

Tie-rod Type Hydraulic Cylinder Double Acting/Single Rod

CHA Series

3.5 MPa

∅40, ∅50, ∅63, ∅80, ∅100, ∅125, ∅160

How to Order

Without Auto Switch CHA L [] 40 - 100 [] - []

With Auto Switch CHDA L [] 40 - 100 [] - M9BW [] - []

With auto switch (built-in magnet)

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) CHDAB50-100

Tube material

| | |
|-----|----------------|
| Nil | Aluminum alloy |
| F | Steel tube |

Bore size

| | | |
|-----|--------|-----------------------------|
| 40 | 40 mm | Aluminum tube Steel tube |
| 50 | 50 mm | |
| 63 | 63 mm | |
| 80 | 80 mm | |
| 100 | 100 mm | |
| 125 | 125 mm | |
| 160 | 160 mm | |

Cylinder options

| | | |
|----------|-----|-------------------|
| Rod boot | Nil | Without rod boot |
| | J | Nylon tarpaulin |
| | K | Neoprene cloth |
| Cushion | Nil | Both sides |
| | N | Without cushion |
| | R | With rod cushion |
| | H | With head cushion |

* Indicate in alphabetical order.

Mounting type

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

Bore size

| | | |
|-----|--------|---------------|
| 40 | 40 mm | Aluminum tube |
| 50 | 50 mm | |
| 63 | 63 mm | |
| 80 | 80 mm | |
| 100 | 100 mm | |
| 160 | 160 mm | |

Auto switch type

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

* Select applicable auto switch models from the table below.

Number of auto switches

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

Cylinder stroke (mm)
Refer to the standard stroke table on page 397.

Made to Order specifications
For details, refer to page 397.

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 | Tie-rod mount | Band mount | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | None | | | | | | | | |
| Solid state auto switch | — | Grommet | — | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9N | — | ● | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | | | | | — | G59** | ● | — | ● | ○ | — | ○ | | | | | | |
| | | | | 3-wire (PNP) | — | ● | ● | ● | ○ | — | ○ | | | | | | | | | | |
| | | 2-wire | | 12 V | — | — | ● | ● | ● | ○ | — | ○ | — | | | | | | | | |
| | | 3-wire (NPN) | | 5 V, 12 V | — | — | — | — | — | — | ● | — | — | ○ | IC circuit | | | | | | |
| | | 2-wire | | 12 V | — | — | — | — | — | — | ● | — | — | ○ | — | | | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | — | M9NW | — | ● | ● | ● | ○ | — | ○ | IC circuit | | | | |
| | | | | | | | | | — | G59W** | ● | — | ● | ○ | — | ○ | | | | | |
| | | | | 3-wire (PNP) | — | ● | ● | ● | ○ | — | ○ | | | | | | | | | | |
| | | 2-wire | | 12 V | — | — | — | — | — | — | ● | — | — | ○ | — | | | | | | |
| | | 3-wire (NPN) | | 5 V, 12 V | — | — | — | — | — | — | — | — | — | — | ○ | IC circuit | | | | | |
| | | 3-wire (PNP) | | — | — | — | — | — | — | — | — | — | — | — | ○ | — | | | | | |
| Water resistant (2-color indicator) | Grommet | — | 3-wire (NPN) | 24 V | 5 V, 12 V | — | — | M9BW | — | ● | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | | | | | — | K59W** | ● | — | ● | ○ | — | ○ | | | | | | |
| | | | 2-wire | 12 V | — | — | — | — | — | — | — | — | — | ○ | — | | | | | | |
| | 3-wire (NPN) | | 5 V, 12 V | — | — | — | — | — | — | — | — | — | — | ○ | IC circuit | | | | | | |
| | 3-wire (PNP) | | — | — | — | — | — | — | — | — | — | — | — | ○ | — | | | | | | |
| | 2-wire | | 12 V | — | — | — | — | — | — | — | — | — | — | ○ | — | | | | | | |
| Diagnostic output (2-color indicator) | Grommet | — | 4-wire (NPN) | — | 5 V, 12 V | — | — | F59F | G59F** | ● | — | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | | | | | — | — | ● | — | ● | ○ | — | ○ | | | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equiv.) | 24 V | 12 V | — | — | A96 | — | ● | — | ● | — | — | ○ | IC circuit | | | | |
| | | | | | | | | | — | A93 | — | ● | ● | ● | — | — | | — | — | | |
| | | | | Terminal conduit | No | 2-wire | 24 V | 12 V | — | — | — | A90 | — | ● | — | ● | — | — | — | IC circuit | |
| | | | | | | | | | | | | — | A54 | — | ● | — | ● | — | — | | — |
| | | | | | | | | | | | | — | A64 | — | ● | — | ● | — | — | | — |
| | | DIN terminal | | Yes | 2-wire | 24 V | 12 V | — | — | — | — | A33 | — | — | — | — | ● | — | — | | |
| | | | | | | | | | | | — | A34 | — | — | — | — | — | ● | | — | |
| | | Grommet | | No | 2-wire | 24 V | 12 V | — | — | — | — | A44 | — | — | — | — | — | ● | — | | |
| | | | | | | | | | | | — | — | — | — | — | — | — | — | | — | — |
| | | | | | | | | | | | — | A59W | B59W** | ● | — | ● | — | — | | — | — |

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

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

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

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

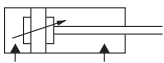
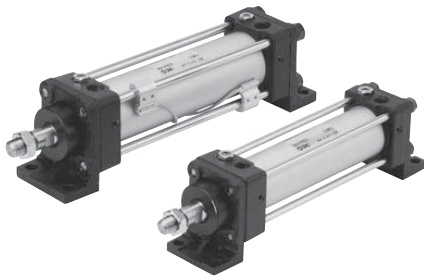
** Types D-G5□, K59, G5□W, K59W, G5BA, G59F, G5NT, B5□, B64, and B59W cannot be mounted on ∅63 bore size cylinders.

* Since there are applicable auto switches other than listed, refer to page 413 for details.

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

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

Tie-rod Type Hydraulic Cylinder Double Acting/Single Rod **CHA Series**



Made to Order specifications
For details, refer to page 415.

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

Models

| Model | Tube material | Bore size (mm) |
|-------|----------------|-------------------------------|
| CHA | Aluminum alloy | 40, 50, 63, 80, 100 |
| CHAF | Steel | 40, 50, 63, 80, 100, 125, 160 |

Specifications

| | |
|--------------------------------------|---|
| Action | Double acting/Single rod |
| Fluid | Hydraulic fluid |
| Nominal pressure | 3.5 MPa |
| Proof pressure | 5.0 MPa |
| Maximum allowable pressure | 3.5 MPa |
| Minimum operating pressure | 0.25 MPa |
| Ambient and fluid temperature | Without auto switch: -10° to 80°C |
| | With auto switch: -10° to 60°C |
| Piston speed | 8 to 300 mm/s |
| Cushion | Cushion seal |
| Stroke length tolerance | to 100st $^{+0.8}_0$, 100 to 250st $^{+1.0}_0$, 250 to 630st $^{+1.25}_0$ 630 to 1000st $^{+1.4}_0$, 1000 to 1500st $^{+1.8}_0$ |
| Mounting | Basic type (B), Axial foot type (L), Rod flange type (F) Head flange type (G), Single clevis type (C), Double clevis type (D), Center trunnion type (T), Rod trunnion type (U) |

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

Standard Strokes

| Bore size (mm) | Standard strokes (mm) |
|----------------|-----------------------|
| 40 | 25 to 1000 |
| 50 | 25 to 1000 |
| 63 | 25 to 1000 |
| 80 | 25 to 1300 |
| 100 | 25 to 1500 |
| 125 | 50 to 1300 |
| 160 | 50 to 1500 |

Note) Refer to pages 232 and 233 to determine stroke limitation depending on the type of mounting brackets that will be used. Then make your selection.

Accessories (Options)

Bracket pin, Knuckle bracket, Knuckle pin, Knuckle, Y-type knuckle, Rod end nut

* Refer to pages 408 and 409 for part numbers and dimensions.

Cushion Strokes (For Rod Side and Head Side)

| Bore size (mm) | Effective cushion stroke (mm) |
|----------------|-------------------------------|
| 40 | 15 |
| 50 | 15 |
| 63 | 17 |
| 80 | 20 |
| 100 | 20 |
| 125 | 20 |
| 160 | 22 |

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 | Not compatible |
| Phosphate hydraulic fluid | Not compatible |

Rod Boot Material

| Symbol | Material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70 |
| K | Heat resistant tarpaulin | 110 * |

* Maximum ambient temperature for the rod boot itself.

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

Theoretical Output

Unit: N

| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm ²) | Operating pressure (MPa) | | | | | |
|----------------|---------------|---------------------|--------------------------------|--------------------------|-------|-------|-------|-------|-------|
| | | | | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 |
| 40 | 18 | OUT | 1257 | 1257 | 1886 | 2514 | 3143 | 3771 | 4400 |
| | | IN | 1002 | 1002 | 1503 | 2004 | 2505 | 3006 | 3507 |
| 50 | 20 | OUT | 1963 | 1963 | 2945 | 3926 | 4908 | 5889 | 6871 |
| | | IN | 1649 | 1649 | 2474 | 3298 | 4123 | 4947 | 5772 |
| 63 | 22.4 | OUT | 3117 | 3117 | 4676 | 6234 | 7793 | 9351 | 10910 |
| | | IN | 2723 | 2723 | 4085 | 5446 | 6808 | 8169 | 9531 |
| 80 | 28 | OUT | 5027 | 5027 | 7541 | 10054 | 12568 | 15081 | 17595 |
| | | IN | 4411 | 4411 | 6617 | 8822 | 11028 | 13233 | 15439 |
| 100 | 35.5 | OUT | 7854 | 7854 | 11781 | 15708 | 19635 | 23562 | 27489 |
| | | IN | 6864 | 6864 | 10296 | 13728 | 17160 | 20592 | 24024 |
| 125 | 35.5 | OUT | 12272 | 12272 | 18408 | 24544 | 30680 | 36816 | 42952 |
| | | IN | 11282 | 11282 | 16923 | 22564 | 28205 | 33846 | 39487 |
| 160 | 45 | OUT | 20106 | 20106 | 30159 | 40212 | 50265 | 60318 | 70371 |
| | | IN | 18516 | 18516 | 27774 | 37032 | 46290 | 55548 | 64806 |

Weight

CH□A Series (Built-in magnet)

Unit: kg

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 |
|------------------------------------|--------------------------|------|------|------|------|------|
| (0 mm stroke) | Basic weight | | | | | |
| | Basic type (B) | 1.3 | 2.0 | 2.6 | 4.3 | 6.5 |
| | Axial foot type (L) | 1.8 | 2.9 | 3.8 | 6.4 | 10.0 |
| | Flange type (F, G) | 1.6 | 2.4 | 3.2 | 5.2 | 8.2 |
| | Single clevis type (C) | 1.7 | 2.6 | 3.6 | 5.8 | 9.0 |
| | Double clevis type (D) | 1.8 | 2.9 | 3.8 | 6.5 | 9.9 |
| | Rod trunnion type (U) | 1.6 | 2.4 | 3.1 | 6.0 | 9.4 |
| | Center trunnion type (T) | 1.7 | 2.8 | 3.4 | 5.8 | 9.2 |
| Additional weight per 10 mm stroke | | 0.05 | 0.07 | 0.09 | 0.12 | 0.16 |

 Calculation (Example) **CHAL50-100**

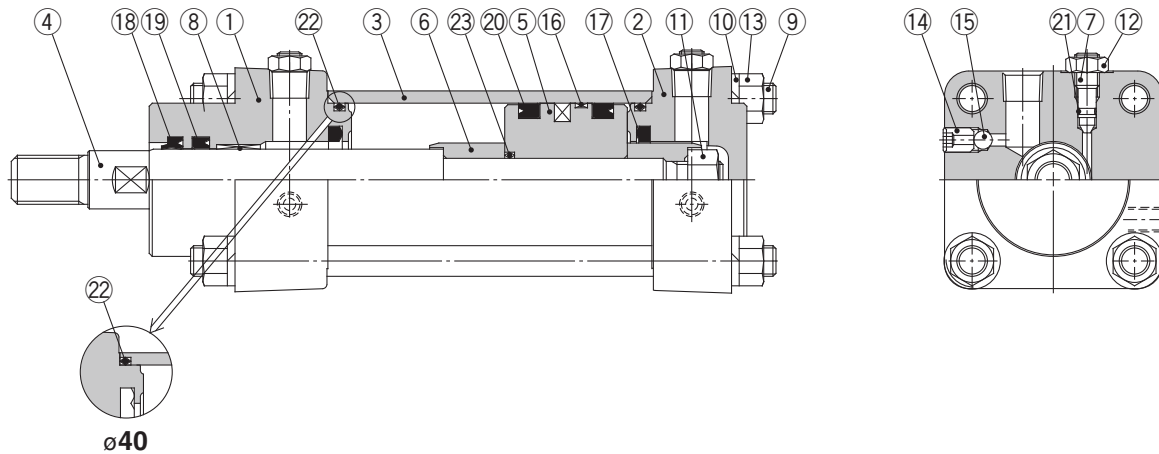
- Basic weight 2.9 (foot type, ø50)
 - Additional weight 0.07/10 mm stroke
 - Cylinder stroke 100 mm
- $$2.9 + 0.07 \times 100 / 10 = 3.6 \text{ kg}$$

CHA□F Series (Steel tube)

Unit: kg

| Bore size (mm) | | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
|------------------------------------|--------------------------|------|------|------|------|------|------|------|
| (0 mm stroke) | Basic weight | | | | | | | |
| | Basic type (B) | 1.5 | 2.1 | 2.7 | 4.7 | 7.1 | 9.2 | 15.8 |
| | Axial foot type (L) | 2.0 | 3.1 | 3.9 | 6.8 | 10.6 | 15.8 | 26.5 |
| | Flange type (F, G) | 1.7 | 2.6 | 3.2 | 5.7 | 8.8 | 12.1 | 26.7 |
| | Single clevis type (C) | 1.9 | 2.8 | 3.6 | 6.3 | 9.6 | 13.0 | 22.9 |
| | Double clevis type (D) | 2.0 | 3.1 | 3.9 | 7.0 | 10.5 | 14.7 | 25.6 |
| | Rod trunnion type (U) | 1.7 | 2.6 | 3.2 | 6.5 | 10.0 | 13.7 | 23.6 |
| | Center trunnion type (T) | 1.9 | 2.9 | 3.4 | 6.2 | 9.8 | 12.9 | 22.7 |
| Additional weight per 10 mm stroke | | 0.09 | 0.08 | 0.10 | 0.19 | 0.24 | 0.31 | 0.47 |

Construction



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

Parts List

| No. | Description | Material | Note |
|-----|----------------------|----------------|-----------------------------|
| 1 | Rod cover | Aluminum alloy | 70% flat black |
| 2 | Head cover | Aluminum alloy | 70% flat black |
| 3 | Cylinder tube | Aluminum alloy | Hard anodized |
| | | Carbon steel | |
| 4 | Piston rod | Carbon steel | Hard chromium electroplated |
| 5 | Piston | Aluminum alloy | |
| 6 | Cushion ring | Rolled steel | |
| 7 | Needle valve | Rolled steel | |
| 8 | Bushing | Lead bronze | |
| 9 | Tie-rod | Carbon steel | |
| 10 | Tie-rod washer | Steel wire | |
| 11 | Piston nut | Rolled steel | |
| 12 | Needle valve nut | Carbon steel | |
| 13 | Tie-rod nut | Carbon steel | |
| 14 | Air release valve | Alloy steel | |
| 15 | Check ball | Bearing steel | |
| 16 | Wear ring | Resin | |
| 17 | Cushion seal | — | |
| 18 | Wiper ring | NBR | |
| 19 | Rod seal | NBR | |
| 20 | Piston seal | NBR | |
| 21 | Needle valve seal | NBR | |
| 22 | Cylinder tube gasket | NBR | |
| 23 | Piston gasket | NBR | |

Replacement Parts: Seal Kit

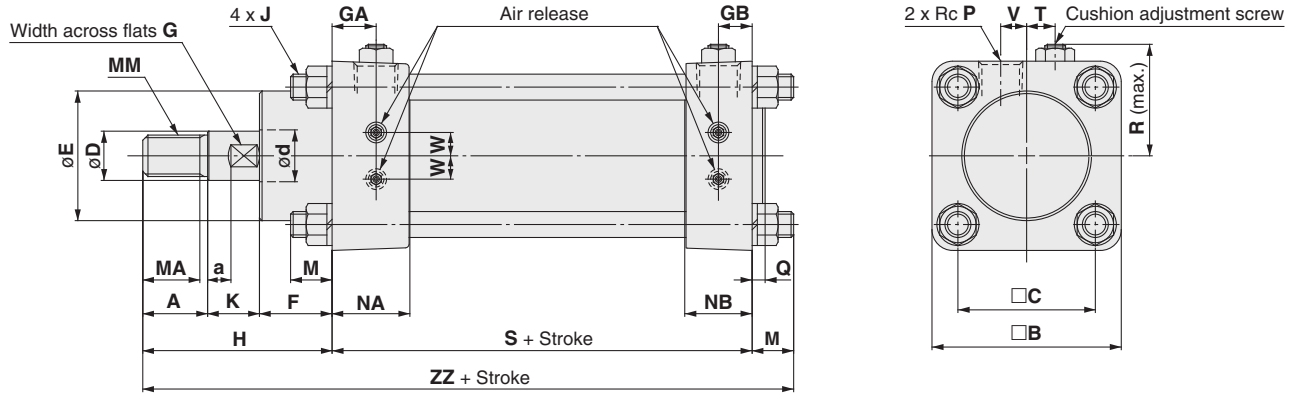
| Bore size (mm) | Seal kit no. | Content |
|----------------|--------------|---|
| 40 | CHA40-PS | Nos. 17 to 22 from the chart at left |
| 50 | CHA50-PS | |
| 63 | CHA63-PS | |
| 80 | CHA80-PS | |
| 100 | CHA100-PS | |
| 125 | CHA125-PS | |
| 160 | CHA160-PS | |

* Seal kit consists of items 17 through 22 and can be ordered using the seal kit number for each bore size.

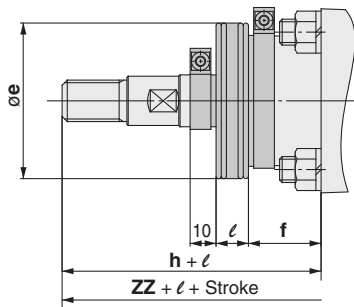
CHA Series

Dimensions

Basic type: CHAB



With rod boot

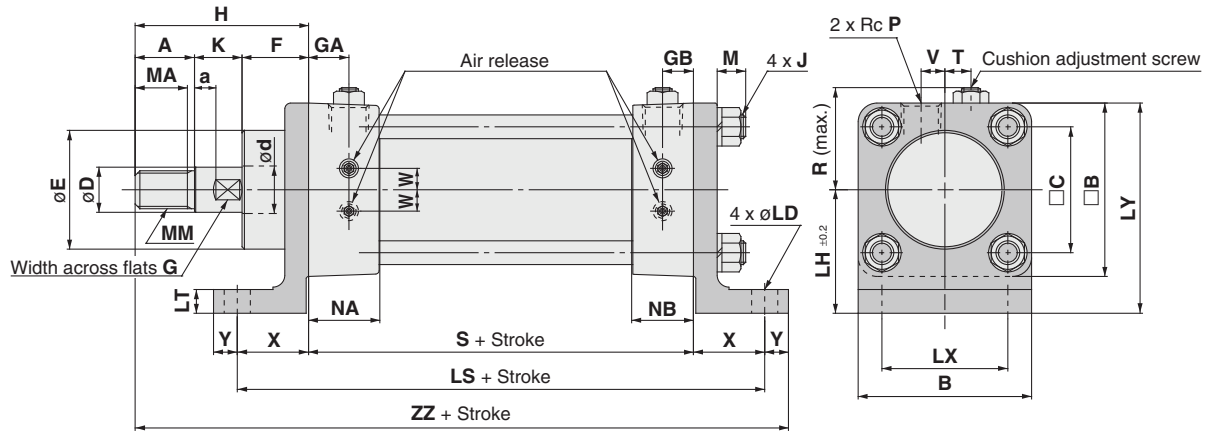


| Bore size (mm) | A | a | □B | □C | D | d | E | F | G | GA | GB | J | K | M | MA | MM | NA | NB | P | Q | R | S | T | V | W |
|----------------|----|-----|-----|-----|-----------------------------------|------|------------------------------------|----|----|------|-----|------------|----|----|----|-----------|----|----|-----|---|----|-----|----|-----|----|
| 40 | 23 | 10 | 60 | 44 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 13 | 20 | M14 x 1.5 | 30 | 22 | 1/4 | 5 | 37 | 106 | 11 | 7.5 | 8 |
| 50 | 25 | 9 | 73 | 53 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 17 | 17 | 13 | M10 x 1.5 | 20 | 16 | 22 | M16 x 1.5 | 30 | 26 | 3/8 | 5 | 43 | 112 | 11 | 10 | 9 |
| 63 | 28 | 8 | 80 | 60 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 17 | 17 | 13 | M10 x 1.5 | 22 | 16 | 25 | M18 x 1.5 | 30 | 26 | 3/8 | 5 | 47 | 116 | 11 | 12 | 10 |
| 80 | 32 | 8 | 100 | 75 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 22 | 20 | 15 | M12 x 1.75 | 26 | 19 | 29 | M22 x 1.5 | 35 | 30 | 1/2 | 5 | 57 | 127 | 11 | 16 | 13 |
| 100 | 38 | 6.5 | 118 | 90 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M12 x 1.75 | 27 | 21 | 34 | M27 x 2 | 35 | 32 | 1/2 | 8 | 66 | 137 | 12 | 20 | 16 |
| 125 | 38 | 6.5 | 140 | 112 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M14 x 2 | 27 | 24 | 34 | M27 x 2 | 35 | 32 | 1/2 | 8 | 77 | 137 | 12 | 20 | 16 |
| 160 | 42 | 9 | 174 | 140 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 36 | 22 | 18 | M16 x 2 | 28 | 27 | 38 | M33 x 2 | 40 | 36 | 3/4 | 8 | 94 | 155 | 12 | 24 | 20 |

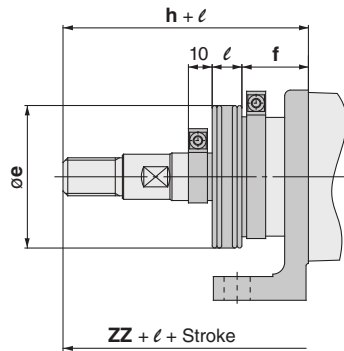
(mm)

| Bore size (mm) | Without rod boot | | With rod boot | | | | |
|----------------|------------------|-----|---------------|----|-----|------------|-----|
| | H | ZZ | e | f | h | ℓ | ZZ |
| 40 | 66 | 185 | 55 | 25 | 92 | | 211 |
| 50 | 73 | 201 | 60 | 28 | 99 | 1/4 stroke | 227 |
| 63 | 80 | 212 | 65 | 30 | 106 | | 238 |
| 80 | 90 | 236 | 80 | 32 | 116 | | 262 |
| 100 | 100 | 258 | 100 | 35 | 123 | 1/5 stroke | 281 |
| 125 | 100 | 261 | 100 | 35 | 123 | | 284 |
| 160 | 108 | 290 | 120 | 38 | 131 | | 313 |

Foot type: CHAL



With rod boot



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

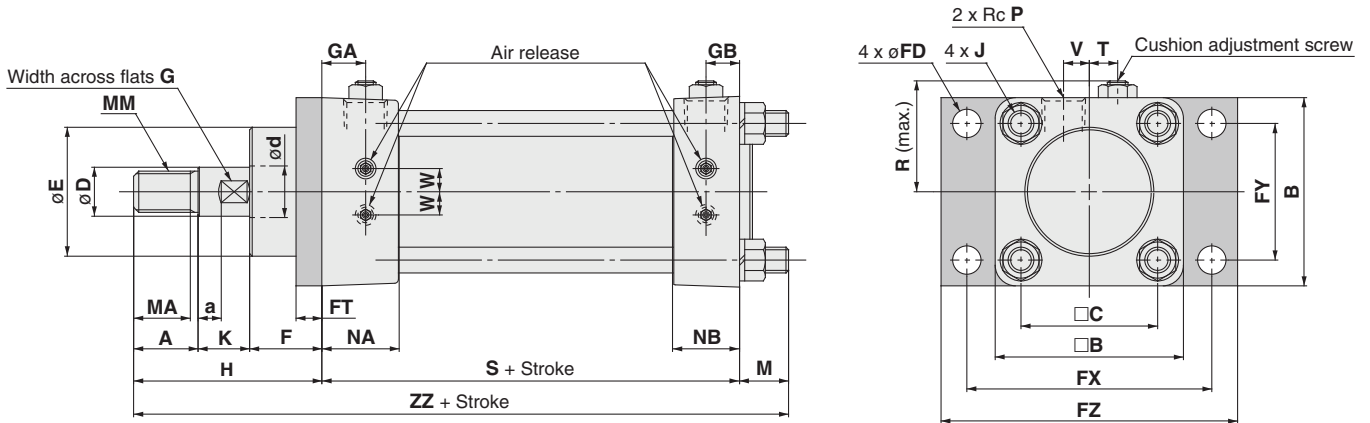
| Bore size (mm) | A | a | B | □B | □C | D | d | E | F | G | GA | GB | J | K | LD | LH | LS | LT | LX | LY | M | MA | MM | NA | NB |
|----------------|----|-----|-----|-----|-----|-----------------------------------|------|------------------------------------|----|----|------|-----|------------|----|----|-----|-----|----|-----|------|----|----|-----------|----|----|
| 40 | 23 | 10 | 60 | 60 | 44 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 9 | 47 | 160 | 8 | 44 | 77 | 10 | 20 | M14 x 1.5 | 30 | 22 |
| 50 | 25 | 9 | 73 | 73 | 53 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 17 | 17 | 13 | M10 x 1.5 | 20 | 11 | 52 | 172 | 10 | 53 | 88.5 | 12 | 22 | M16 x 1.5 | 30 | 26 |
| 63 | 28 | 8 | 80 | 80 | 60 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 17 | 17 | 13 | M10 x 1.5 | 22 | 11 | 55 | 190 | 10 | 60 | 95 | 12 | 25 | M18 x 1.5 | 30 | 26 |
| 80 | 32 | 8 | 100 | 100 | 75 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 22 | 20 | 15 | M12 x 1.75 | 26 | 13 | 65 | 207 | 12 | 75 | 115 | 14 | 29 | M22 x 1.5 | 35 | 30 |
| 100 | 38 | 6.5 | 118 | 118 | 90 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M12 x 1.75 | 27 | 13 | 80 | 231 | 14 | 90 | 139 | 14 | 34 | M27 x 2 | 35 | 32 |
| 125 | 38 | 6.5 | 140 | 140 | 112 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M14 x 2 | 27 | 15 | 100 | 247 | 16 | 112 | 170 | 16 | 34 | M27 x 2 | 35 | 32 |
| 160 | 42 | 9 | 174 | 174 | 140 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 36 | 22 | 18 | M16 x 2 | 28 | 17 | 110 | 275 | 18 | 140 | 197 | 18 | 38 | M33 x 2 | 40 | 36 |

| Bore size (mm) | P | R | S | T | V | W | X | Y | Without rod boot | | With rod boot | | | | | |
|----------------|-----|----|-----|----|-----|----|----|----|------------------|-----|---------------|----|-----|------------|-----|--|
| | | | | | | | | | H | ZZ | e | f | h | l | ZZ | |
| | | | | | | | | | | | | | | | | |
| 40 | 1/4 | 37 | 106 | 11 | 7.5 | 8 | 27 | 8 | 66 | 207 | 55 | 25 | 92 | 1/4 stroke | 233 | |
| 50 | 3/8 | 43 | 112 | 11 | 10 | 9 | 30 | 10 | 73 | 225 | 60 | 28 | 99 | | 251 | |
| 63 | 3/8 | 47 | 116 | 11 | 12 | 10 | 37 | 10 | 80 | 243 | 65 | 30 | 106 | | 269 | |
| 80 | 1/2 | 57 | 127 | 11 | 16 | 13 | 40 | 13 | 90 | 270 | 80 | 32 | 116 | 1/5 stroke | 296 | |
| 100 | 1/2 | 66 | 137 | 12 | 20 | 16 | 47 | 13 | 100 | 297 | 100 | 35 | 123 | | 322 | |
| 125 | 1/2 | 77 | 137 | 12 | 20 | 16 | 55 | 15 | 100 | 307 | 100 | 35 | 123 | | 328 | |
| 160 | 3/4 | 94 | 155 | 12 | 24 | 20 | 60 | 20 | 108 | 343 | 120 | 38 | 131 | 366 | | |

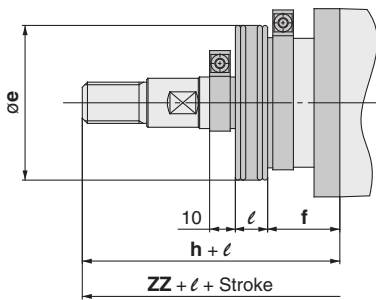
CHA Series

Dimensions

Rod flange type: CHAF



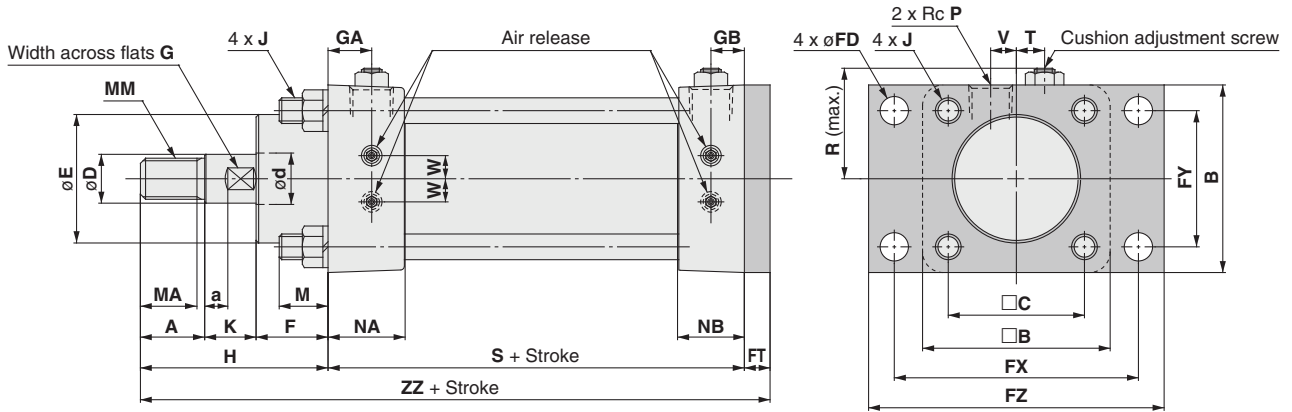
With rod boot



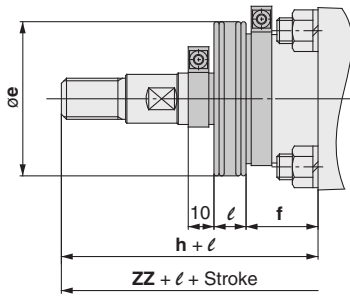
| Bore size (mm) | A | a | B | $\square B$ | $\square C$ | D | d | E | F | FD | FT | FX | FY | FZ | G | GA | GB | J | K | M | MA | MM | NA | NB | P |
|----------------|----|-----|-----|-------------|-------------|-----------------------------------|------|------------------------------------|----|----|----|-----|-----|-----|----|------|-----|------------|----|----|----|-----------|----|----|-----|
| 40 | 23 | 10 | 60 | 60 | 44 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 9 | 10 | 77 | 44 | 95 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 16 | 20 | M14 x 1.5 | 30 | 22 | 1/4 |
| 50 | 25 | 9 | 73 | 73 | 53 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 11 | 10 | 95 | 53 | 115 | 17 | 17 | 13 | M10 x 1.5 | 20 | 22 | 22 | M16 x 1.5 | 30 | 26 | 3/8 |
| 63 | 28 | 8 | 80 | 80 | 60 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 11 | 12 | 102 | 60 | 122 | 17 | 17 | 13 | M10 x 1.5 | 22 | 20 | 25 | M18 x 1.5 | 30 | 26 | 3/8 |
| 80 | 32 | 8 | 100 | 100 | 75 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 13 | 12 | 130 | 75 | 155 | 22 | 20 | 15 | M12 x 1.75 | 26 | 26 | 29 | M22 x 1.5 | 35 | 30 | 1/2 |
| 100 | 38 | 6.5 | 118 | 118 | 90 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 13 | 16 | 145 | 90 | 172 | 27 | 19 | 16 | M12 x 1.75 | 27 | 26 | 34 | M27 x 2 | 35 | 32 | 1/2 |
| 125 | 38 | 6.5 | 140 | 140 | 112 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 15 | 18 | 170 | 112 | 200 | 27 | 19 | 16 | M14 x 2 | 27 | 30 | 34 | M27 x 2 | 35 | 32 | 1/2 |
| 160 | 42 | 9 | 174 | 174 | 140 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 17 | 20 | 205 | 140 | 240 | 36 | 22 | 18 | M16 x 2 | 28 | 34 | 38 | M33 x 2 | 40 | 36 | 3/4 |

| Bore size (mm) | R | S | T | V | W | Without rod boot | | With rod boot | | | | |
|----------------|----|-----|----|-----|----|------------------|-----|---------------|----|-----|------------|-----|
| | | | | | | H | ZZ | e | f | h | ℓ | ZZ |
| | | | | | | | | | | | | |
| 40 | 37 | 106 | 11 | 7.5 | 8 | 66 | 188 | 55 | 25 | 92 | | 214 |
| 50 | 43 | 112 | 11 | 10 | 9 | 73 | 207 | 60 | 28 | 99 | 1/4 stroke | 233 |
| 63 | 47 | 116 | 11 | 12 | 10 | 80 | 216 | 65 | 30 | 106 | | 242 |
| 80 | 57 | 127 | 11 | 16 | 13 | 90 | 243 | 80 | 32 | 116 | | 269 |
| 100 | 66 | 137 | 12 | 20 | 16 | 100 | 263 | 100 | 35 | 123 | 1/5 stroke | 286 |
| 125 | 77 | 137 | 12 | 20 | 16 | 100 | 267 | 100 | 35 | 123 | | 290 |
| 160 | 94 | 155 | 12 | 24 | 20 | 108 | 297 | 120 | 38 | 131 | | 320 |

Head flange type: CHAG



With rod boot



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

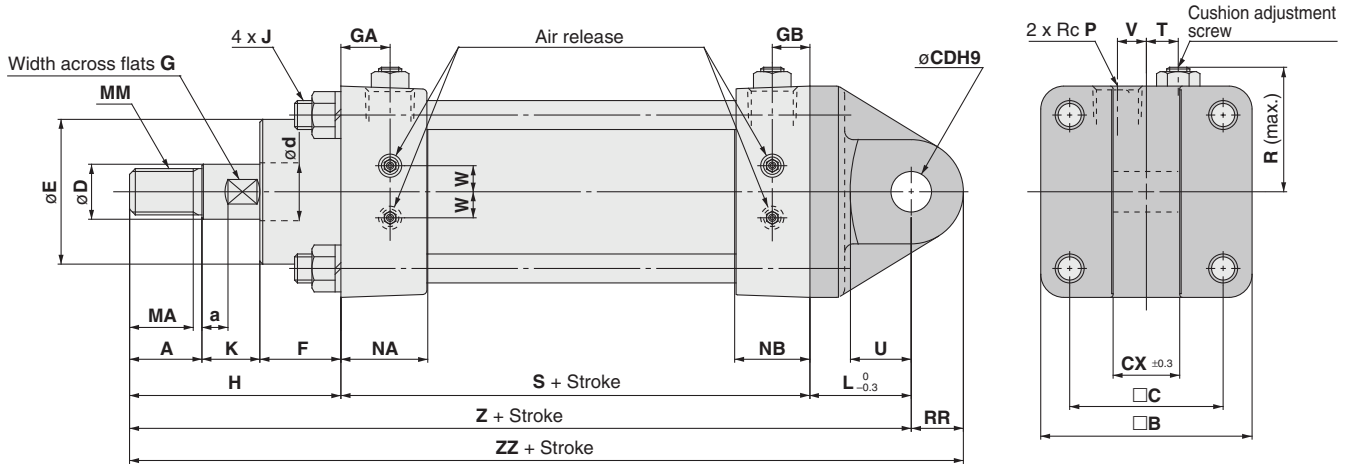
| Bore size (mm) | A | a | □B | □C | D | d | E | F | FD | FT | FX | FY | FZ | G | GA | GB | J | K | M | MA | MM | NA | NB | P | R |
|----------------|----|-----|-----|-----|-----------------------------------|------|------------------------------------|----|----|----|-----|-----|-----|----|------|-----|------------|----|----|----|-----------|----|----|-----|----|
| 40 | 23 | 10 | 60 | 44 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 9 | 10 | 77 | 44 | 95 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 16 | 20 | M14 x 1.5 | 30 | 22 | 1/4 | 37 |
| 50 | 25 | 9 | 73 | 53 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 11 | 10 | 95 | 53 | 115 | 17 | 17 | 13 | M10 x 1.5 | 20 | 22 | 22 | M16 x 1.5 | 30 | 26 | 3/8 | 43 |
| 63 | 28 | 8 | 80 | 60 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 11 | 12 | 102 | 60 | 122 | 17 | 17 | 13 | M10 x 1.5 | 22 | 20 | 25 | M18 x 1.5 | 30 | 26 | 3/8 | 47 |
| 80 | 32 | 8 | 100 | 75 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 13 | 12 | 130 | 75 | 155 | 22 | 20 | 15 | M12 x 1.75 | 26 | 26 | 29 | M22 x 1.5 | 35 | 30 | 1/2 | 57 |
| 100 | 38 | 6.5 | 118 | 90 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 13 | 16 | 145 | 90 | 172 | 27 | 19 | 16 | M12 x 1.75 | 27 | 26 | 34 | M27 x 2 | 35 | 32 | 1/2 | 66 |
| 125 | 38 | 6.5 | 140 | 112 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 15 | 18 | 170 | 112 | 200 | 27 | 19 | 16 | M14 x 2 | 27 | 30 | 34 | M27 x 2 | 35 | 32 | 1/2 | 77 |
| 160 | 42 | 9 | 174 | 140 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 17 | 20 | 205 | 140 | 240 | 36 | 22 | 18 | M16 x 2 | 28 | 34 | 38 | M33 x 2 | 40 | 36 | 3/4 | 94 |

| Bore size (mm) | S | T | V | W | Without rod boot | | With rod boot | | | | |
|----------------|-----|----|-----|----|------------------|-----|---------------|----|-----|------------|-----|
| | | | | | H | ZZ | e | f | h | ℓ | ZZ |
| 40 | 106 | 11 | 7.5 | 8 | 66 | 182 | 55 | 25 | 92 | | 208 |
| 50 | 112 | 11 | 10 | 9 | 73 | 195 | 60 | 28 | 99 | 1/4 stroke | 221 |
| 63 | 116 | 11 | 12 | 10 | 80 | 208 | 65 | 30 | 106 | | 234 |
| 80 | 127 | 11 | 16 | 13 | 90 | 229 | 80 | 32 | 116 | | 255 |
| 100 | 137 | 12 | 20 | 16 | 100 | 253 | 100 | 35 | 123 | 1/5 stroke | 276 |
| 125 | 137 | 12 | 20 | 16 | 100 | 255 | 100 | 35 | 123 | | 278 |
| 160 | 155 | 12 | 24 | 20 | 108 | 283 | 120 | 38 | 131 | | 306 |

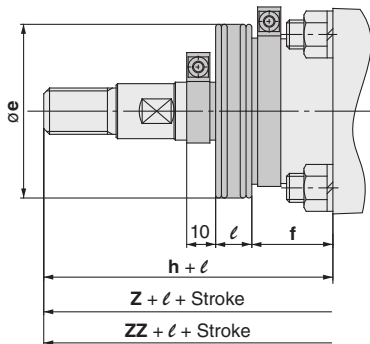
CHA Series

Dimensions

Single clevis type: CHAC



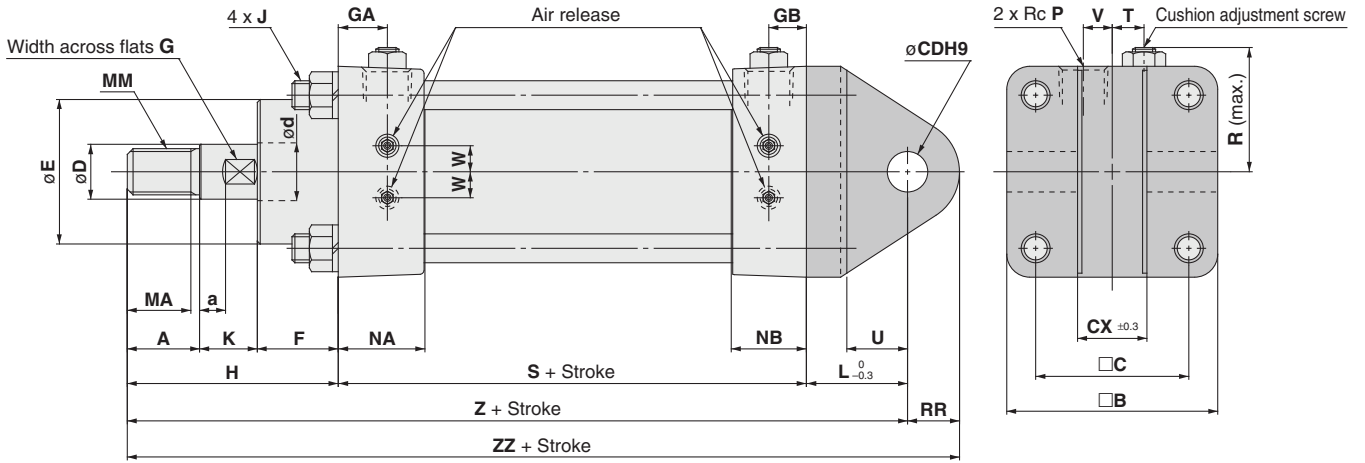
With rod boot



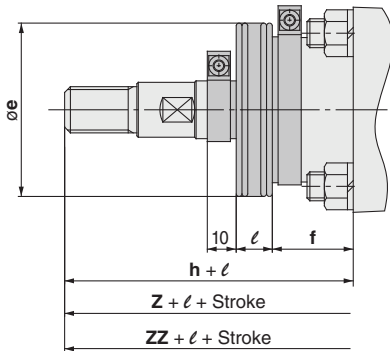
| Bore size (mm) | A | a | □B | □C | CDH9 | CX | D | d | E | F | G | GA | GB | J | K | L | MA | MM | NA | NB | P | R | RR | S |
|----------------|----|-----|-----|-----|-----------------------------------|----|-----------------------------------|------|------------------------------------|----|----|------|-----|------------|----|----|----|-----------|----|----|-----|----|----|-----|
| 40 | 23 | 10 | 60 | 44 | 12 ^{+0.043} ₀ | 21 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 32 | 20 | M14 x 1.5 | 30 | 22 | 1/4 | 37 | 15 | 106 |
| 50 | 25 | 9 | 73 | 53 | 14 ^{+0.043} ₀ | 23 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 17 | 17 | 13 | M10 x 1.5 | 20 | 35 | 22 | M16 x 1.5 | 30 | 26 | 3/8 | 43 | 18 | 112 |
| 63 | 28 | 8 | 80 | 60 | 16 ^{+0.043} ₀ | 27 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 17 | 17 | 13 | M10 x 1.5 | 22 | 40 | 25 | M18 x 1.5 | 30 | 26 | 3/8 | 47 | 20 | 116 |
| 80 | 32 | 8 | 100 | 75 | 18 ^{+0.043} ₀ | 31 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 22 | 20 | 15 | M12 x 1.75 | 26 | 45 | 29 | M22 x 1.5 | 35 | 30 | 1/2 | 57 | 22 | 127 |
| 100 | 38 | 6.5 | 118 | 90 | 20 ^{+0.052} ₀ | 35 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M12 x 1.75 | 27 | 50 | 34 | M27 x 2 | 35 | 32 | 1/2 | 66 | 24 | 137 |
| 125 | 38 | 6.5 | 140 | 112 | 22 ^{+0.052} ₀ | 41 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M14 x 2 | 27 | 55 | 34 | M27 x 2 | 35 | 32 | 1/2 | 77 | 26 | 137 |
| 160 | 42 | 9 | 174 | 140 | 25 ^{+0.052} ₀ | 54 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 36 | 22 | 18 | M16 x 2 | 28 | 65 | 38 | M33 x 2 | 40 | 36 | 3/4 | 94 | 30 | 155 |

| Bore size (mm) | T | U | V | W | Without rod boot | | With rod boot | | | | | | |
|----------------|----|----|-----|----|------------------|-----|---------------|-----|----|-----|------------|-----|-----|
| | | | | | H | Z | ZZ | e | f | h | l | Z | ZZ |
| 40 | 11 | 18 | 7.5 | 8 | 66 | 204 | 219 | 55 | 25 | 92 | | 230 | 245 |
| 50 | 11 | 21 | 10 | 9 | 73 | 220 | 238 | 60 | 28 | 99 | 1/4 stroke | 246 | 264 |
| 63 | 11 | 23 | 12 | 10 | 80 | 236 | 258 | 65 | 30 | 106 | | 262 | 284 |
| 80 | 11 | 26 | 16 | 13 | 90 | 262 | 284 | 80 | 32 | 116 | | 288 | 310 |
| 100 | 12 | 30 | 20 | 16 | 100 | 287 | 311 | 100 | 35 | 123 | 1/5 stroke | 310 | 334 |
| 125 | 12 | 30 | 20 | 16 | 100 | 292 | 318 | 100 | 35 | 123 | | 315 | 341 |
| 160 | 12 | 40 | 24 | 20 | 108 | 328 | 358 | 120 | 38 | 131 | | 351 | 381 |

Double clevis type: CHAD



With rod boot



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

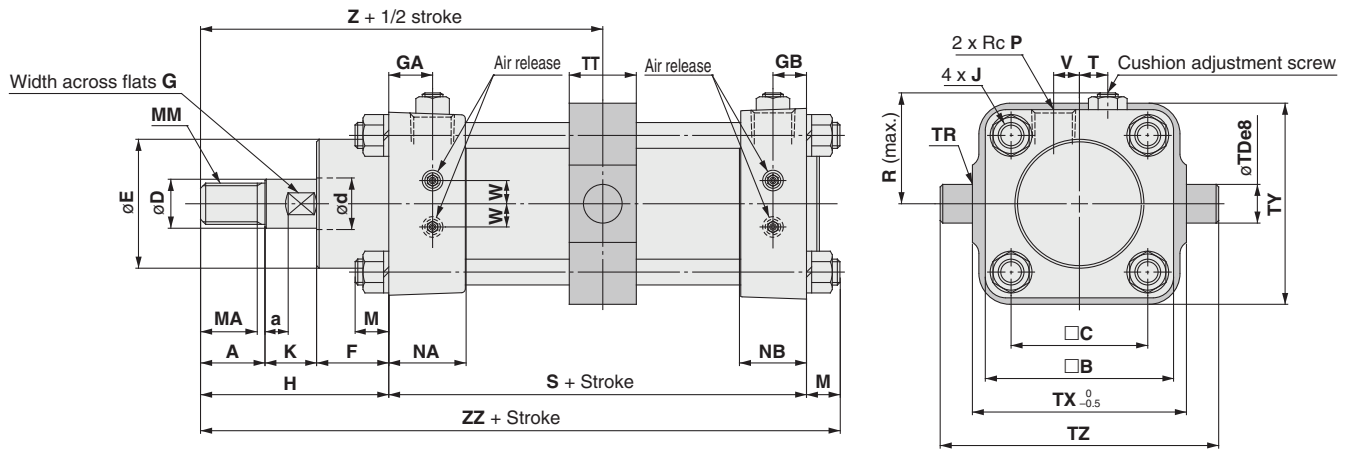
| Bore size (mm) | A | a | B | C | CDH9 | CX | D | d | E | F | G | GA | GB | J | K | L | MA | MM | NA | NB | P | R | RR | S |
|----------------|----|-----|-----|-----|--------------------------------------|----|-----------------------------------|------|------------------------------------|----|----|------|-----|------------|----|----|----|-----------|----|----|-----|----|----|-----|
| 40 | 23 | 10 | 60 | 44 | ø12H9 ^{+0.043} ₀ | 22 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 32 | 20 | M14 x 1.5 | 30 | 22 | 1/4 | 37 | 15 | 106 |
| 50 | 25 | 9 | 73 | 53 | ø14H9 ^{+0.043} ₀ | 24 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 17 | 17 | 13 | M10 x 1.5 | 20 | 35 | 22 | M16 x 1.5 | 30 | 26 | 3/8 | 43 | 18 | 112 |
| 63 | 28 | 8 | 80 | 60 | ø16H9 ^{+0.043} ₀ | 28 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 17 | 17 | 13 | M10 x 1.5 | 22 | 40 | 25 | M18 x 1.5 | 30 | 26 | 3/8 | 47 | 20 | 116 |
| 80 | 32 | 8 | 100 | 75 | ø18H9 ^{+0.043} ₀ | 32 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 22 | 20 | 15 | M12 x 1.75 | 26 | 45 | 29 | M22 x 1.5 | 35 | 30 | 1/2 | 57 | 22 | 127 |
| 100 | 38 | 6.5 | 118 | 90 | ø20H9 ^{+0.052} ₀ | 36 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M12 x 1.75 | 27 | 50 | 34 | M27 x 2 | 35 | 32 | 1/2 | 66 | 24 | 137 |
| 125 | 38 | 6.5 | 140 | 112 | ø22H9 ^{+0.052} ₀ | 42 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M14 x 2 | 27 | 55 | 34 | M27 x 2 | 35 | 32 | 1/2 | 77 | 26 | 137 |
| 160 | 42 | 9 | 174 | 140 | ø25H9 ^{+0.052} ₀ | 55 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 36 | 22 | 18 | M16 x 2 | 28 | 65 | 38 | M33 x 2 | 40 | 36 | 3/4 | 94 | 30 | 155 |

| Bore size (mm) | T | U | V | W | Without rod boot | | | With rod boot | | | | | |
|----------------|----|----|-----|----|------------------|-----|-----|---------------|----|-----|------------|-----|-----|
| | | | | | H | Z | ZZ | e | f | h | l | Z | ZZ |
| 40 | 11 | 18 | 7.5 | 8 | 66 | 204 | 219 | 55 | 25 | 92 | | 230 | 245 |
| 50 | 11 | 21 | 10 | 9 | 73 | 220 | 238 | 60 | 28 | 99 | 1/4 stroke | 246 | 264 |
| 63 | 11 | 23 | 12 | 10 | 80 | 236 | 258 | 65 | 30 | 106 | | 262 | 284 |
| 80 | 11 | 26 | 16 | 13 | 90 | 262 | 284 | 80 | 32 | 116 | | 288 | 310 |
| 100 | 12 | 30 | 20 | 16 | 100 | 287 | 311 | 100 | 35 | 123 | 1/5 stroke | 310 | 334 |
| 125 | 12 | 30 | 20 | 16 | 100 | 292 | 318 | 100 | 35 | 123 | | 315 | 341 |
| 160 | 12 | 40 | 24 | 20 | 108 | 328 | 358 | 120 | 38 | 131 | | 351 | 381 |

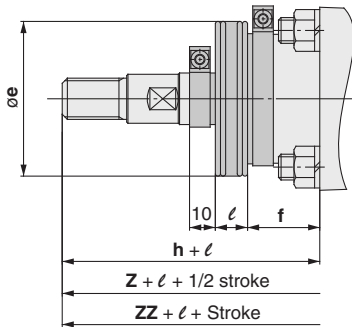
CHA Series

Dimensions

Center trunnion type: CHAT



With rod boot



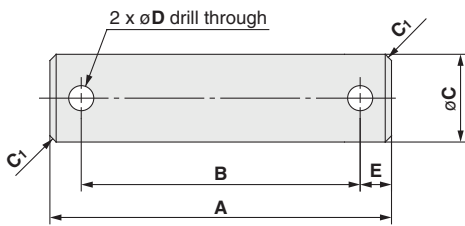
| Bore size (mm) | A | a | □B | □C | D | d | E | F | G | GA | GB | J | K | M | MA | MM | NA | NB | P | R | S | T | Tde8 |
|----------------|----|-----|-----|-----|-----------------------------------|------|------------------------------------|----|----|------|-----|------------|----|----|----|-----------|----|----|-----|----|-----|----|--|
| 40 | 23 | 10 | 60 | 44 | 17 ⁰ _{-0.018} | 18 | 45 ⁰ _{-0.062} | 25 | 14 | 17.5 | 9.5 | M8 x 1.25 | 18 | 10 | 20 | M14 x 1.5 | 30 | 22 | 1/4 | 37 | 106 | 11 | 15 ^{-0.032} _{-0.059} |
| 50 | 25 | 9 | 73 | 53 | 19 ⁰ _{-0.021} | 20 | 50 ⁰ _{-0.062} | 28 | 17 | 17 | 13 | M10 x 1.5 | 20 | 10 | 22 | M16 x 1.5 | 30 | 26 | 3/8 | 43 | 112 | 11 | 15 ^{-0.032} _{-0.059} |
| 63 | 28 | 8 | 80 | 60 | 21 ⁰ _{-0.021} | 22.4 | 55 ⁰ _{-0.074} | 30 | 17 | 17 | 13 | M10 x 1.5 | 22 | 10 | 25 | M18 x 1.5 | 30 | 26 | 3/8 | 47 | 116 | 11 | 15 ^{-0.032} _{-0.059} |
| 80 | 32 | 8 | 100 | 75 | 26 ⁰ _{-0.021} | 28 | 65 ⁰ _{-0.074} | 32 | 22 | 20 | 15 | M12 x 1.75 | 26 | 13 | 29 | M22 x 1.5 | 35 | 30 | 1/2 | 57 | 127 | 11 | 25 ^{-0.040} _{-0.073} |
| 100 | 38 | 6.5 | 118 | 90 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M12 x 1.75 | 27 | 13 | 34 | M27 x 2 | 35 | 32 | 1/2 | 66 | 137 | 12 | 32 ^{-0.050} _{-0.089} |
| 125 | 38 | 6.5 | 140 | 112 | 34 ⁰ _{-0.025} | 35.5 | 80 ⁰ _{-0.074} | 35 | 27 | 19 | 16 | M14 x 2 | 27 | 15 | 34 | M27 x 2 | 35 | 32 | 1/2 | 77 | 137 | 12 | 32 ^{-0.050} _{-0.089} |
| 160 | 42 | 9 | 174 | 140 | 43 ⁰ _{-0.025} | 45 | 100 ⁰ _{-0.087} | 38 | 36 | 22 | 18 | M16 x 2 | 28 | 17 | 38 | M33 x 2 | 40 | 36 | 3/4 | 94 | 155 | 12 | 36 ^{-0.050} _{-0.089} |

| Bore size (mm) | TR | TT | TX | TY | TZ | V | W | (mm) | | | | | | | | | | | | | | | | | | | | | |
|----------------|------|----|-----|-----|-----|-----|----|------------------|-------|-----|-----|----|-----|---------------|---|----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | Without rod boot | | | | | | With rod boot | | | | | | | | | | | | | | | |
| | | | | | | | | H | Z | ZZ | e | f | h | ℓ | Z | ZZ | | | | | | | | | | | | | |
| 40 | R0.5 | 24 | 70 | 65 | 95 | 7.5 | 8 | 66 | 123 | 182 | 55 | 25 | 92 | | | | | | | | | | | | | | | | |
| 50 | R0.5 | 26 | 83 | 78 | 108 | 10 | 9 | 73 | 131 | 195 | 60 | 28 | 99 | 1/4 stroke | | | | | | | | | | | | | | | |
| 63 | R0.5 | 26 | 90 | 86 | 115 | 12 | 10 | 80 | 140 | 206 | 65 | 30 | 106 | | | | | | | | | | | | | | | | |
| 80 | R2.5 | 36 | 112 | 106 | 162 | 16 | 13 | 90 | 156 | 230 | 80 | 32 | 116 | | | | | | | | | | | | | | | | |
| 100 | R2.5 | 42 | 140 | 130 | 204 | 20 | 16 | 100 | 170 | 250 | 100 | 35 | 123 | 1/5 stroke | | | | | | | | | | | | | | | |
| 125 | R2.5 | 42 | 170 | 162 | 234 | 20 | 16 | 100 | 170 | 252 | 100 | 35 | 123 | | | | | | | | | | | | | | | | |
| 160 | R2.5 | 52 | 212 | 200 | 284 | 24 | 20 | 108 | 187.5 | 280 | 120 | 38 | 131 | | | | | | | | | | | | | | | | |

Accessories (Options)

Bracket pin

Material: Carbon steel

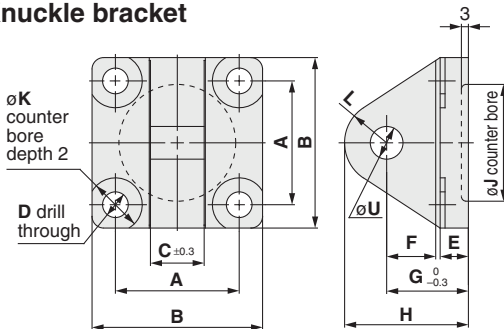


| Bore size (mm) | A | B | C (f8) | | D | E | Flat washer | Cotter pin | Applicable cylinder type | Order no. |
|----------------|-----|-----|--------|----------------------|---|-----|-----------------------|-----------------------|--------------------------|-----------------|
| | | | Size | Tolerance | | | | | | |
| 40 | 80 | 70 | 12 | -0.016 -0.043 | 3 | 5 | Polished round 12SPCC | ø3 x 18 \angle SWRM | ø40 clevis type | AC-C1-bore size |
| 50 | 94 | 84 | 14 | -0.016 -0.043 | 4 | 5 | Polished round 14SPCC | ø4 x 22 \angle SWRM | ø50 clevis type | |
| 63 | 102 | 92 | 16 | -0.016 -0.043 | 4 | 5 | Polished round 16SPCC | ø4 x 22 \angle SWRM | ø63 clevis type | |
| 80 | 123 | 113 | 18 | -0.016 -0.043 | 5 | 5 | Polished round 18SPCC | ø5 x 28 \angle SWRM | ø80 clevis type | |
| 100 | 147 | 132 | 20 | -0.020 -0.053 | 5 | 7.5 | Polished round 20SPCC | ø5 x 30 \angle SWRM | ø100 clevis type | |
| 125 | 169 | 154 | 22 | -0.020 -0.053 | 5 | 7.5 | Polished round 22SPCC | ø5 x 35 \angle SWRM | ø125 clevis type | |
| 160 | 205 | 190 | 25 | -0.020 -0.053 | 5 | 7.5 | Polished round 24SPCC | ø5 x 35 \angle SWRM | ø160 clevis type | |

Note) Does not come with other accessories.

Knuckle bracket

Material: Cast iron

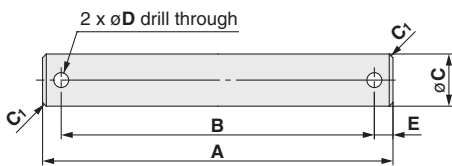


| Bore size (mm) | A | B | C | D | E | F | G | H | J | K | L | U(H8) | | Hexagon mounting bolt | Applicable cylinder type | Order no. |
|----------------|-----|-----|----|----|----|----|----|----|-----|----|-----|-------|---------------|-----------------------|--------------------------|-----------------|
| | | | | | | | | | | | | Size | Tolerance | | | |
| 40 | 44 | 60 | 21 | 9 | 12 | 18 | 32 | 47 | 45 | 19 | R15 | 12 | $+0.027$ 0 | M8 x 20 | ø40 double clevis type | AC-A1-bore size |
| 50 | 53 | 73 | 23 | 11 | 12 | 21 | 35 | 53 | 50 | 23 | R18 | 14 | $+0.027$ 0 | M10 x 22 | ø50 double clevis type | |
| 63 | 60 | 80 | 27 | 11 | 15 | 23 | 40 | 60 | 55 | 23 | R20 | 16 | $+0.027$ 0 | M10 x 25 | ø63 double clevis type | |
| 80 | 75 | 100 | 31 | 13 | 16 | 26 | 45 | 67 | 65 | 28 | R22 | 18 | $+0.027$ 0 | M12 x 28 | ø80 double clevis type | |
| 100 | 90 | 118 | 35 | 13 | 17 | 30 | 50 | 74 | 80 | 28 | R24 | 20 | $+0.033$ 0 | M12 x 32 | ø100 double clevis type | |
| 125 | 112 | 140 | 41 | 15 | 20 | 30 | 55 | 81 | 90 | 31 | R26 | 22 | $+0.033$ 0 | M14 x 36 | ø125 double clevis type | |
| 160 | 140 | 174 | 54 | 17 | 22 | 40 | 65 | 95 | 100 | 34 | R30 | 25 | $+0.033$ 0 | M16 x 40 | ø160 double clevis type | |

Note) Does not come with other accessories.

Knuckle pin

Material: Carbon steel

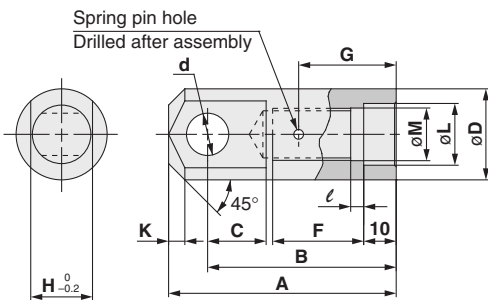


| Bore size (mm) | A | B | C (f8) | | D | E | Flat washer | Cotter pin | Applicable cylinder type | Order no. |
|----------------|------|------|--------|----------------------|---|-----|-----------------------|-----------------------|--------------------------|-----------------|
| | | | Size | Tolerance | | | | | | |
| 40 | 51.5 | 41.5 | 13 | -0.016 -0.043 | 3 | 5 | Polished round 12SPCC | ø3 x 18 \angle SWRM | ø40 all types | AC-D1-bore size |
| 50 | 54.5 | 44.5 | 13 | -0.016 -0.043 | 3 | 5 | Polished round 14SPCC | ø3 x 18 \angle SWRM | ø50 all types | |
| 63 | 64.5 | 54.5 | 16 | -0.016 -0.043 | 4 | 5 | Polished round 16SPCC | ø4 x 22 \angle SWRM | ø63 all types | |
| 80 | 71.5 | 61.5 | 16 | -0.016 -0.043 | 4 | 5 | Polished round 18SPCC | ø4 x 22 \angle SWRM | ø80 all types | |
| 100 | 82 | 72 | 20 | -0.020 -0.053 | 5 | 5 | Polished round 20SPCC | ø5 x 30 \angle SWRM | ø100, ø125 all types | |
| 160 | 94 | 79 | 20 | -0.020 -0.053 | 5 | 7.5 | Polished round 22SPCC | ø5 x 30 \angle SWRM | ø160 all types | |

Note) Does not come with other accessories.

Knuckle

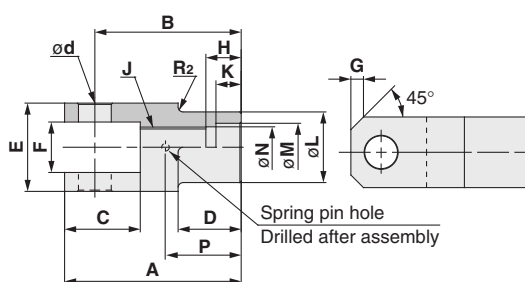
Material: Carbon steel



| Bore size (mm) | A | B | C | D | d (H8) | | E | F | Reference G | H | K | L (F8) | | M | ℓ | Spring pin | Applicable cylinder type | Order no. |
|----------------|-----|-----|----|----|--------|---------------|-----------|----|-------------|----|----|--------|----------------------|------|---|------------|--------------------------|-----------------|
| | | | | | Size | Tolerance | | | | | | Size | Tolerance | | | | | |
| 40 | 67 | 55 | 15 | 25 | 13 | $+0.027$ 0 | M14 x 1.5 | 26 | 28 | 17 | 4 | 17 | $+0.043$ $+0.016$ | 14.2 | 4 | 3 x 25AW | ø40 all types | AC-B1-bore size |
| 50 | 70 | 58 | 18 | 28 | 13 | $+0.027$ 0 | M16 x 1.5 | 28 | 30 | 19 | 5 | 19 | $+0.053$ $+0.020$ | 16.2 | 4 | 3 x 28AW | ø50 all types | |
| 63 | 80 | 65 | 20 | 30 | 16 | $+0.027$ 0 | M18 x 1.5 | 32 | 32 | 22 | 6 | 21 | $+0.053$ $+0.020$ | 18.3 | 4 | 4 x 28AW | ø63 all types | |
| 80 | 95 | 78 | 22 | 35 | 16 | $+0.027$ 0 | M22 x 1.5 | 40 | 36 | 27 | 7 | 26 | $+0.053$ $+0.020$ | 22.3 | 4 | 4 x 36AW | ø80 all types | |
| 100 | 110 | 90 | 26 | 42 | 20 | $+0.033$ 0 | M27 x 2 | 45 | 40 | 32 | 8 | 34 | $+0.064$ $+0.025$ | 27.5 | 5 | 5 x 40AW | ø100, ø125 all types | |
| 160 | 120 | 100 | 30 | 50 | 22 | $+0.033$ 0 | M33 x 2 | 50 | 44 | 36 | 10 | 43 | $+0.064$ $+0.025$ | 34 | 5 | 5 x 50AW | ø160 all types | |

Y-type knuckle

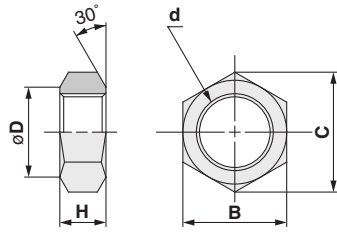
Material: Carbon steel



| Bore size (mm) | A | B | C | D | d (H8) | | E | F | | G | H | J | K | L | M | | N | P | Spring pin | Applicable cylinder type | Order no. |
|----------------|-----|-----|----|----|--------|---------------|----|------|-------------|----|----|-----------|----|----|------|----------------------|------|----|------------|--------------------------|-----------------|
| | | | | | Size | Tolerance | | Size | Tolerance | | | | | | Size | Tolerance | | | | | |
| 40 | 67 | 55 | 27 | 19 | 13 | $+0.027$ 0 | 32 | 18 | $+0.2$ 0 | 4 | 14 | M14 x 1.5 | 10 | 25 | 17 | $+0.043$ $+0.016$ | 14.2 | 28 | 3 x 25 AW | ø40 all types | AC-3Y-bore size |
| 50 | 70 | 58 | 30 | 25 | 13 | $+0.027$ 0 | 35 | 20 | $+0.2$ 0 | 5 | 14 | M16 x 1.5 | 10 | 28 | 19 | $+0.053$ $+0.020$ | 16.2 | 30 | 3 x 28 AW | ø50 all types | |
| 63 | 80 | 65 | 35 | 30 | 16 | $+0.027$ 0 | 43 | 23 | $+0.2$ 0 | 6 | 14 | M18 x 1.5 | 10 | 30 | 21 | $+0.053$ $+0.020$ | 18.3 | 32 | 4 x 28 AW | ø63 all types | |
| 80 | 95 | 78 | 39 | 35 | 16 | $+0.027$ 0 | 50 | 28 | $+0.2$ 0 | 7 | 14 | M22 x 1.5 | 10 | 35 | 26 | $+0.053$ $+0.020$ | 22.3 | 36 | 4 x 36 AW | ø80 all types | |
| 100 | 110 | 90 | 46 | 43 | 20 | $+0.033$ 0 | 59 | 33 | $+0.2$ 0 | 8 | 15 | M27 x 2 | 10 | 42 | 34 | $+0.064$ $+0.025$ | 27.5 | 40 | 5 x 40 AW | ø100, ø125 all types | |
| 160 | 120 | 100 | 50 | 45 | 22 | $+0.033$ 0 | 66 | 37 | $+0.2$ 0 | 10 | 15 | M33 x 2 | 10 | 50 | 43 | $+0.064$ $+0.025$ | 34 | 44 | 5 x 50 AW | ø160 all types | |

Tie-rod Type Hydraulic Cylinder Double Acting/Single Rod **CHA Series**

Rod end nut



| Bore size (mm) | B | C | D | d | H | Applicable cylinder type | Order no. |
|----------------|----|------|----|---------|----|--------------------------|---------------------|
| 40 | 22 | 25.4 | 21 | M14×1.5 | 8 | ø40all types | AC-N1- bore size |
| 50 | 24 | 27.7 | 23 | M16×1.5 | 10 | ø50all types | |
| 63 | 27 | 31.2 | 26 | M18×1.5 | 11 | ø63all types | |
| 80 | 32 | 37 | 31 | M22×1.5 | 13 | ø80all types | |
| 100 | 41 | 47.3 | 39 | M27×2 | 16 | ø100, ø125all types | |
| 160 | 50 | 57.7 | 48 | M33×2 | 20 | ø160all types | |

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-

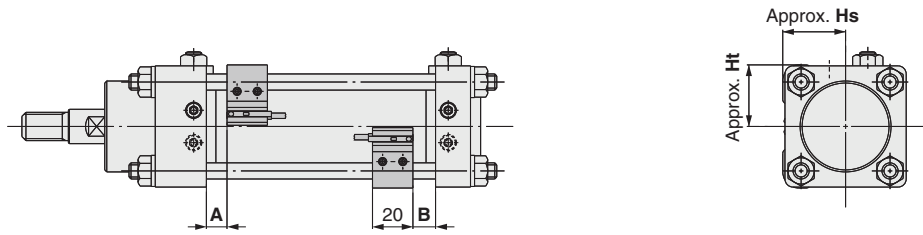
Auto Switch Mounting

Refer to pages 431 to 490 for detailed specifications.

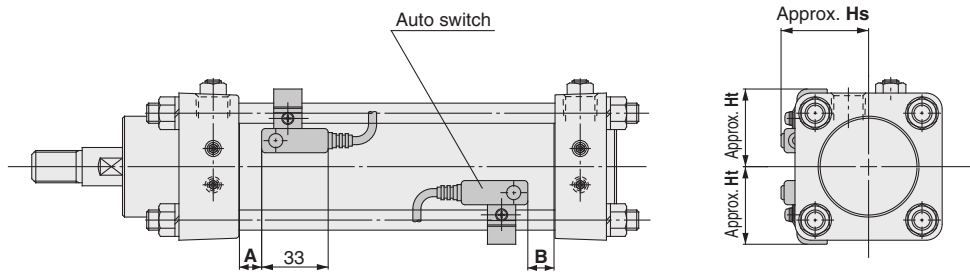
Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

<Tie-rod mount type>

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

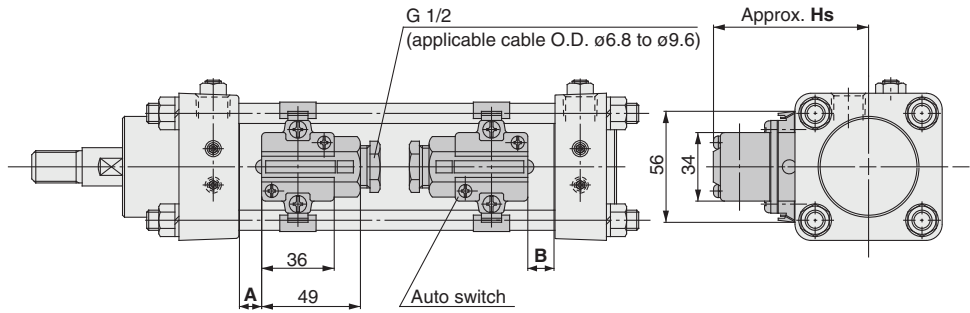


- D-F5□/J59
- D-F5NT
- D-F5□W/J59W
- D-F5BA/F59F
- D-A5□/A6□
- D-A59W

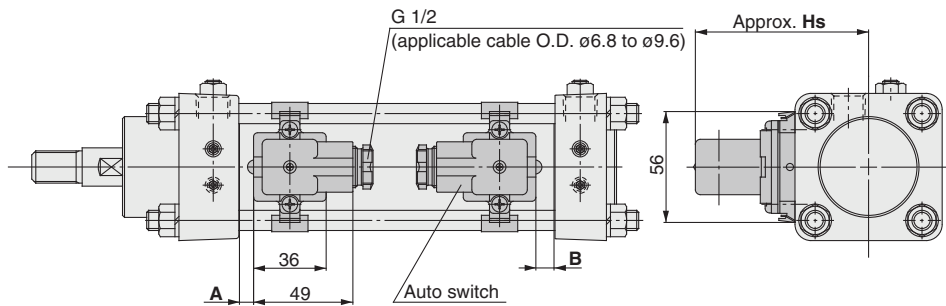


<Band mount type>

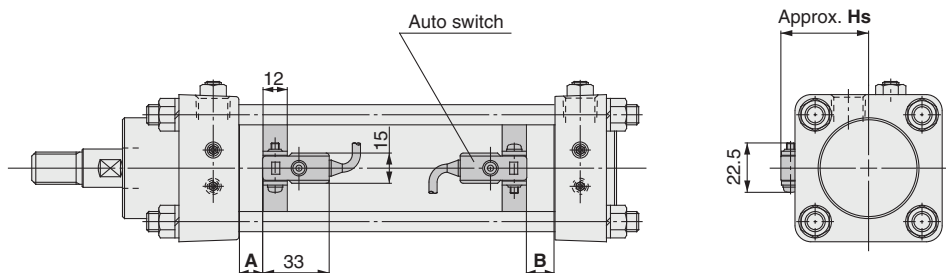
- D-G39/K39
- D-A3□



- D-A44



- D-B5□/B6□



Auto Switch Proper Mounting Positions

(mm)

| Bore size (mm) | D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | | D-F5□/J59 D-F5□W/J59W D-F59F/F5BA | | D-F5NT | | D-G5□/K59 D-G5□W/K59W D-G59F/G5BA D-G5NT | | D-G39□/K39□ | | D-A9□/A9□V | | D-A5□/A6□ | | D-A59W | | D-B5□/B64 | | D-B59W | | D-A3□/A44 | |
|----------------|--|------|---|------|--------|------|---|------|-------------|------|------------|------|-----------|------|--------|------|-----------|------|--------|------|-----------|------|
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 40 | 20.5 | 21.5 | 17 | 18 | 22 | 23 | 12.5 | 13.5 | 10.5 | 11.5 | 16.5 | 17.5 | 10.5 | 11.5 | 14.5 | 15.5 | 11 | 12 | 13.5 | 15 | 10.5 | 11.5 |
| 50 | 21 | 23 | 17.5 | 19.5 | 22.5 | 24.5 | 13 | 15 | 11 | 13 | 17 | 19 | 11 | 13 | 15 | 17 | 11.5 | 13.5 | 14 | 16.5 | 11 | 13 |
| 63 | 23.5 | 24.5 | 20 | 21 | 25 | 26 | — | — | 13.5 | 14.5 | 19.5 | 20.5 | 13.5 | 14.5 | 17.5 | 18.5 | — | — | — | — | 13.5 | 14.5 |
| 80 | 23.5 | 26.5 | 20 | 23 | 25 | 28 | 15.5 | 18.5 | 13.5 | 16.5 | 19.5 | 22.5 | 13.5 | 16.5 | 17.5 | 20.5 | 14 | 17 | 16.5 | 20 | 13.5 | 16.5 |
| 100 | 27 | 31 | 23.5 | 27.5 | 28.5 | 32.5 | 19 | 23 | 17 | 21 | 23 | 27 | 17 | 21 | 21 | 25 | 17.5 | 21.5 | 20 | 24.5 | 17 | 21 |

Note 1) The auto switches listed below cannot be mounted on ø63.

D-G5□, K59, G5□W, K59W, G5BA, G59F, G5NT, B5□, B64, and B59W

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

Auto Switch Mounting Heights

(mm)

| Bore size (mm) | D-M9□/M9□W D-A9□A D-A9□ | | D-M9□V/M9□WV D-M9□AV D-A9□V | | D-F5□/J59 D-F5□W/J59W D-F59F/F5BA D-F5NT | | D-A5□/A6□ D-A59W | | D-G5□/K59 D-G5□W/K59W D-G59F/G5BA D-G5NT D-B5□/B64 D-B59W | | D-G39□/K39□ D-A3□ | | D-A44 | |
|----------------|-------------------------------|------|-----------------------------------|------|---|------|---------------------|------|--|------|----------------------|------|-------|------|
| | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht | Hs | Ht |
| 40 | 31 | 31 | 36 | 31 | 38 | 33.5 | 39.5 | 33.5 | 38 | 38 | 72.5 | 82.5 | 82.5 | 82.5 |
| 50 | 36.5 | 36.5 | 40 | 36.5 | 43 | 39 | 44 | 39 | 43.5 | 43.5 | 78 | 88 | 88 | 88 |
| 63 | 40 | 40 | 45 | 40 | 48.5 | 43 | 50 | 43 | — | — | 85 | 95 | 95 | 95 |
| 80 | 50 | 50 | 55.5 | 50 | 56 | 51 | 57 | 51 | 59 | 59 | 93.5 | 104 | 104 | 104 |
| 100 | 59 | 59 | 63 | 59 | 63.5 | 58.5 | 65 | 58.5 | 70 | 70 | 104 | 114 | 114 | 114 |

* The auto switches listed below cannot be mounted on ø63.

D-G5□, K59, G5□W, K59W, G5BA, G59F, G5NT, B5□, B64, and B59W

Operating Range

(mm)

| Auto switch model | Bore size | | | | |
|--|-----------|------|------|------|------|
| | 40 | 50 | 63 | 80 | 100 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 3.5 | 3.5 | 5 | 4.5 | 5.5 |
| D-F5□/J59/F59F D-F5□W/J59W D-F5BA/F5NT | 4.5 | 4 | 4.5 | 4.5 | 4.5 |
| D-G5□/K59/G59F D-G5□W/K59W D-G5BA/G5NT | 5 | 5 | — | 6.5 | 6.5 |
| D-G39/K39 | 9.5 | 9.5 | 10 | 10 | 10 |
| D-A9□/A9□V | 7.5 | 8 | 8.5 | 9 | 9 |
| D-A5□/A6□ | 9 | 9 | 9.5 | 9.5 | 9.5 |
| D-A59W | 13.5 | 13.5 | 14 | 14 | 14 |
| D-B5□/B64 | 11.5 | 12 | — | 13.5 | 14.5 |
| D-B59W | 12 | 12.5 | — | 14.5 | 15 |
| D-A3□/A44 | 10 | 10 | 11.5 | 11.5 | 12 |

* The auto switches listed below cannot be mounted on ø63.

D-G5□, K59, G5□W, K59W, G5BA, G59F, G5NT, B5□, B64, and B59W

* 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.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Products

D-□

Minimum Strokes for Auto Switch Mounting

n: Number of auto switches

| Auto switch types | Number of auto switches | Mounting brackets other than center trunnion | Center trunnion type | | | | |
|--|---|--|---|---|---|---|---|
| | | | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-M9□/M9□W | 1 or 2 pcs. (different surfaces/same surface) | 15 | 80 | 80 | 85 | 90 | 95 |
| | "n" pcs. (same surface) | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-M9□V/M9□WV | 1 or 2 pcs. (different surfaces/same surface) | 10 | 55 | 55 | 60 | 65 | 70 |
| | "n" pcs. (same surface) | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-M9□A | 1 or 2 pcs. (different surfaces/same surface) | 15 | 85 | 85 | 90 | 95 | 100 |
| | "n" pcs. (same surface) | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-M9□AV | 1 or 2 pcs. (different surfaces/same surface) | 15 | 60 | 65 | 65 | 75 | 75 |
| | "n" pcs. (same surface) | $15 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-A9□ | 1 or 2 pcs. (different surfaces/same surface) | 15 | 75 | 75 | 80 | 85 | 90 |
| | "n" pcs. (same surface) | $15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-A9□V | 1 or 2 pcs. (different surfaces/same surface) | 10 | 50 | 50 | 55 | 60 | 65 |
| | "n" pcs. (same surface) | $10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-A5□, A6□ D-F5□, J59 | 1 or 2 pcs. (different surfaces/same surface) | 10 | 100 | 100 | 100 | 110 | 120 |
| | "n" pcs. (same surface) | $10 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| D-A59W | 2 pcs. (different surfaces/same surface) | 20 | 100 | 100 | 100 | 110 | 120 |
| | "n" pcs. (same surface) | $20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| | 1 pc. | 15 | 100 | 100 | 100 | 110 | 120 |
| D-F5□W, J59W D-F5BA D-F59F D-F5NT | 1 or 2 pcs. (different surfaces/same surface) | 15 | 120 | 120 | 120 | 130 | 140 |
| | "n" pcs. (same surface) | $15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | $140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| | 1 pc. | 15 | 120 | 120 | 120 | 130 | 140 |
| D-B5□, B64 | 2 pcs. | Different surfaces | 15 | 90 | — | — | 120 |
| | | Same surface | 75 | 90 | — | — | 120 |
| | "n" pcs. | Different surfaces | $15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | — | — | $120 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| | | Same surface | $75 + 50 (n-2)$ (n = 2, 3, 4 ...) | $90 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | — | — | $120 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) ^{Note 1)} |
| | 1 pc. | 10 | 90 | — | — | 120 | |
| D-B59W | 2 pcs. | Different surfaces | 20 | 90 | — | — | 120 |
| | | Same surface | 75 | 90 | — | — | 120 |
| | "n" pcs. | Different surfaces | $20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8 ...) ^{Note 1)} | $90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} | — | — | $120 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16 ...) ^{Note 2)} |
| | | Same surface | $75 + 50 (n-2)$ (n = 2, 3, 4 ...) | $90 + 50 (n-2)$ (n = 2, 4, 6 ...) ^{Note 1)} | — | — | $120 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) ^{Note 1)} |
| | 1 pc. | 15 | 90 | — | — | 120 | |
| D-A3□ D-G39 D-K39 | 2 pcs. | Different surfaces | 35 | 75 | 80 | 90 | 90 |
| | | Same surface | — | — | 100 | — | 90 |
| | "n" pcs. | Different surfaces | $35 + 30 (n-2)$ (n = 2, 3, 4 ...) | $75 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $80 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $90 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $90 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) |
| | | Same surface | $100 + 100 (n-2)$ (n = 2, 3, 4 ...) | — | $100 + 100 (n-2)$ (n = 2, 4, 6, 8 ...) | — | $100 + 100 (n-2)$ (n = 2, 4, 6, 8 ...) |
| | 1 pc. | 10 | 75 | 80 | 90 | 90 | |
| D-A44 | 2 pcs. | Different surfaces | 35 | 75 | 80 | 90 | 90 |
| | | Same surface | 55 | 75 | 80 | 90 | 90 |
| | "n" pcs. | Different surfaces | $35 + 30 (n-2)$ (n = 2, 3, 4 ...) | $75 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $80 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $90 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) | $90 + 30 (n-2)$ (n = 2, 4, 6, 8 ...) |
| | | Same surface | $55 + 50 (n-2)$ (n = 2, 3, 4 ...) | $75 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) | $80 + 50 (n-2)$ (n = 2, 6, 8 ...) | $90 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) | $90 + 50 (n-2)$ (n = 2, 4, 6, 8 ...) |
| | 1 pc. | 10 | 75 | 80 | 90 | 90 | |

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

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

Auto Switch Mounting Brackets: Part Nos.

<Tie-rod mounting>

| Auto switch models | Bore size (mm) | | | | |
|---|----------------|---------|---------|---------|---------|
| | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-M9□/M9□V/M9□W/M9□WV D-M9□A/M9□AV/A9□/A9□V | BA7-040 | BA7-063 | BA7-063 | BA7-080 | BA7-080 |
| D-F5□/J59/F5□W/J59W D-F5BA/F59F/F5NT D-A5□/A6□/A59W | BT-04 | BT-06 | BT-06 | BT-08 | BT-08 |

<Band mounting>

| Auto switch models | Bore size (mm) | | | | |
|---|----------------|---------|---------|---------|---------|
| | ø40 | ø50 | ø63 | ø80 | ø100 |
| D-G39/K39/A3□/A44 | BD1-04M | BD1-05M | BD1-06M | BD1-08M | BD1-10M |
| D-G5□/K59 D-G5□W/K59W/G5BA/G59F D-G5NT/B5□/B64/B59W | BA-04 | BA-05 | — | BA-08 | BA-10 |

Note 1) The auto switches listed below cannot be mounted on ø63.
D-G5□, K59, G5□W, K59W, G5BA, G59F, G5NT, B5□, B64, and B59W

[Stainless steel mounting screw kits]

The following stainless steel mounting screw kits are available for use depending on the operating environment. (Switch mounting bands are not included and should be ordered separately.)

- BBA1 : D-F5, J5, A5, A6
- BBA3 : D-G5, K5, B5, B6

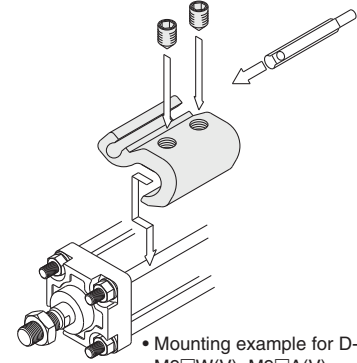
Note 2) Refer to the table below for details on BBA1, BBA3.

Stainless mounting screw kit details

| Part no. | Contents | | | | Applicable auto switch mounting bracket part nos. | Applicable auto switches |
|----------|----------|-----------------------------|----------------|------|---|--|
| | No. | Description | Size | Pcs. | | |
| BBA1 | 1 | Auto switch mounting screws | M4 x 0.7 x 8L | 1 | BT-□□ BT-03, BT-04, BT-05 BT-06, BT-08, BT-12 | D-A5, A6 D-F5, J5 |
| | 2 | Set screw | M4 x 0.7 x 6L | 2 | BA4-040, BA4-063, BA4-080 BMB4-032, BMB4-050 BMB5-032 BA7-040, BA7-063, BA7-080 | D-Z7, Z8 D-Y5, Y6, Y7 D-A9 D-M9 |
| | 3 | Set screw | M4 x 0.7 x 8L | 2 | BT-16, BT-18A, BT-20 BS4-125, BS4-160 BS4-180, BS4-200 BS5-125, BS5-160 BS5-180, BS5-200 | D-A5, A6 D-F5, J5 D-Z7, Z8 D-Y5, Y6, Y7 D-A9 D-M9 |
| BBA3 | 4 | Auto switch mounting screws | M4 x 0.7 x 22L | 1 | BA-01, BA-02, BA-32, BA-04 BA-05, BA-06, BA-08, BA-10 BA2-020, BA2-025 BA2-032, BA2-040 BA5-050, BHN2-025, BSG1-032 BH2-040, BH2-050 BH2-080, BH2-100 BAF-32, BAF-04, BAF-05 BAF-06, BAF-08, BAF-10 | D-B5, B6 D-G5, K5 |

When D-F5BA and G5BA auto switches are shipped mounted on a cylinder, the above stainless steel screws are used. Also when switches are shipped separately, BBA1, BBA3 are included.

Note 3) When using D-M9□A(V), order stainless mounting screw kit BBA1 instead of the iron auto switch mounting brackets (BA7-□□□, BS5-□□□) in the table above, and use the M4 x 6L stainless set screws included.



• Mounting example for D-M9□(V), M9□W(V), M9□A(V).

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-□

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.

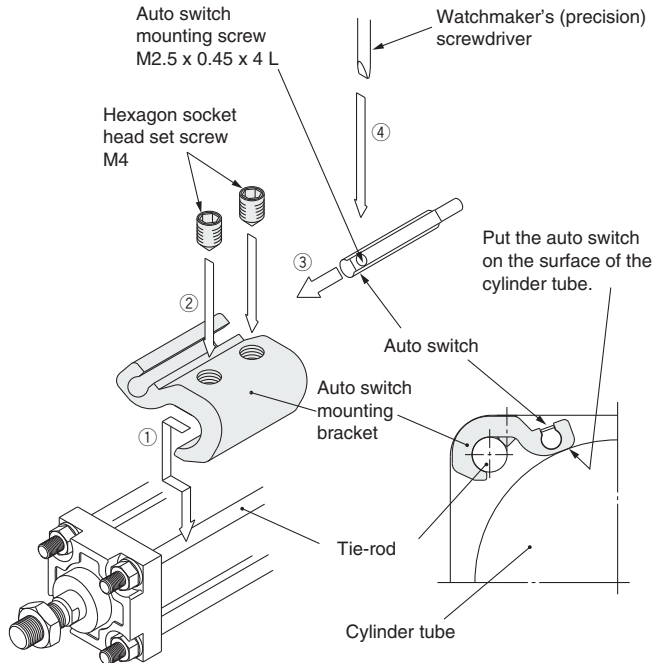
| Auto switch type | Part no. | Electrical entry | Features |
|------------------|-----------------------|-------------------------|---|
| Solid state | D-M9NV, M9PV, M9BV | Grommet (perpendicular) | — |
| | D-M9NWV, M9PWV, M9BWV | | Diagnostic indication (2-color indicator) |
| | D-M9NAV, M9PAV, M9BAV | | Water resistant (2-color indicator) |
| | D-F59, F5P, J59 | Grommet (in-line) | — |
| | D-F59W, F5PW, J59W | | Diagnostic indication (2-color indicator) |
| | D-F5BA | | Water resistant (2-color indicator) |
| | D-F5NT, G5NT | | With timer |
| Reed | D-A93V, A96V | Grommet (perpendicular) | — |
| | D-A90V | Grommet (in-line) | Without indicator light |
| | D-A53, A56, B53 | | — |
| | D-A67 | | 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) are also available. For details, refer to page 443.

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)



1. Fix it to the detecting position with a set screw by installing an auto switch mounting bracket in cylinder tie-rod and letting the bottom surface of an auto switch mounting bracket contact the cylinder tube firmly.
2. Fix it to the detecting position with a hexagon socket head set screw (M4).
(Use a hexagon wrench.)
3. Fit an auto switch into the auto switch mounting groove to set it roughly to the mounting position for an auto switch.
4. After confirming the detecting position, tighten up the mounting screw (M2.5) attached to an auto switch, and secure the auto switch.
5. When changing the detecting position, carry out in the state of 3.

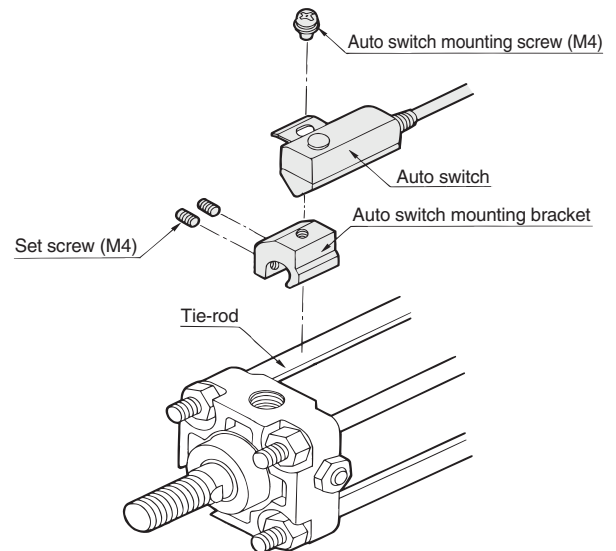
Note 1) To protect auto switches, ensure that main body of an auto switch should be embedded into auto switch mounting groove with a depth of 15 mm or more.

Note 2) Set the tightening torque of a hexagon socket head set screw (M4) to be 1 to 1.2 N·m.

Note 3) When tightening an auto switch mounting screw (M2.5), use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm. Also, set the tightening torque to be 0.05 to 0.15 N·m. As a guide, turn 90° from the position where it comes to feel tight.

<Applicable auto switch>

Solid state D-F59, D-F5P
 D-J59, D-F5BA
 D-F59W, D-F5PW, D-J59W
 D-F59F, D-F5NT
 Reed D-A53, D-A54, D-A56, D-A64, D-A67
 D-A59W



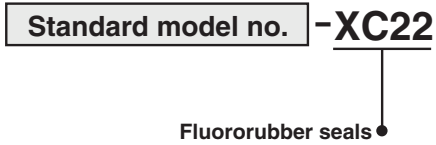
1. Fix the auto switch on the auto switch mounting bracket with the auto switch mounting screw (M4) and install the set screw.
2. Fit the auto switch mounting bracket into the cylinder tie-rod and then fix the auto switch at the detecting position with the hexagonal wrench. (Be sure to put the auto switch on the surface of cylinder tube.)
3. When changing the detecting position, loosen the set screw to move the auto switch and then re-fix the auto switch on the cylinder tube. (Tightening torque of M4 screw should be 1 to 1.2 N·m.)



1 Fluororubber Seals

Symbol
-XC22

How to Order



Specifications

| | |
|---|---|
| Seal material | Fluororubber |
| Ambient temperature range | Note 1) With auto switch : -10 to 60 Without auto switch : -10 to 80 |
| Specifications other than above and external dimensions | Same as standard type |

Note 1) Please confirm with SMC, as the type of chemical and the operating temperature may not allow the use of this product.

Note 2) Cylinders with auto switches can also be produced; however, auto switch related parts (auto switch units, mounting brackets, built-in magnets) are the same as standard products. Before using these, please contact SMC regarding their suitability for the operating environment.

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Products

D-