

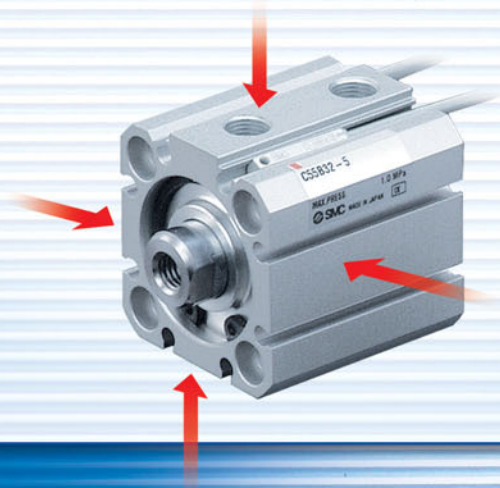
# Compact Cylinder

## ISO Standards [ISO/21287]

New

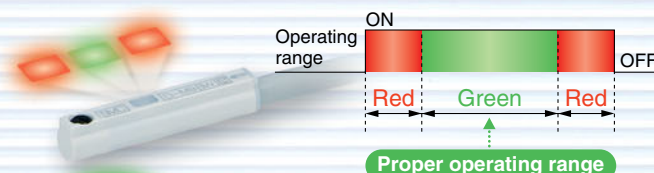
### It is possible to mount small auto switches on 4 surfaces.

Auto switches can be mounted on any of the 4 surfaces, depending on the installation conditions. Improved flexibility of system design.



### 2-color indication solid state auto switch

Appropriate setting of the mounting position can be performed without mistakes.



The green light lights up at a proper operating range.

Even if 2-color indication solid state auto switches are fixed at a proper operating range (the green light lights up), the operation may become unstable depending on the installation environment or magnetic field disturbance.

(Magnetic body, external magnetic field, proximal installation of cylinders with built-in magnet and actuators, temperature change, other factors for magnetic force fluctuation during operation, etc.)

**NEW** Bore sizes  
ø80, ø100 added.



Series C55



CAT.ES20-184B

# ISO Standards [ISO/21287]

## Compact Cylinder

# Series C55

ø20,ø25,ø32,ø40,ø50,ø63,ø80,ø100

### How to Order

**C55 B 20 - 10**

**With auto switch CD55 B 20 - 10 - M9B S**

**With auto switch (Built-in magnet)**

**Mounting style**

|          |                                                 |
|----------|-------------------------------------------------|
| <b>B</b> | Through-hole/Both ends tapped common (Standard) |
| <b>L</b> | Foot style                                      |
| <b>F</b> | Rod side flange style                           |
| <b>G</b> | Head side flange style                          |
| <b>C</b> | Single clevis style                             |

**Bore size**

|            |        |
|------------|--------|
| <b>20</b>  | 20 mm  |
| <b>25</b>  | 25 mm  |
| <b>32</b>  | 32 mm  |
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

**Number of auto switches**

|            |          |
|------------|----------|
| <b>Nil</b> | 2 pcs.   |
| <b>S</b>   | 1 pc.    |
| <b>n</b>   | "n" pcs. |

**Auto switch**

|            |                                                |
|------------|------------------------------------------------|
| <b>Nil</b> | Without auto switch (Built-in magnet cylinder) |
|------------|------------------------------------------------|

\* For the applicable auto switch model, refer to the table below.  
\* Auto switches are shipped together, (but not assembled).

**Rod end thread**

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>M</b>   | Rod end male thread   |

**Cylinder stroke (mm)**

Refer to page 2 for standard and intermediate strokes.

### Applicable Auto Switches/Refer to pages 16 to 21 for further information on auto switches.

| Type               | Special function   | Electrical entry | Indicator light | Wiring (Output) | Load voltage |           | Auto switch model |         | Lead wire length (m) |                         |       |       |          | Pre-wired connector | Applicable load |            |            |   |   |   |   |   |            |   |
|--------------------|--------------------|------------------|-----------------|-----------------|--------------|-----------|-------------------|---------|----------------------|-------------------------|-------|-------|----------|---------------------|-----------------|------------|------------|---|---|---|---|---|------------|---|
|                    |                    |                  |                 |                 | DC           | AC        | Perpendicular     | In-line | 0.5 (Nil)            | 1 (M)                   | 3 (L) | 5 (Z) | None (N) |                     |                 |            |            |   |   |   |   |   |            |   |
| Solid state 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    | ●                    | ●                       | ●     | ○     | —        | ○                   | IC circuit      |            |            |   |   |   |   |   |            |   |
|                    | 3-wire (PNP)       |                  |                 | M9PWV           |              |           |                   | M9PW    | ●                    | ●                       | ●     | ○     | —        | ○                   |                 |            |            |   |   |   |   |   |            |   |
|                    | 2-wire             |                  |                 | M9B WV          |              |           |                   | M9BW    | ●                    | ●                       | ●     | ○     | —        | ○                   | —               |            |            |   |   |   |   |   |            |   |
|                    | 3-wire (NPN)       |                  |                 | M9NAV           |              |           |                   | M9NA    | ○                    | ○                       | ●     | ○     | —        | ○                   | IC circuit      |            |            |   |   |   |   |   |            |   |
|                    | 3-wire (PNP)       |                  |                 | M9PAV           |              |           |                   | M9PA    | ○                    | ○                       | ●     | ○     | —        | ○                   |                 |            |            |   |   |   |   |   |            |   |
|                    | 2-wire             |                  |                 | M9BAV           |              |           |                   | M9BA    | ○                    | ○                       | ●     | ○     | —        | ○                   | —               |            |            |   |   |   |   |   |            |   |
|                    | 2-wire (Non-polar) |                  |                 | —               |              |           |                   | P3DW    | ●                    | —                       | ●     | ●     | —        | ●                   |                 |            |            |   |   |   |   |   |            |   |
|                    | Reed switch        |                  |                 | —               |              |           |                   | Grommet | Yes                  | 3-wire (NPN equivalent) | —     | 5 V   | —        | A96V                | A96             | ●          |            | — | ● | — | — | — | IC circuit | — |
|                    |                    |                  |                 |                 |              |           |                   |         |                      | 2-wire                  | 24 V  | 12 V  | 100 V    | A93V                | A93             | ●          |            | — | ● | — | — | — | —          | — |
| No                 |                    | 5 V, 12 V        | 100 V or less   |                 | A90V         | A90       | ●                 |         | —                    | ●                       | —     | —     | —        | —                   | —               | —          | IC circuit |   |   |   |   |   |            |   |
|                    |                    |                  |                 |                 |              |           |                   |         |                      |                         |       |       |          |                     |                 |            |            |   |   |   |   |   |            |   |

Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
1 m..... M (Example) M9NWM  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NWLZ

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

\* There are other applicable auto switches other than the listed above. For details, refer to page 11.

\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2. Refer to pages 20 and 21 for the D-P3DW□ type.

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



## ⚠ Caution

Be sure to read before handling.

- ① Refer to back cover for Safety Instructions and "Handling Precautions for SMC Product" (M-E03-3) for Actuators and Auto Switches Precautions.
- ② This product should not be used as a stopper.
- ③ Use the PF thread fittings for this cylinder.

## Theoretical Output



Unit: N

| Bore size (mm) | Operating direction | Operating pressure (MPa) |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 20             | IN                  | 71                       | 118  | 165  |
|                | OUT                 | 94                       | 157  | 220  |
| 25             | IN                  | 113                      | 189  | 264  |
|                | OUT                 | 147                      | 245  | 344  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1150 |
|                | OUT                 | 589                      | 982  | 1370 |
| 63             | IN                  | 841                      | 1400 | 1960 |
|                | OUT                 | 935                      | 1560 | 2180 |
| 80             | IN                  | 1360                     | 2270 | 3180 |
|                | OUT                 | 1510                     | 2520 | 3520 |
| 100            | IN                  | 2150                     | 3580 | 5010 |
|                | OUT                 | 2360                     | 3930 | 5500 |

## Mounting Bracket Part No.

| Bore size (mm) | Foot     | Flange   | Single clevis |
|----------------|----------|----------|---------------|
| 20             | C55-L020 | C55-F020 | C55-C020      |
| 25             | C55-L025 | C55-F025 | C55-C025      |
| 32             | C55-L032 | C55-F032 | C55-C032      |
| 40             | C55-L040 | C55-F040 | C55-C040      |
| 50             | C55-L050 | C55-F050 | C55-C050      |
| 63             | C55-L063 | C55-F063 | C55-C063      |
| 80             | C55-L080 | C55-F080 | C55-C080      |
| 100            | C55-L100 | C55-F100 | C55-C100      |

- Order two foot brackets per cylinder.
- Parts belonging to each bracket are as follows.  
Foot, Flange, Single clevis/Body mounting bolt

## Specifications

|                                          |                                                                                               |                |
|------------------------------------------|-----------------------------------------------------------------------------------------------|----------------|
| Type                                     | Pneumatic (Non-lube)                                                                          |                |
| Action                                   | Double acting, Single rod                                                                     |                |
| Fluid                                    | Air                                                                                           |                |
| Proof pressure                           | 1.5 MPa                                                                                       |                |
| Maximum operating pressure               | 1.0 MPa                                                                                       |                |
| Minimum operating pressure               | 0.05 MPa (ø20 to ø63), 0.03 MPa (ø80, ø100)                                                   |                |
| Ambient and fluid temperature            | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |                |
| Cushion                                  | Rubber bumper on both end                                                                     |                |
| Stroke length tolerance <sup>Note)</sup> | +1.0<br>0 mm                                                                                  |                |
| Mounting                                 | Through-hole/Both ends tapped common                                                          |                |
| Piston speed                             | ø20 to ø63                                                                                    | 50 to 500 mm/s |
|                                          | ø80, ø100                                                                                     | 50 to 300 mm/s |

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

## Standard Stroke

| Bore size (mm) | Standard stroke (mm)                                         |
|----------------|--------------------------------------------------------------|
| 20 to 63       | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80, 100, 125, 150 |
| 80, 100        | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80, 100, 125         |

## Manufacture of Intermediate Stroke

|              |                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------|
| Description  | Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke |
| Part no.     | Refer to "How to Order" for the standard model no. (page at left)                                 |
| Stroke range | 6 to 149                                                                                          |
| Example      | Part no.: C55B32-47                                                                               |
|              | Makes 47 stroke tube                                                                              |

## Weight

### Without Auto Switch

Unit: g

| Bore size (mm) | Cylinder stroke (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 60   | 80   | 100  | 125  | 150  |
| 20             | 111                  | 124  | 137  | 150  | 163  | 176  | 189  | 202  | 215  | 228  | 254  | 306  | 357  | 422  | 487  |
| 25             | 152                  | 168  | 183  | 199  | 214  | 230  | 246  | 261  | 277  | 292  | 323  | 386  | 448  | 526  | 603  |
| 32             | 250                  | 273  | 295  | 317  | 339  | 362  | 384  | 406  | 428  | 451  | 495  | 584  | 673  | 785  | 896  |
| 40             | 315                  | 339  | 364  | 388  | 412  | 436  | 461  | 485  | 509  | 533  | 582  | 679  | 776  | 897  | 1018 |
| 50             | 497                  | 534  | 570  | 607  | 644  | 681  | 718  | 755  | 791  | 828  | 902  | 1049 | 1197 | 1381 | 1565 |
| 63             | 677                  | 717  | 757  | 797  | 837  | 877  | 917  | 957  | 997  | 1037 | 1117 | 1277 | 1437 | 1638 | 1838 |
| 80             | —                    | 1164 | 1223 | 1281 | 1339 | 1398 | 1456 | 1514 | 1573 | 1631 | 1748 | 1981 | 2214 | 2506 | —    |
| 100            | —                    | 2213 | 2295 | 2377 | 2459 | 2541 | 2623 | 2705 | 2787 | 2870 | 3034 | 3362 | 3690 | 4101 | —    |

### With Auto Switch (Built-in magnet)

Unit: g

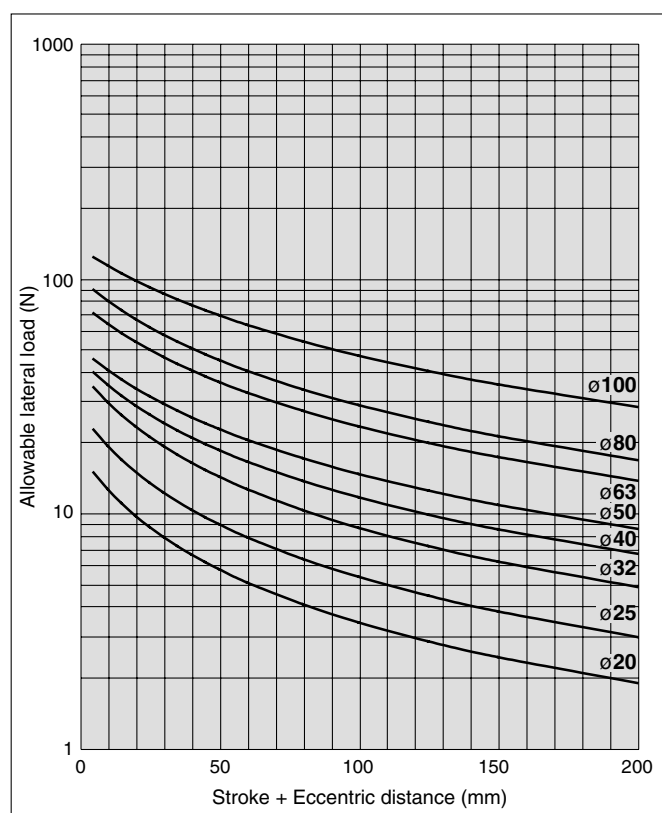
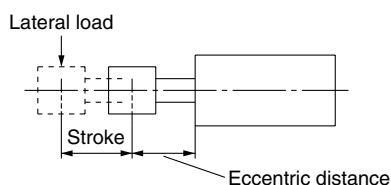
| Bore size (mm) | Cylinder stroke (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 60   | 80   | 100  | 125  | 150  |
| 20             | 113                  | 126  | 139  | 152  | 165  | 178  | 191  | 204  | 216  | 229  | 255  | 307  | 359  | 424  | 489  |
| 25             | 154                  | 170  | 185  | 201  | 217  | 232  | 248  | 263  | 279  | 294  | 325  | 388  | 450  | 528  | 606  |
| 32             | 254                  | 277  | 299  | 321  | 343  | 366  | 388  | 410  | 432  | 455  | 499  | 588  | 677  | 788  | 900  |
| 40             | 319                  | 344  | 368  | 392  | 416  | 441  | 465  | 489  | 513  | 537  | 586  | 683  | 780  | 901  | 1022 |
| 50             | 502                  | 539  | 575  | 612  | 649  | 686  | 723  | 760  | 796  | 833  | 907  | 1054 | 1202 | 1386 | 1570 |
| 63             | 685                  | 725  | 765  | 805  | 845  | 885  | 925  | 965  | 1005 | 1045 | 1125 | 1285 | 1445 | 1645 | 1845 |
| 80             | —                    | 1188 | 1246 | 1305 | 1363 | 1421 | 1480 | 1538 | 1596 | 1654 | 1771 | 2004 | 2238 | 2529 | —    |
| 100            | —                    | 2248 | 2330 | 2412 | 2494 | 2577 | 2659 | 2741 | 2823 | 2905 | 3069 | 3397 | 3726 | 4136 | —    |

Add each weight of auto switches and mounting brackets when mounting an auto switches.  
Refer to pages 16 to 21 for auto switch weight.

## Allowable Lateral Load

**Make sure to operate strictly within the allowable lateral load range to the rod end.**

Operation outside of this range may result in shorter service life or damage to the device.

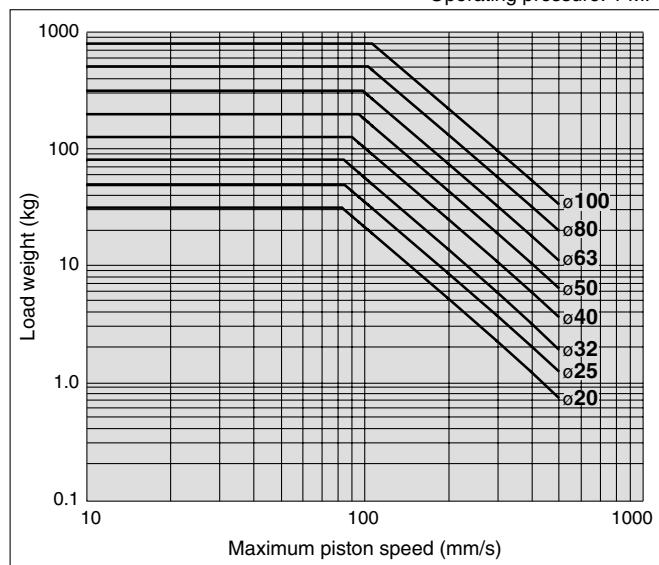


## Allowable Kinetic Energy

**Make sure to operate strictly within the allowable range of the load weight and maximum speed.**

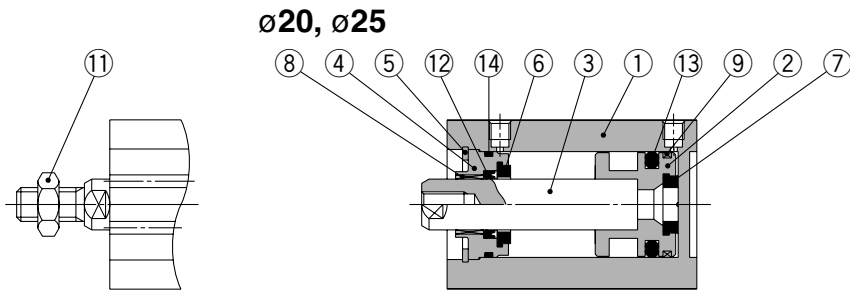
Operation outside of this range may cause excessive impact, which may result in the damage to the device.

Operating pressure: 1 MPa

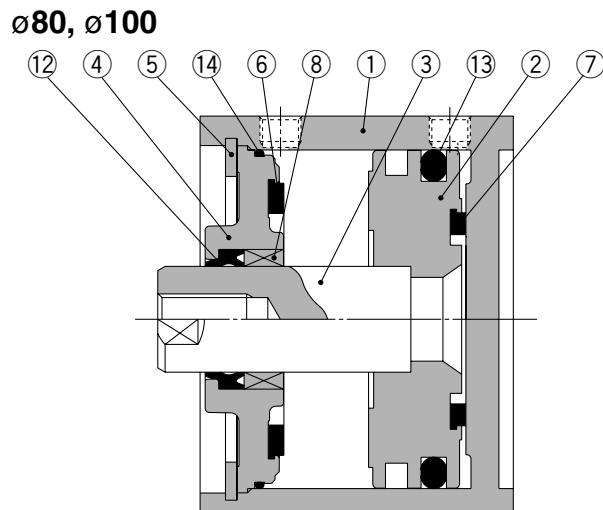
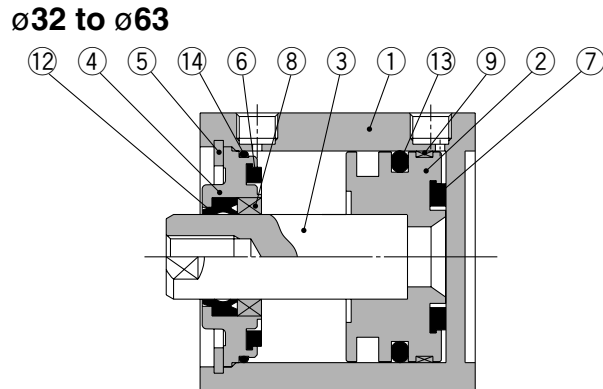


\* Refer to Model Selection in Best Pneumatics No.2 for details about model selection procedure.

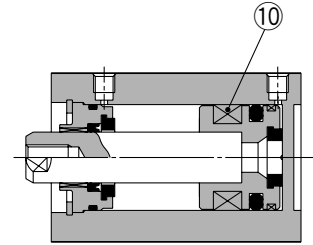
## Construction



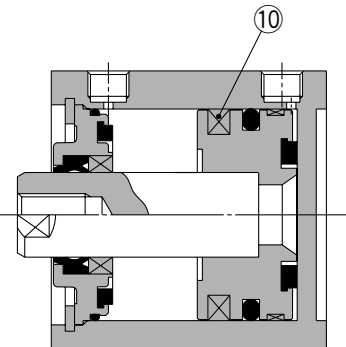
M: Rod end  
male thread



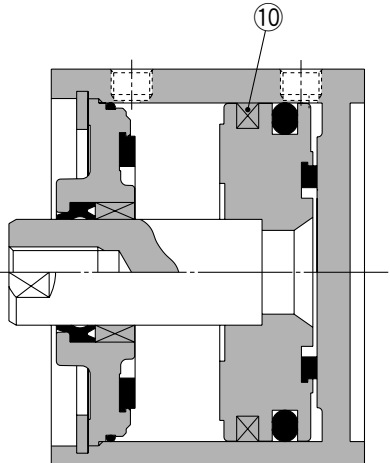
With auto switch (Built-in magnet)



With auto switch (Built-in magnet)



With auto switch (Built-in magnet)



## Component Parts

| No. | Description    | Material              | Note                                |
|-----|----------------|-----------------------|-------------------------------------|
| 1   | Cylinder tube  | Aluminum alloy        | Hard anodized                       |
| 2   | Piston         | Aluminum alloy        | Chromated                           |
| 3   | Piston rod     | Stainless steel       | ø20, ø25                            |
|     |                | Carbon steel          | ø32 to ø100 Hard chrome plated      |
| 4   | Collar         | Aluminum alloy        | ø20 to ø40 Anodized                 |
|     |                | Aluminum alloy casted | ø50 to ø100 Painted after chromated |
| 5   | Retaining ring | Carbon tool steel     | Phosphate coated                    |
| 6   | Bumper A       | Urethane              |                                     |
| 7   | Bumper B       | Urethane              |                                     |
| 8   | Bushing        | Bearing alloy         |                                     |
| 9   | Wear ring      | Resin                 | ø20 to ø63                          |
| 10  | Magnet         | —                     |                                     |
| 11  | Rod end nut    | Carbon steel          | Nickel plated                       |
| 12  | Rod seal       | NBR                   |                                     |
| 13  | Piston seal    | NBR                   |                                     |
| 14  | Tube gasket    | NBR                   |                                     |

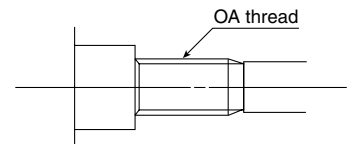
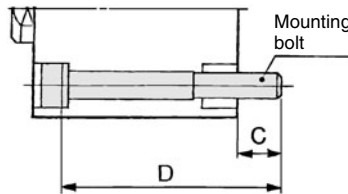
## Replacement Parts/Seal Kit

| Bore size<br>(mm) | Kit no.    | Contents                             |
|-------------------|------------|--------------------------------------|
| 20                | CQ2B20-PS  | Set of nos.<br>at left<br>12, 13, 14 |
| 25                | CQ2B25-PS  |                                      |
| 32                | CQ2B32-PS  |                                      |
| 40                | CQ2B40-PS  |                                      |
| 50                | CQ2B50-PS  |                                      |
| 63                | CQ2B63-PS  |                                      |
| 80                | CQ2B80-PS  |                                      |
| 100               | CQ2B100-PS |                                      |

\* Seal kit includes 12, 13, 14. Order the seal kit, based on each bore size.

## Mounting Bolt

Should use recommended bolt shown as below table when mounting the cylinder using through-hole.



Note) To install a through-hole type mounting bolt, bore size 20 to 100 mm, make sure to use the flat washer that is provided.

## Mounting Bolt for C55

| Model              | C                                                                                 | D   | Mounting bolt |
|--------------------|-----------------------------------------------------------------------------------|-----|---------------|
| <b>C(D)55B20-5</b> | 7.2                                                                               | 45  | M4 x 45 ℓ     |
| <b>-10</b>         |                                                                                   | 50  | x 50 ℓ        |
| <b>-15</b>         |                                                                                   | 55  | x 55 ℓ        |
| <b>-20</b>         |                                                                                   | 60  | x 60 ℓ        |
| <b>-25</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-30</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-35</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-40</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-45</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-50</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-60</b>         | Fix the cylinder by using the OA thread that are provided with the cylinder tube. |     |               |
| <b>-80</b>         |                                                                                   |     |               |
| <b>-100</b>        |                                                                                   |     |               |
| <b>-125</b>        |                                                                                   |     |               |
| <b>-150</b>        |                                                                                   |     |               |
| <b>C(D)55B25-5</b> | 10.2                                                                              | 50  | M4 x 50 ℓ     |
| <b>-10</b>         |                                                                                   | 55  | x 55 ℓ        |
| <b>-15</b>         |                                                                                   | 60  | x 60 ℓ        |
| <b>-20</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-25</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-30</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-35</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-40</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-45</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-50</b>         |                                                                                   | 95  | x 95 ℓ        |
| <b>-60</b>         | Fix the cylinder by using the OA thread that are provided with the cylinder tube. |     |               |
| <b>-80</b>         |                                                                                   |     |               |
| <b>-100</b>        |                                                                                   |     |               |
| <b>-125</b>        |                                                                                   |     |               |
| <b>-150</b>        |                                                                                   |     |               |
| <b>C(D)55B32-5</b> | 10                                                                                | 55  | M5 x 55 ℓ     |
| <b>-10</b>         |                                                                                   | 60  | x 60 ℓ        |
| <b>-15</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-20</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-25</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-30</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-35</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-40</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-45</b>         |                                                                                   | 95  | x 95 ℓ        |
| <b>-50</b>         |                                                                                   | 100 | x 100 ℓ       |
| <b>-60</b>         |                                                                                   | 110 | x 110 ℓ       |
| <b>-80</b>         |                                                                                   | 130 | x 130 ℓ       |
| <b>-100</b>        |                                                                                   | 150 | x 150 ℓ       |
| <b>-125</b>        | Fix the cylinder by using the OA thread that are provided with the cylinder tube. |     |               |
| <b>-150</b>        |                                                                                   |     |               |

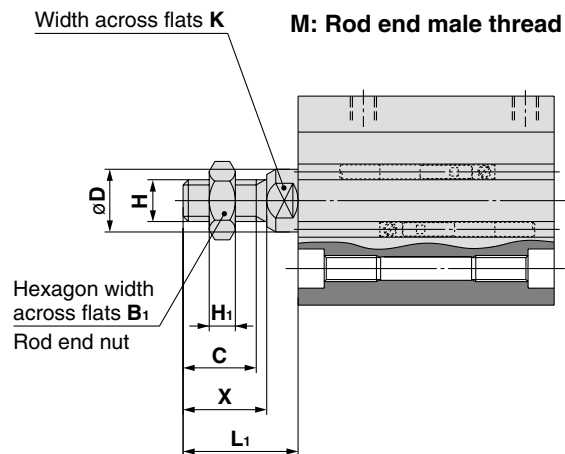
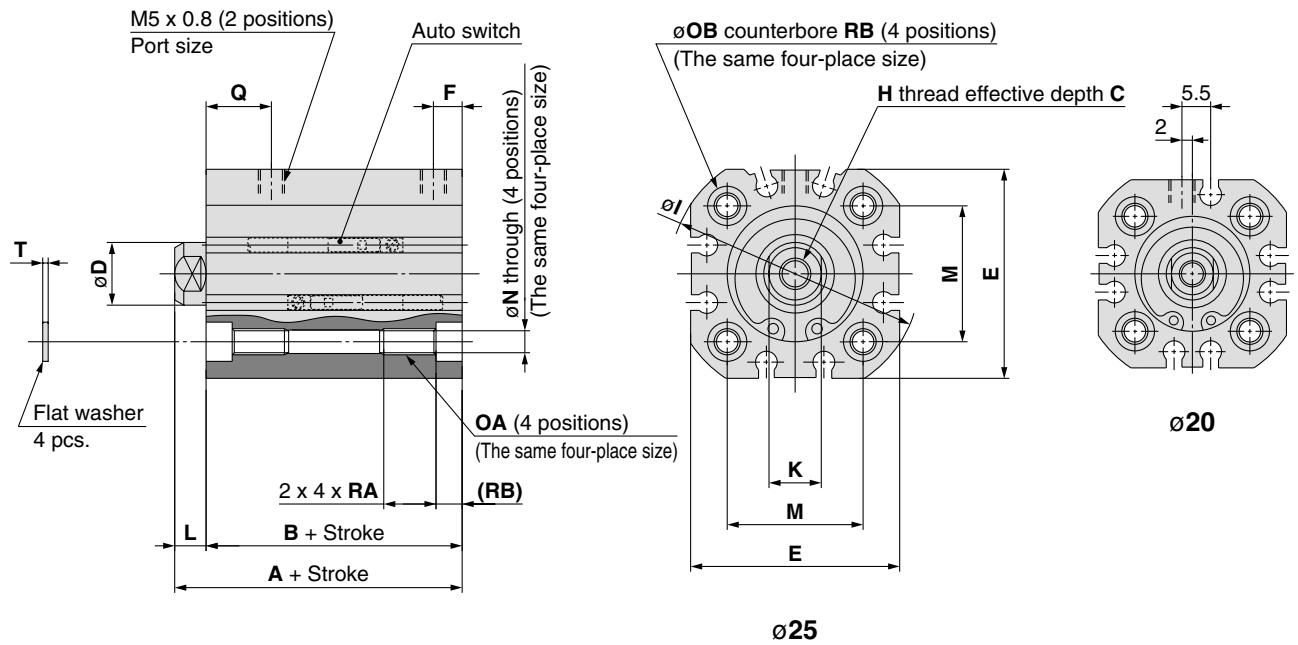
| Model              | C                                                                                 | D   | Mounting bolt |
|--------------------|-----------------------------------------------------------------------------------|-----|---------------|
| <b>C(D)55B40-5</b> | 9                                                                                 | 55  | M5 x 55 ℓ     |
| <b>-10</b>         |                                                                                   | 60  | x 60 ℓ        |
| <b>-15</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-20</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-25</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-30</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-35</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-40</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-45</b>         |                                                                                   | 95  | x 95 ℓ        |
| <b>-50</b>         |                                                                                   | 100 | x 100 ℓ       |
| <b>-60</b>         | Fix the cylinder by using the OA thread that are provided with the cylinder tube. | 110 | x 110 ℓ       |
| <b>-80</b>         |                                                                                   | 130 | x 130 ℓ       |
| <b>-100</b>        |                                                                                   | 150 | x 150 ℓ       |
| <b>-125</b>        |                                                                                   |     |               |
| <b>-150</b>        |                                                                                   |     |               |
| <b>C(D)55B50-5</b> | 8.4                                                                               | 55  | M6 x 55 ℓ     |
| <b>-10</b>         |                                                                                   | 60  | x 60 ℓ        |
| <b>-15</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-20</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-25</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-30</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-35</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-40</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-45</b>         |                                                                                   | 95  | x 95 ℓ        |
| <b>-50</b>         |                                                                                   | 100 | x 100 ℓ       |
| <b>-60</b>         | Fix the cylinder by using the OA thread that are provided with the cylinder tube. | 110 | x 110 ℓ       |
| <b>-80</b>         |                                                                                   | 130 | x 130 ℓ       |
| <b>-100</b>        |                                                                                   | 150 | x 150 ℓ       |
| <b>-125</b>        |                                                                                   |     |               |
| <b>-150</b>        |                                                                                   |     |               |
| <b>C(D)55B63-5</b> | 9.4                                                                               | 60  | M6 x 60 ℓ     |
| <b>-10</b>         |                                                                                   | 65  | x 65 ℓ        |
| <b>-15</b>         |                                                                                   | 70  | x 70 ℓ        |
| <b>-20</b>         |                                                                                   | 75  | x 75 ℓ        |
| <b>-25</b>         |                                                                                   | 80  | x 80 ℓ        |
| <b>-30</b>         |                                                                                   | 85  | x 85 ℓ        |
| <b>-35</b>         |                                                                                   | 90  | x 90 ℓ        |
| <b>-40</b>         |                                                                                   | 95  | x 95 ℓ        |
| <b>-45</b>         |                                                                                   | 100 | x 100 ℓ       |
| <b>-50</b>         |                                                                                   | 105 | x 105 ℓ       |
| <b>-60</b>         | Fix the cylinder by using the OA thread that are provided with the cylinder tube. | 115 | x 115 ℓ       |
| <b>-80</b>         |                                                                                   | 135 | x 135 ℓ       |
| <b>-100</b>        |                                                                                   | 155 | x 155 ℓ       |
| <b>-125</b>        |                                                                                   |     |               |
| <b>-150</b>        |                                                                                   |     |               |

| Model                | C                                                                                 | D   | Mounting bolt |
|----------------------|-----------------------------------------------------------------------------------|-----|---------------|
| <b>C(D)55B80-10</b>  | 11                                                                                | 70  | M8 x 70 ℓ     |
| <b>-15</b>           |                                                                                   | 75  | x 75 ℓ        |
| <b>-20</b>           |                                                                                   | 80  | x 80 ℓ        |
| <b>-25</b>           |                                                                                   | 85  | x 85 ℓ        |
| <b>-30</b>           |                                                                                   | 90  | x 90 ℓ        |
| <b>-35</b>           |                                                                                   | 95  | x 95 ℓ        |
| <b>-40</b>           |                                                                                   | 100 | x 100 ℓ       |
| <b>-45</b>           |                                                                                   | 105 | x 105 ℓ       |
| <b>-50</b>           |                                                                                   | 110 | x 110 ℓ       |
| <b>-60</b>           |                                                                                   | 120 | x 120 ℓ       |
| <b>-80</b>           | Fix the cylinder by using the OA thread that are provided with the cylinder tube. | 140 | x 140 ℓ       |
| <b>-100</b>          |                                                                                   | 160 | x 160 ℓ       |
| <b>-125</b>          |                                                                                   |     |               |
| <b>C(D)55B100-10</b> | 13                                                                                | 85  | M8 x 85 ℓ     |
| <b>-15</b>           |                                                                                   | 90  | x 90 ℓ        |
| <b>-20</b>           |                                                                                   | 95  | x 95 ℓ        |
| <b>-25</b>           |                                                                                   | 100 | x 100 ℓ       |
| <b>-30</b>           |                                                                                   | 105 | x 105 ℓ       |
| <b>-35</b>           |                                                                                   | 110 | x 110 ℓ       |
| <b>-40</b>           |                                                                                   | 115 | x 115 ℓ       |
| <b>-45</b>           |                                                                                   | 120 | x 120 ℓ       |
| <b>-50</b>           |                                                                                   | 125 | x 125 ℓ       |
| <b>-60</b>           |                                                                                   | 135 | x 135 ℓ       |
| <b>-80</b>           | Fix the cylinder by using the OA thread that are provided with the cylinder tube. | 155 | x 155 ℓ       |
| <b>-100</b>          |                                                                                   | 175 | x 175 ℓ       |
| <b>-125</b>          |                                                                                   |     |               |

## Dimensions

[First angle projection]

ø20, ø25



Rod End Male Thread

(mm)

| Bore size (mm) | $B_1$ | $C$ | $D$ | $H$       | $H_1$ | $K$ | $L_1$ | $X$ |
|----------------|-------|-----|-----|-----------|-------|-----|-------|-----|
| 20             | 13    | 14  | 10  | M8 x 1.25 | 5     | 8   | 22    | 16  |
| 25             | 13    | 14  | 12  | M8 x 1.25 | 5     | 10  | 22    | 16  |

Basic Style

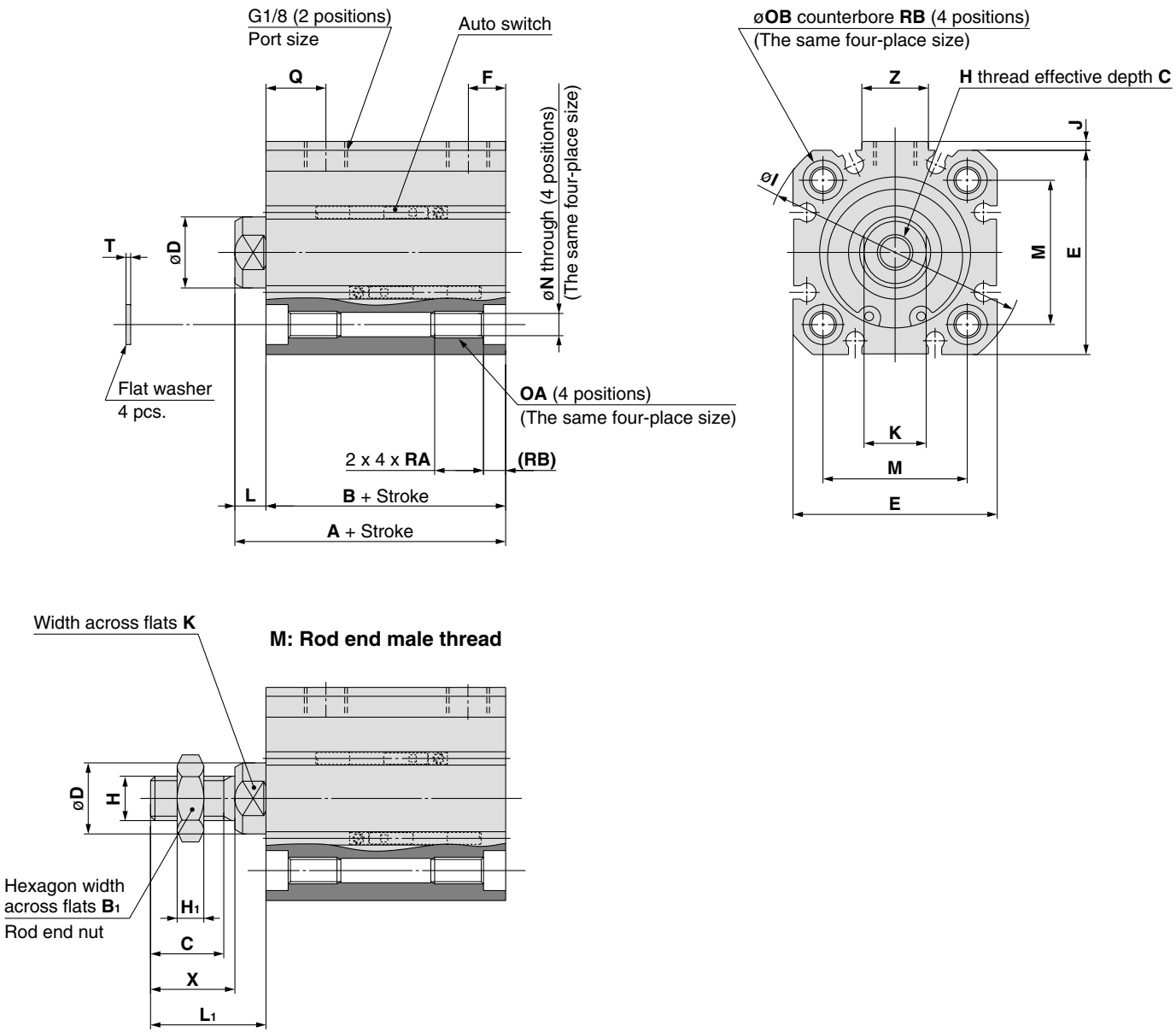
(mm)

| Bore size (mm) | A  | B  | C  | D  | E  | F   | H        | I  | K  | L | M  | N   | OA       | OB  | Q  | RA | RB | T   |
|----------------|----|----|----|----|----|-----|----------|----|----|---|----|-----|----------|-----|----|----|----|-----|
| 20             | 43 | 37 | 10 | 10 | 36 | 5.5 | M6 x 1.0 | 43 | 8  | 6 | 22 | 4.5 | M5 x 0.8 | 7.5 | 13 | 10 | 5  | 0.8 |
| 25             | 45 | 39 | 10 | 12 | 40 | 5.5 | M6 x 1.0 | 48 | 10 | 6 | 26 | 4.5 | M5 x 0.8 | 7.5 | 13 | 10 | 5  | 0.8 |

Dimensions

[First angle projection]

ø32 to ø63



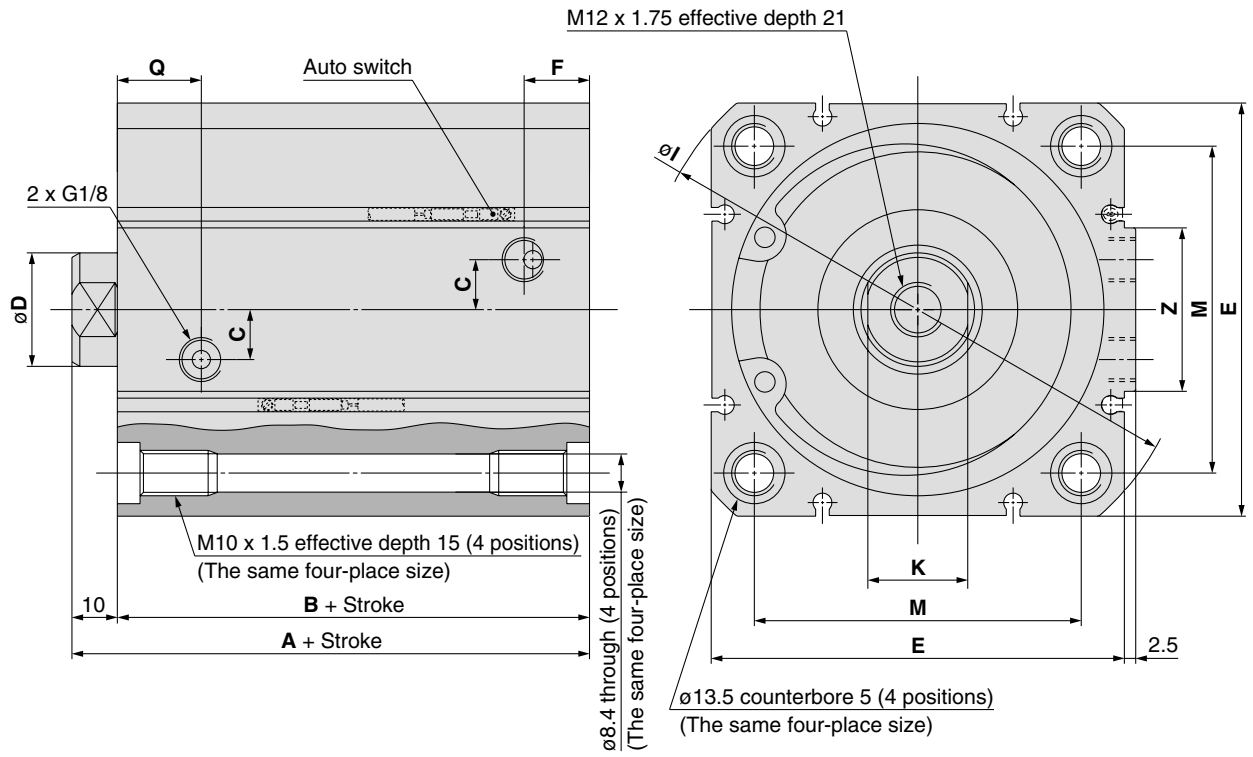
| Rod End Male Thread |                |      |    |            |                |    |                |    | (mm) |
|---------------------|----------------|------|----|------------|----------------|----|----------------|----|------|
| Bore size (mm)      | B <sub>1</sub> | C    | D  | H          | H <sub>1</sub> | K  | L <sub>1</sub> | X  |      |
| 32                  | 17             | 16.5 | 16 | M10 x 1.25 | 6              | 14 | 26             | 19 |      |
| 40                  | 17             | 16.5 | 16 | M10 x 1.25 | 6              | 14 | 26             | 19 |      |
| 50                  | 19             | 19.5 | 20 | M12 x 1.25 | 7              | 17 | 30             | 22 |      |
| 63                  | 19             | 19.5 | 20 | M12 x 1.25 | 7              | 17 | 30             | 22 |      |

| Basic Style    |    |    |    |    |    |      |           |    |   |    |   |      |     |           |      |      |    |    |     | (mm) |
|----------------|----|----|----|----|----|------|-----------|----|---|----|---|------|-----|-----------|------|------|----|----|-----|------|
| Bore size (mm) | A  | B  | C  | D  | E  | F    | H         | I  | J | K  | L | M    | N   | OA        | OB   | Q    | RA | RB | T   | Z    |
| 32             | 51 | 44 | 12 | 16 | 46 | 8.5  | M8 x 1.25 | 59 | 2 | 14 | 7 | 32.5 | 5.5 | M6 x 1.0  | 9    | 14.5 | 11 | 5  | 1   | 15   |
| 40             | 52 | 45 | 12 | 16 | 52 | 9.5  | M8 x 1.25 | 67 | 3 | 14 | 7 | 38   | 5.5 | M6 x 1.0  | 9    | 14.5 | 11 | 5  | 1   | 17   |
| 50             | 53 | 45 | 16 | 20 | 64 | 10.5 | M10 x 1.5 | 82 | 2 | 17 | 8 | 46.5 | 6.6 | M8 x 1.25 | 10.5 | 13.5 | 15 | 5  | 1.6 | 17   |
| 63             | 57 | 49 | 16 | 20 | 74 | 14.5 | M10 x 1.5 | 96 | 3 | 17 | 8 | 56.5 | 6.6 | M8 x 1.25 | 10.5 | 15.5 | 15 | 5  | 1.6 | 17   |

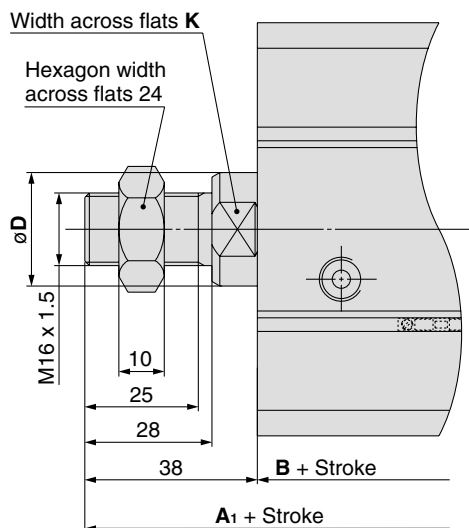
## Dimensions

[First angle projection]

ø80, ø100



**M: Rod end male thread**



### Basic Style

(mm)

| Bore size (mm) | A  | B  | C  | D  | E   | F  | I   | K  | M  | Q  | Z  |
|----------------|----|----|----|----|-----|----|-----|----|----|----|----|
| 80             | 64 | 54 | 11 | 25 | 91  | 15 | 121 | 22 | 72 | 19 | 36 |
| 100            | 77 | 67 | 14 | 30 | 111 | 18 | 145 | 27 | 89 | 26 | 42 |

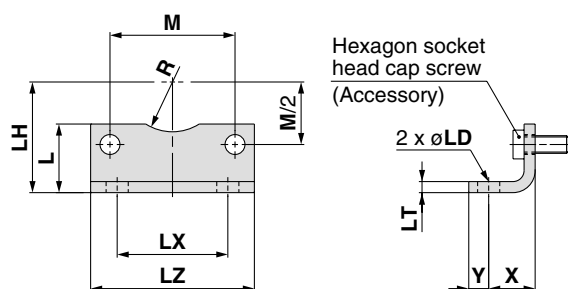
### Rod End Male Thread (mm)

| Bore size (mm) | A <sub>1</sub> |
|----------------|----------------|
| 80             | 92             |
| 100            | 106.5          |

## Mounting Bracket

[First angle projection]

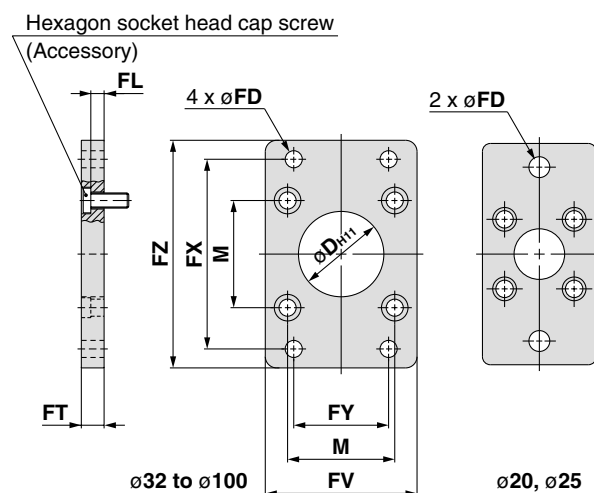
### Foot bracket



(mm)

| Bore size (mm) | L    | LD   | LH   | LT | LX | LZ  | M    | R    | X  | Y  | Hexagon socket head cap screw |
|----------------|------|------|------|----|----|-----|------|------|----|----|-------------------------------|
| 20             | 22   | 7    | 27   | 4  | 22 | 36  | 22   | 8    | 16 | 7  | M5                            |
| 25             | 22   | 7    | 29   | 4  | 26 | 40  | 26   | 10   | 16 | 7  | M5                            |
| 32             | 24.5 | 7    | 33.5 | 4  | 32 | 46  | 32.5 | 15   | 16 | 7  | M6                            |
| 40             | 26   | 10   | 38   | 4  | 36 | 52  | 38   | 17.5 | 18 | 9  | M6                            |
| 50             | 31   | 10   | 45   | 5  | 45 | 64  | 46.5 | 20   | 21 | 9  | M8                            |
| 63             | 31   | 10   | 50   | 5  | 50 | 74  | 56.5 | 22.5 | 21 | 9  | M8                            |
| 80             | 38.5 | 12   | 63   | 6  | 63 | 96  | 72   | —    | 26 | 11 | M10                           |
| 100            | 45   | 14.5 | 74   | 6  | 75 | 116 | 89   | —    | 27 | 13 | M10                           |

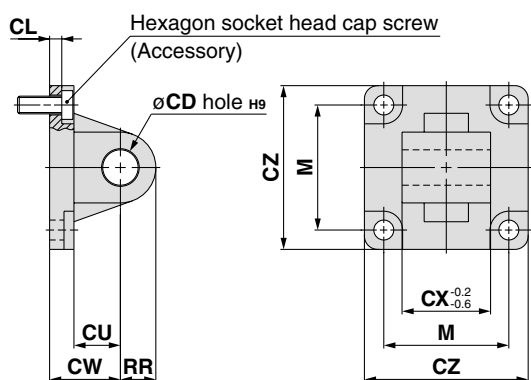
### Flange bracket



(mm)

| Bore size (mm) | D  | M    | FD  | FL  | FT | FV  | FX  | FY | FZ  | Hexagon socket head cap screw |
|----------------|----|------|-----|-----|----|-----|-----|----|-----|-------------------------------|
| 20             | 16 | 22   | 6.6 | 2.8 | 8  | 38  | 55  | —  | 68  | M5                            |
| 25             | 16 | 26   | 6.6 | 2.8 | 8  | 38  | 60  | —  | 73  | M5                            |
| 32             | 30 | 32.5 | 7   | 5   | 10 | 50  | 64  | 32 | 79  | M6                            |
| 40             | 35 | 38   | 9   | 5   | 10 | 55  | 72  | 36 | 90  | M6                            |
| 50             | 40 | 46.5 | 9   | 6   | 12 | 70  | 90  | 45 | 110 | M8                            |
| 63             | 45 | 56.5 | 9   | 6   | 12 | 80  | 100 | 50 | 120 | M8                            |
| 80             | 45 | 72   | 12  | 8   | 16 | 100 | 126 | 63 | 153 | M10                           |
| 100            | 55 | 89   | 14  | 8   | 16 | 120 | 150 | 75 | 178 | M10                           |

### Single clevis bracket



(mm)

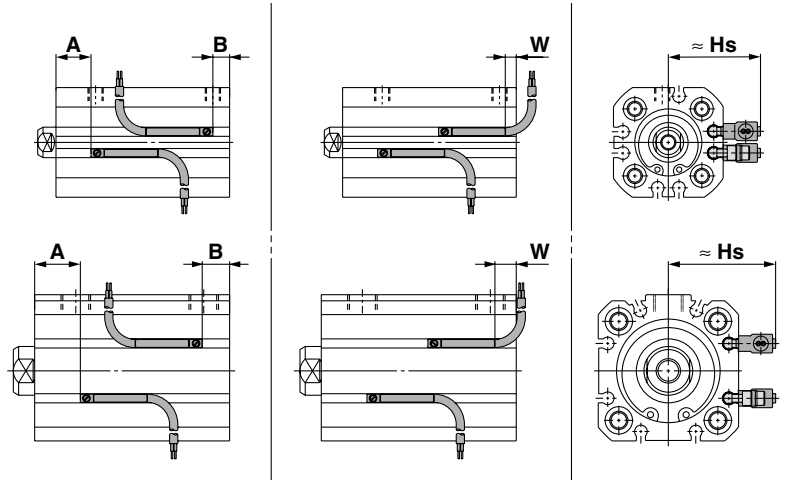
| Bore size (mm) | $CD_{H9}$ | CL  | CU | CW | CX | CZ  | M    | RR  | Hexagon socket head cap screw |
|----------------|-----------|-----|----|----|----|-----|------|-----|-------------------------------|
| 20             | 8         | 3   | 12 | 20 | 16 | 35  | 22   | 9   | M5                            |
| 25             | 8         | 3   | 12 | 20 | 16 | 40  | 26   | 9   | M5                            |
| 32             | 10        | 5.5 | 12 | 22 | 26 | 45  | 32.5 | 9.5 | M6                            |
| 40             | 12        | 5.5 | 15 | 25 | 28 | 51  | 38   | 12  | M6                            |
| 50             | 12        | 6.5 | 15 | 27 | 32 | 64  | 46.5 | 12  | M8                            |
| 63             | 16        | 6.5 | 20 | 32 | 40 | 74  | 56.5 | 16  | M8                            |
| 80             | 16        | 10  | 20 | 36 | 50 | 94  | 72   | 16  | M10                           |
| 100            | 20        | 10  | 25 | 41 | 60 | 113 | 89   | 20  | M10                           |

**Proper Auto Switch Mounting Position (Detection at Stroke End) and Its Mounting Height** [First angle projection]

Reed auto switch  
D-A9□

Solid state auto switch  
D-M9□  
D-M9□W  
D-M9□AL  
D-P3DW□

ø20, ø25



ø32, ø40, ø50, ø63, ø80, ø100

\* Figures in the table below 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.

| Auto switch model<br>Bore size (mm) | D-A9□ |      |           | D-M9□<br>D-M9□W |      |      | D-M9□AL |      |      | D-P3DW□ |      |      |      |
|-------------------------------------|-------|------|-----------|-----------------|------|------|---------|------|------|---------|------|------|------|
|                                     | A     | B    | W         | A               | B    | W    | A       | B    | W    | A       | B    | W    | Hs   |
| 20                                  | 11.5  | 5.5  | 1 (3.5)   | 15.5            | 9.5  | -0.5 | 15.5    | 9.5  | -2.5 | 6.0     | 0.5  | -3.0 | 30   |
| 25                                  | 12.5  | 7.5  | 3 (5.5)   | 16.5            | 11.5 | 1.5  | 16.5    | 11.5 | -0.5 | 7       | 2.5  | -1   | 32   |
| 32                                  | 14.5  | 9.5  | 5 (7.5)   | 18.5            | 13.5 | 3.5  | 18.5    | 13.5 | 1.5  | 9.5     | 4    | 1    | 35   |
| 40                                  | 13    | 12   | 7.5 (10)  | 17              | 16   | 6    | 17      | 16   | 4    | 8       | 7    | 3.5  | 38   |
| 50                                  | 9.5   | 15.5 | 11 (13.5) | 13.5            | 19.5 | 9.5  | 13.5    | 19.5 | 7.5  | 4.5     | 10.5 | 7    | 44   |
| 63                                  | 10.5  | 18.5 | 14 (16.5) | 14.5            | 22.5 | 12.5 | 14.5    | 22.5 | 10.5 | 5.5     | 13.5 | 10   | 49   |
| 80                                  | 16.5  | 17.5 | 13 (15.5) | 20.5            | 21.5 | 11.5 | 20.5    | 21.5 | 9.5  | 11.5    | 12.5 | 9    | 57.5 |
| 100                                 | 24.5  | 22.5 | 18 (20.5) | 28.5            | 26.5 | 16.5 | 28.5    | 26.5 | 14.5 | 19.5    | 17.5 | 14   | 67.5 |

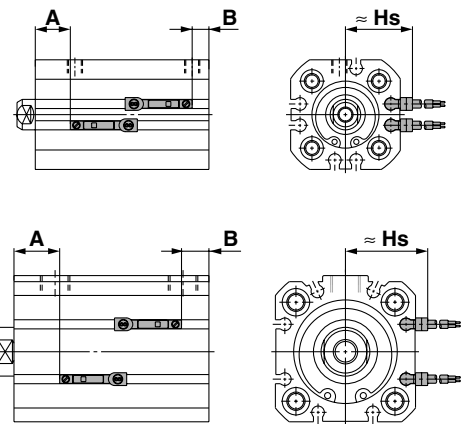
The dimension inside ( ) is for D-A96.

Negative figures in the table W indicate an auto switch is mounted outward from the edge of the cylinder body.

Reed auto switch  
D-A9□V

Solid state auto switch  
D-M9□V  
D-M9□WV  
D-M9□AVL

ø20, ø25



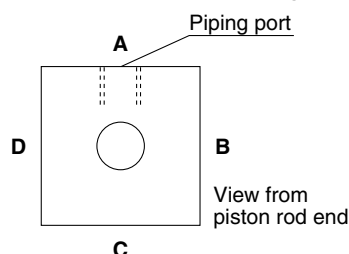
ø32, ø40, ø50, ø63, ø80, ø100

\* Figures in the table below 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.

| Auto switch model<br>Bore size (mm) | D-A9□V |      |      | D-M9□V<br>D-M9□WV<br>D-M9□AVL |      |    |
|-------------------------------------|--------|------|------|-------------------------------|------|----|
|                                     | A      | B    | Hs   | A                             | B    | Hs |
| 20                                  | 11.5   | 5.5  | 22   | 15.5                          | 9.5  | 24 |
| 25                                  | 12.5   | 7.5  | 24   | 16.5                          | 11.5 | 26 |
| 32                                  | 14.5   | 9.5  | 27   | 18.5                          | 13.5 | 29 |
| 40                                  | 13     | 12   | 30   | 17                            | 16   | 32 |
| 50                                  | 9.5    | 15.5 | 36   | 13.5                          | 19.5 | 38 |
| 63                                  | 10.5   | 18.5 | 41   | 14.5                          | 22.5 | 43 |
| 80                                  | 16.5   | 17.5 | 49.5 | 20.5                          | 21.5 | 52 |
| 100                                 | 24.5   | 22.5 | 60   | 28.5                          | 26.5 | 62 |

## The Number of Surfaces and Grooves Where an Auto Switch Can Be Mounted (As Direct Mounting)

The number of the surfaces and grooves where the auto switch can be mounted, by switch type, are shown in the table below.



Mounting the D-P3DW□ on a ø20 to ø25 port surface interferes with the fitting, so it needs to be mounted on a place other than the port surface.

For ø32 to ø100, if the corner of the fitting hexagon interferes with the D-P3DW□ Series, adjust the tightening of the fitting to eliminate the interference.

Also, in the case of interference with an elbow type fitting, direct the port of the fitting away from the D-P3DW□ Series.

If you have any other questions, please contact SMC.

| Auto switch model | D-A9□, M9□                 |                            |                            |                            | D-P3DW□                    |                            |                            |                            |
|-------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                   | A<br>(Mounting groove no.) | B<br>(Mounting groove no.) | C<br>(Mounting groove no.) | D<br>(Mounting groove no.) | A<br>(Mounting groove no.) | B<br>(Mounting groove no.) | C<br>(Mounting groove no.) | D<br>(Mounting groove no.) |
| 20                | ○<br>(1)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 25                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 32                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 40                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 50                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 63                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ×                          | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 80                | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |
| 100               | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   | ○<br>(2)                   |

## Operating Range

| Auto switch model                  | Bore size (mm) |     |     |     |     |      |    |      |
|------------------------------------|----------------|-----|-----|-----|-----|------|----|------|
|                                    | 20             | 25  | 32  | 40  | 50  | 63   | 80 | 100  |
| D-A9□(V)                           | 9              | 9   | 9   | 9   | 9   | 10.5 | 14 | 10.5 |
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□A(V) | 5              | 4.5 | 5   | 4   | 4.5 | 5    | 10 | 8    |
| D-P3DW□                            | 5              | 5.5 | 5.5 | 5.5 | 5.5 | 6.5  | 9  | 7    |

\* The operating ranges are provided as guidelines including hystereses and are not guaranteed values (assuming approximately ±30% variations).

They may vary significantly with ambient environments.

## Minimum Auto Switch Mounting Stroke

| Bore size (mm) | Auto switch model<br>No. of auto switch mounted | (mm)  |        |       |                  |        |         |         |         |
|----------------|-------------------------------------------------|-------|--------|-------|------------------|--------|---------|---------|---------|
|                |                                                 | D-A9□ | D-A9□V | D-M9□ | D-M9□W<br>D-M9□A | D-M9□V | D-M9□WV | D-M9□AV | D-P3DW□ |
| 20             | 2 pcs.                                          | 10    | 10     | 15    | 15               | 5      | 10      | 10      | 15      |
|                | 1 pc.                                           | 10    | 5      | 15    | 15               | 5      | 5       | 10      | 15      |
| 25             | 2 pcs.                                          | 10    | 10     | 10    | 15               | 5      | 10      | 10      | 15      |
|                | 1 pc.                                           | 10    | 5      | 10    | 15               | 5      | 5       | 10      | 15      |
| 32, 40, 50     | 2 pcs.                                          | 10    | 10     | 10    | 15               | 5      | 10      | 10      | 10      |
|                | 1 pc.                                           | 10    | 5      | 10    | 15               | 5      | 5       | 10      | 10      |
| 63             | 2 pcs.                                          | 10    | 10     | 10    | 15               | 5      | 10      | 10      | 10      |
|                | 1 pc.                                           | 5     | 5      | 5     | 15               | 5      | 5       | 10      | 10      |
| 80, 100        | 2 pcs.                                          | 10    | 10     | 15    | 15               | 5      | 10      | 10      | 10      |
|                | 1 pc.                                           | 10    | 5      | 15    | 15               | 5      | 5       | 10      | 10      |

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

\* Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H type, and D-F8 type) are also available. For details, refer to Best Pneumatics No.2.

\* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to Best Pneumatics No.2 for details.

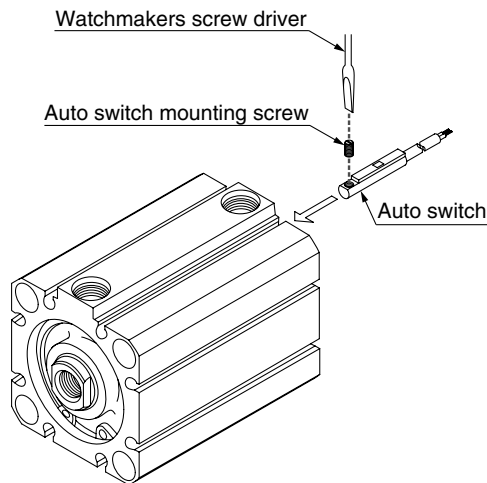
## Mounting of Auto Switch/Direct Mounting Style

To mount auto switches, follow the instruction illustrated below.

### <Applicable auto switch>

Solid state.....D-M9□(V)  
                           D-M9□W(V)  
                           D-M9□A(V)  
 Reed.....D-A□(V)

ø20 to ø100



Use a watchmakers screwdriver with a handle 5 to 6 mm in diameter when tightening the auto switch mounting screw.

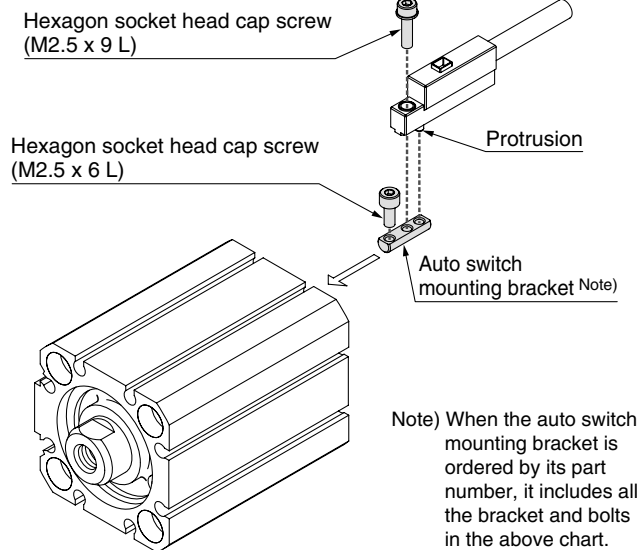
### Tightening Torque of Auto Switch Mounting Screws

| Auto switch model                   | Tightening torque (N·m) |
|-------------------------------------|-------------------------|
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□A(V)L | 0.05 to 0.15            |
| D-A9□(V)                            | 0.10 to 0.20            |

### <Applicable auto switch>

Solid state.....D-P3DW□

ø20 to ø100



Note) When the auto switch mounting bracket is ordered by its part number, it includes all the bracket and bolts in the above chart.

| Applicable auto switch | Auto switch mounting bracket part no. |
|------------------------|---------------------------------------|
| D-P3DW□                | BQ3-032S                              |

- ① Insert the protrusion on the bottom of the auto switch into the mating part of the auto switch mounting bracket and fix the auto switch and the auto switch mounting bracket temporarily by tightening the hexagon socket head cap screw (M2.5 x 9 L) 1 to 2 turns.
- ② Insert the temporarily tightened mounting bracket into the mating groove of the cylinder/actuator, and slide the auto switch onto the cylinder/actuator through the groove.
- ③ Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9 L).\*
- ④ If the detecting position is changed, go back to step ②.

\* The hexagon socket head cap screw (M2.5 x 6 L) is used to fix the mounting bracket and cylinder/actuator.  
 This enables the replacement of the auto switch without adjusting the auto switch position.

Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.

Note 2) The torque for tightening the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9 L) is 0.2 to 0.3 N·m.

Note 3) Tighten the hexagon socket head cap screws evenly.

Note 4) For ø80 or ø100, in the case of mounting the auto switch of the D-P3DW□ Series onto the port surface, if the corner of the fitting hexagon interferes with the auto switch, adjust the tightening of the fitting to eliminate the interference.  
 In the case of interference with an elbow type fitting, direct the port of the fitting away from the auto switch.  
 Such interference must be avoided especially when selecting a speed controller with fittings or speed exhaust controller, etc.

Note 5) When the cylinder with auto switches is ordered, the body of the cylinder/auto switch and auto switch mounting bracket are shipped together.

# Prior to Use

## Auto Switches Common Specifications 1

### ⚠ Specific Product Precautions

Before handling auto switches, refer to “Handling Precautions for SMC Products” (M-E03-3) for Auto Switches Precautions.

### Auto Switches Common Specifications

| Type                  | Reed auto switch                                           | Solid state auto switch                               |
|-----------------------|------------------------------------------------------------|-------------------------------------------------------|
| Operating time        | 1.2 ms                                                     | 1 ms or less *                                        |
| Impact resistance     | 300 m/s <sup>2</sup>                                       | 1000 m/s <sup>2</sup>                                 |
| Insulation resistance | 50 MΩ or more at 500 VDC Mega (Between lead wire and case) |                                                       |
| Withstand voltage     | 1500 VAC for 1 minute<br>(Between lead wire and case)      | 1000 VAC for 1 minute<br>(Between lead wire and case) |
| Ambient temperature   | -10 to 60°C                                                |                                                       |
| Enclosure             | IEC60529 Standard IP67                                     |                                                       |

\* The operating time for the D-P3DW□ is 40 ms or less.

### Lead Wire

Lead wire length indication  
(Example)

**D-M9BW** **L**

● Lead wire length

|     |       |
|-----|-------|
| Nil | 0.5 m |
| M   | 1 m   |
| L   | 3 m   |
| Z   | 5 m   |

Note 1) Lead wire length Z: 5 m

Applicable auto switches

Solid state auto switch: Manufactured upon receipt of order as standard.

Note 2) The standard lead wire length for water resistant 2-color indication solid state auto switches is 3 m.

(D-M9□A(V)L can be used with a lead wire of 0.5 m and 3 m.)

Note 3) 1 m (M): D-M9□(V), M9□W(V), M9□A(V)L only.

Note 4) Lead wire length tolerance

| Lead wire length | Tolerance |
|------------------|-----------|
| 0.5 m            | ±15 mm    |
| 1 m              | ±30 mm    |
| 3 m              | ±90 mm    |
| 5 m              | ±150 mm   |

# Prior to Use

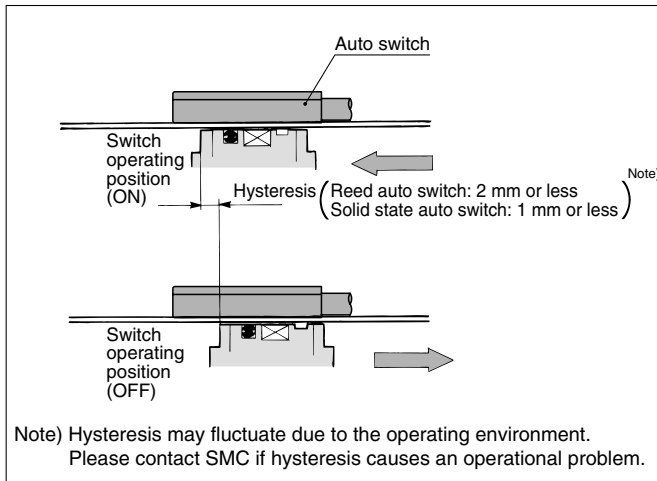
## Auto Switches Common Specifications 2

### ⚠ Specific Product Precautions

Before handling auto switches, refer to “Handling Precautions for SMC Products” (M-E03-3) for Auto Switches Precautions.

#### Auto Switch Hysteresis

Hysteresis is the distance between the position at which piston movement operates an auto switch to the position at which reverse movement turns the switch off. This hysteresis is included in part of the operating range (one side).



#### Contact Protection Box: CD-P11, CD-P12

##### <Applicable switch models>

D-A9/A9□V

The auto switches above do not have a built-in contact protection circuit. A contact protection box is not required for solid state auto switches due to their construction.

- ① Where the operation load is an inductive load.
- ② Where the wiring length to load is greater than 5 m.
- ③ Where the load voltage is 100 VAC.

Therefore, use a contact protection box with the switch for any of the above cases:

The contact life may be shortened (due to permanent energizing conditions.)

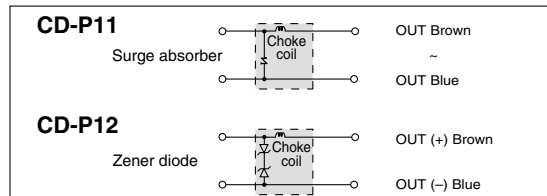
When the load voltage is increased by more than 10% to the rating of applicable auto switches above, use a contact protection box (CD-P11) to reduce the upper limit of the load current by 10% so that it can be set within the range of the load current range, 110 VAC.

##### Contact Protection Box Specifications

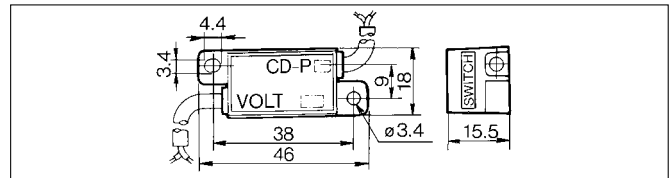
| Part no.                 | CD-P11          | CD-P12  |
|--------------------------|-----------------|---------|
| <b>Load voltage</b>      | 100 VAC or less | 200 VAC |
| <b>Max. load current</b> | 25 mA           | 12.5 mA |
|                          |                 | 50 mA   |

\* Lead wire length — Auto switch connection side 0.5 m  
Load connection side 0.5 m

##### Contact Protection Box Internal Circuit



##### Contact Protection Box/Dimensions



#### Contact Protection Box Connection

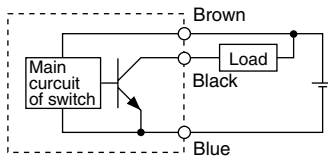
To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box, with a lead wire length of no more than 1 meter.

# Prior to Use

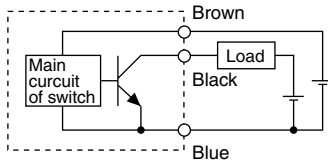
## Auto Switches Connection and Example

### Basic Wiring

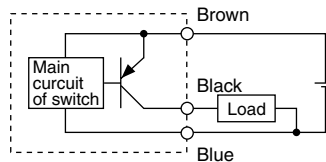
#### Solid state 3-wire, NPN



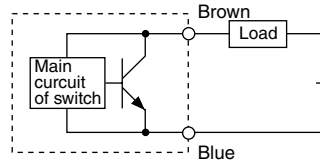
(Power supply for switch and load are separate)



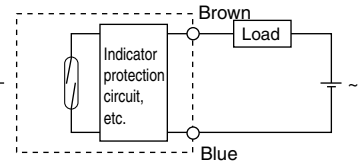
#### Solid state 3-wire, PNP



#### 2-wire (Solid state)

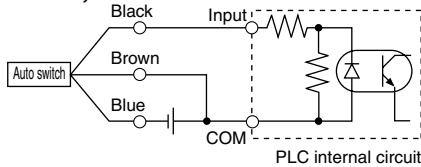


#### 2-wire (Reed switch)

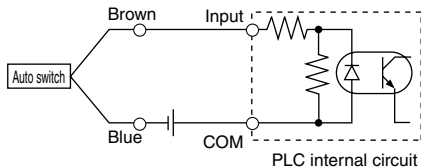


### Example of Connection with PLC (Programmable Logic Controller)

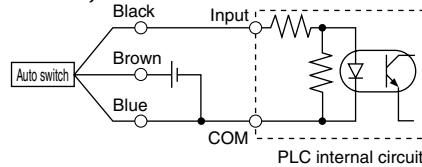
#### • Sink input specifications 3-wire, NPN



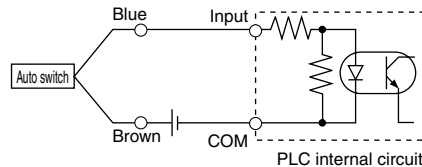
#### 2-wire



#### • Source input specifications 3-wire, PNP



#### 2-wire

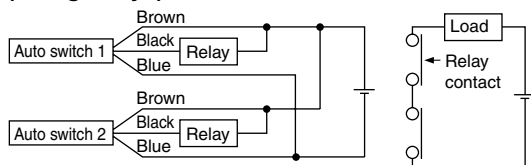


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

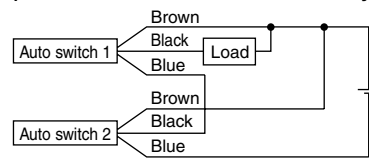
### Example of AND (Series) and OR (Parallel) Connection

#### • 3-wire

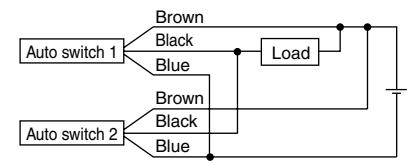
##### AND connection for NPN output (Using relays)



##### AND connection for NPN output (Performed with auto switches only)



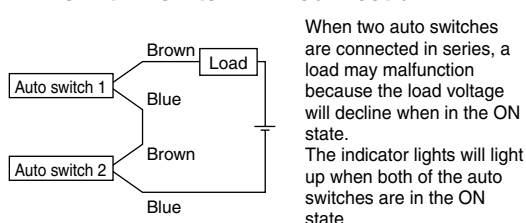
##### OR connection for NPN output



The indicator lights will light up when both auto switches are turned ON.

#### • 2-wire

##### 2-wire with 2-switch AND connection

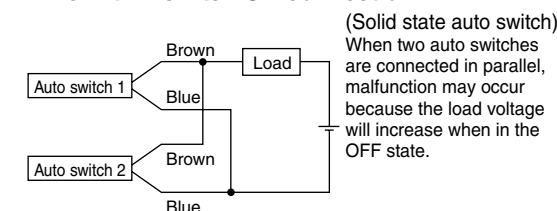


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

Load voltage at ON = Power supply voltage – Residual voltage x 2 pcs.  
= 24 V – 4 V x 2 pcs.  
= 16 V

Example: Power supply is 24 VDC  
Internal voltage drop in auto switch is 4 V.

##### 2-wire with 2-switch OR connection



(Solid state auto switch)  
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance  
= 1 mA x 2 pcs. x 3 kΩ  
= 6 V

Example: Load impedance is 3 kΩ.  
Leakage current from auto switch is 1 mA.

(Reed auto switch)  
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

# Solid State Auto Switch Direct Mounting Style D-M9N(V)/D-M9P(V)/D-M9B(V) C €



For details about certified products conforming to international standards, visit us at [www.smcworld.com](http://www.smcworld.com).

## Auto Switch Specifications

PLC: Programmable Logic Controller

| D-M9□, D-M9□V (With indicator light) |                                               |               |         |               |                       |               |
|--------------------------------------|-----------------------------------------------|---------------|---------|---------------|-----------------------|---------------|
| Auto switch model                    | D-M9N                                         | D-M9NV        | D-M9P   | D-M9PV        | D-M9B                 | D-M9BV        |
| Electrical entry direction           | In-line                                       | Perpendicular | In-line | Perpendicular | In-line               | Perpendicular |
| Wiring type                          | 3-wire                                        |               |         |               | 2-wire                |               |
| Output type                          | NPN                                           |               | PNP     |               | —                     |               |
| Applicable load                      | IC circuit, Relay, PLC                        |               |         |               | 24 VDC relay, PLC     |               |
| Power supply voltage                 | 5, 12, 24 VDC (4.5 to 28 V)                   |               |         |               | —                     |               |
| Current consumption                  | 10 mA or less                                 |               |         |               | —                     |               |
| Load voltage                         | 28 VDC or less                                |               | —       |               | 24 VDC (10 to 28 VDC) |               |
| Load current                         | 40 mA or less                                 |               |         |               | 2.5 to 40 mA          |               |
| Internal voltage drop                | 0.8 V or less at 10 mA (2 V or less at 40 mA) |               |         |               | 4 V or less           |               |
| Leakage current                      | 100 μA or less at 24 VDC                      |               |         |               | 0.8 mA or less        |               |
| Indicator light                      | Red LED illuminates when turned ON.           |               |         |               |                       |               |
| Standard                             | CE marking                                    |               |         |               |                       |               |

- Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm<sup>2</sup>, 2 cores (D-M9B(V)), 3 cores (D-M9N(V), D-M9P(V))

Note 1) Refer to page 13 for solid state auto switch common specifications.

Note 2) Refer to page 13 for lead wire lengths.

### Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.



### Caution

#### Precautions

Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

## Weight

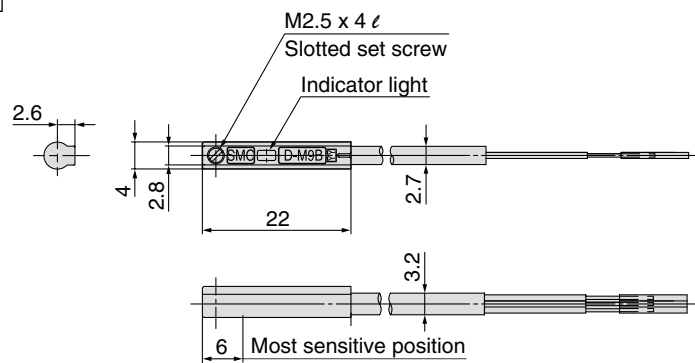
Unit: g

| Auto switch model    |     | D-M9N(V) | D-M9P(V) | D-M9B(V) |
|----------------------|-----|----------|----------|----------|
| Lead wire length (m) | 0.5 | 8        | 8        | 7        |
|                      | 1   | 14       | 14       | 13       |
|                      | 3   | 41       | 41       | 38       |
|                      | 5   | 68       | 68       | 63       |

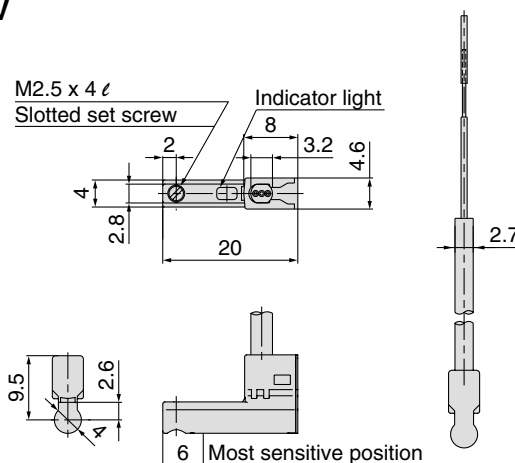
## Dimensions

Unit: mm

### D-M9□

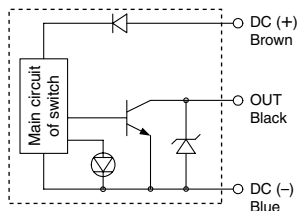


### D-M9□V

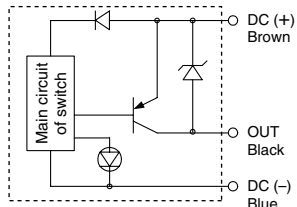


### Auto Switch Internal Circuit

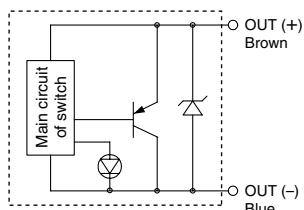
#### D-M9N, D-M9NV



#### D-M9P, D-M9PV



#### D-M9B, D-M9BV



# 2-Color Indication Type Solid State Auto Switch Direct Mounting Style

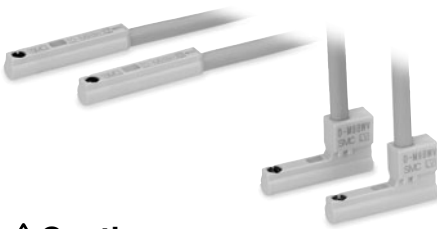
## D-M9NW(V)/D-M9PW(V)/D-M9BW(V)



For details about certified products conforming to international standards, visit us at [www.smcworld.com](http://www.smcworld.com).

### Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.
- A proper operating range can be determined by the color of the light. (Red → Green ← Red)



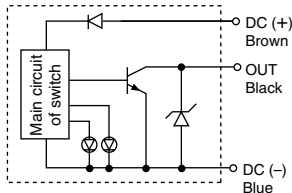
### Caution

#### Precautions

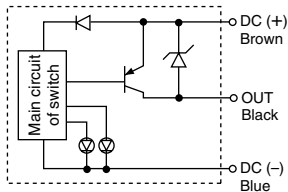
Fix the auto switch with the existing screw installed on the auto switch body.  
The auto switch may be damaged if a screw other than the one supplied is used.

### Auto Switch Internal Circuit

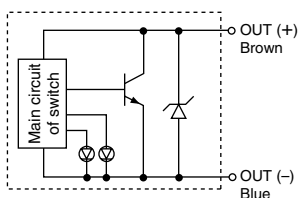
#### D-M9NW, D-M9NWV



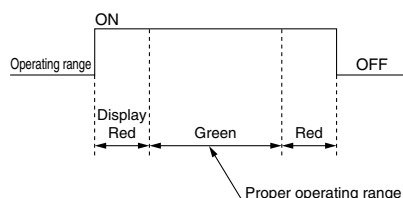
#### D-M9PW, D-M9PWV



#### D-M9BW, D-M9BWV



### Indicator light / Display method



### Auto Switch Specifications

PLC: Programmable Logic Controller

#### D-M9□W, D-M9□WV (With indicator light)

|                            |                                                                                                   |               |         |               |                       |               |
|----------------------------|---------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------------------|---------------|
| Auto switch model          | D-M9NW                                                                                            | D-M9NWV       | D-M9PW  | D-M9PWV       | D-M9BW                | D-M9BWV       |
| Electrical entry direction | In-line                                                                                           | Perpendicular | In-line | Perpendicular | In-line               | Perpendicular |
| Wiring type                | 3-wire                                                                                            |               |         |               | 2-wire                |               |
| Output type                | NPN                                                                                               |               | PNP     |               | —                     |               |
| Applicable load            | IC circuit, Relay, PLC                                                                            |               |         |               | 24 VDC relay, PLC     |               |
| Power supply voltage       | 5, 12, 24 VDC (4.5 to 28 V)                                                                       |               |         |               | —                     |               |
| Current consumption        | 10 mA or less                                                                                     |               |         |               | —                     |               |
| Load voltage               | 28 VDC or less                                                                                    |               | —       |               | 24 VDC (10 to 28 VDC) |               |
| Load current               | 40 mA or less                                                                                     |               |         |               | 2.5 to 40 mA          |               |
| Internal voltage drop      | 0.8 V or less at 10 mA (2 V or less at 40 mA)                                                     |               |         |               | 4 V or less           |               |
| Leakage current            | 100 μA or less at 24 VDC                                                                          |               |         |               | 0.8 mA or less        |               |
| Indicator light            | Operating range ..... Red LED illuminates.<br>Proper operating range ..... Green LED illuminates. |               |         |               |                       |               |
| Standard                   | CE marking                                                                                        |               |         |               |                       |               |

- Lead wires — Oilproof flexible heavy-duty vinyl cord:  $\phi 2.7 \times 3.2$  ellipse, 0.15 mm<sup>2</sup>, 2 cores (D-M9BW(V)), 3 cores (D-M9NW(V), D-M9PW(V))

Note 1) Refer to page 13 for solid state auto switch common specifications.

Note 2) Refer to page 13 for lead wire lengths.

### Weight

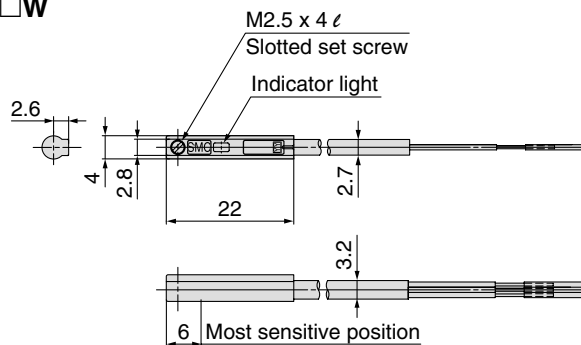
Unit: g

| Auto switch model    | D-M9NW(V) | D-M9PW(V) | D-M9BW(V) |
|----------------------|-----------|-----------|-----------|
| Lead wire length (m) | 0.5       | 8         | 7         |
|                      | 1         | 14        | 13        |
|                      | 3         | 41        | 38        |
|                      | 5         | 68        | 63        |

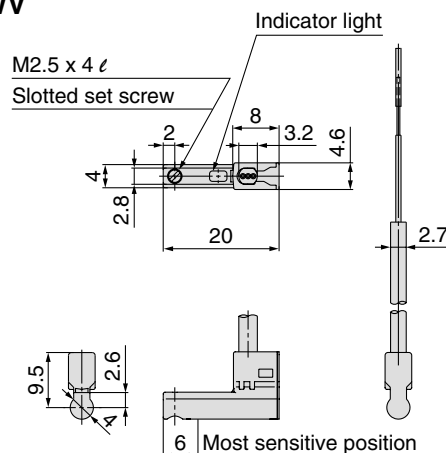
### Dimensions

Unit: mm

#### D-M9□W



#### D-M9□WV



# Water Resistant 2-Color Indication Type Solid State Auto Switch: Direct Mounting Style D-M9NA(V)/D-M9PA(V)/D-M9BA(V) C €

## Grommet

- Water (coolant) resistant type
- 2-wire load current is reduced (2.5 to 40 mA).
- A proper operating range can be determined by the color of the light. (Red → Green ← Red)
- Using flexible cable as standard spec.



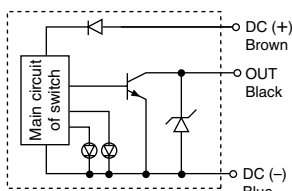
## Caution

### Precautions

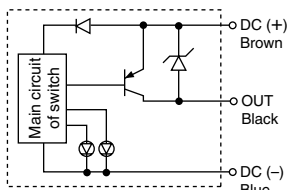
Fix the auto switch with the existing screw installed on the auto switch body.  
The auto switch may be damaged if a screw other than the one supplied is used.

## Auto Switch Internal Circuit

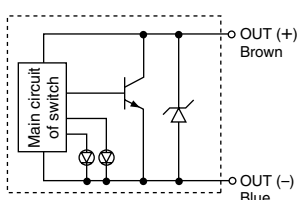
### D-M9NA, D-M9NAV



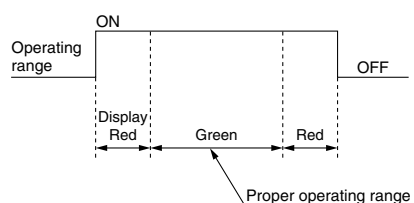
### D-M9PA, D-M9PAV



### D-M9BA, D-M9BAV



## Indicator light/Display method



## Auto Switch Specifications

PLC: Programmable Logic Controller

| D-M9□A, D-M9□AV (With indicator light) |                                                                                                   |               |         |               |                       |               |
|----------------------------------------|---------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------------------|---------------|
| Auto switch model                      | D-M9NA                                                                                            | D-M9NAV       | D-M9PA  | D-M9PAV       | D-M9BA                | D-M9BAV       |
| Electrical entry direction             | In-line                                                                                           | Perpendicular | In-line | Perpendicular | In-line               | Perpendicular |
| Wiring type                            | 3-wire                                                                                            |               |         |               | 2-wire                |               |
| Output type                            | NPN                                                                                               |               | PNP     |               | —                     |               |
| Applicable load                        | IC circuit, Relay, PLC                                                                            |               |         |               | 24 VDC relay, PLC     |               |
| Power supply voltage                   | 5, 12, 24 VDC (4.5 to 28 V)                                                                       |               |         |               | —                     |               |
| Current consumption                    | 10 mA or less                                                                                     |               |         |               | —                     |               |
| Load voltage                           | 28 VDC or less                                                                                    |               | —       |               | 24 VDC (10 to 28 VDC) |               |
| Load current                           | 40 mA or less                                                                                     |               |         |               | 2.5 to 40 mA          |               |
| Internal voltage drop                  | 0.8 V or less at 10 mA (2 V or less at 40 mA)                                                     |               |         |               | 4 V or less           |               |
| Leakage current                        | 100 μA or less at 24 VDC                                                                          |               |         |               | 0.8 mA or less        |               |
| Indicator light                        | Operating range ..... Red LED illuminates.<br>Proper operating range ..... Green LED illuminates. |               |         |               |                       |               |
| Standard                               | CE marking                                                                                        |               |         |               |                       |               |

- Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm<sup>2</sup>, 2 cores (D-M9BA(V)), 3 cores (D-M9NA(V), D-M9PA(V))

Note 1) Refer to page 13 for solid state auto switch common specifications.

Note 2) Refer to page 13 for lead wire lengths.

## Weight

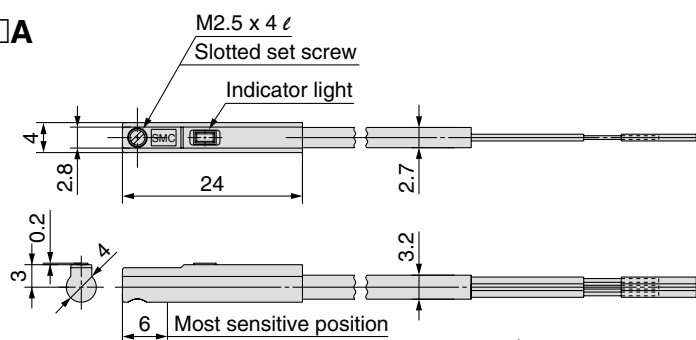
Unit: g

| Auto switch model    |     | D-M9NA(V) | D-M9PA(V) | D-M9BA(V) |
|----------------------|-----|-----------|-----------|-----------|
| Lead wire length (m) | 0.5 | 8         | 8         | 7         |
|                      | 1   | 14        | 14        | 13        |
|                      | 3   | 41        | 41        | 38        |
|                      | 5   | 68        | 68        | 63        |

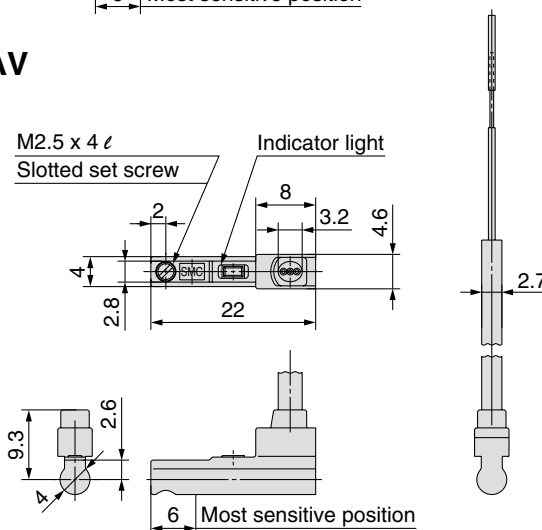
## Dimensions

Unit: mm

### D-M9□A



### D-M9□AV



# Reed Auto Switch Direct Mounting Style

## D-A90(V)/D-A93(V)/D-A96(V)



For details about certified products conforming to international standards, visit us at [www.smcworld.com](http://www.smcworld.com).

### Auto Switch Specifications

PLC: Programmable Logic Controller

| D-A90, D-A90V (Without indicator light)                    |                                                                                       |                              |                               |
|------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------|-------------------------------|
| Auto switch model                                          | D-A90, D-A90V                                                                         |                              |                               |
| Applicable load                                            | IC circuit, Relay, PLC                                                                |                              |                               |
| Load voltage                                               | 24 V $\frac{AC}{DC}$ or less                                                          | 48 V $\frac{AC}{DC}$ or less | 100 V $\frac{AC}{DC}$ or less |
| Maximum load current                                       | 50 mA                                                                                 | 40 mA                        | 20 mA                         |
| Contact protection circuit                                 | None                                                                                  |                              |                               |
| Internal resistance                                        | 1 Ω or less (Including lead wire length of 3 m)                                       |                              |                               |
| Standard                                                   | CE marking                                                                            |                              |                               |
| D-A93, D-A93V, D-A96, D-A96V (With indicator light)        |                                                                                       |                              |                               |
| Auto switch model                                          | D-A93, D-A93V                                                                         |                              | D-A96, D-A96V                 |
| Applicable load                                            | Relay, PLC                                                                            |                              | IC circuit                    |
| Load voltage                                               | 24 VDC                                                                                | 100 VAC                      | 4 to 8 VDC                    |
| Load current range and Maximum load current <sup>(3)</sup> | 5 to 40 mA                                                                            | 5 to 20 mA                   | 20 mA                         |
| Contact protection circuit                                 | None                                                                                  |                              |                               |
| Internal voltage drop                                      | D-A93: 2.4 V or less (up to 20 mA)/3 V or less (up to 40 mA)<br>D-A93V: 2.7 V or less |                              | 0.8 V or less                 |
| Indicator light                                            | Red LED illuminates when turned ON.                                                   |                              |                               |
| Standard                                                   | CE marking                                                                            |                              |                               |

#### • Lead wires

D-A90(V)/D-A93(V)—Oilproof heavy-duty vinyl cord,  $\phi 2.7$ , 0.18 mm<sup>2</sup> x 2 cores (Brown, Blue), 0.5 m

D-A96(V)—Oilproof heavy-duty vinyl cord,  $\phi 2.7$ , 0.15 mm<sup>2</sup> x 3 cores (Brown, Black, Blue), 0.5 m

Note 1) Refer to page 13 for reed auto switch common specifications.

Note 2) Refer to page 13 for lead wire lengths.

Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 1 mA or more.

### Weight

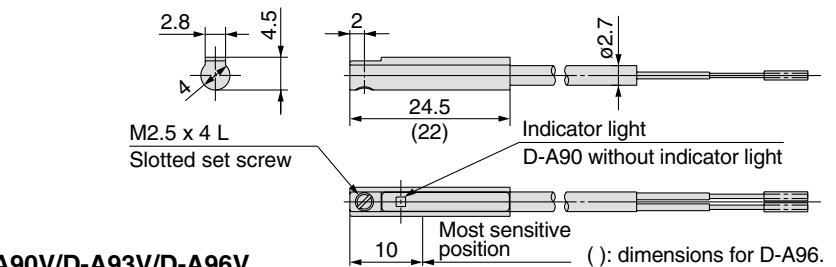
Unit: g

| Model                | D-A90 | D-A90V | D-A93 | D-A93V | D-A96 | D-A96V |
|----------------------|-------|--------|-------|--------|-------|--------|
| Lead wire length (m) | 0.5   | 6      | 6     | 6      | 8     | 8      |
|                      | 3     | 30     | 30    | 30     | 41    | 41     |

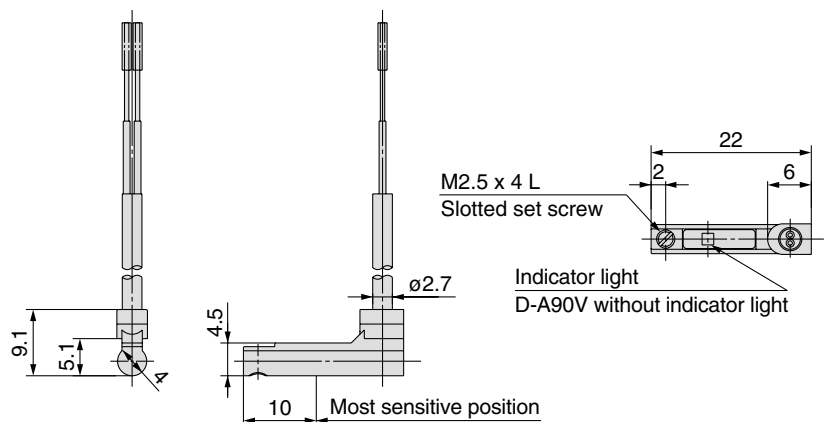
### Dimensions

Unit: mm

#### D-A90/D-A93/D-A96



#### D-A90V/D-A93V/D-A96V



### Grommet



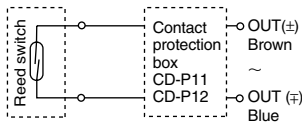
### Caution

#### Precautions

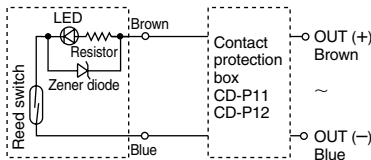
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

### Auto Switch Internal Circuit

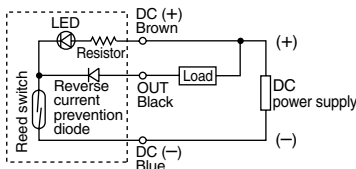
#### D-A90, A90V



#### D-A93, A93V



#### D-A96, A96V



Note 1) Operating load is an induction load.

Note 2) Wiring to the load is 5 m or longer.

Note 3) Load voltage is 100 VAC.

Use the contact protection box in any of the above listed situations. The contact point life may decrease. (Refer to page 14 for contact protection box.)

# Magnetic Field Resistant 2-Color Display Solid State Auto Switch

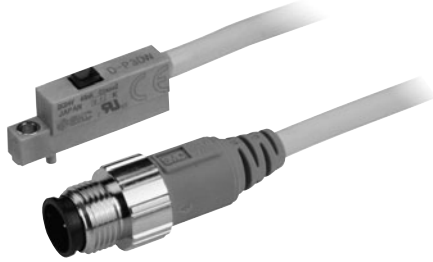
## D-P3DWSC/D-P3DWSE

(Electrical entry: Pre-wired connector)



For details about certified products conforming to international standards, visit us at [www.smcworld.com](http://www.smcworld.com).

- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- A proper operating range can be determined by the color of the light.  
(Red → Green ← Red)



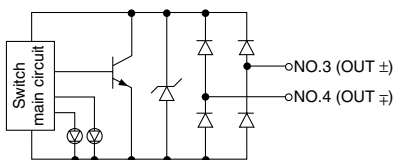
### Caution

#### Precautions

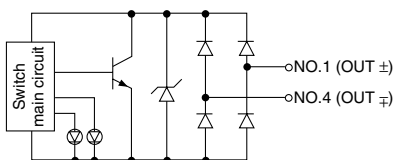
For single-phase AC welding machines  
If it is used for current inverter welders (including rectifying type) and condenser type welders, the magnetic field resistance is reduced. Please contact SMC regarding the performance.

### Auto Switch Internal Circuit

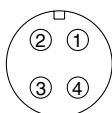
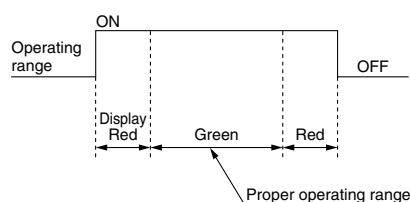
#### D-P3DWSC



#### D-P3DWSE



### Indicator light/Display method



Connector pin assignment

### Auto Switch Specifications

PLC: Programmable Logic Controller

| D-P3DWSC/E (With indicator light) |                                                                                               |          |
|-----------------------------------|-----------------------------------------------------------------------------------------------|----------|
| Auto switch model                 | D-P3DWSC                                                                                      | D-P3DWSE |
| Applicable load                   | 24 VDC relay, PLC                                                                             |          |
| Load voltage                      | 24 VDC (20 to 28 VDC)                                                                         |          |
| Load current                      | 6 to 40 mA                                                                                    |          |
| Internal voltage drop             | 5 V or less                                                                                   |          |
| Leakage current                   | 1 mA or less at 24 VDC                                                                        |          |
| Operating time                    | 40 ms or less                                                                                 |          |
| Indicator light                   | Operating range.....Red LED illuminates.<br>Proper operating range.....Green LED illuminates. |          |
| Standards                         | CE marking, UL (CSA), RoHS                                                                    |          |

- Lead wire — Oilproof heavy-duty vinyl cable,  $\phi 4.8$ , 0.5 mm<sup>2</sup>, 2 cores
- Impact resistance — Switch: 1000 m/s<sup>2</sup>, Connector: 300 m/s<sup>2</sup>
- Insulation resistance — 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case)
- Withstand voltage — 1000 VAC for 1 minute (between lead wire and case)
- Ambient temperature — -10 to 60°C
- Enclosure — IEC60529 standard IP67
- Polarity: Non-polar

### Magnetic Field Resistance

If the current of the AC welding machine is 16000 A or lower, the auto switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder/actuator or auto switch is 0 mm. Please contact SMC when the AC welding current exceeds 16000 A.

### Weight

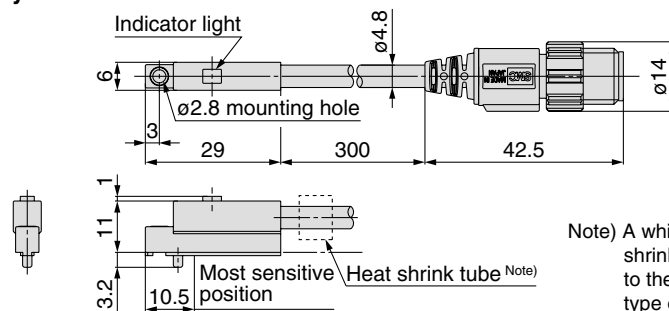
Unit: g

| Auto switch model    | D-P3DWSC | D-P3DWSE |
|----------------------|----------|----------|
| Lead wire length (m) | 0.3      | 23       |

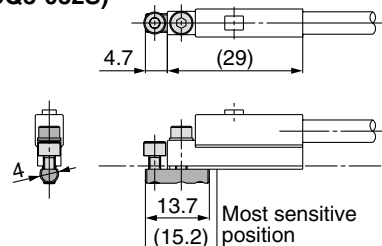
### Dimensions

Unit: mm

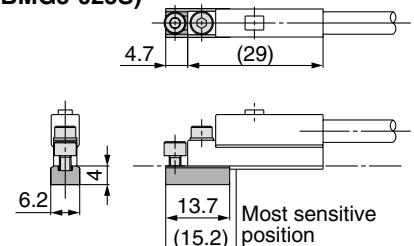
#### Body



#### Auto switch mounting bracket (For round groove mounting: BQ3-032S)



#### Auto switch mounting bracket (For square groove mounting: BMG5-025S)



\* When the auto switch is ordered on its own, the auto switch mounting bracket is not enclosed. In that case, please order it separately.

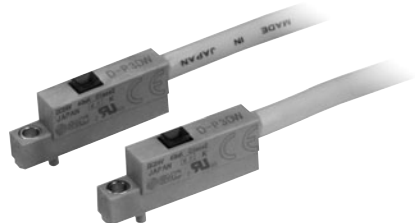
# Magnetic Field Resistant 2-Color Display Solid State Auto Switch D-P3DW/L/Z

(Electrical entry: Grommet)



For details about certified products conforming to international standards, visit us at [www.smcworld.com](http://www.smcworld.com).

- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- A proper operating range can be determined by the color of the light.  
(Red → Green ← Red)



## Caution

### Precautions

For single-phase AC welding machines  
If it is used for current inverter welders (including rectifying type) and condenser type welders, the magnetic field resistance is reduced. Please contact SMC regarding the performance.

## Auto Switch Specifications

PLC: Programmable Logic Controller

| D-P3DW/L/Z (With indicator light) |                                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------------------|
| Auto switch model                 | D-P3DW/L/Z                                                                                    |
| Applicable load                   | 24 VDC relay, PLC                                                                             |
| Load voltage                      | 24 VDC (20 to 28 VDC)                                                                         |
| Load current                      | 6 to 40 mA                                                                                    |
| Internal voltage drop             | 5 V or less                                                                                   |
| Leakage current                   | 1 mA or less at 24 VDC                                                                        |
| Operating time                    | 40 ms or less                                                                                 |
| Indicator light                   | Operating range.....Red LED illuminates.<br>Proper operating range.....Green LED illuminates. |
| Standards                         | CE marking, UL (CSA), RoHS                                                                    |

- Lead wire — Oilproof heavy-duty vinyl cable,  $\phi 4.8$ , 0.5 mm<sup>2</sup>, 2 cores,  
D-P3DW: 0.5 m, D-P3DWL: 3 m, D-P3DWZ: 5 m
- Impact resistance — Switch: 1000 m/s<sup>2</sup>
- Insulation resistance — 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case)
- Withstand voltage — 1000 VAC for 1 minute (between lead wire and case)
- Ambient temperature — -10 to 60°C
- Enclosure — IEC60529 standard IP67
- Polarity: Non-polar

## Magnetic Field Resistance

If the current of the AC welding machine is 16000 A or lower, the auto switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder/actuator or auto switch is 0 mm. Please contact SMC when the AC welding current exceeds 16000 A.

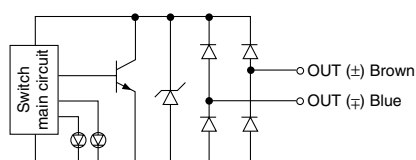
## Weight

Unit: g

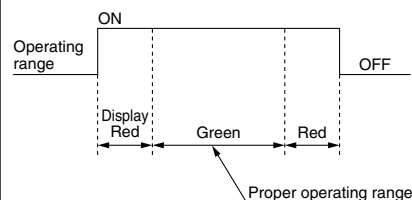
| Auto switch model    | D-P3DW/L/Z |     |
|----------------------|------------|-----|
| Lead wire length (m) | 0.5        | 20  |
|                      | 3          | 102 |
|                      | 5          | 168 |

## Auto Switch Internal Circuit

### D-P3DW/L/Z



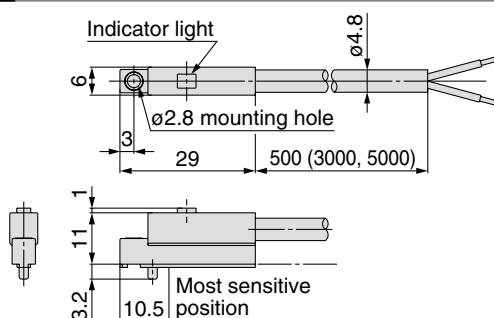
### Indicator light/Display method



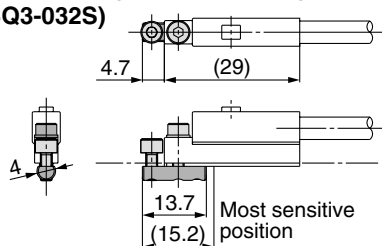
## Dimensions

Unit: mm

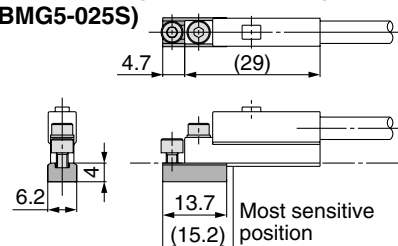
### Body



### Auto switch mounting bracket (For round groove mounting: BQ3-032S)



### Auto switch mounting bracket (For square groove mounting: BMG5-025S)



\* When the auto switch is ordered on its own, the auto switch mounting bracket is not enclosed. In that case, please order it separately.

# ISO Standards [ISO/21287]

## Compact Cylinder (ATEX directive category 2)

# Series 55-C55

ø20,ø25,ø32,ø40,ø50,ø63,ø80,ø100



### How to Order

55 - C D 55 B 20 - 10

**ATEX directive category 2**

|    |                                          |
|----|------------------------------------------|
| 55 | Compliant with ATEX directive category 2 |
|----|------------------------------------------|

**Magnet**

|     |                 |
|-----|-----------------|
| Nil | None            |
| D   | Built-in magnet |

**Mounting style**

|   |                                                 |
|---|-------------------------------------------------|
| B | Through-hole/Both ends tapped common (Standard) |
| L | Foot style                                      |
| F | Rod side flange style                           |
| G | Head side flange style                          |
| C | Single clevis style                             |

**Bore size**

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

**Rod end thread**

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| M   | Rod end male thread   |

**Cylinder stroke (mm)**  
Refer to page 2 for standard and intermediate strokes.

### Specifications

|                               |            |                                               |
|-------------------------------|------------|-----------------------------------------------|
| Pneumatics                    |            |                                               |
| Type                          |            | Pneumatic (Non-lube)                          |
| Action                        |            | Double acting, Single rod                     |
| Fluid                         |            | Air                                           |
| Proof pressure                |            | 1.5 MPa                                       |
| Maximum operating pressure    |            | 1.0 MPa                                       |
| Minimum operating pressure    |            | 0.05 MPa (ø20 to ø63)<br>0.03 MPa (ø80, ø100) |
| Ambient and fluid temperature |            | −10 to 60°C (No freezing)                     |
| Cushion                       |            | Rubber bumper on both end                     |
| Stroke length tolerance       |            | +1.0<br>0 mm                                  |
| Mounting                      |            | Through-hole/Both ends tapped common          |
| Piston speed                  | ø20 to ø63 | 50 to 500 mm/s                                |
|                               | ø80, ø100  | 50 to 300 mm/s                                |

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

When using an Auto switch, select the appropriate switch from the following table and order it separately.

### Applicable auto switch specifications

Auto switch only conforms to Category 3. (II 3GD EEx nA II T5x -10°C ≤ Ta ≤ +60°C IP67)  
For detailed specifications on the D-M9P(V), A93(V) and A90(V), please refer to page 16, 19.  
(Note: Reed auto switches for 100 VAC and 100 VDC are not within the specification.)

| Type               | Model        | Electrical entry        | Indicator light | Wiring (output) | Load voltage |          | Lead wire length (m) * |       |       | Applicable load |            |            |  |  |  |  |
|--------------------|--------------|-------------------------|-----------------|-----------------|--------------|----------|------------------------|-------|-------|-----------------|------------|------------|--|--|--|--|
|                    |              |                         |                 |                 | DC           | AC       | 0.5 (Nil)              | 3 (L) | 5 (Z) |                 |            |            |  |  |  |  |
| Reed switch        | D-M9PV□-588  | Grommet (Perpendicular) | Yes             | 3-wire (PNP)    | 24 V         | 5V, 12 V | —                      | ●     | ●     | ○               | IC circuit | Relay, PLC |  |  |  |  |
|                    | D-M9P□-588   | Grommet (in-line)       |                 |                 |              |          |                        | ●     | ●     | ○               |            |            |  |  |  |  |
|                    | D-M9PWV□-588 | Grommet (Perpendicular) | Yes (2-color)   |                 |              |          |                        | ●     | ●     | ○               |            |            |  |  |  |  |
|                    | D-M9PW□-588  | Grommet (in-line)       |                 |                 |              |          |                        | ●     | ●     | ○               |            |            |  |  |  |  |
| Solid state switch | D-A93V□-588  | Grommet (Perpendicular) | Yes             | 2-wire          | 24 V         | 12 V     | —                      | ●     | ●     | ●               | —          |            |  |  |  |  |
|                    | D-A90V□-588  |                         | No              |                 | 24 V or less | 48 V     | 48 V or less           | ●     | ●     | —               | IC circuit |            |  |  |  |  |
|                    | D-A93□-588   | Grommet (in-line)       | Yes             |                 | 24 V         | 12 V     | —                      | ●     | ●     | ●               | —          |            |  |  |  |  |
|                    | D-A90□-588   |                         | No              |                 | 24 V or less | 48 V     | 48 V or less           | ●     | ●     | —               | IC circuit |            |  |  |  |  |

\* Lead wire length symbols: 0.5 m ..... Nil (Example) D-A93-588  
3 m ..... L (Example) D-A93L-588  
5 m ..... Z (Example) D-A93Z-588

\* ○ solid state auto switch is available after receiving an order.

Note) When mounting an auto switch on a 55-series (Category 2) model, the ATEX class of the cylinder with auto switch changes to Category 3, which is the same class as the auto switch.

## Safety Instructions

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

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- \*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots - Safety.  
etc.

### Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

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

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

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

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

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

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

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

If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/ Compliance Requirements

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

Read and accept them before using the product.

### Limited warranty and Disclaimer

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

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

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

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

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

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

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

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

### Compliance Requirements

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

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

### Record of changes

Edition B \* Bore sizes ø80, ø100 added.

NZ

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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