
- Make sure that rotational torque is not applied to the piston rod. If this is unavoidable, operate the cylinder within the allowable rotational torque listed in the table below.

- To secure a workpiece to the end of the piston rod, tighten the workpiece onto the piston rod with the piston rod fully retracted so that torque is not applied to the piston rod.
- To install a cylinder, tighten it within the torque values indicated in the table below.

### Proper Tightening Torque

| Bore size (mm) | Hexagon socket head bolt diameter (mm) | Proper tightening torque (N·m) |
|----------------|--|--------------------------------|
| ø10            | M3                                     | 1.08 ± 10%                     |
| ø16            | M4                                     | 2.45 ± 10%                     |
| ø20, ø25       | M5                                     | 5.10 ± 10%                     |
| ø32            | M6                                     | 8.04 ± 10%                     |

### Allowable Rotational Torque

| Bore size (mm)                    | ø10  | ø16  | ø20  | ø25  | ø32  |
|-----------------------------------|------|------|------|------|------|
| Allowable rotational torque (N·m) | 0.02 | 0.04 | 0.10 | 0.15 | 0.20 |

### Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the [Web Catalog](#).

# ZCUK Series

## Standard Stroke

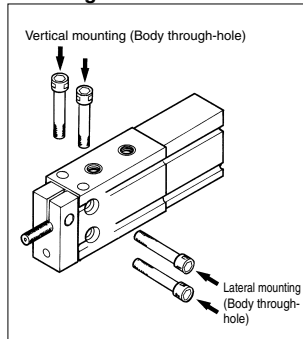
| Applicable cylinder<br>Stroke (mm) | Double acting type/Single rod type/Non-rotating rod |    |    |    |    |    |    |    |
|------------------------------------|---|----|----|----|----|----|----|----|
|                                    | Stroke (mm)   |    |    |    |    |    |    |    |
| Bore size (mm)                     | 5   | 10 | 15 | 20 | 25 | 30 | 40 | 50 |
| 10                                 | ●   | ●  | ●  | ●  | ●  | ●  | —  | —  |
| 16                                 | ●   | ●  | ●  | ●  | ●  | ●  | —  | —  |
| 20                                 | ●   | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25                                 | ●   | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32                                 | ●   | ●  | ●  | ●  | ●  | ●  | ●  | ●  |

## Theoretical Output/Double Acting Type

Unit: N

| Bore size (mm) | Rod dia. (mm) | Piston area (mm <sup>2</sup> ) | Operating pressure (MPa) |     |      |
|----------------|---------------|--------------------------------|--------------------------|-----|------|
|                |               |                                | 0.3                      | 0.5 | 0.7  |
| 10             | 4             | 66.0                           | 19.8                     | 33  | 46.2 |
| 16             | 6             | 172                            | 51.6                     | 86  | 121  |
| 20             | 8             | 264                            | 79.2                     | 132 | 185  |
| 25             | 10            | 412                            | 124                      | 206 | 289  |
| 32             | 12            | 691                            | 207                      | 346 | 484  |

## Mounting



## Minimum Stroke for Mounting Auto Switch

| Number of auto switches | Applicable auto switch |               |                 |
|-------------------------|------------------------|---------------|-----------------|
|                         | D-A9□, D-A9□V          | D-M9□, D-M9□V | D-M9□W, D-M9□VW |
| 1 pc.                   | 5                      | 5             | 5               |
| 2 pcs.                  | 10                     | 5             | 10              |

## Cylinder/Applicable Pad

### • In the case of rod end male thread

Use ZPT series pad (perpendicular vacuum entry/female thread mounting).

| Cylinder Model | Bore size (mm) | Pad (ZPT02 to 50□□-B4 to 10) |   |   |   |    |    |    |    |    |    | Thread dia. |    |            |
|----------------|----------------|------------------------------|---|---|---|----|----|----|----|----|----|-------------|----|------------|
|                |                | Rod dia. (mm)                |   |   |   |    |    |    |    |    |    |             |    |            |
|                |                | 2                            | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 32 | 40          | 50 |            |
| ZCUKC          | 10             | ●                            | ● | ● | ● | —  | —  | —  | —  | —  | —  | —           | —  | M4 x 0.7   |
| ZCUKQ          | 16             | ●                            | ● | ● | ● | —  | —  | —  | —  | —  | —  | —           | —  | M5 x 0.8   |
| ZCDUKC         | 20             | —                            | — | — | ● | ●  | ●  | ●  | ●  | ●  | —  | —           | —  | M6 x 1.0   |
| ZCDUKQ         | 25             | —                            | — | — | — | —  | —  | ●  | ●  | ●  | ●  | ●           | —  | M8 x 1.25  |
|                | 32             | —                            | — | — | — | —  | —  | ●  | ●  | ●  | ●  | ●           | —  | M10 x 1.25 |

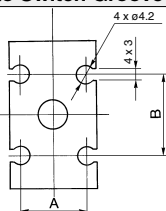
### • In the case of pad direct mounting

Use ZP series pad (single unit).

| Cylinder Model | Bore size  | Pad (ZP02 to 50□□) |   |   |   |    |    |    |    |    |    |    |    |
|----------------|------------|--------------------|---|---|---|----|----|----|----|----|----|----|----|
|                |            | Rod dia. (mm)      |   |   |   |    |    |    |    |    |    |    |    |
|                |            | 2                  | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 32 | 40 | 50 |
| ZCUKD          | 10 Note 1) | ●                  | ● | ● | ● | —  | —  | —  | —  | —  | —  | —  | —  |
| ZCUKR          | 16         | ●                  | ● | ● | ● | —  | —  | —  | —  | —  | —  | —  | —  |
| ZCDUKD         | 20         | —                  | — | — | — | ●  | ●  | ●  | —  | —  | —  | —  | —  |
| ZCDUKR         | 25         | —                  | — | — | — | —  | —  | —  | ●  | ●  | ●  | —  | —  |
|                | 32         | —                  | — | — | — | —  | —  | —  | —  | —  | —  | ●  | ●  |

Note) When using "ZC(D)UK<sub>R</sub>10", use ZP02 to 08U□-X11. Pad shape is flat only.

## Auto Switch Groove

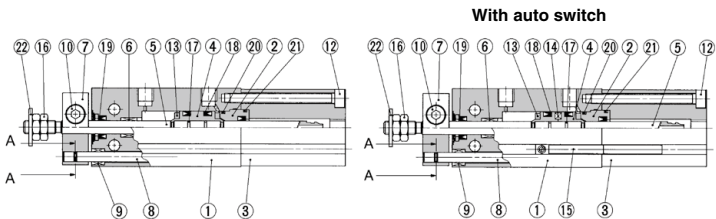
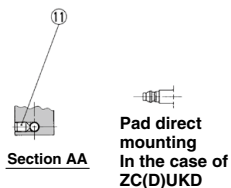


| Bore size | A    | B  |
|-----------|------|----|
| 10        | 10.3 | 13 |
| 16        | 15   | 18 |
| 20        | 21   | 23 |
| 25        | 27   | 25 |
| 32        | 35   | 27 |

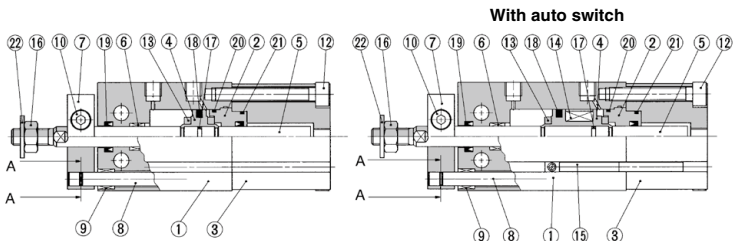
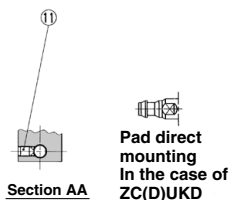
## Construction

Cap piping/Male thread: ZC(D)UKK

ø10



ø16 to ø32



### Component Parts

| No. | Description                   | Material        | Note          |
|-----|-------------------------------|-----------------|---------------|
| 1   | Cylinder tubing               | Aluminum alloy  | Hard anodized |
| 2   | Rod cover B                   | Aluminum alloy  | Chromated     |
| 3   | Cap                           | Aluminum alloy  | Anodized      |
| 4   | Piston                        | Aluminum alloy  | Chromated     |
| 5   | Piston rod                    | Stainless steel |               |
| 6   | Bush                          | Bearing alloy   |               |
| 7   | Plate                         | Aluminum alloy  | Nickel plated |
| 8   | Guide rod                     | Stainless steel |               |
| 9   | Bush                          | Bearing alloy   |               |
| 10  | Hexagon socket head cap screw | Carbon steel    | Chromated     |
| 11  | Hexagon socket set screw      | Carbon steel    | Chromated     |
| 12  | Hexagon socket head cap screw | Carbon steel    | Nickel plated |

### Component Parts

| No.              | Description    | Material         | Note      |
|------------------|----------------|------------------|-----------|
| 13               | Bumper         | Urethane         |           |
| 14               | Magnet         | —                |           |
| 15               | Auto switch    | —                |           |
| 16               | Rod end nut    | Carbon steel     | Chromated |
| 17               | Piston gasket  | NBR              |           |
| 18 <sup>*)</sup> | Piston seal    | NBR              |           |
| 19 <sup>*)</sup> | Rod seal       |                  |           |
| 20 <sup>*)</sup> | Gasket         |                  |           |
| 21 <sup>*)</sup> | Gasket for cap |                  |           |
| 22               | Seal washer    | Rolled steel/NBR |           |

### Replacement Parts: Seal Kit

#### Cap piping

| Kit no. | Bore size / Part no. |          |          |          |          |
|---------|----------------------|----------|----------|----------|----------|
|         | ø10                  | ø16      | ø20      | ø25      | ø32      |
|         | ZCU10-PS             | ZCU16-PS | ZCU20-PS | ZCU25-PS | ZCU32-PS |

\* Seal kit includes 18, 19, 20 and 21. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

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

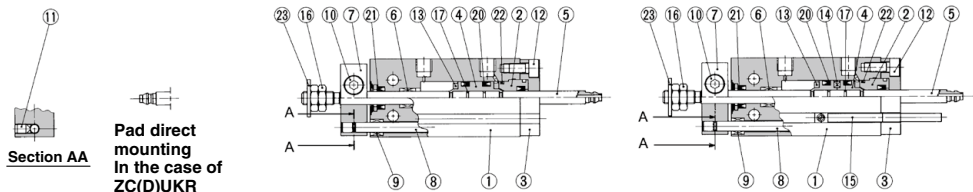
Grease pack part no.: GR-S-010 (10 g)

# ZCUK Series

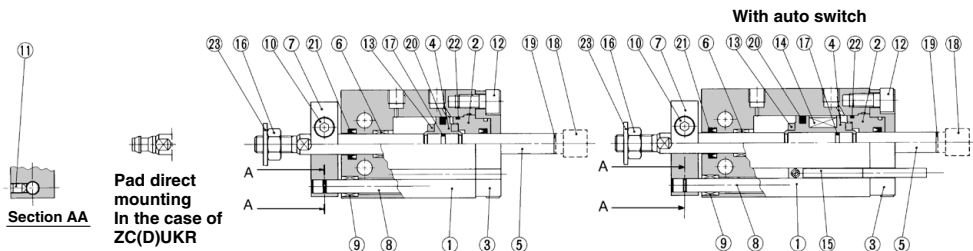
## Construction

### Rod piping-Male thread: ZC(D)UKQ

ø10



ø16 to ø32



### Component Parts

| No. | Description                   | Material        | Note          |
|-----|-------------------------------|-----------------|---------------|
| 1   | Cylinder tubing               | Aluminum alloy  | Hard anodized |
| 2   | Rod cover B                   | Aluminum alloy  | Chromated     |
| 3   | Rod cover retainer plate      | Aluminum alloy  | Anodized      |
| 4   | Piston                        | Aluminum alloy  | Chromated     |
| 5   | Piston rod                    | Stainless steel |               |
| 6   | Bush                          | Bearing alloy   |               |
| 7   | Plate                         | Aluminum alloy  | Nickel plated |
| 8   | Guide rod                     | Stainless steel |               |
| 9   | Bush                          | Bearing alloy   |               |
| 10  | Hexagon socket head cap screw | Carbon steel    | Chromated     |
| 11  | Hexagon socket set screw      | Carbon steel    | Chromated     |
| 12  | Hexagon socket head cap screw | Carbon steel    | Nickel plated |

### Component Parts

| No.              | Description   | Material         | Note      |
|------------------|---------------|------------------|-----------|
| 13               | Bumper        | Urethane         |           |
| 14               | Magnet        | —                |           |
| 15               | Auto switch   | —                |           |
| 16               | Rod end nut   | Carbon steel     | Chromated |
| 17               | Piston gasket | NBR              |           |
| 18               | Socket        | Carbon steel     | ø16 only  |
| 19               | Gasket        | NBR              | ø16 only  |
| 20 <sup>1)</sup> | Piston seal   |                  |           |
| 21 <sup>1)</sup> | Rod seal      |                  |           |
| 22 <sup>1)</sup> | Gasket        |                  |           |
| 23               | Seal washer   | Rolled steel/NBR |           |

### Replacement Parts: Seal Kit Rod piping

| Kit no. | Bore size / Part no. |           |           |           |           |
|---------|----------------------|-----------|-----------|-----------|-----------|
|         | ø10                  | ø16       | ø20       | ø25       | ø32       |
|         | CUW10D-PS            | CUW16D-PS | CUW20D-PS | CUW25D-PS | CUW32D-PS |

\* Seal kit includes 20, 21 and 22. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

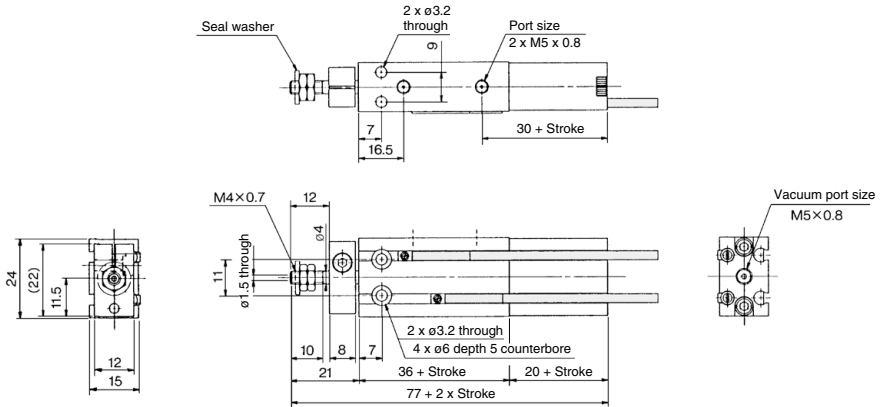
Order with the following part number when only the grease pack is needed.

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

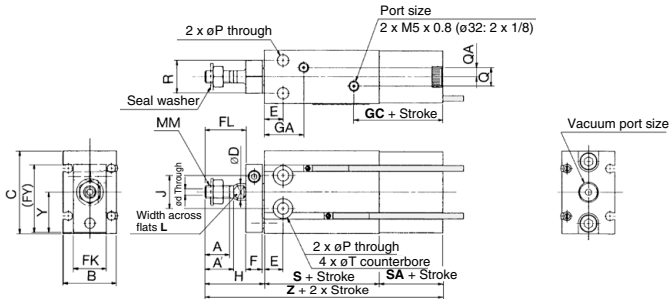
## Vacuum Piping: Cap Piping/Rod End Shape: Male Thread

ZC(D)UKC [Cylinder bore] – [Stroke] D

ø10



ø16 to ø32



| Model      | Port size |             | Stroke range (mm) | A    | A'   | B  | C  | ød | øD | E  | F  | FK | FL | FY   | GA        | GC   |
|------------|-----------|-------------|-------------------|------|------|----|----|----|----|----|----|----|----|------|-----------|------|
|            | Air port  | Vacuum port |                   |      |      |    |    |    |    |    |    |    |    |      |           |      |
| ZC(D)UKC16 | M5 x 0.8  | M5 x 0.8    | 5 to 30           | 11   | 12.5 | 20 | 32 | 2  | 6  | 7  | 8  | 13 | 17 | 28   | 16.5 (88) | 31   |
| ZC(D)UKC20 | M5 x 0.8  | 1/8         | 5 to 50           | 12   | 14   | 26 | 40 | 3  | 8  | 9  | 8  | 16 | 20 | 33   | 19        | 33.5 |
| ZC(D)UKC25 | M5 x 0.8  | 1/8         | 5 to 50           | 15.5 | 18   | 32 | 50 | 4  | 10 | 10 | 10 | 20 | 22 | 43.5 | 21.5      | 34   |
| ZC(D)UKC32 | 1/8       | 1/8         | 5 to 50           | 19.5 | 22   | 40 | 62 | 5  | 12 | 11 | 12 | 24 | 29 | 51.5 | 23        | 34.5 |

| Model      | H  | J  | L  | MM         | øP  | Q    | QA  | R  | S       | SA   | øT            | Y    | Z           |
|------------|----|----|----|------------|-----|------|-----|----|---------|------|---------------|------|-------------|
| ZC(D)UKC16 | 26 | 14 | 5  | M5 x 0.8   | 4.5 | 4    | 2   | 12 | 30 (40) | 19.5 | 7.6 depth 6.5 | 15.5 | 75.5 (85.5) |
| ZC(D)UKC20 | 29 | 16 | 6  | M6 x 1.0   | 5.5 | 5    | 4.5 | 16 | 36 (46) | 21   | 9.3 depth 8   | 19.5 | 86 (96)     |
| ZC(D)UKC25 | 33 | 20 | 8  | M8 x 1.25  | 5.5 | 5    | 4.5 | 20 | 40 (50) | 21   | 9.3 depth 9   | 24.5 | 94 (104)    |
| ZC(D)UKC32 | 42 | 24 | 10 | M10 x 1.25 | 6.6 | 13.5 | 4.5 | 24 | 42 (52) | 22   | 11 depth 11.5 | 30.5 | 106 (116)   |

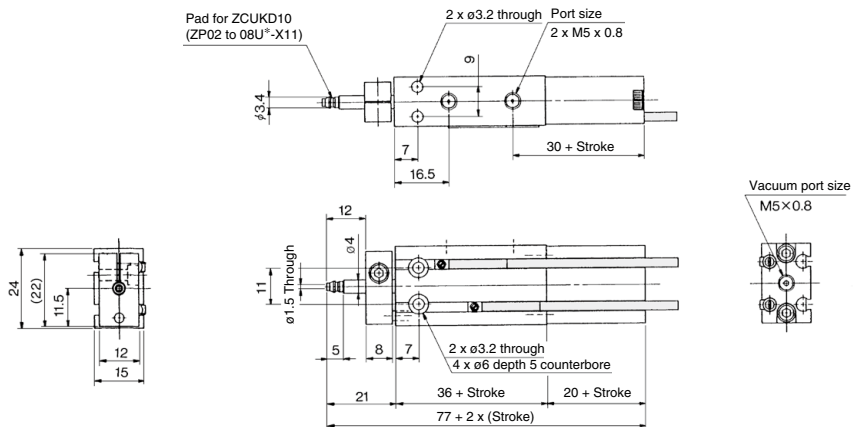
( ): In the case of a mounted auto switch.

Note 1) In the case of ZCUKC16-5D: 14.5 mm.

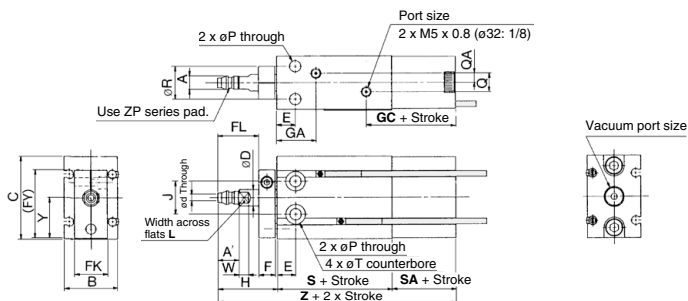
# ZCUK Series

## Vacuum Piping: Cap Piping/Rod End Shape: Pad Direct Mounting ZC(D)UKD [Cylinder bore] – [Stroke] D

ø10



ø16 to ø32



| Model      | Port size |             | Stroke range (mm) | øA   | A'   | B  | C  | ød | øD | E  | F  | FK | FL | FY   | GA                  | GC   |
|------------|-----------|-------------|-------------------|------|------|----|----|----|----|----|----|----|----|------|---------------------|------|
|            | Air port  | Vacuum port |                   |      |      |    |    |    |    |    |    |    |    |      |                     |      |
| ZC(D)UKD16 | M5 x 0.8  | M5 x 0.8    | 5 to 30           | 5    | 7    | 20 | 32 | 2  | 6  | 7  | 8  | 13 | 17 | 28   | 16.5 <sup>(1)</sup> | 31   |
| ZC(D)UKD20 | M5 x 0.8  | 1/8         | 5 to 50           | 6.6  | 8    | 26 | 40 | 3  | 8  | 9  | 8  | 16 | 20 | 33   | 19                  | 33.5 |
| ZC(D)UKD25 | M5 x 0.8  | 1/8         | 5 to 50           | 8    | 9    | 32 | 50 | 4  | 10 | 10 | 10 | 20 | 22 | 43.5 | 21.5                | 34   |
| ZC(D)UKD32 | 1/8       | 1/8         | 5 to 50           | 11.5 | 10.5 | 40 | 62 | 5  | 12 | 11 | 12 | 24 | 29 | 51.5 | 23                  | 34.5 |

| Model      | H  | J  | L  | øP  | Q    | QA  | R  | S       | SA   | øT            | W   | Y    | Z           |
|------------|----|----|----|-----|------|-----|----|---------|------|---------------|-----|------|-------------|
| ZC(D)UKD16 | 26 | 14 | 5  | 4.5 | 4    | 2   | 12 | 30 (40) | 19.5 | 7.6 depth 6.5 | 3.5 | 15.5 | 75.5 (85.5) |
| ZC(D)UKD20 | 29 | 16 | 6  | 5.5 | 9    | 4.5 | 16 | 36 (46) | 21   | 9.3 depth 8   | 5   | 19.5 | 86 (96)     |
| ZC(D)UKD25 | 33 | 20 | 8  | 5.5 | 9    | 4.5 | 20 | 40 (50) | 21   | 9.3 depth 9   | 5   | 24.5 | 94 (104)    |
| ZC(D)UKD32 | 42 | 24 | 10 | 6.6 | 13.5 | 4.5 | 24 | 42 (52) | 22   | 11 depth 11.5 | 5   | 30.5 | 106 (116)   |

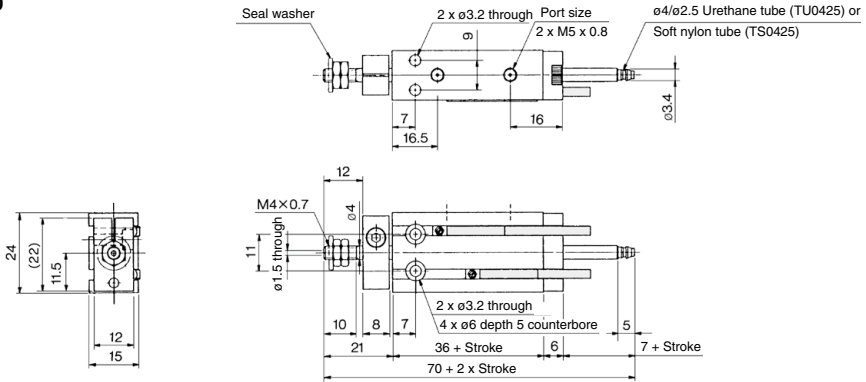
( ): In the case of a mounted auto switch.

Note 1) In the case of ZCUKD16-5D: 14.5 mm.

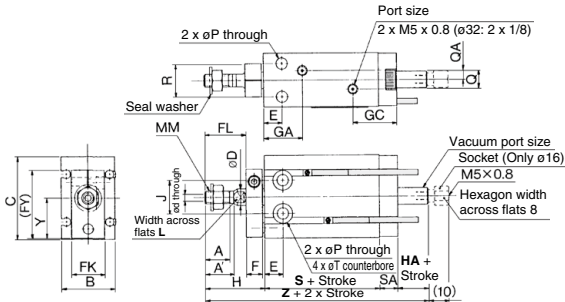
## Vacuum Piping: Rod Piping/Rod End Shape: Male Thread

ZC(D)UKQ Cylinder bore — Stroke D

ø10



ø16 to ø32



| Model      | Port size |                   | Stroke range (mm) | A    | A'   | B  | C  | ød | øD | E  | F  | FK | FL | FY   | GA         | GC   |
|------------|-----------|-------------------|-------------------|------|------|----|----|----|----|----|----|----|----|------|------------|------|
|            | Air port  | Vacuum port       |                   |      |      |    |    |    |    |    |    |    |    |      |            |      |
| ZC(D)UKQ16 | M5 x 0.8  | M5 x 0.8 (Note 2) | 5 to 30           | 11   | 12.5 | 20 | 32 | 2  | 6  | 7  | 8  | 13 | 17 | 28   | 16.5 (Max) | 19   |
| ZC(D)UKQ20 | M5 x 0.8  | M5 x 0.8          | 5 to 50           | 12   | 14   | 26 | 40 | 3  | 8  | 9  | 8  | 16 | 20 | 33   | 19         | 21.5 |
| ZC(D)UKQ25 | M5 x 0.8  | M5 x 0.8          | 5 to 50           | 15.5 | 18   | 32 | 50 | 4  | 10 | 10 | 10 | 20 | 22 | 43.5 | 21.5       | 22   |
| ZC(D)UKQ32 | 1/8       | 1/8               | 5 to 50           | 19.5 | 22   | 40 | 62 | 5  | 12 | 11 | 12 | 24 | 29 | 51.5 | 23         | 22.5 |

| Model      | H  | HA | J  | L  | MM         | øP  | Q    | QA  | R  | S       | SA  | øT            | Y    | Z           |
|------------|----|----|----|----|------------|-----|------|-----|----|---------|-----|---------------|------|-------------|
| ZC(D)UKQ16 | 26 | 5  | 14 | 5  | M5 x 0.8   | 4.5 | 4    | 2   | 12 | 30 (40) | 7.5 | 7.6 depth 6.5 | 15.5 | 68.5 (78.5) |
| ZC(D)UKQ20 | 29 | 5  | 16 | 6  | M6 x 1.0   | 5.5 | 9    | 4.5 | 16 | 36 (46) | 9   | 9.3 depth 8   | 19.5 | 79 (89)     |
| ZC(D)UKQ25 | 33 | 5  | 20 | 8  | M8 x 1.25  | 5.5 | 9    | 4.5 | 20 | 40 (50) | 9   | 9.3 depth 9   | 24.5 | 87 (97)     |
| ZC(D)UKQ32 | 42 | 5  | 24 | 10 | M10 x 1.25 | 6.6 | 13.5 | 4.5 | 24 | 42 (52) | 10  | 11 depth 11.5 | 30.5 | 99 (109)    |

( ): In the case of a mounted auto switch.

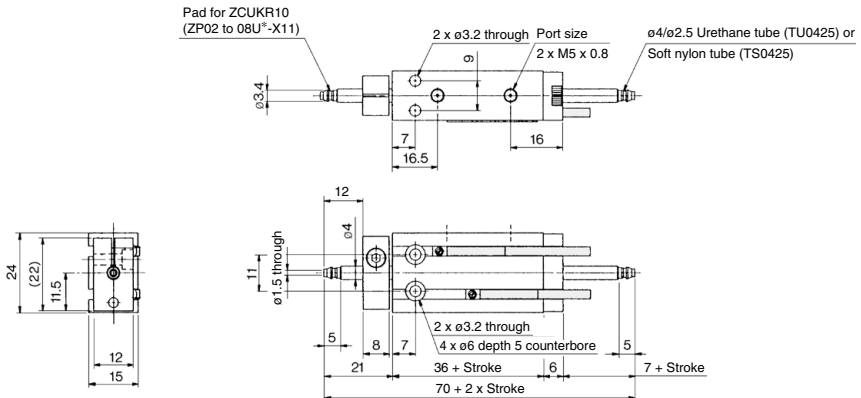
Note 1) In the case of ZCUK16-5D: 14.5 mm.

Note 2) In the case of socket equipped type.

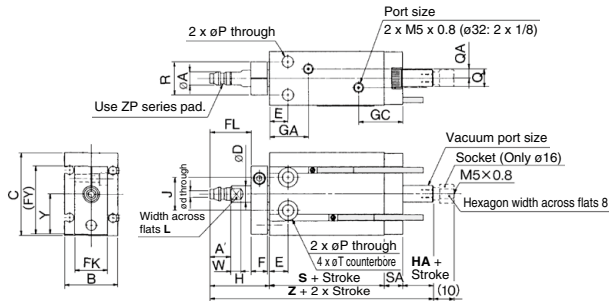
# ZCUK Series

## Vacuum Piping: Rod Piping/Rod End Shape: Pad Direct Mounting ZC(D)UKR [Cylinder bore] – Stroke D

ø10



ø16 to ø32



| Model      | Port size |                   | Stroke range (mm) | øA   | A    | B  | C  | ød | øD | E  | F  | FK | FL | FY   | GA          | GC   |
|------------|-----------|-------------------|-------------------|------|------|----|----|----|----|----|----|----|----|------|-------------|------|
|            | Air port  | Vacuum port       |                   |      |      |    |    |    |    |    |    |    |    |      |             |      |
| ZC(D)UKR16 | M5 x 0.8  | M5 x 0.8 (Note 2) | 5 to 30           | 5    | 7    | 20 | 32 | 2  | 6  | 7  | 8  | 13 | 17 | 28   | 16.5 (16.5) | 19   |
| ZC(D)UKR20 | M5 x 0.8  | M5 x 0.8          | 5 to 50           | 6.6  | 8    | 26 | 40 | 3  | 8  | 9  | 8  | 16 | 20 | 33   | 19          | 21.5 |
| ZC(D)UKR25 | M5 x 0.8  | M5 x 0.8          | 5 to 50           | 8    | 9    | 32 | 50 | 4  | 10 | 10 | 10 | 20 | 22 | 43.5 | 21.5        | 22   |
| ZC(D)UKR32 | 1/8       | 1/8               | 5 to 50           | 11.5 | 10.5 | 40 | 62 | 5  | 12 | 11 | 12 | 24 | 29 | 51.5 | 23          | 22.5 |

| Model      | H  | HA | J  | L  | øP  | Q    | QA  | R  | S       | SA  | øT            | W   | Y    | Z           |
|------------|----|----|----|----|-----|------|-----|----|---------|-----|---------------|-----|------|-------------|
| ZC(D)UKR16 | 26 | 5  | 14 | 5  | 4.5 | 4    | 2   | 12 | 30 (40) | 7.5 | 7.6 depth 6.5 | 3.5 | 15.5 | 68.5 (78.5) |
| ZC(D)UKR20 | 29 | 5  | 16 | 6  | 5.5 | 9    | 4.5 | 16 | 36 (46) | 9   | 9.3 depth 8   | 5   | 19.5 | 79 (89)     |
| ZC(D)UKR25 | 33 | 5  | 20 | 8  | 5.5 | 9    | 4.5 | 20 | 40 (50) | 9   | 9.3 depth 9   | 5   | 24.5 | 87 (97)     |
| ZC(D)UKR32 | 42 | 5  | 24 | 10 | 6.6 | 13.5 | 4.5 | 24 | 42 (52) | 10  | 11 depth 11.5 | 5   | 30.5 | 99 (109)    |

( ): In the case of a mounted auto switch.

Note 1) In the case of ZCUK16-5D: 14.5 mm.

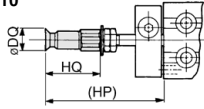
Note 2) In the case of socket equipped type.



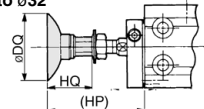
## Dimensions of Pad Mounted Model

### Rod end shape: Male thread

Tubing bore:  $\phi 10$



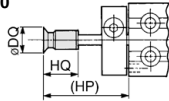
Tubing bore:  $\phi 16$  to  $\phi 32$



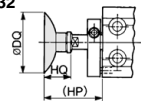
| Model      | Flat/Flat with ribs |      |      |      |      |    |    |      |    |    | Deep |      |    |    | Bellows |    |    |      |      |      |    |      |      |    | Applicable pad model |    |    |    |           |          |
|------------|---------------------|------|------|------|------|----|----|------|----|----|------|------|----|----|---------|----|----|------|------|------|----|------|------|----|----------------------|----|----|----|-----------|----------|
|            | Dia.(mm)            | 2    | 4    | 6    | 8    | 10 | 13 | 16   | 20 | 25 | 32   | 40   | 50 | 10 | 16      | 25 | 40 | 6    | 8    | 10   | 13 | 16   | 20   | 25 |                      | 32 | 40 | 50 |           |          |
| ZC(D)UKC10 | $\phi$ DQ           | 2.6  | 4.8  | 7    | 9    | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | 7    | 9    | —    | —  | —    | —    | —  | —                    | —  | —  | —  | —         | ZPT□□-B4 |
| ZC(D)UQ10  | HQ                  | 19.5 | 19.5 | 19.5 | 19.5 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | 20.5 | 20.5 | —    | —  | —    | —    | —  | —                    | —  | —  | —  | —         |          |
|            | HP                  | 36.5 | 36.5 | 36.5 | 36.5 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | 37.5 | 37.5 | —    | —  | —    | —    | —  | —                    | —  | —  | —  | —         |          |
| ZC(D)UKC16 | $\phi$ DQ           | 2.6  | 4.8  | 7    | 9    | 12 | 15 | 18   | —  | —  | —    | —    | —  | 12 | 18      | —  | —  | —    | 7    | 9    | 12 | 15   | 18   | —  | —                    | —  | —  | —  | —         | ZPT□□-B5 |
| ZC(D)UQ16  | HQ                  | 19.5 | 19.5 | 19.5 | 19.5 | 21 | 21 | 21.5 | —  | —  | —    | —    | —  | 24 | 25      | —  | —  | —    | 20.5 | 20.5 | 25 | 27.5 | 29   | —  | —                    | —  | —  | —  | —         |          |
|            | HP                  | 41.5 | 41.5 | 41.5 | 41.5 | 44 | 42 | 42.5 | —  | —  | —    | —    | —  | 45 | 46      | —  | —  | —    | 42.5 | 42.5 | 46 | 48.5 | 50   | —  | —                    | —  | —  | —  | —         |          |
| ZC(D)UKC20 | $\phi$ DQ           | —    | —    | —    | —    | 12 | 15 | 18   | 23 | 28 | 35   | —    | —  | 12 | 18      | 28 | —  | —    | —    | —    | —  | 12   | 15   | 18 | 22                   | 27 | 34 | —  | —         | ZPT□□-B6 |
| ZC(D)UQ20  | HQ                  | —    | —    | —    | —    | 21 | 21 | 21.5 | 23 | 23 | 23.5 | —    | —  | 24 | 25      | 29 | —  | —    | —    | —    | —  | 25   | 27.5 | 29 | 32.5                 | 33 | 38 | —  | —         |          |
|            | HP                  | —    | —    | —    | —    | 44 | 44 | 44.5 | 46 | 46 | 46.5 | —    | —  | 47 | 48      | 52 | —  | —    | —    | —    | —  | 48   | 50.5 | 52 | 55.5                 | 56 | 61 | —  | —         |          |
| ZC(D)UKC25 | $\phi$ DQ           | —    | —    | —    | —    | —  | —  | —    | —  | 23 | 28   | 35   | 43 | 53 | —       | —  | —  | —    | —    | —    | 22 | 27   | 34   | 43 | 53                   | —  | —  | —  | ZPT□□-B8  |          |
| ZC(D)UQ25  | HQ                  | —    | —    | —    | —    | —  | —  | —    | —  | 29 | 29   | 29.5 | 32 | 33 | —       | —  | —  | —    | —    | —    | 35 | 42.5 | —    | —  | —                    | —  | —  | —  |           |          |
|            | HP                  | —    | —    | —    | —    | —  | —  | —    | —  | 54 | 54   | 54.5 | 57 | 58 | —       | —  | —  | —    | —    | —    | 60 | 67.5 | —    | —  | —                    | —  | —  | —  |           |          |
| ZC(D)UKC32 | $\phi$ DQ           | —    | —    | —    | —    | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | —    | —    | —    | —  | —    | —    | —  | —                    | —  | —  | —  | ZPT□□-B10 |          |
| ZC(D)UQ32  | HQ                  | —    | —    | —    | —    | —  | —  | —    | —  | 32 | 32   | 32.5 | 35 | 36 | —       | —  | —  | —    | —    | —    | 38 | 45.5 | —    | —  | —                    | —  | —  | —  |           |          |
|            | HP                  | —    | —    | —    | —    | —  | —  | —    | —  | 64 | 64   | 64.5 | 67 | 68 | —       | —  | —  | —    | —    | —    | 70 | 77.5 | —    | —  | —                    | —  | —  | —  |           |          |

### Rod end shape: Pad direct mounting

Tubing bore:  $\phi 10$



Tubing bore:  $\phi 16$  to  $\phi 32$

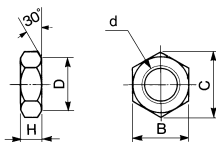


| Model      | Flat/Flat with ribs |     |     |    |    |    |    |      |    |    | Deep |      |    |    | Bellows |    |    |   |    |    |    |      |    |    | Applicable pad model |    |    |    |                    |       |
|------------|---------------------|-----|-----|----|----|----|----|------|----|----|------|------|----|----|---------|----|----|---|----|----|----|------|----|----|----------------------|----|----|----|--------------------|-------|
|            | Dia.(mm)            | 2   | 4   | 6  | 8  | 10 | 13 | 16   | 20 | 25 | 32   | 40   | 50 | 10 | 16      | 25 | 40 | 6 | 8  | 10 | 13 | 16   | 20 | 25 |                      | 32 | 40 | 50 |                    |       |
| ZC(D)UKD10 | $\phi$ DQ           | 2.6 | 4.8 | 7  | 9  | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  | ZP□□-X11<br>(Note) |       |
| ZC(D)UKR10 | HQ                  | 10  | 10  | 10 | 10 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  |                    |       |
|            | HP                  | 26  | 26  | 26 | 26 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  |                    |       |
| ZC(D)UKD16 | $\phi$ DQ           | 2.6 | 4.8 | 7  | 9  | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | 7  | 9  | —  | —    | —  | —  | —                    | —  | —  | —  | —                  | ZP□□□ |
| ZC(D)UKR16 | HQ                  | 12  | 12  | 12 | 12 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | 13 | 13 | —  | —    | —  | —  | —                    | —  | —  | —  | —                  |       |
|            | HP                  | 31  | 31  | 31 | 31 | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | 32 | 32 | —  | —    | —  | —  | —                    | —  | —  | —  | —                  |       |
| ZC(D)UKD20 | $\phi$ DQ           | —   | —   | —  | —  | 12 | 15 | 18   | —  | —  | —    | —    | —  | 12 | 18      | —  | —  | — | —  | —  | 12 | 15   | 18 | —  | —                    | —  | —  | —  | —                  | ZP□□□ |
| ZC(D)UKR20 | HQ                  | —   | —   | —  | —  | 12 | 12 | 12.5 | —  | —  | —    | —    | —  | 15 | 16      | —  | —  | — | —  | —  | 16 | 18.5 | 20 | —  | —                    | —  | —  | —  |                    |       |
|            | HP                  | —   | —   | —  | —  | 33 | 33 | 33.5 | —  | —  | —    | —    | —  | 36 | 37      | —  | —  | — | —  | —  | 37 | 39.5 | 41 | —  | —                    | —  | —  | —  |                    |       |
| ZC(D)UKD25 | $\phi$ DQ           | —   | —   | —  | —  | —  | —  | —    | —  | 23 | 28   | 35   | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  | ZP□□□              |       |
| ZC(D)UKR25 | HQ                  | —   | —   | —  | —  | —  | —  | —    | —  | 14 | 14   | 14.5 | —  | —  | —       | —  | —  | — | —  | —  | 20 | —    | —  | —  | —                    | —  | —  | —  |                    |       |
|            | HP                  | —   | —   | —  | —  | —  | —  | —    | —  | 38 | 38   | 38.5 | —  | —  | —       | —  | —  | — | —  | —  | 44 | —    | —  | —  | —                    | —  | —  | —  |                    |       |
| ZC(D)UKD32 | $\phi$ DQ           | —   | —   | —  | —  | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  | ZP□□□              |       |
| ZC(D)UKR32 | HQ                  | —   | —   | —  | —  | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  |                    |       |
|            | HP                  | —   | —   | —  | —  | —  | —  | —    | —  | —  | —    | —    | —  | —  | —       | —  | —  | — | —  | —  | —  | —    | —  | —  | —                    | —  | —  | —  |                    |       |

(Note) ZP□□-X11: Flat type only.

## Accessory Dimensions (Attached only to a rod end male thread type.)

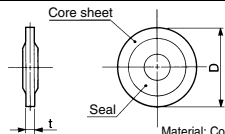
### Rod end nut



Material: Carbon steel

| Part no. | Applicable cylinder bore (mm) | d          | H   | B  | C    | D    |
|----------|-------------------------------|------------|-----|----|------|------|
| NTP-010  | 10                            | M4 x 0.7   | 2.4 | 7  | 8.1  | 6.8  |
| NTJ-015C | 16                            | M5 x 0.8   | 4   | 8  | 9.2  | 7.8  |
| NT-015A  | 20                            | M6 x 1.0   | 5   | 10 | 11.5 | 9.8  |
| NT-02    | 25                            | M8 x 1.25  | 5   | 13 | 15.0 | 12.5 |
| NT-03    | 32                            | M10 x 1.25 | 6   | 17 | 19.6 | 16.5 |

### Seal washer



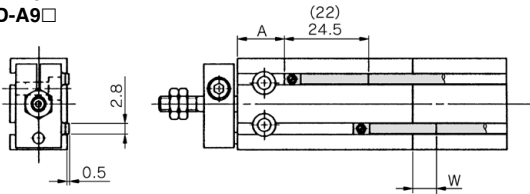
Material: Core sheet — Rolled steel  
Seal — NBR

| Part no.   | Applicable cylinder bore (mm) | t   | D    |
|------------|-------------------------------|-----|------|
| WCS4 x 0.7 | 10                            | 1.2 | 11.5 |
| WCS5 x 0.8 | 16                            | 1.2 | 12.5 |
| WCS6 x 1   | 20                            | 1.2 | 14.0 |
| WCS8 x 1   | 25                            | 1.6 | 15.5 |
| WCS10 x 1  | 32                            | 1.6 | 18.0 |

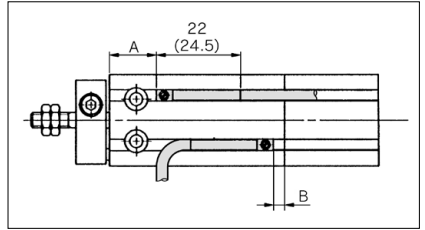
# ZCUK Series Auto Switch Mounting

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

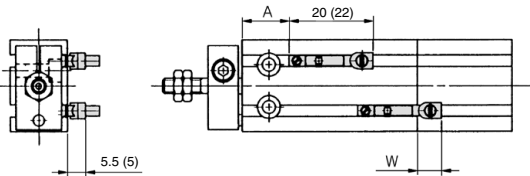
D-M9□  
D-M9□W  
D-M9□A  
D-A9□



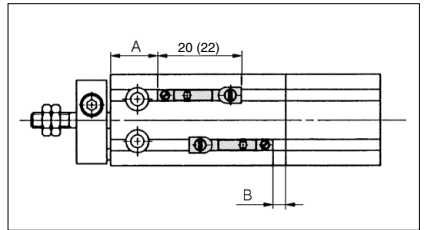
( ): Denotes the values of D-A96.



D-M9□V  
D-M9□WV  
D-M9□AV  
D-A9□V



( ): Denotes the values of D-A9□V.



| Bore size (mm) | D-A9□, D-A9□V |   | D-M9□, D-M9□W |      |      | D-M9□V, D-M9□WV |      |      | D-M9□A |      |      | D-M9□AV |      |      |      |
|----------------|---------------|---|---------------|------|------|-----------------|------|------|--------|------|------|---------|------|------|------|
|                | A             | B | W             | A    | B    | W               | A    | B    | W      | A    | B    | W       | A    | B    | W    |
| 10             | 12.5          | 3 | -1.5 (1)      | 16.5 | 7.5  | 2.5             | 16.5 | 7.5  | 0.5    | 16.5 | 7.5  | 4.5     | 16.5 | 7.5  | 2.5  |
| 16             | 16            | 4 | -2 (0.5)      | 20   | 8    | 1.5             | 20   | 8    | 0      | 20   | 8    | 3.5     | 20   | 8    | 2    |
| 20             | 20            | 6 | -4 (-1.5)     | 24   | 10   | 0               | 24   | 10   | -2     | 24   | 10   | 2       | 24   | 10   | 0    |
| 25             | 22.5          | 7 | -5.5 (-3)     | 26.5 | 11.5 | -1.5            | 26.5 | 11.5 | -3.5   | 26.5 | 11.5 | 0.5     | 26.5 | 11.5 | -1.5 |
| 32             | 23.5          | 8 | -6.5 (-4)     | 27.5 | 12.5 | -2.5            | 27.5 | 12.5 | -4.5   | 27.5 | 12.5 | -0.5    | 27.5 | 12.5 | -2.5 |

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

Note 2) Negative figures in the table show dimensions mounted inside cylinder body.

Note 3) In the case of 5 mm stroke or the 10 mm stroke, there are times in which the auto switches will not turn OFF or 2 auto switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the auto switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 auto switches are used, make sure that both switches turn ON).

Note 4) Figures in ( ) in the table W are D-A90 and A93.

### Operation Range

| Auto switch model                             | Bore size (mm) |    |    |      |    |
|---|----------------|----|----|------|----|
|   | 10             | 16 | 20 | 25   | 32 |
| D-A9□, A9□V                                   | 6              | 9  | 11 | 12.5 | 14 |
| D-M9□, M9□V<br>D-M9□W, M9□WV<br>D-M9□A, M9□AV | 4              | 5  | 7  | 7    | 7  |

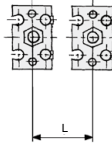
\* Since this is the average value at a normal temperature including hysteresis (tolerance  $\pm 30\%$ ), it is not guaranteed.

Figures may change substantially depending upon the surrounding environment.

## Mounting of Auto Switch

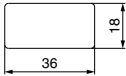
### Cautions on Proximity Installation

When free mounting cylinders equipped with auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimensions shown in the table. Therefore, make sure to provide a greater clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shielding plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) Auto switches may malfunction if a shielding plate is not used.



| Bore size (mm) | Mounting pitch L (mm) |
|----------------|-----------------------|
| 10             | 20                    |
| 16             | 33                    |
| 20             | 40                    |
| 25             | 46                    |
| 32             | 56                    |

### Shielding plate (MU-S025) dimensions



Material: Ferrite stainless steel, Thickness: 0.3 mm  
The product is attached to the cylinder since the bottom side is pre-treated with adhesive glue.

## Weight

### Basic Type/With Auto Switch ( )

( ) : Denotes the values with D-A93.

Unit: g

| Model    | Bore size (mm) | Cylinder stroke (mm) |              |              |              |              |              |               |                |
|----------|----------------|----------------------|--------------|--------------|--------------|--------------|--------------|---------------|----------------|
|          |                | 5                    | 10           | 15           | 20           | 25           | 30           | 40            | 50             |
| ZC(D)UKC | 10             | 63<br>(68)           | 69<br>(79)   | 75<br>(85)   | 81<br>(91)   | 87<br>(97)   | 93<br>(103)  | —             | —              |
|          | 16             | 103<br>(128)         | 115<br>(145) | 127<br>(157) | 139<br>(169) | 151<br>(181) | 163<br>(193) | —             | —              |
|          | 20             | 180<br>(214)         | 204<br>(244) | 228<br>(267) | 252<br>(292) | 276<br>(316) | 300<br>(340) | 348<br>(388)  | 396<br>(436)   |
|          | 25             | 304<br>(358)         | 343<br>(402) | 382<br>(441) | 421<br>(480) | 460<br>(519) | 499<br>(558) | 577<br>(636)  | 655<br>(714)   |
|          | 32             | 514<br>(587)         | 574<br>(652) | 634<br>(712) | 694<br>(772) | 754<br>(832) | 814<br>(892) | 934<br>(1012) | 1054<br>(1132) |
| ZC(D)UKQ | 10             | 49<br>(54)           | 53<br>(63)   | 57<br>(67)   | 61<br>(71)   | 65<br>(75)   | 69<br>(79)   | —             | —              |
|          | 16             | 79<br>(104)          | 86<br>(116)  | 93<br>(123)  | 100<br>(130) | 107<br>(137) | 114<br>(144) | —             | —              |
|          | 20             | 145<br>(179)         | 159<br>(198) | 173<br>(212) | 187<br>(226) | 201<br>(240) | 215<br>(254) | 243<br>(282)  | 271<br>(310)   |
|          | 25             | 259<br>(313)         | 279<br>(338) | 299<br>(358) | 319<br>(378) | 339<br>(398) | 359<br>(418) | 399<br>(458)  | 439<br>(498)   |
|          | 32             | 421<br>(494)         | 451<br>(529) | 481<br>(559) | 511<br>(589) | 541<br>(619) | 571<br>(649) | 631<br>(709)  | 691<br>(769)   |

Besides the models listed in How to Order, the following auto switches are applicable.

- \* For solid state switches, auto switches with a pre-wired connector are also available. Refer to pages 1340 and 1341 for details.
- \* Normally closed (NC = b contact) solid state switches (D-M9□E(V)) are also available. Refer to page 1290 for details.