

# JIS Standard Compact Hydraulic Cylinder

## Compact Hydraulic Cylinder

### ***CHKD/CHKG Series***

**CHQ**

**CHK** ☐

**CHN**

**CHM**

**CHS** ☐

**CH2** ☐

**CHA**

Related  
Products

**D-** ☐

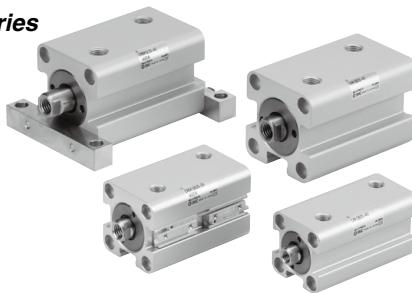
#### ***CHKD Series***



Nominal pressure: **10 MPa**

Bore size (mm): 20, 25, 32, 40, 50, 63, 80, 100

#### ***CHKG Series***



Nominal pressure: **16 MPa**

Bore size (mm): 20, 25, 32, 40, 50, 63, 80, 100

# JIS Standard Compact Hydraulic Cylinder

## CH□KD Series

10 MPa

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

### How to Order

CHKD B 32 □ - 30 □ - □

With Auto Switch

CHDKD B 32 □ - 30 □ - M9BW □ - □

With auto switch  
(built-in magnet)

#### Mounting bracket type

| Symbol | Type       | Port position (Note) |
|--------|------------|----------------------|
| B      | Basic type | Top                  |
| L      | Foot type  | Foot bracket         |
| LB     |            | Right                |
| LD     |            | Left                 |

(Note) Indicates the relative position of the foot bracket and port, as seen from the rod side.

#### 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 |

#### Port thread type

|     |     |
|-----|-----|
| Nil | Rc  |
| TN  | NPT |

#### Cylinder stroke (mm)

Refer to the standard stroke table on page 265.

#### Auto switch type

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

\* Select applicable auto switch models from the table below.

#### Rod end thread type

|     |               |
|-----|---------------|
| Nil | Female thread |
| M   | Male thread   |

\* Rod end thread type is an optional product. (Refer to page 266).

#### Made to Order specifications

For details, refer to page 265.

#### Number of auto switches

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

### Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CHDKDB50-100

### Applicable Auto Switches

Refer to pages 431 to 490 for further details on each auto switch.

| 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   | Electrical entry direction |                    | 0.5 (Nil)            | 1 (M)             | 3 (L)      | 5 (Z) |                     |                 |           |
|                         |                                           |                  |                     |                    |              |      | Perpendicular              | In-line            |                      |                   |            |       |                     |                 |           |
| Solid state auto switch | Diagnostic indication (2-color indicator) | Grommet          | Yes                 | 3-wire (NPN)       | 5 V, 12 V    | —    | M9NV                       | M9N                | ●                    | ●                 | ●          | ○     | ○                   | IC circuit      | Relay PLC |
|                         |                                           |                  |                     | 3-wire (PNP)       |              |      | M9PV                       | M9P                | ●                    | ●                 | ●          | ○     | ○                   |                 |           |
|                         |                                           |                  |                     | 2-wire             | 12 V         |      | M9BV                       | M9B                | ●                    | ●                 | ●          | ○     | ○                   | —               |           |
|                         |                                           |                  |                     | 3-wire (NPN)       | 5 V, 12 V    |      | M9NVW                      | M9NW               | ●                    | ●                 | ●          | ○     | ○                   | IC circuit      |           |
|                         | 3-wire (PNP)                              | 5 V, 12 V        | M9PWV               | M9PW               | ●            | ●    | ●                          | ○                  | ○                    | —                 |            |       |                     |                 |           |
|                         | 2-wire                                    | 12 V             | M9BWV               | M9BW               | ●            | ●    | ●                          | ○                  | ○                    |                   | IC circuit |       |                     |                 |           |
|                         | 3-wire (NPN)                              | 5 V, 12 V        | M9NAV <sup>*1</sup> | M9NA <sup>*1</sup> | ○            | ○    | ○                          | ○                  | ●                    | ●                 |            |       |                     |                 |           |
|                         | 3-wire (PNP)                              | 5 V, 12 V        | M9PAV <sup>*1</sup> | M9PA <sup>*1</sup> | ○            | ○    | ○                          | ○                  | ●                    | ●                 |            |       |                     |                 |           |
| Reed auto switch        | —                                         | Grommet          | Yes                 | 3-wire (NPN)       | —            | 5 V  | M9BAV <sup>*1</sup>        | M9BA <sup>*1</sup> | ○                    | ○                 | ○          | ○     | ○                   | IC circuit      | —         |
|                         |                                           |                  |                     | No                 | 2-wire       | 24 V | 12 V                       | 100 V or less      | A96V <sup>**</sup>   | A96 <sup>**</sup> | ●          | —     | ●                   |                 |           |
|                         |                                           |                  |                     |                    |              |      | A93V <sup>**</sup>         | A93 <sup>**</sup>  | ●                    | ●                 | ●          | ●     | —                   |                 |           |
|                         |                                           |                  |                     |                    |              |      | A90V <sup>**</sup>         | A90 <sup>**</sup>  | ●                    | —                 | ●          | —     | —                   | IC circuit      |           |

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. A water resistant type cylinder is recommended for use in an environment which requires water resistance. Consult with SMC regarding water resistant type for foot type.

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWW

\* Solid state auto switches marked "○" are produced upon receipt of order.  
\*\* The D-A9 model cannot be mounted on ø50.

\* For ø32 to ø100, there are applicable auto switches other than listed. Refer to page 273 for details.

\* For details about auto switches with pre-wired connector, refer to pages 474 and 475.

\* Cylinders with auto switch will be shipped together with the auto switch and auto switch mounting bracket (ø32 to ø50) (not assembled).

Specifications



| Bore size (mm)                | 20                                   | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------------------------|--------------------------------------|----|----|----|----|----|----|-----|
| Action                        | Double acting/Single rod             |    |    |    |    |    |    |     |
| Fluid                         | Hydraulic fluid                      |    |    |    |    |    |    |     |
| Nominal pressure              | 10 MPa                               |    |    |    |    |    |    |     |
| Proof pressure                | 15 MPa                               |    |    |    |    |    |    |     |
| Maximum allowable pressure    | 13 MPa                               |    |    |    |    |    |    |     |
| Minimum operating pressure    | 0.3 MPa                              |    |    |    |    |    |    |     |
| Ambient and fluid temperature | Without auto switch: -10° to 80°C    |    |    |    |    |    |    |     |
|                               | With auto switch: -10° to 60°C       |    |    |    |    |    |    |     |
| Piston speed                  | 8 to 100 mm/s                        |    |    |    |    |    |    |     |
| Cushion                       | None                                 |    |    |    |    |    |    |     |
| Rod end thread                | Female thread, Male thread           |    |    |    |    |    |    |     |
| Stroke length tolerance       | +0.8<br>0 mm                         |    |    |    |    |    |    |     |
| Mounting type                 | Basic type (through hole), Foot type |    |    |    |    |    |    |     |

Note) Refer to page 214 for definitions of terms related to pressure.



Made to Order specifications  
(For details, refer to pages 275 to 278)

| Symbol | Specifications                                  |
|--------|-------------------------------------------------|
| -XA□   | Change of rod end shape                         |
| -XC61  | Compatible with CHQHB series (14 MPa)           |
| -XC63  | Intermediate stroke type (Built-in spacer type) |
| -XC64  | With air release valve                          |

Standard Strokes

| Stroke<br>(mm)    |        |    |            |         |   |    |    |    |    |    | 75                                                   |    |    |    | 100                                                  |    |    |    |
|-------------------|--------|----|------------|---------|---|----|----|----|----|----|------------------------------------------------------|----|----|----|------------------------------------------------------|----|----|----|
|                   |        |    |            |         |   |    |    |    |    |    | Intermediate stroke [XC63]<br>(Built-in spacer type) |    |    |    | Intermediate stroke [XC63]<br>(Built-in spacer type) |    |    |    |
|                   |        |    |            |         |   |    |    |    |    |    | 55                                                   | 60 | 65 | 70 | 80                                                   | 85 | 90 | 95 |
| Bore size<br>(mm) | 20, 25 | 32 | 40, 50, 63 | 80, 100 | 5 | 10 | 15 | 20 | 25 | 30 | 35                                                   | 40 | 45 | 50 | 55                                                   | 60 | 65 | 70 |
| 20, 25            | ○      | ○  | ○          | ○       | ○ | ○  | ○  | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  |
| 32                | ○      | ○  | ○          | ○       | ○ | ○  | ○  | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  |
| 40, 50, 63        | ○      | ○  | ○          | ○       | ○ | ○  | ○  | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  |
| 80, 100           | ○      | ○  | ○          | ○       | ○ | ○  | ○  | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  | ○                                                    | ○  | ○  | ○  |

○: Standard stroke (dedicated cylinder tube)  
□: Intermediate stroke XC63 (built-in spacer type)



Manufacture of Intermediate Stroke Cylinders  
[XC63] (Built-in spacer type)

Intermediate strokes in 5 mm increments can be manufactured by installing spacers inside standard stroke cylinders. (Except ø20, ø25) 55, 60, 65 and 70 mm stroke cylinders have the same overall length as a 75 mm stroke cylinder, and 80, 85, 90 and 95 mm stroke cylinders have the same length as a 100 mm stroke cylinder.  
Refer to the Made to Order Specifications on page 277 for the ordering procedure.

Hydraulic Fluid Compatibility

| Hydraulic fluid                  | Compatibility  |
|----------------------------------|----------------|
| Standard mineral hydraulic fluid | Compatible     |
| W/O hydraulic fluid              | Compatible     |
| O/W hydraulic fluid              | Compatible     |
| Water/Glycol hydraulic fluid     | *              |
| Phosphate hydraulic fluid        | Not compatible |

\* Consult with SMC.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□

Theoretical Output

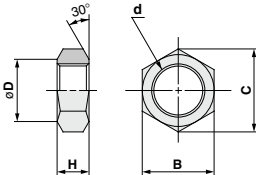
Unit: N

| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm²) | Operating pressure (MPa) |       |       |
|----------------|---------------|---------------------|-------------------|--------------------------|-------|-------|
|                |               |                     |                   | 3.5                      | 7     | 10    |
| 20             | 12            | OUT                 | 314               | 1099                     | 2198  | 3140  |
|                |               | IN                  | 201               | 704                      | 1407  | 2010  |
| 25             | 14            | OUT                 | 490               | 1715                     | 3430  | 4900  |
|                |               | IN                  | 336               | 1176                     | 2352  | 3360  |
| 32             | 18            | OUT                 | 804               | 2814                     | 5628  | 8040  |
|                |               | IN                  | 549               | 1922                     | 3843  | 5490  |
| 40             | 22.4          | OUT                 | 1256              | 4396                     | 8792  | 12560 |
|                |               | IN                  | 862               | 3017                     | 6034  | 8620  |
| 50             | 28            | OUT                 | 1963              | 6871                     | 13741 | 19630 |
|                |               | IN                  | 1347              | 4715                     | 9429  | 13470 |
| 63             | 35.5          | OUT                 | 3117              | 10910                    | 21819 | 31170 |
|                |               | IN                  | 2127              | 7445                     | 14889 | 21270 |
| 80             | 45            | OUT                 | 5026              | 17591                    | 35182 | 50260 |
|                |               | IN                  | 3436              | 12026                    | 24052 | 34360 |
| 100            | 56            | OUT                 | 7853              | 27486                    | 54971 | 78530 |
|                |               | IN                  | 5390              | 18865                    | 37730 | 53900 |

Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

Optional Parts

Rod end nut



(mm)

| Part no. | Bore size (mm) | B  | C    | d          | D    | H  |
|----------|----------------|----|------|------------|------|----|
| NTH-020  | 20             | 13 | 15   | M8 x 1     | 12.5 | 5  |
| NTH-025  | 20             | 17 | 19.6 | M10 x 1.25 | 16.5 | 6  |
| NTH-032  | 25             | 19 | 21.9 | M12 x 1.25 | 18   | 7  |
| NTH-040  | 32             | 22 | 25.4 | M16 x 1.5  | 21   | 10 |
| NTH-050  | 40             | 27 | 31.2 | M20 x 1.5  | 26   | 12 |
| NTH-060  | 50             | 32 | 37   | M24 x 1.5  | 31   | 14 |
| NTH-080  | 63             | 41 | 47.3 | M30 x 1.5  | 40   | 17 |
| NTH-100  | 80             | 55 | 63.5 | M39 x 1.5  | 54   | 20 |
| NTH-125  | 100            | 70 | 80.8 | M48 x 1.5  | 69   | 26 |

Note) There may be a slight difference between the part numbers and the corresponding bore size.

Weight

CH□KDB/Basic type

Unit: g

| Bore size (mm) | Standard stroke (mm) |      |      |      |      |      |      |      |      |      |      |       |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|-------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100   |
| 20             | 218                  | 240  | 262  | 282  | 304  | 326  | 348  | 370  | 392  | 414  | —    | —     |
| 25             | 299                  | 327  | 355  | 383  | 411  | 439  | 467  | 495  | 523  | 551  | —    | —     |
| 32             | 515                  | 558  | 601  | 644  | 687  | 730  | 773  | 816  | 859  | 902  | 1117 | 1332  |
| 40             | 729                  | 784  | 839  | 894  | 949  | 1004 | 1059 | 1114 | 1169 | 1224 | 1499 | 1774  |
| 50             | 1065                 | 1139 | 1213 | 1287 | 1361 | 1435 | 1509 | 1583 | 1657 | 1731 | 2101 | 2471  |
| 63             | 1773                 | 1882 | 1991 | 2100 | 2209 | 2318 | 2427 | 2536 | 2645 | 2754 | 3299 | 3844  |
| 80             | 3216                 | 3379 | 3542 | 3868 | 4031 | 4194 | 4357 | 4520 | 4683 | 4846 | 5661 | 6476  |
| 100            | 6142                 | 6384 | 6626 | 6868 | 7110 | 7352 | 7594 | 7836 | 8078 | 8320 | 9530 | 10740 |

CH□KDL/Foot type

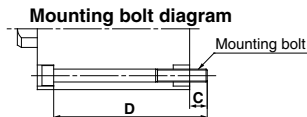
Unit: g

| Bore size<br>(mm) | Standard stroke (mm) |       |       |       |       |       |       |       |       |       |       |       |
|-------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                   | 5                    | 10    | 15    | 20    | 25    | 30    | 35    | 40    | 45    | 50    | 75    | 100   |
| 20                | 465                  | 490   | 510   | 535   | 560   | 580   | 605   | 630   | 650   | 675   | —     | —     |
| 25                | 570                  | 600   | 630   | 660   | 690   | 720   | 750   | 780   | 810   | 840   | —     | —     |
| 32                | 880                  | 925   | 970   | 1015  | 1060  | 1100  | 1150  | 1190  | 1235  | 1280  | 1505  | 1730  |
| 40                | 1375                 | 1435  | 1495  | 1550  | 1610  | 1670  | 1725  | 1785  | 1845  | 1900  | 2195  | 2485  |
| 50                | 2200                 | 2280  | 2360  | 2435  | 2515  | 2595  | 2675  | 2755  | 2835  | 2910  | 3310  | 3705  |
| 63                | 3845                 | 3960  | 4075  | 4195  | 4310  | 4425  | 4545  | 4660  | 4775  | 4895  | 5475  | 6060  |
| 80                | 6555                 | 6725  | 6900  | 7235  | 7410  | 7580  | 7755  | 7930  | 8100  | 8275  | 9150  | 10010 |
| 100               | 11355                | 11610 | 11865 | 12120 | 12375 | 12630 | 12885 | 13140 | 13400 | 13655 | 14930 | 16210 |

## Mounting Bolts for CH□KDB The mounting bolts shown below conform to JIS B 1176, strength class 10.9 or higher.

Through hole type mounting bolts are available.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

**Example) CQ-M5x55L 4 pcs.**



| Model                 | C    | D   | Mounting bolt part no. |
|-----------------------|------|-----|------------------------|
| <b>CH□KDB20-5 (M)</b> | 12.4 | 55  | CQ-M5 x 55L            |
| -10 (M)               |      | 60  | x 60L                  |
| -15 (M)               |      | 65  | x 65L                  |
| -20 (M)               |      | 70  | x 70L                  |
| -25 (M)               |      | 75  | x 75L                  |
| -30 (M)               |      | 80  | x 80L                  |
| -35 (M)               |      | 85  | x 85L                  |
| -40 (M)               |      | 90  | x 90L                  |
| -45 (M)               |      | 95  | x 95L                  |
| -50 (M)               |      | 100 | x 100L                 |
| <b>CH□KDB25-5 (M)</b> | 10.4 | 55  | CQ-M5 x 55L            |
| -10 (M)               |      | 60  | x 60L                  |
| -15 (M)               |      | 65  | x 65L                  |
| -20 (M)               |      | 70  | x 70L                  |
| -25 (M)               |      | 75  | x 75L                  |
| -30 (M)               |      | 80  | x 80L                  |
| -35 (M)               |      | 85  | x 85L                  |
| -40 (M)               |      | 90  | x 90L                  |
| -45 (M)               |      | 95  | x 95L                  |
| -50 (M)               |      | 100 | x 100L                 |
| <b>CH□KDB32-5 (M)</b> | 10.5 | 60  | CQ-M6 x 60L            |
| -10 (M)               |      | 65  | x 65L                  |
| -15 (M)               |      | 70  | x 70L                  |
| -20 (M)               |      | 75  | x 75L                  |
| -25 (M)               |      | 80  | x 80L                  |
| -30 (M)               |      | 85  | x 85L                  |
| -35 (M)               |      | 90  | x 90L                  |
| -40 (M)               |      | 95  | x 95L                  |
| -45 (M)               |      | 100 | x 100L                 |
| -50 (M)               |      | 105 | x 105L                 |
| -75 (M)               |      | 130 | x 130L                 |
| <b>CH□KDB40-5 (M)</b> | 13.5 | 65  | CQ-M8 x 65L            |
| -10 (M)               |      | 70  | x 70L                  |
| -15 (M)               |      | 75  | x 75L                  |
| -20 (M)               |      | 80  | x 80L                  |
| -25 (M)               |      | 85  | x 85L                  |
| -30 (M)               |      | 90  | x 90L                  |
| -35 (M)               |      | 95  | x 95L                  |
| -40 (M)               |      | 100 | x 100L                 |
| -45 (M)               |      | 105 | x 105L                 |
| -50 (M)               |      | 110 | x 110L                 |
| -75 (M)               |      | 135 | x 135L                 |
| -100 (M)              |      | 160 | x 160L                 |

| Model                  | C    | D   | Mounting bolt part no. |
|------------------------|------|-----|------------------------|
| <b>CH□KDB50-5 (M)</b>  | 15.8 | 70  | CQ-M10 x 70L           |
| -10 (M)                |      | 75  | x 75L                  |
| -15 (M)                |      | 80  | x 80L                  |
| -20 (M)                |      | 85  | x 85L                  |
| -25 (M)                |      | 90  | x 90L                  |
| -30 (M)                |      | 95  | x 95L                  |
| -35 (M)                |      | 100 | x 100L                 |
| -40 (M)                |      | 105 | x 105L                 |
| -45 (M)                |      | 110 | x 110L                 |
| -50 (M)                |      | 115 | x 115L                 |
| -75 (M)                |      | 140 | x 140L                 |
| -100 (M)               |      | 165 | x 165L                 |
| <b>CH□KDB63-5 (M)</b>  | 16   | 75  | CQ-M12 x 75L           |
| -10 (M)                |      | 80  | x 80L                  |
| -15 (M)                |      | 85  | x 85L                  |
| -20 (M)                |      | 90  | x 90L                  |
| -25 (M)                |      | 95  | x 95L                  |
| -30 (M)                |      | 100 | x 100L                 |
| -35 (M)                |      | 105 | x 105L                 |
| -40 (M)                |      | 110 | x 110L                 |
| -45 (M)                |      | 115 | x 115L                 |
| -50 (M)                |      | 120 | x 120L                 |
| -75 (M)                |      | 145 | x 145L                 |
| -100 (M)               |      | 170 | x 170L                 |
| <b>CH□KDB80-5 (M)</b>  | 22.2 | 90  | CQ-M14 x 90L           |
| -10 (M)                |      | 95  | x 95L                  |
| -15 (M)                |      | 100 | x 100L                 |
| -20 (M)                |      | 105 | x 105L                 |
| -25 (M)                |      | 110 | x 110L                 |
| -30 (M)                |      | 115 | x 115L                 |
| -35 (M)                |      | 120 | x 120L                 |
| -40 (M)                |      | 125 | x 125L                 |
| -45 (M)                |      | 130 | x 130L                 |
| -50 (M)                |      | 135 | x 135L                 |
| -75 (M)                |      | 160 | x 160L                 |
| -100 (M)               |      | 185 | x 185L                 |
| <b>CH□KDB100-5 (M)</b> | 26.5 | 110 | CQ-M16 x 110L          |
| -10 (M)                |      | 115 | x 115L                 |
| -15 (M)                |      | 120 | x 120L                 |
| -20 (M)                |      | 125 | x 125L                 |
| -25 (M)                |      | 130 | x 130L                 |
| -30 (M)                |      | 135 | x 135L                 |
| -35 (M)                |      | 140 | x 140L                 |
| -40 (M)                |      | 145 | x 145L                 |
| -45 (M)                |      | 150 | x 150L                 |
| -50 (M)                |      | 155 | x 155L                 |
| -75 (M)                |      | 180 | x 180L                 |
| -100 (M)               |      | 205 | x 205L                 |

CHQ

CHK□

CHN

CHM

CHS□

CH2□

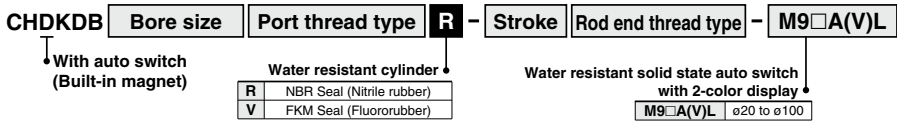
CHA

Related Products

D-□

Water Resistant Type

A special scraper is installed on the basic cylinder to prevent liquid in the surrounding area from entering the cylinder. It can be used in environments where exposure to machine tool coolants is likely, as well as in environments where water spray and splashing is frequent, such as in food processing machinery and car washing equipment.



Some of the parts are different from the dimensions of the basic type.  
Refer to Best Pneumatics No. 2-1 for details.

⚠ Specific Product Precautions

Be sure to read this before handling the products.  
Refer to back page 50 for Safety Instructions and pages 214 to 221 for Hydraulic Cylinder and Auto Switch Precautions.

Usage

⚠ Caution

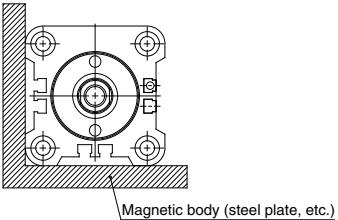
- 1. Use hexagon socket head cap screws (JISB1176, strength class 10.9 or higher) for cylinder mounting.
- 2. Since a lateral load (eccentric load) cannot be applied to the piston rod, build the mounting jig in such a way that a lateral load will not be applied to the piston rod.
- 3. Make sure that the interlocking length of the rod end thread (male or female thread) and the mounting material is at least 80% of the thread diameter.
- 4. When operating a cylinder for the first time, be sure to release the air inside the cylinder and the piping. When the air release is complete, operate the cylinder at reduced pressure, then gradually increase it to the normal operating pressure.

- 5. Since CH□KDB series does not have an air release plug, release air from other components (e.g. from piping, etc.) as well.
- 6. Do not use two cylinders facing one another horizontally or vertically in such a way that their piston rods strike each other.
- 7. When the cylinder head side contains hydraulic fluid or is in a normally pressurized condition, the applied load must not be allowed to strike the piston rod end. Avoid such applications.
- 8. When mounting the cylinder body with mounting bolts, use tightening torques in the table at left as a guide.

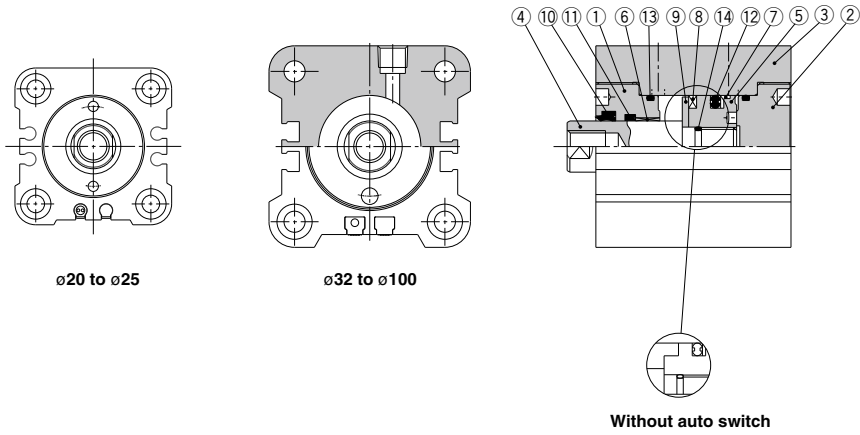
Body mounting bolt tightening torques

| Bore size (mm) | Mounting bolt size | Tightening torque (N·m) |
|----------------|--------------------|-------------------------|
| 20             | M5                 | 2.5                     |
| 25             | M5                 | 4                       |
| 32             | M6                 | 7                       |
| 40             | M8                 | 16                      |
| 50             | M10                | 30                      |
| 63             | M12                | 40                      |
| 80             | M14                | 70                      |
| 100            | M16                | 100                     |

Consult with SMC when using a cylinder in close proximity to a magnetic body (including proximity on any side) as shown in the figure below, as the operation of auto switches may become unstable.



Construction



- CHQ
- CHK□
- CHN
- CHM
- CHS□
- CH2□
- CHA
- Related Products
- D-□

Parts List

| No. | Description   | Material                |                                 | Note                        |
|-----|---------------|-------------------------|---------------------------------|-----------------------------|
| 1   | Rod cover     | Aluminum alloy          |                                 | Black anodized              |
| 2   | Head cover    | Aluminum alloy          |                                 | Black anodized              |
| 3   | Cylinder tube | Aluminum alloy          |                                 | Hard anodized               |
| 4   | Piston rod    | ø20, ø25<br>ø32 to ø100 | Stainless steel<br>Carbon steel | Hard chromium electroplated |
| 5   | Piston        | Stainless steel         |                                 |                             |
| 6   | Bushing       | Copper alloy            |                                 |                             |
| 7   | Back-up ring  | Resin                   |                                 |                             |
| 8   | Magnet        | —                       |                                 | With auto switch only       |
| 9   | Magnet plate  | Stainless steel         |                                 | With auto switch only       |
| 10  | Scraper       | NBR                     |                                 |                             |
| 11  | Rod seal      |                         |                                 |                             |
| 12  | Piston seal   |                         |                                 |                             |
| 13  | Tube gasket   |                         |                                 |                             |
| 14  | Piston gasket |                         |                                 |                             |

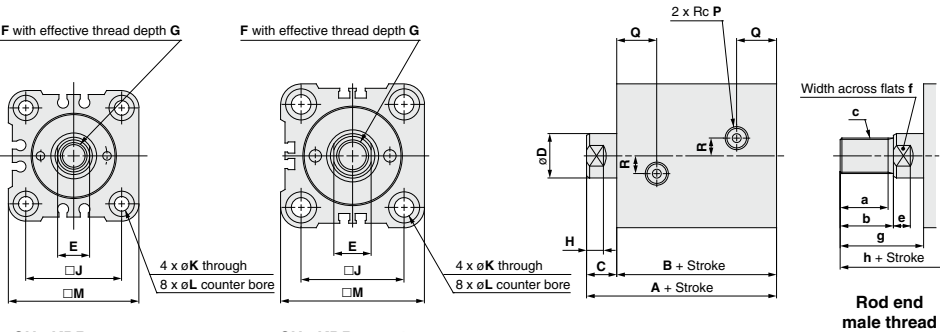
Replacement Parts/Seal Kit

| Bore size (mm) | Seal kit no. | Content                                       |
|----------------|--------------|-----------------------------------------------|
| 20             | CHKD20-PS    | Nos. ⑦, ⑩, ⑪, ⑫, and ⑬ from the chart at left |
| 25             | CHKD25-PS    |                                               |
| 32             | CHKD32-PS    |                                               |
| 40             | CHKD40-PS    |                                               |
| 50             | CHKD50-PS    |                                               |
| 63             | CHKD63-PS    |                                               |
| 80             | CHKD80-PS    |                                               |
| 100            | CHKD100-PS   |                                               |

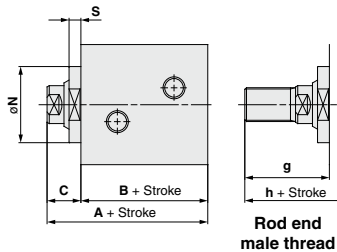
- \* Seal kit consists of items ⑦, ⑩, ⑪, ⑫ and ⑬, and can be ordered by using the seal kit number for each bore size.
- \* Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

Dimensions

Basic type/CH□KDB



Water resistant type



| Bore size (mm) | A   | B  | C  | D    | E  | F          | G  | H  | J   | K   | L               | M   | P   | Q    | R  |
|----------------|-----|----|----|------|----|------------|----|----|-----|-----|-----------------|-----|-----|------|----|
| 20             | 51  | 43 | 8  | 12   | 10 | M8 x 1.25  | 10 | 6  | 30  | 5.5 | 9.5 depth 5.4   | 43  | 1/8 | 16.5 | 6  |
| 25             | 53  | 45 | 8  | 14   | 12 | M10 x 1.5  | 12 | 6  | 36  | 5.5 | 9.5 depth 5.4   | 49  | 1/8 | 17   | 8  |
| 32             | 61  | 51 | 10 | 18   | 14 | M12 x 1.75 | 15 | 7  | 47  | 6.6 | 11 depth 6.5    | 63  | 1/4 | 19.5 | 10 |
| 40             | 65  | 55 | 10 | 22.4 | 19 | M16 x 2    | 20 | 7  | 52  | 9   | 14 depth 8.6    | 71  | 1/4 | 20.5 | 10 |
| 50             | 71  | 60 | 11 | 28   | 24 | M20 x 2.5  | 24 | 8  | 58  | 11  | 17.5 depth 10.8 | 81  | 1/4 | 22   | 10 |
| 63             | 80  | 67 | 13 | 35.5 | 30 | M27 x 3    | 33 | 9  | 69  | 13  | 20 depth 13     | 97  | 1/4 | 25.5 | 10 |
| 80             | 95  | 78 | 17 | 45   | 41 | M30 x 3.5  | 36 | 14 | 86  | 15  | 23 depth 15.2   | 117 | 3/8 | 30   | 15 |
| 100            | 122 | 96 | 26 | 56   | 50 | M39 x 4    | 45 | 21 | 106 | 17  | 26 depth 17.5   | 142 | 3/8 | 36   | 15 |

Note 1) Body dimensions are the same with or without auto switches.

Rod end male threads

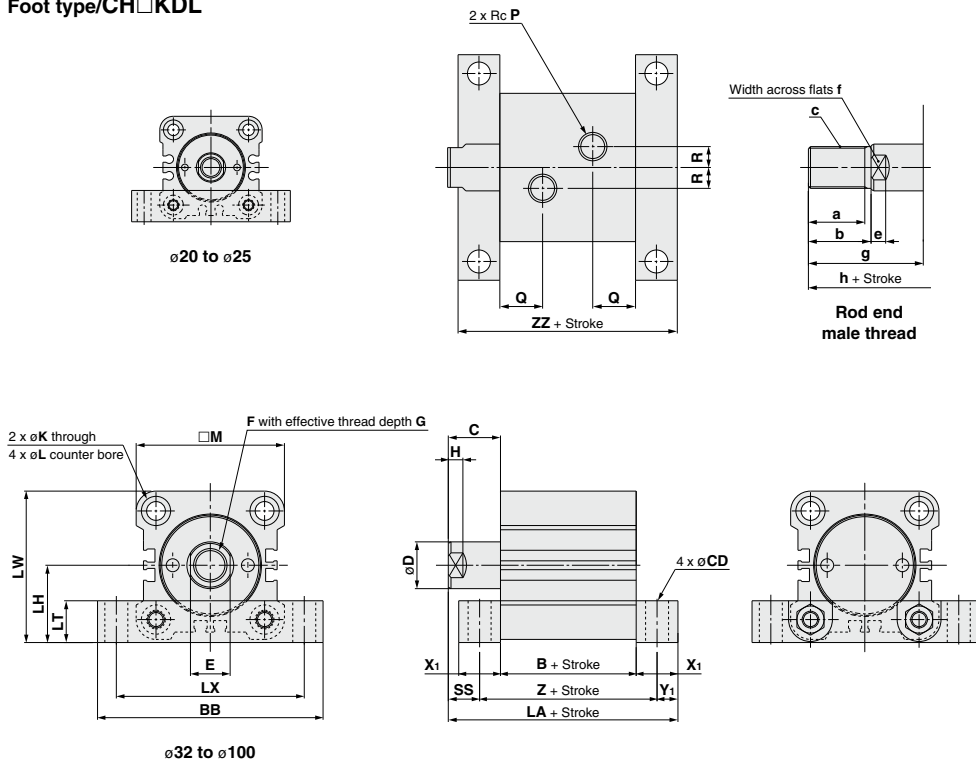
| Bore size (mm) | a    | b  | c          | e  | f  | g   | h   |
|----------------|------|----|------------|----|----|-----|-----|
| 20             | 12.5 | 15 | M10 x 1.25 | 6  | 10 | 23  | 66  |
| 25             | 15.5 | 18 | M12 x 1.25 | 6  | 12 | 26  | 71  |
| 32             | 22   | 25 | M16 x 1.5  | 7  | 14 | 35  | 86  |
| 40             | 27   | 30 | M20 x 1.5  | 7  | 19 | 40  | 95  |
| 50             | 32   | 35 | M24 x 1.5  | 8  | 24 | 46  | 106 |
| 63             | 42   | 45 | M30 x 1.5  | 9  | 30 | 58  | 125 |
| 80             | 57   | 60 | M39 x 1.5  | 14 | 41 | 77  | 155 |
| 100            | 72   | 75 | M48 x 1.5  | 21 | 50 | 101 | 197 |

Water resistant type

| Bore size (mm) | A   | B  | C  | N    | S | g   | h   |
|----------------|-----|----|----|------|---|-----|-----|
| 20             | 61  | 43 | 18 | 26.5 | 6 | 33  | 76  |
| 25             | 63  | 45 | 18 | 30   | 6 | 36  | 81  |
| 32             | 71  | 51 | 20 | 38   | 7 | 45  | 96  |
| 40             | 75  | 55 | 20 | 45   | 7 | 50  | 105 |
| 50             | 81  | 60 | 21 | 55   | 7 | 56  | 116 |
| 63             | 90  | 67 | 23 | 66   | 7 | 68  | 135 |
| 80             | 105 | 78 | 27 | 86   | 7 | 87  | 165 |
| 100            | 132 | 96 | 36 | 104  | 7 | 111 | 207 |

## Dimensions

### Foot type/CH□KDL



CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□

| Bore size (mm) | LA  | B  | BB  | C  | CD  | D    | E  | F          | G  | H  | K   | L               | LH | LT | LX  |
|----------------|-----|----|-----|----|-----|------|----|------------|----|----|-----|-----------------|----|----|-----|
| 20             | 76  | 43 | 70  | 18 | 6.6 | 12   | 10 | M8 x 1.25  | 10 | 6  | 5.5 | 9.5 depth 5.4   | 23 | 15 | 58  |
| 25             | 78  | 45 | 76  | 18 | 6.6 | 14   | 12 | M10 x 1.5  | 12 | 6  | 5.5 | 9.5 depth 5.4   | 26 | 15 | 64  |
| 32             | 86  | 51 | 94  | 19 | 9   | 18   | 14 | M12 x 1.75 | 15 | 7  | 6.6 | 11 depth 6.5    | 33 | 16 | 79  |
| 40             | 98  | 55 | 108 | 23 | 11  | 22.4 | 19 | M16 x 2    | 20 | 7  | 9   | 14 depth 8.6    | 37 | 20 | 90  |
| 50             | 111 | 60 | 126 | 27 | 14  | 28   | 24 | M20 x 2.5  | 24 | 8  | 11  | 17.5 depth 10.8 | 43 | 24 | 104 |
| 63             | 130 | 67 | 146 | 33 | 16  | 35.5 | 30 | M27 x 3    | 33 | 9  | 13  | 20 depth 13     | 52 | 30 | 121 |
| 80             | 151 | 78 | 172 | 38 | 18  | 45   | 41 | M30 x 3.5  | 36 | 14 | 15  | 23 depth 15.2   | 63 | 35 | 144 |
| 100            | 179 | 96 | 208 | 43 | 22  | 56   | 50 | M39 x 4    | 45 | 21 | 17  | 26 depth 17.5   | 76 | 40 | 174 |

Note 1) Body dimensions are the same with or without auto switches.

| Bore size (mm) | LW    | M   | P   | Q    | R  | SS   | X <sub>1</sub> | Y <sub>1</sub> | Z   | ZZ  |
|----------------|-------|-----|-----|------|----|------|----------------|----------------|-----|-----|
| 20             | 44.5  | 43  | 1/8 | 16.5 | 6  | 10.5 | 15             | 7.5            | 58  | 73  |
| 25             | 50.5  | 49  | 1/8 | 17   | 8  | 10.5 | 15             | 7.5            | 60  | 75  |
| 32             | 64.5  | 63  | 1/4 | 19.5 | 10 | 11   | 16             | 8              | 67  | 83  |
| 40             | 72.5  | 71  | 1/4 | 20.5 | 10 | 13   | 20             | 10             | 75  | 95  |
| 50             | 83.5  | 81  | 1/4 | 22   | 10 | 15   | 24             | 12             | 84  | 108 |
| 63             | 100.5 | 97  | 1/4 | 25.5 | 10 | 18   | 30             | 15             | 97  | 127 |
| 80             | 121.5 | 117 | 3/8 | 30   | 15 | 20.5 | 35             | 17.5           | 113 | 148 |
| 100            | 147   | 142 | 3/8 | 36   | 15 | 23   | 40             | 20             | 136 | 176 |

| Bore size (mm) | a    | b  | c          | e  | f  | g   | h   |
|----------------|------|----|------------|----|----|-----|-----|
| 20             | 12.5 | 15 | M10 x 1.25 | 6  | 10 | 33  | 91  |
| 25             | 15.5 | 18 | M12 x 1.25 | 6  | 12 | 36  | 96  |
| 32             | 22   | 25 | M16 x 1.5  | 7  | 14 | 44  | 111 |
| 40             | 27   | 30 | M20 x 1.5  | 7  | 19 | 53  | 128 |
| 50             | 32   | 35 | M24 x 1.5  | 8  | 24 | 62  | 146 |
| 63             | 42   | 45 | M30 x 1.5  | 9  | 30 | 78  | 175 |
| 80             | 57   | 60 | M39 x 1.5  | 14 | 41 | 98  | 221 |
| 100            | 72   | 75 | M48 x 1.5  | 21 | 50 | 118 | 254 |

# CH□KD Series Auto Switch Mounting

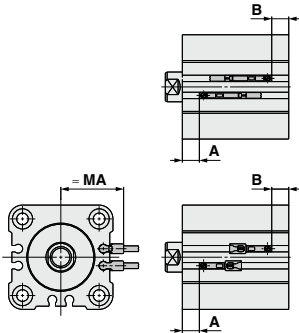
Refer to pages 431 to 490 for detailed specifications.

## Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

ø20, ø25

D-M9□  
D-M9□W  
D-M9□A  
D-A9□

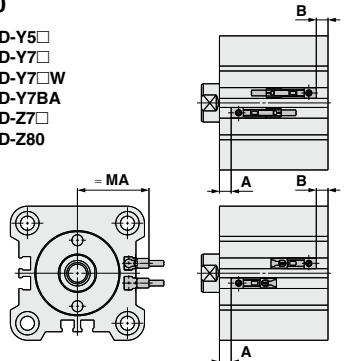
D-M9□V  
D-M9□WV  
D-M9□AV  
D-A9□V



ø32 to ø100

D-M9□  
D-M9□W  
D-M9□A  
D-A9□  
D-Y5□  
D-Y7□  
D-Y7□W  
D-Y7BA  
D-Z7□  
D-Z80

D-M9□V  
D-M9□WV  
D-M9□AV  
D-Y6□  
D-Y7□V  
D-Y7□WV  
D-A9□V



## Auto Switch Proper Mounting Positions

(mm)

| Bore size<br>(mm) | Solid state auto switch                    |      |                                                     |      | Reed auto switch |      |           |      |
|-------------------|--------------------------------------------|------|-----------------------------------------------------|------|------------------|------|-----------|------|
|                   | D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV |      | D-Y59□/Y69□<br>D-Y7□/Y7□V<br>D-Y7□W/Y7□WV<br>D-Y7BA |      | D-A9□/A9□V       |      | D-Z7□/Z80 |      |
|                   | A                                          | B    | A                                                   | B    | A                | B    | A         | B    |
| 20                | 12                                         | 19   | —                                                   | —    | 8                | 15   | —         | —    |
| 25                | 13                                         | 20   | —                                                   | —    | 9                | 16   | —         | —    |
| 32                | 15                                         | 21.5 | 10                                                  | 16.5 | 11               | 17.5 | 10        | 16.5 |
| 40                | 17                                         | 23.5 | 12                                                  | 18.5 | 13               | 19.5 | 12        | 18.5 |
| 50                | 18                                         | 27.5 | 13                                                  | 22.5 | —                | —    | 13        | 22.5 |
| 63                | 21.5                                       | 31   | 16.5                                                | 26   | 17.5             | 27   | 16.5      | 26   |
| 80                | 23.5                                       | 40   | 18.5                                                | 35   | 19.5             | 36   | 18.5      | 35   |
| 100               | 31.5                                       | 49.5 | 26.5                                                | 44.5 | 27.5             | 45.5 | 26.5      | 44.5 |

Note 1) D-A9□/A9□V models cannot be mounted on ø50.

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

## Auto Switch Mounting Heights

(mm)

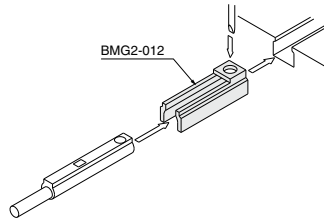
| Bore size<br>(mm) | D-M9□<br>D-M9□W<br>D-M9□A<br>D-A9□ | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V   | D-Y59□<br>D-Y7P<br>D-Y7□W<br>D-Y7BA<br>D-Z7□<br>D-Z80 | D-Y69□<br>D-Y7PV<br>D-Y7□WV |
|-------------------|------------------------------------|------------------------------|----------|-------------------------------------------------------|-----------------------------|
|                   | U                                  | U                            | U        | U                                                     | U                           |
| 20                | 21.5                               | 28                           | 25.5     | —                                                     | —                           |
| 25                | 24.5                               | 30                           | 27.5     | —                                                     | —                           |
| 32                | 31.5                               | 34                           | 31.5     | 31.5                                                  | 31.5                        |
| 40                | 35.5                               | 38.5                         | 36       | 35.5                                                  | 35.5                        |
| 50                | 40.5 (Note)                        | 44.5                         | — (Note) | 40.5                                                  | 41.5                        |
| 63                | 48.5                               | 53                           | 50.5     | 48.5                                                  | 50                          |
| 80                | 58.5                               | 63.5                         | 61       | 58.5                                                  | 60.5                        |
| 100               | 71                                 | 76                           | 73.5     | 71                                                    | 73                          |

Note 1) D-A9□/A9□V models cannot be mounted on ø50.

## Auto Switch Mounting Brackets: Part Nos.

| Auto switch models                                       | Bore size (mm) |
|----------------------------------------------------------|----------------|
|                                                          | ø32 to ø100    |
| D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV<br>D-A9□/A9□V | BMG2-012       |

Note 1) D-A9□/A9□V models cannot be mounted on ø50.



\* Examples of D-A9□(V), M9□(V), M9□W(V), M9□A(V) models mounted on CHKD.

## Minimum Auto Switch Mounting Stroke

| Auto Switch Mounting Number | (mm)                                                   |                                   |                   |                                        |        |
|-----------------------------|--------------------------------------------------------|-----------------------------------|-------------------|----------------------------------------|--------|
|                             | D-M9□<br>D-M9□V<br>D-Y59□<br>D-Y69□<br>D-Y7P<br>D-Y7PV | D-A9□<br>D-A9□V<br>D-Z7□<br>D-Z80 | D-Y7□W<br>D-Y7□WV | D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV | D-Y7BA |
| 1 pc.                       | 5                                                      | 5                                 | 10                | 10                                     | 15     |
| 2 pcs.                      | 5                                                      | 10                                | 10                | 15                                     | 15     |

## Operating Range

| Auto switch models                                  | (mm)      |     |     |     |      |      |     |     |
|-----------------------------------------------------|-----------|-----|-----|-----|------|------|-----|-----|
|                                                     | Bore size |     |     |     |      |      |     |     |
|                                                     | 20        | 25  | 32  | 40  | 50   | 63   | 80  | 100 |
| D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV          | 4.5       | 4.5 | 4   | 7   | 5    | 5.5  | 7.5 | 11  |
| D-Y59□/Y69□<br>D-Y7□/Y7□V<br>D-Y7□W/Y7□WV<br>D-Y7BA | —         | —   | 8   | 9.5 | 11.5 | 11.5 | 16  | 17  |
| D-A9□/A9□V<br>D-Z7□/Z80                             | 12        | 11  | 9   | 9.5 | —    | 11.5 | 15  | 17  |
|                                                     | —         | —   | 9.5 | 11  | 12   | 14   | 16  | 20  |

Note) D-A9□/A9□V models cannot be mounted on ø50.

\* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)  
There may be the case it will vary substantially depending on an ambient environment.

For ø32 to ø100, besides the models listed in "How to Order," the following auto switches are applicable.

Refer to pages 431 to 490 for detailed auto switch specifications.

| Auto switch type | Part no.              | Electrical entry        | Features                                  |
|------------------|-----------------------|-------------------------|-------------------------------------------|
| Solid state      | D-Y69A, Y69B, Y7PV    | Grommet (perpendicular) | —                                         |
|                  | D-Y7NWV, Y7PWV, Y7BWV |                         | Diagnostic indication (2-color indicator) |
|                  | D-Y59A, Y59B, Y7P     | Grommet (in-line)       | —                                         |
|                  | D-Y7NW, Y7PW, Y7BW    |                         | Diagnostic indication (2-color indicator) |
|                  | D-Y7BA                |                         | Water resistant (2-color indicator)       |
| Reed             | D-Z73, Z76            | Grommet (in-line)       | —                                         |
|                  | D-Z80                 |                         | Without indicator light                   |

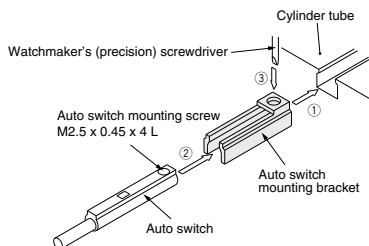
\* Solid state auto switches are also available with pre-wired connector. Refer to pages 474 and 475 for details.

\* Normally closed (N.C. = b contact), solid state auto switches (D-F9G, F9H, Y7G, Y7H) are also available. For details, refer to pages 443 and 445.

## How to Mount and Move the Auto Switch

### <Applicable auto switch>

**Solid state** ..... D-M9N(V), D-M9P(V), D-M9B(V),  
D-M9NW(V), D-M9PW(V), D-M9BW(V)  
D-M9NA(V), D-M9PA(V), D-M9BA(V)  
**Reed** ..... D-A90(V), D-A93(V), D-A96(V)



1. Insert the auto switch mounting bracket into the auto switch mounting groove to set it roughly to the auto switch mounting position.
2. Insert the auto switch into the attachment part of the auto switch mounting bracket.
3. After confirming the detecting position, secure the auto switch by tightening the set screw (M2.5) attached to the auto switch.
4. When changing the detecting position, carry out in the state of 2.

Note) When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm.

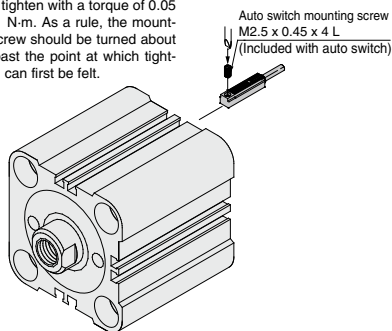
Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

### <Applicable auto switch>

**Solid state** ..... D-Y59<sup>Δ</sup>, D-Y69<sup>Δ</sup>, D-Y7P(V)  
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)  
D-Y7BA  
**Reed** ..... D-Z73, D-Z76, D-Z80

Note) When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm.

Also, tighten with a torque of 0.05 to 0.1 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.



1. Insert the auto switch into the mounting groove and set it at the auto switch mounting position.
2. After reconfirming the detecting position, tighten the mounting screw to secure the auto switch.
3. Modification of the detecting position should be made in the condition of 1.

# CH□KD Series Simple Specials

These changes are dealt with Simple Specials System.



## 1 Change of Rod End Shape

Symbol

-XA1/2/7/18/20/22/31/32/33/34

CH□KD Mounting type Bore size Rod size series - Stroke Suffix for auto switch - X A0

Indicate the rod end shape pattern symbol

| <p><b>A0</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>                      | <p><b>A1</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>                      | <p><b>A2</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>  | <p><b>A7</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|-----------|------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|--|
| <p><b>A18</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>                     | <p><b>A20</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p>                     | <p><b>A22</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p> | <p><b>A31</b></p> <p>Note) Female thread effective depth should be no more than twice the thread diameter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <p><b>A32</b></p> <p>Note) Female thread effective depth should be no more than twice the thread diameter.</p> | <p><b>A33</b></p> <p>Note) Female thread effective depth should be no more than twice the thread diameter.</p> | <p><b>A34</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p> | <p>Note 1) Dimensions indicated with an asterisk (*) in the patterns A1, A2, A18, A20, A22, A31, A32, A33, and A34 are provided in the table below.</p> <p>Note 2) The tolerance and finish values not indicated in the figures above are the same as for standard products, or may be at the discretion of SMC.</p> <table><thead><tr><th>Pattern</th><th>Dimension for *</th></tr></thead><tbody><tr><td><b>A1</b></td><td rowspan="9">øD-2</td></tr><tr><td><b>A2</b></td></tr><tr><td><b>A7</b></td></tr><tr><td><b>A18</b></td></tr><tr><td><b>A20</b></td></tr><tr><td><b>A22</b></td></tr><tr><td><b>A31</b></td></tr><tr><td><b>A32</b></td></tr><tr><td><b>A33</b></td></tr><tr><td><b>A34</b></td><td></td></tr></tbody></table> | Pattern | Dimension for * | <b>A1</b> | øD-2 | <b>A2</b> | <b>A7</b> | <b>A18</b> | <b>A20</b> | <b>A22</b> | <b>A31</b> | <b>A32</b> | <b>A33</b> | <b>A34</b> |  |
| Pattern                                                                                                        | Dimension for *                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A1</b>                                                                                                      | øD-2                                                                                                           |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A2</b>                                                                                                      |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A7</b>                                                                                                      |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A18</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A20</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A22</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A31</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A32</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A33</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |
| <b>A34</b>                                                                                                     |                                                                                                                |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                 |           |      |           |           |            |            |            |            |            |            |            |  |

If dimensions other than the above are necessary, please indicate as such.

## 2 CHQHB Series (14 MPa) Interchangeable Parts

Symbol

-XC61

CH□KDB □ Bore size - Stroke Rod end thread type - Auto switch Suffix for auto switch - XC61 □

### CH□QHB interchangeable parts

Interchangeable contents Overall length End thread size

### Cylinder mounting

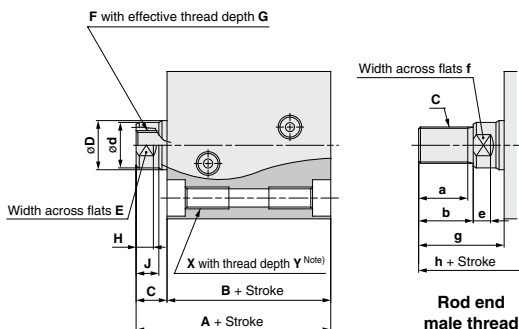
|     |                  |
|-----|------------------|
| Nil | Through hole     |
| R   | Front taps       |
| H   | Rear taps        |
| W   | Double side taps |

\* Built-in spacer types are required for intermediate strokes.

(Example) The overall length of the cylinder tube for CHDKDB50-60-XC61, is equivalent to 75 strokes.

## Dimensions

CH□KDB□-□-XC61□



| Bore size (mm) | A   | B  | C  | D    | d  | E  | F          | G  | H    | J    | X          | Y  |
|----------------|-----|----|----|------|----|----|------------|----|------|------|------------|----|
| 20             | 53  | 43 | 10 | 12   | 11 | 10 | M6 x 1     | 8  | 5.5  | 6.5  | M6 x 1     | 12 |
| 25             | 56  | 45 | 11 | 14   | 13 | 12 | M8 x 1.25  | 10 | 6.5  | 7.5  | M6 x 1     | 12 |
| 32             | 63  | 51 | 12 | 18   | 15 | 13 | M10 x 1.5  | 12 | 7    | 8.5  | M8 x 1.25  | 16 |
| 40             | 69  | 55 | 14 | 22.4 | 19 | 16 | M12 x 1.75 | 15 | 8    | 10   | M10 x 1.5  | 20 |
| 50             | 75  | 60 | 15 | 28   | 24 | 21 | M16 x 2    | 20 | 9.5  | 11.5 | M12 x 1.75 | 24 |
| 63             | 85  | 67 | 18 | 35.5 | 31 | 27 | M20 x 2.5  | 24 | 11.5 | 14   | M16 x 2    | 24 |
| 80             | 99  | 78 | 21 | 45   | 39 | 36 | M27 x 3    | 33 | 15   | 17   | M18 x 2.5  | 27 |
| 100            | 122 | 96 | 26 | 56   | 48 | 41 | M30 x 3.5  | 36 | 17.5 | 22   | M20 x 2.5  | 30 |

### Rod end male threads

| Bore size (mm) | a    | b  | c          | e    | f  | g  | h   |
|----------------|------|----|------------|------|----|----|-----|
| 20             | 12   | 14 | M8 x 1     | 5.5  | 10 | 24 | 67  |
| 25             | 14.5 | 17 | M10 x 1.25 | 6.5  | 12 | 28 | 73  |
| 32             | 17.5 | 20 | M12 x 1.25 | 7    | 13 | 32 | 83  |
| 40             | 22   | 25 | M16 x 1.5  | 8    | 16 | 39 | 94  |
| 50             | 27   | 30 | M20 x 1.5  | 9.5  | 21 | 45 | 105 |
| 63             | 32   | 35 | M24 x 1.5  | 11.5 | 27 | 53 | 120 |
| 80             | 40   | 43 | M30 x 1.5  | 15   | 36 | 64 | 142 |
| 100            | 47   | 50 | M39 x 1.5  | 17.5 | 41 | 76 | 172 |

| Part no. suffix | X & Y dimensions       |
|-----------------|------------------------|
| -XC61           | None                   |
| -XC61R          | 4 places on front side |
| -XC61H          | 4 places on rear side  |
| -XC61W          | 8 places on both sides |

Note) The relationship between the mounting taps (X and Y dimensions) provided on cylinder tubes and their order numbers is as shown above.

### 3 Intermediate Stroke Type (Built-in spacer type)

Symbol

-XC63

Intermediate strokes in 5mm increments can be manufactured by installing spacers inside standard stroke cylinders.

CH□KDB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC63

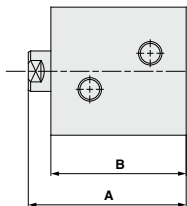
CH□KDL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC63

#### Intermediate stroke

| Bore size (mm)              | Applicable stroke | Applicable cylinder tube |
|-----------------------------|-------------------|--------------------------|
| 32                          | 55, 60, 65, 70    | For 75 mm stroke         |
| 40<br>50<br>63<br>80<br>100 | 55, 60, 65, 70    | For 75 mm stroke         |
|                             | 80, 85, 90, 95    | For 100 mm stroke        |

### Dimensions

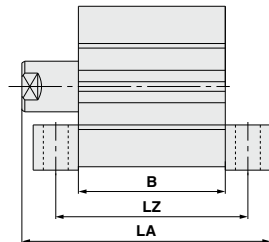
#### CH□KDB□-□-XC63



| Stroke<br>Bore size<br>(mm) | 55, 60, 65, 70 |     | 80, 85, 90, 95 |     |
|-----------------------------|----------------|-----|----------------|-----|
|                             | A              | B   | A              | B   |
| 32                          | 136            | 126 | —              | —   |
| 40                          | 140            | 130 | 165            | 155 |
| 50                          | 146            | 135 | 171            | 160 |
| 63                          | 155            | 142 | 180            | 167 |
| 80                          | 170            | 153 | 195            | 178 |
| 100                         | 197            | 171 | 222            | 196 |

Note) Dimensions other than those highlighted above are standard.

#### CH□KDL□-□-XC63



| Stroke<br>Bore size<br>(mm) | 55, 60, 65, 70 |     |     | 80, 85, 90, 95 |     |     |
|-----------------------------|----------------|-----|-----|----------------|-----|-----|
|                             | LA             | B   | LZ  | LA             | B   | LZ  |
| 32                          | 161            | 126 | 142 | —              | —   | —   |
| 40                          | 173            | 130 | 150 | 198            | 155 | 175 |
| 50                          | 186            | 135 | 159 | 211            | 160 | 184 |
| 63                          | 205            | 142 | 172 | 230            | 167 | 197 |
| 80                          | 226            | 153 | 188 | 251            | 178 | 213 |
| 100                         | 254            | 171 | 211 | 279            | 196 | 236 |

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□

## 4 With Air Release Valve

Symbol

-XC64

Air release valves are provided on cylinder tube surfaces machined for ports.

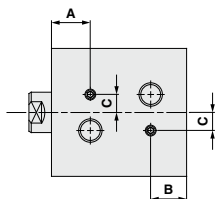
CH□KDB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC64

CH□KDL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC64

With air release valve

## Dimensions

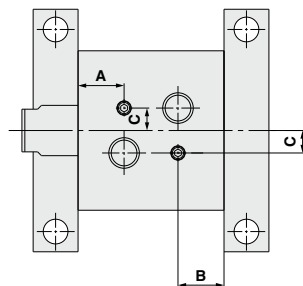
### CH□KDB□-□-XC64



| Bore size (mm) | A    | B    | C  |
|----------------|------|------|----|
| 20             | 16.5 | 14.5 | 7  |
| 25             | 17   | 15   | 8  |
| 32             | 19.5 | 17   | 10 |
| 40             | 20.5 | 17.5 | 10 |
| 50             | 22   | 19.5 | 10 |
| 63             | 25.5 | 22   | 10 |
| 80             | 30   | 26.5 | 15 |
| 100            | 36   | 33   | 15 |

Note) Dimensions other than those highlighted above are standard.

### CH□KDL□-□-XC64



# Compact Hydraulic Cylinder

## CH□KG Series

16 MPa

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

### How to Order

CHKG B 32 □ - 30 □ - □

With Auto Switch

CHDKG B 32 □ - 30 □ - M9BW □ - □

With auto switch  
(built-in magnet)

Mounting bracket type

| Symbol | Type       | Port position <small>(Note)</small> |
|--------|------------|-------------------------------------|
| B      | Basic type | —                                   |
| L      | Foot type  | Top                                 |
| LB     |            | Right                               |
| LD     |            | Left                                |
|        |            | Foot bracket                        |

Note) Indicates the relative position of the foot bracket and port, as seen from the rod side.

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 type

|     |               |
|-----|---------------|
| Nil | Female thread |
| M   | Male thread   |

\* Rod end thread type is an optional product. (Refer to page 281).

Cylinder stroke (mm)

Refer to the standard stroke table on page 280.

Port thread type

|     |     |
|-----|-----|
| Nil | Rc  |
| TN  | NPT |

Made to Order specifications  
For details, refer to page 280.

Number of auto switches

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

Auto switch type

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

\* Select applicable auto switch models from the table below.

### Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CHDKGB50-100

Applicable Auto Switches Refer to pages 431 to 490 for further details on each auto switch.

| 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<br>ø20, ø25 ø32 to ø100 | In-line<br>ø20, ø25 ø32 to ø100 |     | 0.5<br>(Nil)         | 1<br>(M) | 3<br>(L) | 5<br>(Z) |   |                     |                 |
| Solid state auto switch | Diagnostic indication<br>(2-color indicator) | Grommet          | Yes             | 3-wire (NPN)    | 5 V, 12 V    | —             | M9NV                                  | M9N                             | ●   | ●                    | ●        | ○        | ○        | ○ | IC circuit          | Relay<br>PLC    |
|                         |                                              |                  |                 | 3-wire (PNP)    | 12 V         |               | M9PV                                  | M9P                             | ●   | ●                    | ●        | ○        | ○        | ○ | —                   |                 |
|                         |                                              |                  |                 | 2-wire          | 12 V         |               | M9BV                                  | M9B                             | ●   | ●                    | ●        | ○        | ○        | ○ | —                   |                 |
|                         | Water resistant<br>(2-color indicator)       | Grommet          | Yes             | 3-wire (NPN)    | 5 V, 12 V    |               | M9NVV                                 | M9NV                            | ●   | ●                    | ●        | ○        | ○        | ○ | IC circuit          |                 |
|                         |                                              |                  |                 | 3-wire (PNP)    | 12 V         |               | M9PVV                                 | M9PW                            | ●   | ●                    | ●        | ○        | ○        | ○ | —                   |                 |
|                         |                                              |                  |                 | 2-wire          | 12 V         |               | M9BWW                                 | M9BW                            | ●   | ●                    | ●        | ○        | ○        | ○ | —                   |                 |
| Reed auto switch        | —                                            | Grommet          | Yes             | 3-wire (NPN)    | 5 V          |               | M9NAV <sup>*1</sup>                   | M9NA <sup>*1</sup>              | ○   | ○                    | ○        | ○        | ○        | ○ | IC circuit          | Relay<br>PLC    |
|                         |                                              |                  |                 | 3-wire (PNP)    | 12 V         |               | M9PAV <sup>*1</sup>                   | M9PA <sup>*1</sup>              | ○   | ○                    | ○        | ●        | ○        | ○ | —                   |                 |
|                         |                                              |                  |                 | 2-wire          | 12 V         |               | M9BAV <sup>*1</sup>                   | M9BA <sup>*1</sup>              | ○   | ○                    | ○        | ○        | ○        | ○ | —                   |                 |
|                         | —                                            | Grommet          | No              | 2-wire          | 24 V         | 100 V         | A96V                                  | A96                             | Z76 | ●                    | ●        | ●        | ●        | — | IC circuit          |                 |
|                         |                                              |                  |                 | 2-wire          | 24 V         | 100 V         | A93V <sup>*2</sup>                    | A93                             | —   | ●                    | ●        | ●        | ●        | — | —                   |                 |
|                         |                                              |                  |                 | 2-wire          | 24 V         | 100 V or less | A90V                                  | A90                             | Z80 | ●                    | —        | ●        | —        | — | IC circuit          |                 |

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

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

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
1 m ..... M (Example) M9NVW  
3 m ..... L (Example) M9NVWL  
5 m ..... Z (Example) M9NVWZ

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

\* For ø32 to ø100, there are applicable auto switches other than listed. Refer to page 288 for details.

\* For details about auto switches with pre-wired connector, refer to pages 474 and 475.

\* Cylinders with auto switch will be shipped together with the auto switch and auto switch mounting bracket (ø32 to ø50) (not assembled).





Made to Order specifications  
(For details, refer to pages 290 to 293)

| Symbol | Specifications                                  |
|--------|-------------------------------------------------|
| -XA□   | Change of rod end shape                         |
| -XC62  | Compatible with series CHQHB series (14 MPa)    |
| -XC63  | Intermediate stroke type (Built-in spacer type) |
| -XC64  | With air release valve                          |



Specifications

| Bore size (mm)                | 20                                   | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------------------------|--------------------------------------|----|----|----|----|----|----|-----|
| Action                        | Double acting/Single rod type        |    |    |    |    |    |    |     |
| Fluid                         | Hydraulic fluid                      |    |    |    |    |    |    |     |
| Nominal pressure              | 16 MPa                               |    |    |    |    |    |    |     |
| Proof pressure                | 24 MPa                               |    |    |    |    |    |    |     |
| Maximum allowable pressure    | 16 MPa                               |    |    |    |    |    |    |     |
| Minimum operating pressure    | 0.3 MPa                              |    |    |    |    |    |    |     |
| Ambient and fluid temperature | Without auto switch: -10° to 80°C    |    |    |    |    |    |    |     |
|                               | With auto switch: -10° to 60°C       |    |    |    |    |    |    |     |
| Piston speed                  | 8 to 100 mm/s                        |    |    |    |    |    |    |     |
| Cushion                       | None                                 |    |    |    |    |    |    |     |
| Rod end thread                | Female thread, Male thread           |    |    |    |    |    |    |     |
| Stroke length tolerance       | +0.8<br>0 mm                         |    |    |    |    |    |    |     |
| Mounting type                 | Basic type (through hole), Foot type |    |    |    |    |    |    |     |

Note) Refer to page 214 for definitions of terms related to pressure.

Standard Strokes

| Stroke (mm)         | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 | 125 | 150 | 175 |
|---------------------|---|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| Bore size (mm)      |   |    |    |    |    |    |    |    |    |    |    |     |     |     |     |
| 20, 25              | ○ | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○   | ○   | ○   | ○   |
| 32                  | ○ | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○   | ○   | ○   | ○   |
| 40, 50, 63, 80, 100 | ○ | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○   | ○   | ○   | ○   |

| Stroke (mm)         | 75                                                |    |    |    | 100                                               |    |    |    | 125                                               |     |     |     |
|---------------------|---------------------------------------------------|----|----|----|---------------------------------------------------|----|----|----|---------------------------------------------------|-----|-----|-----|
| Bore size (mm)      | Intermediate stroke [XC63] (Built-in spacer type) |    |    |    | Intermediate stroke [XC63] (Built-in spacer type) |    |    |    | Intermediate stroke [XC63] (Built-in spacer type) |     |     |     |
|                     | 55                                                | 60 | 65 | 70 | 80                                                | 85 | 90 | 95 | 105                                               | 110 | 115 | 120 |
| 20, 25              | —                                                 | —  | —  | —  | ○                                                 | —  | —  | —  | ○                                                 | —   | —   | —   |
| 32                  | □                                                 | □  | □  | □  | ○                                                 | □  | □  | □  | ○                                                 | □   | □   | □   |
| 40, 50, 63, 80, 100 | □                                                 | □  | □  | □  | ○                                                 | □  | □  | □  | ○                                                 | □   | □   | □   |

| Stroke (mm)         | 150                                               |     |     |     | 175                                               |     |     |     |
|---------------------|---------------------------------------------------|-----|-----|-----|---------------------------------------------------|-----|-----|-----|
| Bore size (mm)      | Intermediate stroke [XC63] (Built-in spacer type) |     |     |     | Intermediate stroke [XC63] (Built-in spacer type) |     |     |     |
|                     | 130                                               | 135 | 140 | 145 | 155                                               | 160 | 165 | 170 |
| 20, 25              | —                                                 | —   | —   | —   | —                                                 | —   | —   | —   |
| 32                  | □                                                 | □   | □   | □   | ○                                                 | —   | —   | —   |
| 40, 50, 63, 80, 100 | □                                                 | □   | □   | □   | ○                                                 | □   | □   | □   |

○: Standard stroke (dedicated cylinder tube)  
□: Intermediate stroke XC63 (built-in spacer type)

Manufacture of Intermediate Stroke Cylinders  
[XC63] (Built-in spacer type)

Intermediate strokes in 5 mm increments can be manufactured by installing spacers inside standard stroke cylinders. (Except ø20, ø25) 55, 60, 65 and 70 mm stroke cylinders have the same overall length as a 75 mm stroke cylinder, and 80, 85, 90 and 95 mm stroke cylinders have the same length as a 100 mm stroke cylinder, 105, 110, 115 and 120 mm stroke cylinders, have the same overall length as a 125 mm stroke cylinder, 130, 135, 140 and 145 mm stroke cylinders have the same overall length as a 150 mm stroke cylinder, 155, 160, 165 and 170 mm stroke cylinders have the same overall length as a 175 mm stroke cylinder.  
Refer to the Made to Order Specifications on page 292 for the ordering procedure.

Hydraulic Fluid Compatibility

| Hydraulic fluid                  | Compatibility  |
|----------------------------------|----------------|
| Standard mineral hydraulic fluid | Compatible     |
| W/O hydraulic fluid              | Compatible     |
| O/W hydraulic fluid              | Compatible     |
| Water/Glycol hydraulic fluid     | *              |
| Phosphate hydraulic fluid        | Not compatible |

\* Consult with SMC.

## Theoretical Output

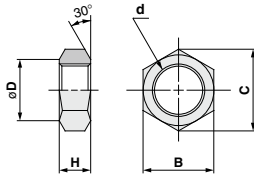
Unit: N

| Bore size<br>(mm) | Rod size<br>(mm) | Operating<br>direction | Piston area<br>(mm <sup>2</sup> ) | Operating pressure (MPa) |       |       |        |
|-------------------|------------------|------------------------|-----------------------------------|--------------------------|-------|-------|--------|
|                   |                  |                        |                                   | 3.5                      | 7     | 10    | 16     |
| 20                | 12               | OUT                    | 314                               | 1099                     | 2198  | 3140  | 5024   |
|                   |                  | IN                     | 201                               | 704                      | 1407  | 2010  | 3216   |
| 25                | 14               | OUT                    | 490                               | 1715                     | 3430  | 4900  | 7840   |
|                   |                  | IN                     | 336                               | 1176                     | 2352  | 3360  | 5376   |
| 32                | 18               | OUT                    | 804                               | 2814                     | 5628  | 8040  | 12864  |
|                   |                  | IN                     | 549                               | 1922                     | 3843  | 5490  | 8784   |
| 40                | 22.4             | OUT                    | 1256                              | 4396                     | 8792  | 12560 | 20096  |
|                   |                  | IN                     | 862                               | 3017                     | 6034  | 8620  | 13792  |
| 50                | 28               | OUT                    | 1963                              | 6871                     | 13741 | 19630 | 31408  |
|                   |                  | IN                     | 1347                              | 4715                     | 9429  | 13470 | 21552  |
| 63                | 35.5             | OUT                    | 3117                              | 10910                    | 21819 | 31170 | 49872  |
|                   |                  | IN                     | 2127                              | 7445                     | 14889 | 21270 | 34032  |
| 80                | 45               | OUT                    | 5026                              | 17591                    | 35182 | 50260 | 80416  |
|                   |                  | IN                     | 3436                              | 12026                    | 24052 | 34360 | 54976  |
| 100               | 56               | OUT                    | 7853                              | 27486                    | 54971 | 78530 | 125648 |
|                   |                  | IN                     | 5390                              | 18865                    | 37730 | 53900 | 86240  |

Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>)

## Optional Parts

### Rod end nut



| Part no. | Bore size (mm) | B  | C    | d          | D    | H  |
|----------|----------------|----|------|------------|------|----|
| NTH-020  | 20             | 13 | 15   | M8 x 1     | 12.5 | 5  |
| NTH-025  | 20             | 17 | 19.6 | M10 x 1.25 | 16.5 | 6  |
| NTH-032  | 25             | 19 | 21.9 | M12 x 1.25 | 18   | 7  |
| NTH-040  | 32             | 22 | 25.4 | M16 x 1.5  | 21   | 10 |
| NTH-050  | 40             | 27 | 31.2 | M20 x 1.5  | 26   | 12 |
| NTH-060  | 50             | 32 | 37   | M24 x 1.5  | 31   | 14 |
| NTH-080  | 63             | 41 | 47.3 | M30 x 1.5  | 40   | 17 |
| NTH-100  | 80             | 55 | 63.5 | M39 x 1.5  | 54   | 20 |
| NTH-125  | 100            | 70 | 80.8 | M48 x 1.5  | 69   | 26 |

Note) There may be a slight difference between the part numbers and the corresponding bore size.

## Weight

### CH□KGB/Basic type

Unit: g

| Bore size<br>(mm) | Standard stroke (mm) |      |      |      |      |      |      |      |      |      |       |       |
|-------------------|----------------------|------|------|------|------|------|------|------|------|------|-------|-------|
|                   | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75    | 100   |
| 20                | 221                  | 242  | 263  | 284  | 305  | 326  | 347  | 368  | 389  | 410  | —     | —     |
| 25                | 312                  | 339  | 366  | 393  | 420  | 447  | 474  | 501  | 528  | 555  | —     | —     |
| 32                | 581                  | 625  | 669  | 713  | 757  | 801  | 845  | 889  | 933  | 977  | 1197  | 1417  |
| 40                | 927                  | 986  | 1045 | 1104 | 1163 | 1222 | 1281 | 1340 | 1399 | 1458 | 1753  | 2048  |
| 50                | 1351                 | 1430 | 1509 | 1588 | 1667 | 1746 | 1825 | 1904 | 1983 | 2062 | 2457  | 2852  |
| 63                | 1813                 | 1936 | 2059 | 2182 | 2305 | 2428 | 2551 | 2674 | 2797 | 2920 | 3535  | 4150  |
| 80                | 3870                 | 4053 | 4236 | 4419 | 4602 | 4785 | 4968 | 5151 | 5334 | 5517 | 6432  | 7347  |
| 100               | 7188                 | 7457 | 7726 | 7995 | 8264 | 8533 | 8802 | 9071 | 9340 | 9609 | 10954 | 12299 |

### CH□KGL/Foot type

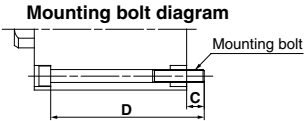
Unit: g

| Bore size<br>(mm) | Standard stroke (mm) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                   | 5                    | 10    | 15    | 20    | 25    | 30    | 35    | 40    | 45    | 50    | 75    | 100   | 125   | 150   | 175   |
| 20                | 465                  | 490   | 515   | 535   | 560   | 580   | 605   | 625   | 650   | 670   | 785   | 890   | —     | —     | —     |
| 25                | 585                  | 610   | 640   | 670   | 700   | 725   | 755   | 785   | 815   | 840   | 985   | 1130  | —     | —     | —     |
| 32                | 945                  | 990   | 1040  | 1085  | 1130  | 1175  | 1220  | 1265  | 1310  | 1360  | 1585  | 1815  | 2045  | 2270  | —     |
| 40                | 1580                 | 1645  | 1705  | 1770  | 1830  | 1895  | 1955  | 2015  | 2080  | 2140  | 2455  | 2765  | 3075  | 3390  | 3700  |
| 50                | 2495                 | 2580  | 2665  | 2750  | 2835  | 2915  | 3000  | 3085  | 3170  | 3255  | 3675  | 4095  | 4515  | 4935  | 5355  |
| 63                | 3900                 | 4030  | 4160  | 4290  | 4420  | 4550  | 4685  | 4815  | 4945  | 5075  | 5730  | 6380  | 7035  | 7685  | 8340  |
| 80                | 7225                 | 7420  | 7615  | 7805  | 8000  | 8195  | 8385  | 8580  | 8775  | 8965  | 9935  | 10990 | 11870 | 12835 | 13800 |
| 100               | 12425                | 12710 | 12990 | 13275 | 13555 | 13840 | 14120 | 14405 | 14685 | 14970 | 16385 | 17795 | 19210 | 20625 | 22035 |

Mounting Bolts for CH□KGB The mounting bolts shown below conform to JIS B 1176, strength class 10.9 or higher.

Through hole type mounting bolts are available.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

Example) CQ-M5x55L 4 pcs.



| Model          | C    | D   | Mounting bolt part no. |
|----------------|------|-----|------------------------|
| CH□KGB20-5 (M) | 12.4 | 55  | CQ-M5 x 55L            |
| -10 (M)        |      | 60  | x 60L                  |
| -15 (M)        |      | 65  | x 65L                  |
| -20 (M)        |      | 70  | x 70L                  |
| -25 (M)        |      | 75  | x 75L                  |
| -30 (M)        |      | 80  | x 80L                  |
| -35 (M)        |      | 85  | x 85L                  |
| -40 (M)        |      | 90  | x 90L                  |
| -45 (M)        |      | 95  | x 95L                  |
| -50 (M)        |      | 100 | x 100L                 |
| -75 (M)        |      | 125 | x 125L                 |
| -100 (M)       |      | 150 | x 150L                 |
| CH□KGB25-5 (M) | 10.4 | 55  | CQ-M5 x 55L            |
| -10 (M)        |      | 60  | x 60L                  |
| -15 (M)        |      | 65  | x 65L                  |
| -20 (M)        |      | 70  | x 70L                  |
| -25 (M)        |      | 75  | x 75L                  |
| -30 (M)        |      | 80  | x 80L                  |
| -35 (M)        |      | 85  | x 85L                  |
| -40 (M)        |      | 90  | x 90L                  |
| -45 (M)        |      | 95  | x 95L                  |
| -50 (M)        |      | 100 | x 100L                 |
| -75 (M)        |      | 125 | x 125L                 |
| -100 (M)       |      | 150 | x 150L                 |
| CH□KGB32-5 (M) | 10.5 | 65  | CQ-M6 x 65L            |
| -10 (M)        |      | 70  | x 70L                  |
| -15 (M)        |      | 75  | x 75L                  |
| -20 (M)        |      | 80  | x 80L                  |
| -25 (M)        |      | 85  | x 85L                  |
| -30 (M)        |      | 90  | x 90L                  |
| -35 (M)        |      | 95  | x 95L                  |
| -40 (M)        |      | 100 | x 100L                 |
| -45 (M)        |      | 105 | x 105L                 |
| -50 (M)        |      | 110 | x 110L                 |
| -75 (M)        |      | 135 | x 135L                 |
| -100 (M)       |      | 160 | x 160L                 |
| -125 (M)       |      | 185 | x 185L                 |
| -150 (M)       |      | 210 | x 210L                 |
| CH□KGB40-5 (M) | 13.5 | 75  | CQ-M8 x 75L            |
| -10 (M)        |      | 80  | x 80L                  |
| -15 (M)        |      | 85  | x 85L                  |
| -20 (M)        |      | 90  | x 90L                  |
| -25 (M)        |      | 95  | x 95L                  |
| -30 (M)        |      | 100 | x 100L                 |
| -35 (M)        |      | 105 | x 105L                 |
| -40 (M)        |      | 110 | x 110L                 |
| -45 (M)        |      | 115 | x 115L                 |
| -50 (M)        |      | 120 | x 120L                 |
| -75 (M)        |      | 145 | x 145L                 |
| -100 (M)       |      | 170 | x 170L                 |
| -125 (M)       |      | 195 | x 195L                 |
| -150 (M)       |      | 220 | x 220L                 |
| -175 (M)       |      | 245 | x 245L                 |

| Model           | C    | D   | Mounting bolt part no. |
|-----------------|------|-----|------------------------|
| CH□KGB50-5 (M)  | 15.5 | 80  | CQ-M10 x 80L           |
| -10 (M)         |      | 85  | x 85L                  |
| -15 (M)         |      | 90  | x 90L                  |
| -20 (M)         |      | 95  | x 95L                  |
| -25 (M)         |      | 100 | x 100L                 |
| -30 (M)         |      | 105 | x 105L                 |
| -35 (M)         |      | 110 | x 110L                 |
| -40 (M)         |      | 115 | x 115L                 |
| -45 (M)         |      | 120 | x 120L                 |
| -50 (M)         |      | 125 | x 125L                 |
| -75 (M)         |      | 150 | x 150L                 |
| -100 (M)        |      | 175 | x 175L                 |
| -125 (M)        |      | 200 | x 200L                 |
| -150 (M)        |      | 225 | x 225L                 |
| -175 (M)        |      | 250 | x 250L                 |
| CH□KGB63-5 (M)  | 16   | 85  | CQ-M12 x 85L           |
| -10 (M)         |      | 90  | x 90L                  |
| -15 (M)         |      | 95  | x 95L                  |
| -20 (M)         |      | 100 | x 100L                 |
| -25 (M)         |      | 105 | x 105L                 |
| -30 (M)         |      | 110 | x 110L                 |
| -35 (M)         |      | 115 | x 115L                 |
| -40 (M)         |      | 120 | x 120L                 |
| -45 (M)         |      | 125 | x 125L                 |
| -50 (M)         |      | 130 | x 130L                 |
| -75 (M)         |      | 155 | x 155L                 |
| -100 (M)        |      | 180 | x 180L                 |
| -125 (M)        |      | 205 | x 205L                 |
| -150 (M)        |      | 230 | x 230L                 |
| -175 (M)        |      | 255 | x 255L                 |
| CH□KGB80-5 (M)  | 22   | 100 | CQ-M14 x 100L          |
| -10 (M)         |      | 105 | x 105L                 |
| -15 (M)         |      | 110 | x 110L                 |
| -20 (M)         |      | 115 | x 115L                 |
| -25 (M)         |      | 120 | x 120L                 |
| -30 (M)         |      | 125 | x 125L                 |
| -35 (M)         |      | 130 | x 130L                 |
| -40 (M)         |      | 135 | x 135L                 |
| -45 (M)         |      | 140 | x 140L                 |
| -50 (M)         |      | 145 | x 145L                 |
| -75 (M)         |      | 170 | x 170L                 |
| -100 (M)        |      | 195 | x 195L                 |
| -125 (M)        |      | 220 | x 220L                 |
| -150 (M)        |      | 245 | x 245L                 |
| -175 (M)        |      | 270 | x 270L                 |
| CH□KGB100-5 (M) | 26.5 | 120 | CQ-M16 x 120L          |
| -10 (M)         |      | 125 | x 125L                 |
| -15 (M)         |      | 130 | x 130L                 |
| -20 (M)         |      | 135 | x 135L                 |
| -25 (M)         |      | 140 | x 140L                 |
| -30 (M)         |      | 145 | x 145L                 |
| -35 (M)         |      | 150 | x 150L                 |
| -40 (M)         |      | 155 | x 155L                 |
| -45 (M)         |      | 160 | x 160L                 |
| -50 (M)         |      | 165 | x 165L                 |
| -75 (M)         |      | 190 | x 190L                 |
| -100 (M)        |      | 215 | x 215L                 |
| -125 (M)        |      | 240 | x 240L                 |
| -150 (M)        |      | 265 | x 265L                 |
| -175 (M)        |      | 290 | x 290L                 |

## ⚠ Specific Product Precautions

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 214 to 221 for Hydraulic Cylinder and Auto Switch Precautions.

### Usage

#### ⚠ Caution

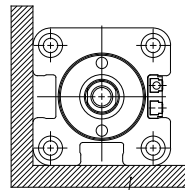
1. Use hexagon socket head cap screws (JISB1176, strength class 10.9 or higher) for cylinder mounting.
2. Since a lateral load (eccentric load) cannot be applied to the piston rod, build the mounting jig in such a way that a lateral load will not be applied to the piston rod.
3. Make sure that the interlocking length of the rod end thread (male or female thread) and the mounting material is at least 80% of the thread diameter.
4. When operating a cylinder for the first time, be sure to release the air inside the cylinder and the piping. When the air release is complete, operate the cylinder at reduced pressure, then gradually increase it to the normal operating pressure.

5. Since CH□KGB series does not have an air release plug, release air from other components (e.g. from piping, etc.) as well.
6. Do not use two cylinders facing one another horizontally or vertically in such a way that their piston rods strike each other.
7. When the cylinder head side contains hydraulic fluid or is in a normally pressurized condition, the applied load must not be allowed to strike the piston rod end. Avoid such applications.
8. When mounting the cylinder body with mounting bolts, use tightening torques in the table at left as a guide.

**Body mounting bolt tightening torques**

| Bore size (mm) | Mounting bolt size | Tightening torque (N·m) |
|----------------|--------------------|-------------------------|
| 20             | M5                 | 3.0                     |
| 25             | M5                 | 4.9                     |
| 32             | M6                 | 10                      |
| 40             | M8                 | 20                      |
| 50             | M10                | 40                      |
| 63             | M12                | 50                      |
| 80             | M14                | 80                      |
| 100            | M16                | 120                     |

Consult with SMC when using a cylinder in close proximity to a magnetic body (including proximity on any side) as shown in the figure below, as the operation of auto switches may become unstable.



Magnetic body (steel plate, etc.)

CHQ

CHK

CHN

CHM

CHS

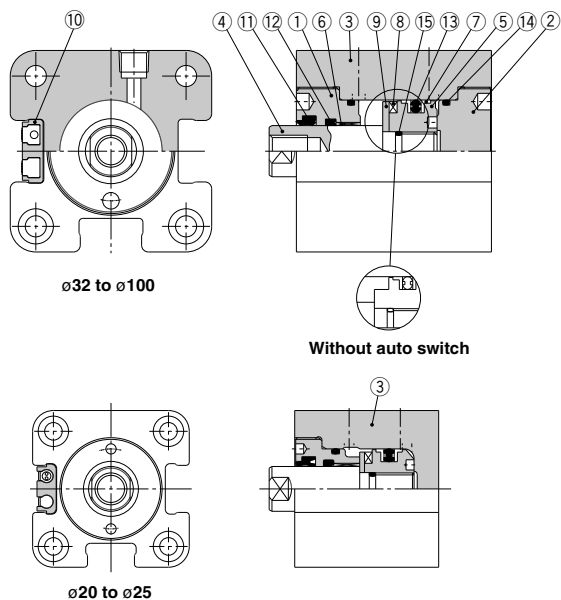
CH2

CHA

Related Products

D-

Construction



Parts List

| No. | Description             | Material                                             | Note                        |
|-----|-------------------------|------------------------------------------------------|-----------------------------|
| 1   | Rod cover               | Aluminum alloy                                       | Black anodized              |
| 2   | Head cover              | Aluminum alloy                                       | Black anodized              |
| 3   | Cylinder tube           | Aluminum alloy                                       | Hard anodized               |
| 4   | Piston rod              | ø20, ø25 Stainless steel<br>ø32 to ø100 Carbon steel | Hard chromium electroplated |
| 5   | Piston                  | Stainless steel                                      |                             |
| 6   | Bushing                 | Copper alloy                                         |                             |
| 7   | Back-up ring            | Resin                                                |                             |
| 8   | Magnet                  | —                                                    | With auto switch only       |
| 9   | Magnet plate            | Stainless steel                                      | With auto switch only       |
| 10  | Switch mounting bracket | Aluminum alloy                                       | With auto switch only       |
| 11  | Scraper                 | NBR                                                  |                             |
| 12  | Rod seal                |                                                      | With back-up ring           |
| 13  | Piston seal             |                                                      |                             |
| 14  | Tube gasket             |                                                      |                             |
| 15  | Piston gasket           |                                                      |                             |

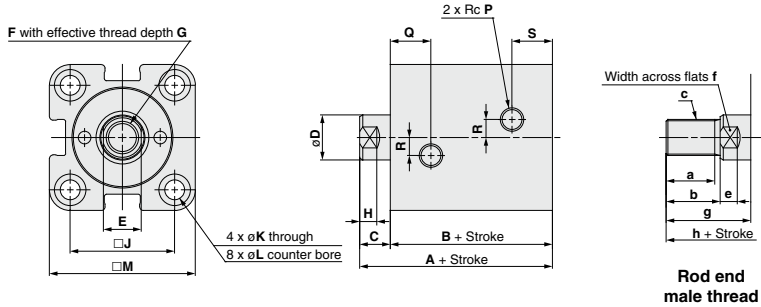
Replacement Parts/Seal kit

| Bore size (mm) | Seal kit no. | Content                                      |
|----------------|--------------|----------------------------------------------|
| 20             | CHKG20-PS    | Nos. ⑦, ⑪, ⑫, ⑬ and ⑭ from the chart at left |
| 25             | CHKG25-PS    |                                              |
| 32             | CHKG32-PS    |                                              |
| 40             | CHKG40-PS    |                                              |
| 50             | CHKG50-PS    |                                              |
| 63             | CHKG63-PS    |                                              |
| 80             | CHKG80-PS    |                                              |
| 100            | CHKG100-PS   |                                              |

- \* Seal kit consists of items ⑦, ⑪, ⑫, ⑬ and ⑭ and can be ordered by using the seal kit number for each bore size.
- \* Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

## Dimensions

### Basic type/CH□KGB



CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□

| Bore size (mm) | A   | B   | C  | D    | E  | F          | G  | H  | J   | K   | L               | M   | P   | Q    | R  | S    |
|----------------|-----|-----|----|------|----|------------|----|----|-----|-----|-----------------|-----|-----|------|----|------|
| 20             | 51  | 43  | 8  | 12   | 10 | M8 x 1.25  | 10 | 6  | 30  | 5.5 | 9.5 depth 5.4   | 43  | 1/8 | 16.5 | 6  | 11.5 |
| 25             | 53  | 45  | 8  | 14   | 12 | M10 x 1.5  | 12 | 6  | 36  | 5.5 | 9.5 depth 5.4   | 49  | 1/8 | 17   | 8  | 12   |
| 32             | 66  | 56  | 10 | 18   | 14 | M12 x 1.75 | 15 | 7  | 47  | 6.6 | 11 depth 6.5    | 63  | 1/4 | 19.5 | 10 | 19.5 |
| 40             | 75  | 65  | 10 | 22.4 | 19 | M16 x 2    | 20 | 7  | 52  | 9   | 14 depth 8.6    | 71  | 1/4 | 21.5 | 10 | 21.5 |
| 50             | 81  | 70  | 11 | 28   | 24 | M20 x 2.5  | 24 | 8  | 58  | 11  | 17.5 depth 10.8 | 81  | 1/4 | 24   | 10 | 24   |
| 63             | 90  | 77  | 13 | 35.5 | 30 | M27 x 3    | 33 | 9  | 69  | 13  | 20 depth 13     | 100 | 1/4 | 27.5 | 10 | 27.5 |
| 80             | 105 | 88  | 17 | 45   | 41 | M30 x 3.5  | 36 | 14 | 86  | 15  | 23 depth 15.2   | 121 | 3/8 | 31   | 15 | 31   |
| 100            | 132 | 106 | 26 | 56   | 50 | M39 x 4    | 45 | 21 | 106 | 17  | 26 depth 17.5   | 146 | 3/8 | 36   | 15 | 36   |

Note 1) Body dimensions are the same with or without auto switches.

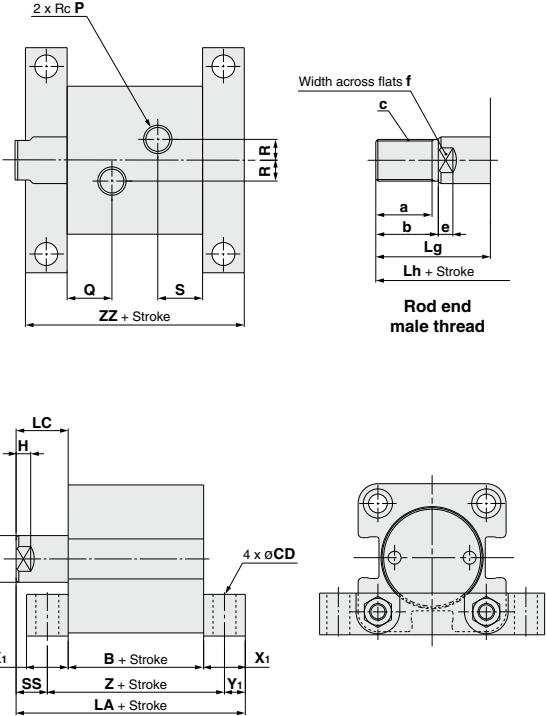
### Rod end male threads

(mm)

| Bore size (mm) | a    | b  | c          | e  | f  | g   | h   |
|----------------|------|----|------------|----|----|-----|-----|
| 20             | 12.5 | 15 | M10 x 1.25 | 6  | 10 | 23  | 66  |
| 25             | 15.5 | 18 | M12 x 1.25 | 6  | 12 | 26  | 71  |
| 32             | 22   | 25 | M16 x 1.5  | 7  | 14 | 35  | 91  |
| 40             | 27   | 30 | M20 x 1.5  | 7  | 19 | 40  | 105 |
| 50             | 32   | 35 | M24 x 1.5  | 8  | 24 | 46  | 116 |
| 63             | 42   | 45 | M30 x 1.5  | 9  | 30 | 58  | 135 |
| 80             | 57   | 60 | M39 x 1.5  | 14 | 41 | 77  | 165 |
| 100            | 72   | 75 | M48 x 1.5  | 21 | 50 | 101 | 207 |

Dimensions

Foot type/CH□KGL



| (mm)           |     |     |     |    |     |      |    |            |    |    |     |                 |    |    |     |       |
|----------------|-----|-----|-----|----|-----|------|----|------------|----|----|-----|-----------------|----|----|-----|-------|
| Bore size (mm) | LA  | B   | BB  | LC | CD  | D    | E  | F          | G  | H  | K   | L               | LH | LT | LX  | LW    |
| 20             | 76  | 43  | 70  | 18 | 6.6 | 12   | 10 | M8 x 1.25  | 10 | 6  | 5.5 | 9.5 depth 5.4   | 23 | 15 | 58  | 44.5  |
| 25             | 78  | 45  | 76  | 18 | 6.6 | 14   | 12 | M10 x 1.5  | 12 | 6  | 5.5 | 9.5 depth 5.4   | 26 | 15 | 64  | 50.5  |
| 32             | 91  | 56  | 94  | 19 | 9   | 18   | 14 | M12 x 1.75 | 15 | 7  | 6.6 | 11 depth 6.5    | 33 | 16 | 79  | 64.5  |
| 40             | 108 | 65  | 108 | 23 | 11  | 22.4 | 19 | M16 x 2    | 20 | 7  | 9   | 14 depth 8.6    | 37 | 20 | 90  | 72.5  |
| 50             | 121 | 70  | 126 | 27 | 14  | 28   | 24 | M20 x 2.5  | 24 | 8  | 11  | 17.5 depth 10.8 | 43 | 24 | 104 | 83.5  |
| 63             | 140 | 77  | 146 | 33 | 16  | 35.5 | 30 | M27 x 3    | 33 | 9  | 13  | 20 depth 13     | 52 | 30 | 121 | 102   |
| 80             | 161 | 88  | 172 | 38 | 18  | 45   | 41 | M30 x 3.5  | 36 | 14 | 15  | 23 depth 15.2   | 63 | 35 | 144 | 123.5 |
| 100            | 189 | 106 | 208 | 43 | 22  | 56   | 50 | M39 x 4    | 45 | 21 | 17  | 26 depth 17.5   | 76 | 40 | 174 | 149   |

Note 1) Body dimensions are the same with or without auto switches.

| (mm)           |     |     |      |    |      |      |                |                |     |     |  |  |  |  |
|----------------|-----|-----|------|----|------|------|----------------|----------------|-----|-----|--|--|--|--|
| Bore size (mm) | M   | P   | Q    | R  | S    | SS   | X <sub>1</sub> | Y <sub>1</sub> | Z   | ZZ  |  |  |  |  |
| 20             | 43  | 1/8 | 16.5 | 6  | 11.5 | 10.5 | 15             | 7.5            | 58  | 73  |  |  |  |  |
| 25             | 49  | 1/8 | 17   | 8  | 12   | 10.5 | 15             | 7.5            | 60  | 75  |  |  |  |  |
| 32             | 63  | 1/4 | 19.5 | 10 | 19.5 | 11   | 16             | 8              | 72  | 88  |  |  |  |  |
| 40             | 71  | 1/4 | 21.5 | 10 | 21.5 | 13   | 20             | 10             | 85  | 105 |  |  |  |  |
| 50             | 81  | 1/4 | 24   | 10 | 24   | 15   | 24             | 12             | 94  | 118 |  |  |  |  |
| 63             | 100 | 1/4 | 27.5 | 10 | 27.5 | 18   | 30             | 15             | 107 | 137 |  |  |  |  |
| 80             | 121 | 3/8 | 31   | 15 | 31   | 20.5 | 35             | 17.5           | 123 | 158 |  |  |  |  |
| 100            | 146 | 3/8 | 36   | 15 | 36   | 23   | 40             | 20             | 146 | 186 |  |  |  |  |

| Rod end male threads (mm) |      |    |            |    |    |     |     |  |  |  |
|---------------------------|------|----|------------|----|----|-----|-----|--|--|--|
| Bore size (mm)            | a    | b  | c          | e  | f  | Lg  | Lh  |  |  |  |
| 20                        | 12.5 | 15 | M10 x 1.25 | 6  | 10 | 33  | 91  |  |  |  |
| 25                        | 15.5 | 18 | M12 x 1.25 | 6  | 12 | 36  | 96  |  |  |  |
| 32                        | 22   | 25 | M16 x 1.5  | 7  | 14 | 44  | 116 |  |  |  |
| 40                        | 27   | 30 | M20 x 1.5  | 7  | 19 | 53  | 138 |  |  |  |
| 50                        | 32   | 35 | M24 x 1.5  | 8  | 24 | 62  | 156 |  |  |  |
| 63                        | 42   | 45 | M30 x 1.5  | 9  | 30 | 78  | 185 |  |  |  |
| 80                        | 57   | 60 | M39 x 1.5  | 14 | 41 | 98  | 221 |  |  |  |
| 100                       | 72   | 75 | M48 x 1.5  | 21 | 50 | 118 | 264 |  |  |  |

# CH□KG Series Auto Switch Specifications

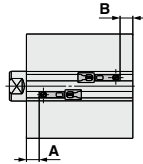
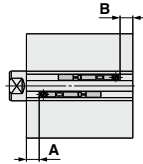
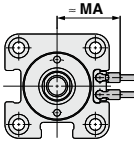
Refer to pages 431 to 490 for detailed specifications.

## Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

ø20, ø25

D-M9□  
D-M9□W  
D-M9□A  
D-A9□

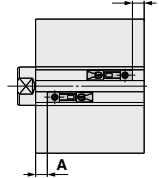
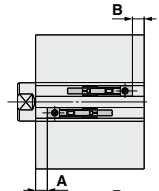
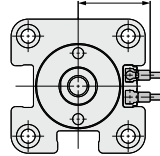
D-M9□V  
D-M9□WV  
D-M9□AV  
D-A9□V



ø32 to ø100

D-M9□ D-Y5□  
D-M9□W D-Y7□  
D-M9□A D-Y7□W  
D-A9□ D-Y7BA  
D-Z7□  
D-Z80

D-M9□V  
D-M9□WV  
D-M9□AV  
D-Y6□  
D-Y7□V  
D-Y7□WV  
D-A9□V



## Auto Switch Proper Mounting Positions

(mm)

| Bore size<br>(mm) | Solid state auto switch                    |      |                                                     |      | Reed auto switch |    |           |      |
|-------------------|--------------------------------------------|------|-----------------------------------------------------|------|------------------|----|-----------|------|
|                   | D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV |      | D-Y59□/Y69□<br>D-Y7□/Y7□V<br>D-Y7□W/Y7□WV<br>D-Y7BA |      | D-A9□/A9□V       |    | D-Z7□/Z80 |      |
|                   | A                                          | B    | A                                                   | B    | A                | B  | A         | B    |
| 20                | 16                                         | 15   | —                                                   | —    | 12               | 11 | —         | —    |
| 25                | 17                                         | 16   | —                                                   | —    | 13               | 12 | —         | —    |
| 32                | 18.5                                       | 23   | 13.5                                                | 18   | —                | —  | 13.5      | 18   |
| 40                | 24                                         | 26.5 | 19                                                  | 21.5 | —                | —  | 19        | 21.5 |
| 50                | 24                                         | 31.5 | 19                                                  | 26.5 | —                | —  | 19        | 26.5 |
| 63                | 26.5                                       | 36   | 21.5                                                | 31   | —                | —  | 21.5      | 31   |
| 80                | 29.5                                       | 44   | 24.5                                                | 39   | —                | —  | 24.5      | 39   |
| 100               | 39.5                                       | 51.5 | 34.5                                                | 46.5 | —                | —  | 34.5      | 46.5 |

Note 1) D-A9□/A9□V models cannot be mounted on ø32 to ø100.

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

## Auto Switch Mounting Heights

(mm)

| Bore size<br>(mm) | D-M9□<br>D-M9□W<br>D-M9□A<br>D-A9□ | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V | D-Y59□<br>D-Y7P<br>D-Y7□W<br>D-Y7BA<br>D-Z7□<br>D-Z80 | D-Y69□<br>D-Y7PV<br>D-Y7□WV |
|-------------------|------------------------------------|------------------------------|--------|-------------------------------------------------------|-----------------------------|
|                   | U                                  | U                            | U      | U                                                     | U                           |
| 20                | 22                                 | 28                           | 25.5   | —                                                     | —                           |
| 25                | 24.5                               | 30                           | 27.5   | —                                                     | —                           |
| 32                | 31.5                               | 34.5                         | —      | 31.5                                                  | 31.5                        |
| 40                | 35.5                               | 39                           | —      | 35.5                                                  | 36                          |
| 50                | 40.5                               | 45                           | —      | 40.5                                                  | 42                          |
| 63                | 50                                 | 53.5                         | —      | 50                                                    | 50.5                        |
| 80                | 60.5                               | 64                           | —      | 60.5                                                  | 61                          |
| 100               | 73                                 | 76.5                         | —      | 73                                                    | 73.5                        |

\* D-A9□/A9□V models cannot be mounted on ø32 to ø100.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

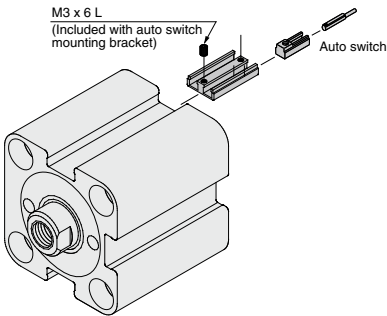
Related  
Products

D-□

Auto Switch Mounting Brackets: Part Nos.

| Auto switch models                                               | Bore size (mm) |                                    |
|------------------------------------------------------------------|----------------|------------------------------------|
|                                                                  | ø20, 25        | ø32 to ø100                        |
| D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV<br>D-A9□/A9□V         | BHK1-020       | Note1)<br>① BHK2-032<br>② BMG2-012 |
| D-Y59□/Y69□<br>D-Y7□/Y7□V<br>D-Y7□W/Y7□WV<br>D-Y7BA<br>D-Z7□/Z80 | —              | BHK2-032                           |

Note 1) Two types of mounting brackets are used as a set.  
Note 2) D-A9□/A9□V models cannot be mounted on ø32 to ø100.



Minimum Auto Switch Mounting Stroke

| Auto Switch Mounting Number | (mm)                                                   |                                   |                   |                                        |        |
|-----------------------------|--------------------------------------------------------|-----------------------------------|-------------------|----------------------------------------|--------|
|                             | D-M9□<br>D-M9□V<br>D-Y59□<br>D-Y69□<br>D-Y7P<br>D-Y7PV | D-A9□<br>D-A9□V<br>D-Z7□<br>D-Z80 | D-Y7□W<br>D-Y7□WV | D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV | D-Y7BA |
| 1 pc.                       | 5                                                      | 5                                 | 10                | 10                                     | 15     |
| 2 pcs.                      | 5                                                      | 10                                | 10                | 15                                     | 15     |

Operating Range

| Auto switch models                                  | (mm) |     |     |     |      |      |     |     |
|-----------------------------------------------------|------|-----|-----|-----|------|------|-----|-----|
|                                                     | 20   | 25  | 32  | 40  | 50   | 63   | 80  | 100 |
| D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV          | 6    | 5.5 | 4.5 | 5.5 | 5.5  | 6.5  | 8.5 | 9.5 |
| D-Y59□/Y69□<br>D-Y7□/Y7□V<br>D-Y7□W/Y7□WV<br>D-Y7BA | —    | —   | 8   | 9.5 | 11.5 | 11.5 | 16  | 17  |
| D-A9□/A9□V                                          | 12   | 11  | —   | —   | —    | —    | —   | —   |
| D-Z7□/Z80                                           | —    | —   | 9.5 | 11  | 12   | 14   | 16  | 20  |

\* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)  
There may be the case it will vary substantially depending on an ambient environment.

For ø32 to ø100, besides the models listed in "How to Order," the following auto switches are applicable. Refer to pages 431 to 490 for detailed auto switch specifications.

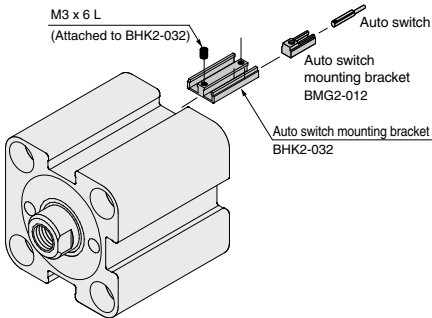
| Auto switch type | Part no.              | Electrical entry        | Features                                  |
|------------------|-----------------------|-------------------------|-------------------------------------------|
| Solid state      | D-Y69A, Y69B, Y7PV    | Grommet (Perpendicular) | —                                         |
|                  | D-Y7NWV, Y7PWV, Y7BWV |                         | Diagnostic indication (2-color indicator) |
|                  | D-Y59A, Y59B, Y7P     | Grommet (In-line)       | —                                         |
|                  | D-Y7NW, Y7PW, Y7BW    |                         | Diagnostic indication (2-color indicator) |
|                  | D-Y7BA                |                         | Water resistant (2-color indicator)       |
| Reed             | D-Z73, Z76            | Grommet (In-line)       | —                                         |
|                  | D-Z80                 |                         | Without indicator light                   |

\* Solid state auto switches are also available with pre-wired connector. Refer to pages 474 and 475 for details.  
\* Normally closed (N.C. = b contact), solid state auto switches (D-F9G, F9H, Y7G, Y7H) are also available. For details, refer to pages 443 and 445.

## How to Mount and Move the Auto Switch

### <Applicable auto switch>

**Solid state** ..... D-M9N(V), D-M9P(V), D-M9B(V)  
 D-M9NW(V), D-M9PW(V), D-M9BW(V)  
 D-M9NA(V), D-M9PA(V), D-M9BA(V)  
**Reed** ..... D-A90(V), D-A93(V), D-A96(V)



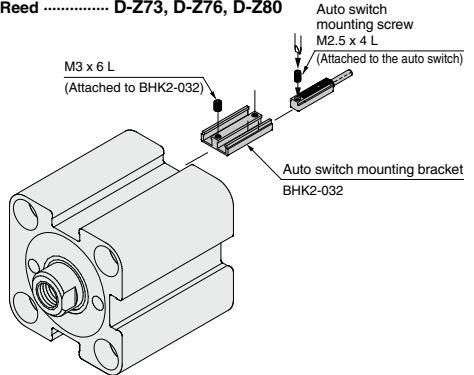
1. Set BMG2-012 into the auto switch mounting bracket (BHK2-032).
2. Set the auto switch into the auto switch mounting part of BMG2-012, then insert it into the cylinder's auto switch installing groove.
3. In the above state, set the approximate auto switch mounting sections, then, using a hexagonal wrench, tighten the mounting screw (M3 x 6L) that is an accessory to BHK-032.
4. After confirming the detecting position, tighten the mounting screw (M2.5) for the auto switch to keep it in place.

When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm. When tightening the mounting bracket screw included with BHK-032, use a 1.5 mm hexagon wrench.

Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

### <Applicable auto switch>

**Solid state** ..... D-Y59<sub>A</sub>, D-Y69<sub>A</sub>, D-Y7P(V)  
 D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)  
 D-Y7BA  
**Reed** ..... D-Z73, D-Z76, D-Z80



When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm. When tightening the mounting bracket screw, use a 1.5 mm hexagon wrench. Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

|                  |
|------------------|
| CHQ              |
| CHK□             |
| CHN              |
| CHM              |
| CHS□             |
| CH2□             |
| CHA              |
| Related Products |
| D-□              |

# CH□KG Series Simple Specials

These changes are dealt with Simple Specials System.



## 1 Change of Rod End Shape

Symbol

-XA1/2/7/18/20/22/31/32/33/34

CH□KG Mounting type Bore size Rod size series - Stroke Suffix for auto switch - X A0

Indicate the rod end shape pattern symbol

| <p><b>A0</b></p> <p>Note) Male thread effective length should be no more than 100 mm.</p> | <p><b>A1</b></p>  | <p><b>A2</b></p>  | <p><b>A7</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |                 |    |      |    |    |     |     |     |     |     |     |     |
|-------------------------------------------------------------------------------------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|----|------|----|----|-----|-----|-----|-----|-----|-----|-----|
| <p><b>A18</b></p>                                                                         | <p><b>A20</b></p> | <p><b>A22</b></p> | <p><b>A31</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| <p><b>A32</b></p>                                                                         | <p><b>A33</b></p> | <p><b>A34</b></p> | <p>Note 1) Dimensions indicated with an asterisk (*) in the patterns A1, A2, A7, A18, A20, A22, A31, A32, A33, and A34 are provided in the table below.</p> <p>Note 2) The tolerance and finish values not indicated in the figures above are the same as for standard products, or may be at the discretion of SMC.</p> <table><tr><th>Pattern</th><th>Dimension for *</th></tr><tr><td>A1</td><td rowspan="9">øD-2</td></tr><tr><td>A2</td></tr><tr><td>A7</td></tr><tr><td>A18</td></tr><tr><td>A20</td></tr><tr><td>A22</td></tr><tr><td>A31</td></tr><tr><td>A32</td></tr><tr><td>A33</td></tr><tr><td>A34</td></tr></table> | Pattern | Dimension for * | A1 | øD-2 | A2 | A7 | A18 | A20 | A22 | A31 | A32 | A33 | A34 |
| Pattern                                                                                   | Dimension for *   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A1                                                                                        | øD-2              |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A2                                                                                        |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A7                                                                                        |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A18                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A20                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A22                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A31                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A32                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A33                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |
| A34                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                 |    |      |    |    |     |     |     |     |     |     |     |

If dimensions other than the above are necessary, please indicate as such.

## 2 CHQHB Series (14 MPa) Interchangeable Parts

Symbol

-XC62

CH□KGB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC62 □

Note) The interchangeable contents are the "C" dimension (from the front end surface to the rod end) and the "F" dimension (rod end thread size).

### CH□QHB Interchangeable parts <sup>Note)</sup>

Interchangeable contents

Piston rod  
C dimension  
End thread size  
F dimension

### Cylinder mounting

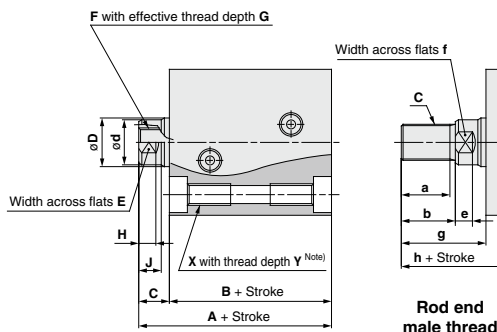
|     |                  |
|-----|------------------|
| Nil | Through hole     |
| R   | Front taps       |
| H   | Rear taps        |
| W   | Double side taps |

\* Built-in spacer types are required for intermediate strokes.

(Example) The overall length of the cylinder tube for CHDKGB50-60-XC62, is equivalent to 75 strokes.

## Dimensions

CH□KGB□-□-XC62□



| Bore size (mm) | A   | B   | C  | D    | d  | E  | F          | G  | H    | J    | X          | Y  |
|----------------|-----|-----|----|------|----|----|------------|----|------|------|------------|----|
| 20             | 53  | 43  | 10 | 12   | 11 | 10 | M6 x 1     | 8  | 5.5  | 6.5  | M6 x 1     | 12 |
| 25             | 56  | 45  | 11 | 14   | 13 | 12 | M8 x 1.25  | 10 | 6.5  | 7.5  | M6 x 1     | 12 |
| 32             | 68  | 56  | 12 | 18   | 15 | 13 | M10 x 1.5  | 12 | 7    | 8.5  | M8 x 1.25  | 16 |
| 40             | 79  | 65  | 14 | 22.4 | 19 | 16 | M12 x 1.75 | 15 | 8    | 10   | M10 x 1.5  | 20 |
| 50             | 85  | 70  | 15 | 28   | 24 | 21 | M16 x 2    | 20 | 9.5  | 11.5 | M12 x 1.75 | 24 |
| 63             | 95  | 77  | 18 | 35.5 | 31 | 27 | M20 x 2.5  | 24 | 11.5 | 14   | M16 x 2    | 24 |
| 80             | 109 | 88  | 21 | 45   | 39 | 36 | M27 x 3    | 33 | 15   | 17   | M18 x 2.5  | 27 |
| 100            | 132 | 106 | 26 | 56   | 48 | 41 | M30 x 3.5  | 36 | 17.5 | 22   | M20 x 2.5  | 30 |

### Rod end male threads

| Bore size (mm) | a    | b  | c          | e    | f  | g  | h   |
|----------------|------|----|------------|------|----|----|-----|
| 20             | 12   | 14 | M8 x 1     | 5.5  | 10 | 24 | 67  |
| 25             | 14.5 | 17 | M10 x 1.25 | 6.5  | 12 | 28 | 73  |
| 32             | 17.5 | 20 | M12 x 1.25 | 7    | 13 | 32 | 88  |
| 40             | 22   | 25 | M16 x 1.5  | 8    | 16 | 39 | 104 |
| 50             | 27   | 30 | M20 x 1.5  | 9.5  | 21 | 45 | 115 |
| 63             | 32   | 35 | M24 x 1.5  | 11.5 | 27 | 53 | 130 |
| 80             | 40   | 43 | M30 x 1.5  | 15   | 36 | 64 | 152 |
| 100            | 47   | 50 | M39 x 1.5  | 17.5 | 41 | 76 | 182 |

| Part no. suffix | X & Y dimensions       |
|-----------------|------------------------|
| -XC62           | None                   |
| -XC62R          | 4 places on front side |
| -XC62H          | 4 places on rear side  |
| -XC62W          | 8 places on both sides |

Note) The relationship between the mounting taps (X & Y dimensions) provided on cylinder tubes and their order numbers is as shown above.

## 3 Intermediate Stroke Type (Built-in spacer type)

-XC63

Intermediate strokes in 5 mm increments can be manufactured by installing spacers inside standard stroke cylinders.

CH□KGB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC63

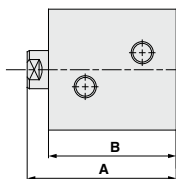
CH□KGL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - XC63

## Intermediate stroke

| Bore size (mm)              | Applicable stroke  | Applicable cylinder tube |
|-----------------------------|--------------------|--------------------------|
| 32                          | 55, 60, 65, 70     | For 75 mm stroke         |
|                             | 80, 85, 90, 95     | For 100 mm stroke        |
|                             | 105, 110, 115, 120 | For 125 mm stroke        |
|                             | 130, 135, 140, 145 | For 150 mm stroke        |
|                             | 155, 160, 165, 170 | For 175 mm stroke        |
| 40<br>50<br>63<br>80<br>100 | 55, 60, 65, 70     | For 75 mm stroke         |
|                             | 80, 85, 90, 95     | For 100 mm stroke        |
|                             | 105, 110, 115, 120 | For 125 mm stroke        |
|                             | 130, 135, 140, 145 | For 150 mm stroke        |
|                             | 155, 160, 165, 170 | For 175 mm stroke        |

## Dimensions

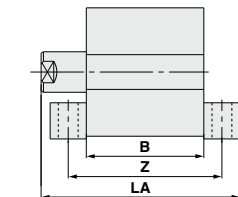
## CH□KGB□-XC63



| Stroke<br>Bore size<br>(mm) | 55, 60, 65, 70 |     |     | 80, 85, 90, 95 |     |     | 105, 110, 115, 120 |     |     | 130, 135, 140, 145 |   |   | 155, 160, 165, 170 |   |   |
|-----------------------------|----------------|-----|-----|----------------|-----|-----|--------------------|-----|-----|--------------------|---|---|--------------------|---|---|
|                             | A              | B   |     | A              | B   |     | A                  | B   |     | A                  | B |   | A                  | B |   |
| 32                          | 141            | 131 | 166 | 156            | 191 | 181 | 216                | 206 | —   | —                  | — | — | —                  | — | — |
| 40                          | 150            | 140 | 175 | 165            | 200 | 190 | 225                | 215 | 250 | 240                | — | — | —                  | — | — |
| 50                          | 156            | 145 | 181 | 170            | 206 | 195 | 231                | 220 | 256 | 245                | — | — | —                  | — | — |
| 63                          | 165            | 152 | 190 | 177            | 215 | 202 | 240                | 227 | 265 | 252                | — | — | —                  | — | — |
| 80                          | 180            | 163 | 205 | 188            | 230 | 213 | 255                | 238 | 280 | 263                | — | — | —                  | — | — |
| 100                         | 207            | 181 | 232 | 206            | 257 | 231 | 282                | 256 | 307 | 281                | — | — | —                  | — | — |

Note) Dimensions other than those highlighted above are standard.

## CH□KGL□-XC63



| Stroke<br>Bore size<br>(mm) | 55, 60, 65, 70 |     |     | 80, 85, 90, 95 |     |     | 105, 110, 115, 120 |     |     | 130, 135, 140, 145 |     |     | 155, 160, 165, 170 |     |     |
|-----------------------------|----------------|-----|-----|----------------|-----|-----|--------------------|-----|-----|--------------------|-----|-----|--------------------|-----|-----|
|                             | LA             | B   | Z   | LA             | B   | Z   | LA                 | B   | Z   | LA                 | B   | Z   | LA                 | B   | Z   |
| 32                          | 166            | 131 | 147 | 191            | 156 | 172 | 216                | 181 | 197 | 241                | 206 | 222 | —                  | —   | —   |
| 40                          | 183            | 140 | 160 | 208            | 165 | 185 | 233                | 190 | 210 | 258                | 215 | 235 | 283                | 240 | 260 |
| 50                          | 196            | 145 | 169 | 221            | 170 | 194 | 246                | 195 | 219 | 271                | 220 | 244 | 296                | 245 | 269 |
| 63                          | 215            | 152 | 182 | 240            | 177 | 207 | 265                | 202 | 232 | 290                | 227 | 257 | 315                | 252 | 282 |
| 80                          | 236            | 163 | 198 | 261            | 188 | 223 | 286                | 213 | 248 | 311                | 238 | 273 | 336                | 263 | 298 |
| 100                         | 264            | 181 | 221 | 289            | 206 | 246 | 314                | 231 | 271 | 339                | 256 | 296 | 364                | 281 | 321 |

### 4 With Air Release Valve

Symbol

-XC64

Air release valves are provided on cylinder tube surfaces machined for ports.

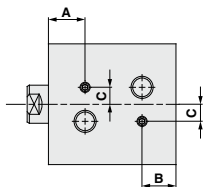
CH□KGB □ - Bore size - Stroke - Rod end thread type - Auto switch - Suffix for auto switch - XC64

CH□KGL □ - Bore size - Stroke - Rod end thread type - Auto switch - Suffix for auto switch - XC64

With air release valve

### Dimensions

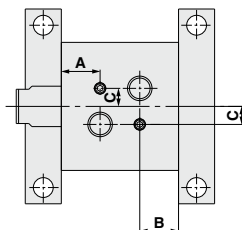
#### CH□KGB□-□-XC64



| Bore size (mm) | A    | B    | C  |
|----------------|------|------|----|
| 20             | 16.5 | 9.5  | 7  |
| 25             | 17   | 10   | 8  |
| 32             | 19.5 | 17   | 10 |
| 40             | 21.5 | 18.5 | 10 |
| 50             | 24   | 21.5 | 10 |
| 63             | 27.5 | 24   | 10 |
| 80             | 31   | 27.5 | 15 |
| 100            | 36   | 33   | 15 |

Note) Dimensions other than those highlighted above are standard.

#### CH□KGL□-□-XC64



CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□