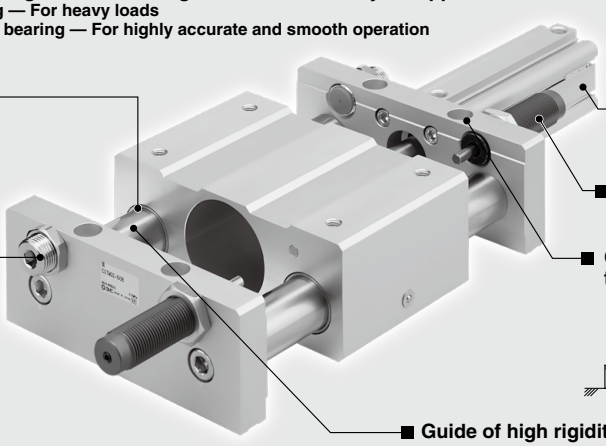
# Platform Cylinder

## *CXT* Series

## ø12, ø16, ø20, ø25, ø32, ø40

## A highly rigid and highly accurate slide table integrated with an actuator.

■ **Two types of guide rod bearings to accommodate your application**
**Slide bearing — For heavy loads**
**Ball bushing bearing — For highly accurate and smooth operation**



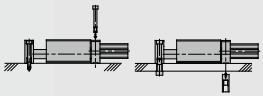
■ **Auto switch can be mounted.**

■ **A shock absorber can be installed (option).**

■ **Can be mounted on two sides.**

**Mounting from the upper side**

**Mounting from the bottom side**

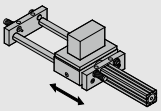


■ **Guide of high rigidity**

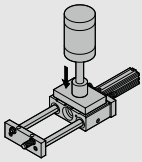
■ **Adjusting bolt with bumper is standard.**

Performs the function of a cushion and adjusts the stroke 5 mm on each side, or 10 mm for both sides.

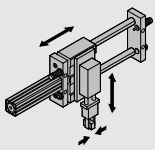
For moving and transferring workpieces.



For moving the receptacle for workpieces used in stamping or press-fitting processes.

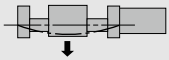


For using as a Pick & Place unit in combination with other actuators.



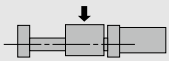
| Series | Maximum load weight (kg) | CXTM (Slide bearing) | | CXTL (Ball bushing bearing) | |
|---|---|---|---|---|---|
| | | Table[1] displacement (mm) | Allowable[2] static mass (kg) | Table[1] displacement (mm) | Allowable[2] static mass (kg) |
| **CXT□12** | 3 | 0.002 | 350 | 0.015 | 60 |
| **CXT□16** | 7 | 0.004 | 500 | 0.019 | 70 |
| **CXT□20** | 12 | 0.007 | 900 | 0.044 | 125 |
| **CXT□25** | 20 | 0.030 | 900 | 0.180 | 125 |
| **CXT□32** | 30 | 0.032 | 1100 | 0.123 | 140 |
| **CXT□40** | 50 | 0.025 | 1900 | 0.109 | 170 |

**Note 1) Table displacement**



"Table displacement" is the amount of deflection of the guide rod that occurs when a maximum load weight is placed on the maximum stroke table while the table is at the center of the stroke (the amount of looseness is not included).

**Note 2) Allowable static weight**



An "allowable static mass the allowable amount of static mass that can be applied vertically to the workpiece mounting surface of the table while the table is at the stroke end.

## ■ Series Variations

| Bearing type | | Bore size (mm) | Stroke (mm) |
|---|---|---|---|
| Slide bearing | Ball bushing bearing | | 15 25 50 75 100 125 150 175 200 250 300 |
| **CXTM12** | **CXTL12** | **12** | ● ● ○ ○ ○ ○ ○ ○ ○ ○ ○ |
| **CXTM16** | **CXTL16** | **16** | ● ● ○ ○ ○ ○ ○ ○ ○ ○ ○ |
| **CXTM20** | **CXTL20** | **20** | ● ● ● ○ ○ ○ ○ ○ ○ ○ ○ |
| **CXTM25** | **CXTL25** | **25** | ● ● ● ○ ○ ○ ○ ○ ○ ○ ○ |
| **CXTM32** | **CXTL32** | **32** | ● ● ● ● ○ ○ ○ ○ ○ ○ ○ |
| **CXTM40** | **CXTL40** | **40** | ● ● ● ● ○ ○ ○ ○ ○ ○ ○ |

● ·····Standard stroke ○ ·····Long stroke

# Model Selection

## Selection Step

**Setting Conditions**

1. Mounting (Horizontal, Inclined, Vertical)
2. Load mass W (kg)
3. Operating pressure P (MPa)
   P ≤ 0.7 MPa
4. Speed V (mm/s)
   V ≤ 500 mm/s

↓

**Selection of bearing type**

↓

**Provisional selection of cylinder bore size**

↓

**Confirmation of sum of load ratio to the guide unit** $\Sigma\alpha n \leq 1$

NO → back to Provisional selection of cylinder bore size

YES ↓

**Calculation of resistance force f**

↓

**Calculation of theoretical output F**

↓ Refer to "Theoretical Output" on page 729.

**Calculation of load ratio β to the theoretical output of cylinder** $\beta = f / F$

$\beta > 0.5$ → back to Provisional selection of cylinder bore size

$\beta \leq 0.5$ ↓

**Confirmation of adjusting bolt capacity** $W \leq W_A$

NO → Determine the movable weight $W_A$ which can be operated only by adjusting bolts. → **Model selected With shock absorber**

YES ↓ **Model selected Without shock absorber**

### Guideline for Selection of Bearing Type

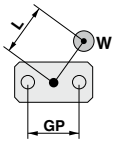
| Bearing type | Required conditions |
|---|---|
| **Slide bearing** | • Impact load and vibration load are added.<br>• Change in load is large.<br>• Long life span is required. |
| **Ball bushing bearing** | • High accuracy (Little rattle is allowed.)<br>• Smooth operation |

$$\Sigma\alpha n = \frac{\text{Load mass [W]}}{\text{Maximum load mass [Wmax]}} + \frac{\text{Moment [mn]}}{\text{Allowable moment [Mn]}}$$

**Load mass [W] are as follows in compliance to the mounting way.**
**Horizontal mounting**: W
**Inclined mounting**: $W\cos\theta$ ($\theta$: Angle of inclination, refer to the figure below.)
**Vertical mounting: 0 (None)**

The moment load rate must be calculated in accordance with the above formula for all types, **M1** to **M3**.
As for **Wmax** and **Mn**, refer to the maximum load weight and allowable moment table in the next section.
The moment for the inclined mounting must be calculated taking the moment caused by the load into consideration.
Note) Make sure that the distance between the guide shaft center to the center of gravity of the load does not exceed the distance **GP** between the guide shafts given in the table below. If the distance must be exceeded due to unavoidable circumstances, decrease the load rate that is applied to the guide as indicated below in order to determine the distance.

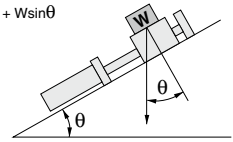
$$\Sigma\alpha n \leq \frac{1}{(L/GP)^2}$$ (Provided that **L > GP**)



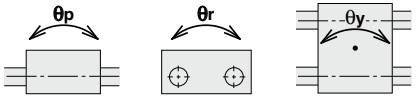

(mm)

| Bore size | 12 | 16 | 20 | 25 | 32 | 40 |
|---|---|---|---|---|---|---|
| Distance between guide rods **GP** | 50 | 65 | 80 | 90 | 110 | 130 |

**Horizontal mounting: f** = μ x W
**Inclined mounting: f** = μ x $W\cos\theta$ + $W\sin\theta$
(Refer to the figure on the right.)
**Vertical mounting: f** = W
μ = 0.3 (Slide bearing)
μ = 0.1 (Ball bushing bearing)



## Non-rotating Accuracy of Slide Block

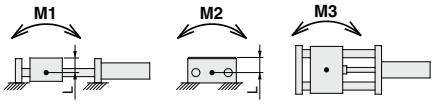



Pitching direction | Rolling direction | Yawing direction

| Bore size (mm) | CXTM (Slide bearing) | | CXTL (Ball bushing bearing) | |
|---|---|---|---|---|
| | θp (= θy) | θr | θp (= θy) | θr |
| **12** | ± 0.09° | ± 0.12° | ± 0.05° | ± 0.05° |
| **16** | ± 0.08° | ± 0.10° | ± 0.05° | ± 0.04° |
| **20** | ± 0.07° | ± 0.08° | ± 0.04° | ± 0.03° |
| **25** | ± 0.07° | ± 0.07° | ± 0.04° | ± 0.03° |
| **32** | ± 0.08° | ± 0.07° | ± 0.04° | ± 0.03° |
| **40** | ± 0.06° | ± 0.06° | ± 0.03° | ± 0.03° |

## Maximum Load Mass and Allowable Moment

| Bore size (mm) | Bearing | Maximum load mass **Wmax** (kg) | Allowable moment (N·m) | |
|---|---|---|---|---|
| | | | **M1 (= M3)** | **M2** |
| **12** | Slide bearing | 3 | 1.25 | 1.68 |
| | Ball bushing bearing | | 0.53 | 0.70 |
| **16** | Slide bearing | 7 | 3.34 | 4.25 |
| | Ball bushing bearing | | 1.53 | 2.11 |
| **20** | Slide bearing | 12 | 11.4 | 17.1 |
| | Ball bushing bearing | | 5.60 | 7.28 |
| **25** | Slide bearing | 20 | 11.4 | 19.3 |
| | Ball bushing bearing | | 5.60 | 8.19 |
| **32** | Slide bearing | 30 | 19.8 | 23.3 |
| | Ball bushing bearing | | 10.1 | 14.8 |
| **40** | Slide bearing | 50 | 37.3 | 46.2 |
| | Ball bushing bearing | | 21.3 | 27.5 |




Note) For the purpose of calculating the moment, the length of the arm is the distance that is measured from the guide shaft center ("●" mark). Dimension L from the guide shaft center to the top surface of the table is indicated below.

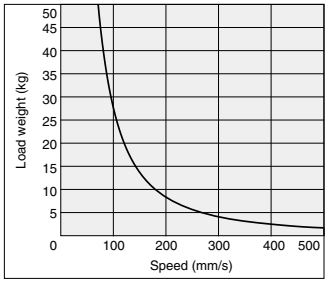
(mm)

| Bore size | 12 | 16 | 20 | 25 | 32 | 40 |
|---|---|---|---|---|---|---|
| L dimension | 19.5 | 24 | 28 | 31 | 39.5 | 47.5 |

## Allowable Load Only by Adjustment Bolt

If only the adjustment bolt is used for stopping the load, make sure that the load weight and the speed will be below the curve in the graph on the right, taking into consideration the durability of the rubber bumper that is attached to the end of the adjustment bolt and the vibration and noise that are created when stopping (provided that the maximum load weight is not exceeded).

In conditions in which the load weight and the speed will be above the curve, use a shock absorber (provided that the maximum load weight not exceeded).




### ⚠ Caution

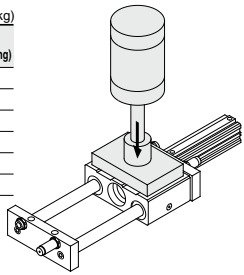
In the case of the ball bushing type, the service life could be drastically shortened if shocks or excessive moments are applied. Therefore, even if the conditions given above are not exceeded, the use of a shock absorber is recommended.

## Static Movable Mass when Stopped

When the CXT series cylinder is used for moving the workpiece receptacle, such as in a stamping or press-fitting process, a vertical load will be applied to the top surface of the stopped slide block (refer to the figure on the right). In this case, the allowable mass is greater than the maximum load weight, as given in the table on the right.

**Allowable Static Mass** (kg)

| Bore size (mm) | CXTM (Slide bearing) | CXTL (Ball bushing bearing) |
|---|---|---|
| **12** | 350 | 60 |
| **16** | 500 | 70 |
| **20** | 900 | 125 |
| **25** | 900 | 125 |
| **32** | 1100 | 140 |
| **40** | 1900 | 170 |



### ⚠ Caution

1. Make sure that the slide block is stopped at the stroke end.
2. Match the center of the mass to be applied with the center of the slide block. The direction of the mass must be vertically downward in relation to the surface on which the workpiece is mounted, as shown in the figure on the right.
3. Do not apply a load that involves shocks such as those caused by pounding (particularly with the ball bushing type).
4. If this mass is applied, the deflection of the guide shaft will also have a large value.

# Platform Cylinder
# *CXT Series*
## ø12, ø16, ø20, ø25, ø32, ø40

## How to Order

**Port thread type**

| | | |
|---|---|---|
| Nil | M thread | ø12 to ø25 |
| | Rc | |
| TN | NPT | ø32, ø40 |
| TF | G | |

**CXT M 20 [ ] – 100 B – M9BW [ ] – [ ]**

- **Platform cylinder**
- **Bearing type**

| | |
|---|---|
| M | Slide bearing |
| L | Ball bushing bearing |

- **Bore size/Stroke (mm)**

| Bore size (mm) | Stroke (mm) 15 25 50 75 100 125 150 175 200 250 300 |
|---|---|
| 12 | ● ● ○ ○ ○ ○ ○ ○ ○ ○ ○ |
| 16 | ● ● ○ ○ ○ ○ ○ ○ ○ ○ ○ |
| 20 | ● ● ● ○ ○ ○ ○ ○ ○ ○ ○ |
| 25 | ● ● ● ○ ○ ○ ○ ○ ○ ○ ○ |
| 32 | ● ● ● ● ○ ○ ○ ○ ○ ○ ○ |
| 40 | ● ● ● ● ○ ○ ○ ○ ○ ○ ○ |

● ·····Standard stroke ○ ·····Long stroke

∗ For minimum strokes for auto switch equipped type, refer to page 734.

- **Auto switch**

| | |
|---|---|
| Nil | Without auto switch (Built-in magnet) |

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

- **Number of auto switches**

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

- **Made to Order**
Refer to page 729 for details.

- **Option**

| | |
|---|---|
| Nil | Adjusting bolt with bumper only (Standard) |
| B | With 2 shock absorbers (Set on the driving cylinder side only when packed.) |
| BS | With 1 shock absorber (Set on the driving cylinder side when packed.) |

### Shock Absorbers

| Type | Bore size (mm) | | | |
|---|---|---|---|---|
| | 12, 16 | 20 | 25 | 32, 40 |
| Standard (shock absorber RB series) | RB0806 | RB1007 | RB1411 | RB2015 |
| Shock absorber soft type RJ series type (-XB22) | RJ0806H | RJ1007H | RJ1412H | — |

∗ The shock absorber service life is different from that of the CXT cylinder. Refer to the **Web Catalog** for each shock absorber for the replacement period.
∗ The shock absorber soft type RJ series type (-XB22) is a made to order specification. For details, refer to page 1468.

### Applicable Auto Switches/Refer to pages 1289 to 1383 for further information on auto switches.

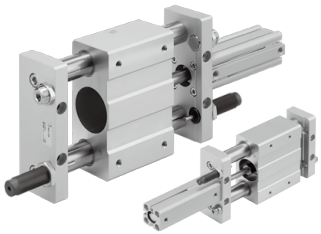
| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage DC | Load voltage AC | Auto switch part no. Perpendicular | Auto switch part no. In-line | Lead wire length 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | None (N) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ● | ○ | — | ○ | | |
| | | | | 2-wire | 12 V | | M9BV | M9B | ● | ● | ● | ○ | — | ○ | — | |
| | Diagnostic indication (2-color indicator) | | | 3-wire (NPN) | 5 V, 12 V | | M9NWV | M9NW | ● | ● | ● | ○ | — | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | M9PWV | M9PW | ● | ● | ● | ○ | — | ○ | | |
| | | | | 2-wire | 12 V | | M9BWV | M9BW | ● | ● | ● | ○ | — | ○ | — | |
| | Water resistant (2-color indicator) | | | 3-wire (PNP) | 5 V, 12 V | | M9NAV∗1 | M9NA∗1 | ○ | ○ | ● | ○ | — | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | M9PAV∗1 | M9PA∗1 | ○ | ○ | ● | ○ | — | ○ | | |
| | | | | 2-wire | 12 V | | M9BAV∗1 | M9BA∗1 | ○ | ○ | ● | ○ | — | ○ | — | |
| | Magnetic field resistant(2-color indicator) | | | 2-wire (Non-polar) | — | | — | P3DWA | ● | — | ● | ● | — | ○ | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | A96V | ● | — | ● | — | — | — | IC circuit | — |
| | | | No | 2-wire | 24 V | 12 V | 100 V | A93V∗2 | ● | ● | ● | ● | — | — | — | Relay, PLC |
| | | | | | | 5 V,12 V | 100 V or less | A90V | ● | — | ● | — | — | — | IC circuit | |

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

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

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ D-P3DWA□ is compatible with ø25 to ø40.

∗ Since there are other applicable auto switches than listed, refer to page 736 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1358 and 1359.



## Specifications

| Bore size (mm) | 12 | 16 | 20 | 25 | 32 | 40 |
|---|---|---|---|---|---|---|
| **Fluid** | Air | | | | | |
| **Action** | Double acting | | | | | |
| **Proof pressure** | 1.5 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa Note) | | | | | |
| **Minimum operating pressure** | 0.15 MPa | | | | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 50 to 500 mm/s | | | | | |
| **Cushion** | Bumper (Both ends/Standard), Shock absorber (Option) | | | | | |
| **Lubrication** | Not required (Non-lube) | | | | | |
| **Stroke adjusting range** | –10 mm (Extension end, Retraction end: –5 mm each) | | | | | |

Note) Maximum operating pressure for this product with the bumper feature.
The maximum operating pressure for the cylinder alone is 1 MPa.

## Shock Absorber Specifications

For detailed specifications about shock absorber, /refer to the **Web Catalog**.

| Model | | CXT□ 12 16 | CXT□20 | CXT□25 | CXT□ 32 40 |
|---|---|---|---|---|---|
| **Shock absorber model** | | RB0806 | RB1007 | RB1411 | RB2015 |
| **Max. energy absorption (J)** | | 2.94 | 5.88 | 14.7 | 58.8 |
| **Stroke absorption (mm)** | | 6 | 7 | 11 | 15 |
| **Collision speed** | | 0.05 to 5 m/s | | | |
| **Max. operating frequency*** **(cycle/min)** | | 80 | 70 | 45 | 25 |
| **Ambient temperature** | | –10 to 80°C | | | |
| **Spring force (N)** | **Extended** | 1.96 | 4.22 | 6.86 | 8.34 |
| | **Retracted** | 4.22 | 6.86 | 15.30 | 20.50 |
| **Weight (g)** | | 15 | 25 | 65 | 150 |

* It denotes the values at the maximum energy absorption per one cycle. Therefore, the operating frequency can be increased according to the energy absorption.

The shock absorber service life is different from that of the CXT cylinder depending on the operating conditions. Refer to the the **Web Catalog** for the replacement period.

Made to Order

**Made to Order: Individual Specifications (For details, refer to page 737.)**

| Symbol | Specifications |
|---|---|
| **X138** | Adjustable stroke type |
| **X777** | Fluororubber seals (Actuating cylinder unit only) |

### Made to Order

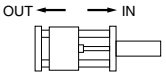
**Click here for details**

| Symbol | Specifications |
|---|---|
| **XB13** | Low speed cylinder (5 to 50 mm/s) |
| **XB22** | Shock absorber soft type RJ series type |

## Theoretical Output

(N)

| Bore size (mm) | Operating direction | Piston area ($mm^2$) | Operating pressure (MPa) 0.3 | 0.5 | 0.7 |
|---|---|---|---|---|---|
| 12 | IN | 84.8 | 25 | 42 | 59 |
| | OUT | 113 | 34 | 57 | 79 |
| 16 | IN | 151 | 45 | 75 | 106 |
| | OUT | 201 | 60 | 101 | 141 |
| 20 | IN | 236 | 71 | 118 | 165 |
| | OUT | 314 | 94 | 157 | 220 |
| 25 | IN | 378 | 113 | 189 | 264 |
| | OUT | 491 | 147 | 245 | 344 |
| 32 | IN | 603 | 181 | 302 | 422 |
| | OUT | 804 | 241 | 402 | 563 |
| 40 | IN | 1056 | 317 | 528 | 739 |
| | OUT | 1257 | 377 | 628 | 880 |



## Weight

### CXTM (Slide bearing)

(kg)

| Bore size (mm) \ Stroke (mm) | 15 | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12** | 0.85 (0.35) | 0.90 (0.35) | 1.02 (0.35) | 1.13 (0.36) | 1.25 (0.37) | — | — | — | — | — | — |
| **16** | 1.18 (0.50) | 1.24 (0.50) | 1.39 (0.51) | 1.54 (0.52) | 1.68 (0.53) | — | — | — | — | — | — |
| **20** | — | 2.35 (0.85) | 2.61 (0.87) | 2.89 (0.88) | 3.15 (0.90) | 3.41 (0.91) | 3.66 (0.93) | 3.92 (0.94) | 4.18 (0.96) | — | — |
| **25** | — | 2.76 (1.09) | 3.03 (1.11) | 3.34 (1.14) | 3.62 (1.16) | 3.89 (1.18) | 4.16 (1.21) | 4.43 (1.23) | 4.70 (1.25) | 5.25 (1.30) | 5.79 (1.34) |
| **32** | — | 4.61 (2.06) | 4.96 (2.10) | 5.32 (2.14) | 5.67 (2.17) | 5.95 (2.21) | 6.31 (2.25) | 6.64 (2.29) | 6.99 (2.33) | 7.67 (2.41) | 8.36 (2.49) |
| **40** | — | 8.28 (3.71) | 8.79 (3.75) | 9.29 (3.79) | 9.79 (3.83) | 10.34 (3.87) | 10.84 (3.91) | 11.36 (3.95) | 11.87 (3.99) | 12.88 (4.07) | 13.91 (4.15) |

### CXTL (Ball bushing bearing)

(kg)

| Bore size (mm) \ Stroke (mm) | 15 | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12** | 0.75 (0.41) | 0.78 (0.42) | 0.85 (0.42) | 0.92 (0.42) | 0.98 (0.43) | — | — | — | — | — | — |
| **16** | 1.05 (0.57) | 1.08 (0.57) | 1.18 (0.58) | 1.27 (0.59) | 1.35 (0.60) | — | — | — | — | — | — |
| **20** | — | 2.00 (1.02) | 2.15 (1.04) | 2.32 (1.05) | 2.46 (1.07) | 2.60 (1.08) | 2.75 (1.10) | 2.89 (1.11) | 3.03 (1.13) | — | — |
| **25** | — | 2.41 (1.25) | 2.57 (1.28) | 2.77 (1.30) | 2.92 (1.33) | 3.08 (1.35) | 3.24 (1.37) | 3.40 (1.39) | 3.56 (1.42) | 3.78 (1.46) | 4.19 (1.50) |
| **32** | — | 4.22 (2.26) | 4.45 (2.30) | 4.69 (2.34) | 4.92 (2.38) | 5.08 (2.42) | 5.32 (2.46) | 5.54 (2.50) | 5.77 (2.54) | 6.21 (2.62) | 6.66 (2.70) |
| **40** | — | 7.53 (4.31) | 7.83 (4.35) | 8.13 (4.39) | 8.42 (4.43) | 8.76 (4.47) | 9.06 (4.51) | 9.37 (4.55) | 9.67 (4.59) | 10.27 (4.67) | 10.88 (4.74) |

Note 1) ( ): Denotes the values of the movable parts weight. (Movable parts weight of a cylinder is included, too.)
Note 2) The weight indicated above does not include a shock absorber.

## Series Applicable to Operating Environments that Do Not Accept Copper

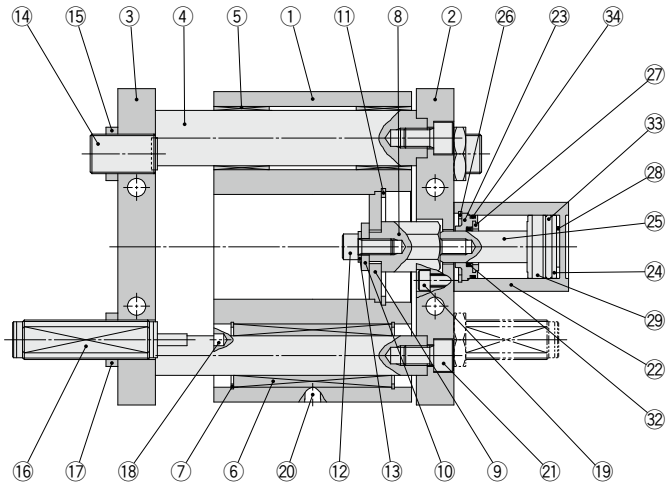
- **Copper/Fluorine-free specifications·····20- series**

∗ For details, refer to the SMC website.

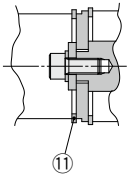
## Construction

**CXTM**
**Guide rod/bearing**

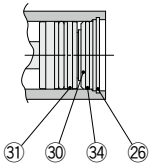
**CXTL**
**Guide rod/bearing**




**ø32**




**Long stroke**




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Slide block** | Aluminum alloy | Anodized |
| 2 | **Plate A** | Aluminum alloy | Anodized |
| 3 | **Plate B** | Aluminum alloy | Anodized |
| 4 | **Guide rod** | Carbon steel | Hard chrome plating |
| 5 | **Slide bearing** | Bearing alloy | |
| 6 | **Ball bushing bearing** | — | |
| 7 | **Type C retaining ring** | Carbon tool steel | Phosphate coating |
| 8 | **Adapter** | Carbon steel | Electroless nickel plating |
| 9 | **Connected disk** | Carbon steel | Electroless nickel plating |
| 10 | **Washer** | Carbon steel | Zinc chromated |
| 11 | **Type C retaining ring** | Carbon tool steel | Phosphate coating |
| 12 | **Hexagon socket head cap screw** | Carbon steel | Zinc chromated |
| 13 | **Spring washer** | Steel wire | Zinc chromated |
| 14 | **Adjusting bolt (With bumper)** | Carbon steel, Urethane | Zinc chromated |
| 15 | **Nut** | Carbon steel | Zinc chromated |
| 16 | **Shock absorber** | — | Option |
| 17 | **Nut** | Carbon steel | Zinc chromated |
| 18 | **Parallel pin** | Carbon steel | |

### Component Parts

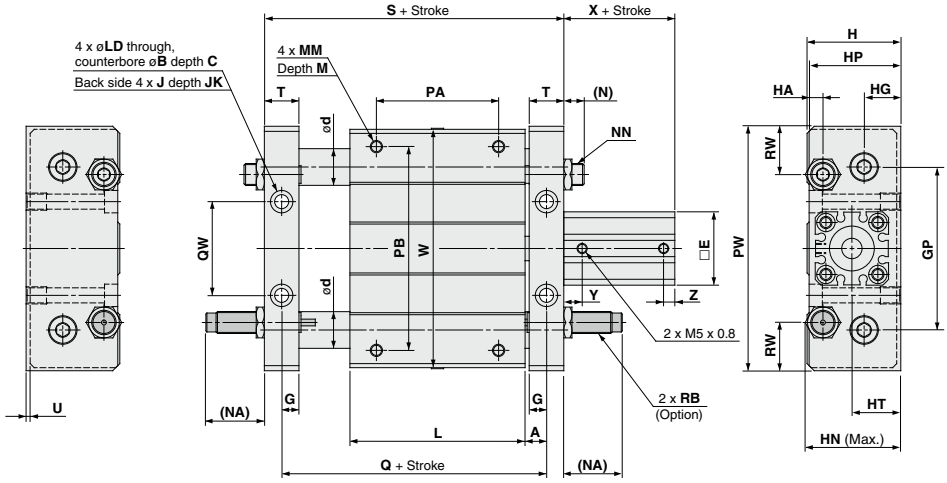
| No. | Description | Material | Note | |
|---|---|---|---|---|
| 19 | **Hexagon socket head cap screw** | Carbon steel | Zinc chromated | |
| 20 | **Grease nipple** | — | ø16 to ø40 | Nickel plating |
| 21 | **Hexagon socket head cap screw** | Carbon steel | Zinc chromated | |
| 22 | **Cylinder tube** | Aluminum alloy | Hard anodized | |
| 23 | **Collar** | Aluminum alloy | Anodized | |
| 24 | **Piston** | Aluminum alloy | Chromated | |
| 25 | **Piston rod** | Stainless steel | ø12 to ø25 | — |
| | | Carbon steel | ø32, ø40 | Hard chrome plating |
| 26 | **Type C retaining ring** | Carbon tool steel | Phosphate coating | |
| 27 | **Bumper A** | Urethane | | |
| 28 | **Bumper B** | Urethane | | |
| 29 | **Magnet** | — | | |
| 30 | **Bottom plate** | Aluminum alloy | Anodized | |
| 31 | **Wear ring** | Resin | | |
| 32 | **Rod seal** | NBR | | |
| 33 | **Piston seal** | NBR | | |
| 34 | **Tube gasket** | NBR | | |

### Replacement Parts/Seal Kit

| Model / Cylinder / Stroke | Kit no. | | | | | |
|---|---|---|---|---|---|---|
| | **CXT□12** | **CXT□16** | **CXT□20** | **CXT□25** | **CXT□32** | **CXT□40** |
| Standard stroke | CQSB12-PS | CQSB16-PS | CQSB20-PS | CQSB25-PS | CQ2B32-PS | CQ2B40-PS |
| Long stroke | CQSB12-L-PS | CQSB16-L-PS | CQSB20-L-PS | CQSB25-L-PS | CQ2A32-L-PS | CQ2A40-L-PS |

∗ Seal kit includes ㉜, ㉝ and ㉞. Order the seal kit with the kit number.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

## Dimensions: ø12 to ø25




**Cylinder form**

**ø12**

**ø16**

(mm)

| Bore size (mm) | Standard stroke (mm) | A | B | C | d | | E | G | GP | H | HA | HG | HN | HP | HT | J | JK | L | LD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Slide | Ball bushing | | | | | | | | | | | | | |
| **12** | 15, 25 | 8.5 | 8 | 4 | 16 | 10 | 25 | 7.5 | 50 | 34 | 6 | 14.5 | 34 | 33 | 18 | M5 x 0.8 | 9.5 | 68 | 4.3 |
| **16** | 15, 25 | 7.5 | 9.5 | 5 | 18 | 12 | 29 | 6.5 | 65 | 40 | 6.5 | 16 | 39.5 | 39 | 21 | M6 x 1 | 9.5 | 75 | 5.2 |
| **20** | 25, 50 | 9.5 | 11 | 6.5 | 25 | 16 | 36 | 8.5 | 80 | 46 | 9 | 18 | 44.1 | 45 | 24 | M8 x 1.25 | 10 | 86 | 6.9 |
| **25** | 25, 50 | 9.5 | 11 | 6.5 | 25 | 16 | 40 | 8.5 | 90 | 54 | 9 | 23 | 55 | 53 | 28 | M8 x 1.25 | 10 | 86 | 6.9 |

| Bore size (mm) | MM | M | (N) | (NA) | NN | PA* | PB | PW | Q | QW | RB | RW | S | T | U | W | X | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12** | M4 x 0.7 | 6 | 8 | 27 | M8 x 1.0 | 30 | 60 | 80 | 85 | 26 | RB0806 | 17.5 | 96 | 13 | 1 | 77 | 22 | 7.5 | 5 |
| **16** | M5 x 0.8 | 8 | 8 | 27 | M8 x 1.0 | 45 | 70 | 95 | 90 | 40 | RB0806 | 15 | 103 | 13 | 2 | 92 | 22 | 7.5 | 5 |
| **20** | M6 x 1 | 10 | 10 | 29 | M10 x 1.0 | 60 | 100 | 120 | 105 | 46 | RB1007 | 26 | 122 | 17 | 2 | 117 | 29.5 | 8 | 5.5 |
| **25** | M6 x 1 | 10 | 12 | 50 | M14 x 1.5 | 60 | 100 | 130 | 105 | 50 | RB1411 | 22 | 122 | 17 | 2 | 127 | 32.5 | 9 | 5.5 |

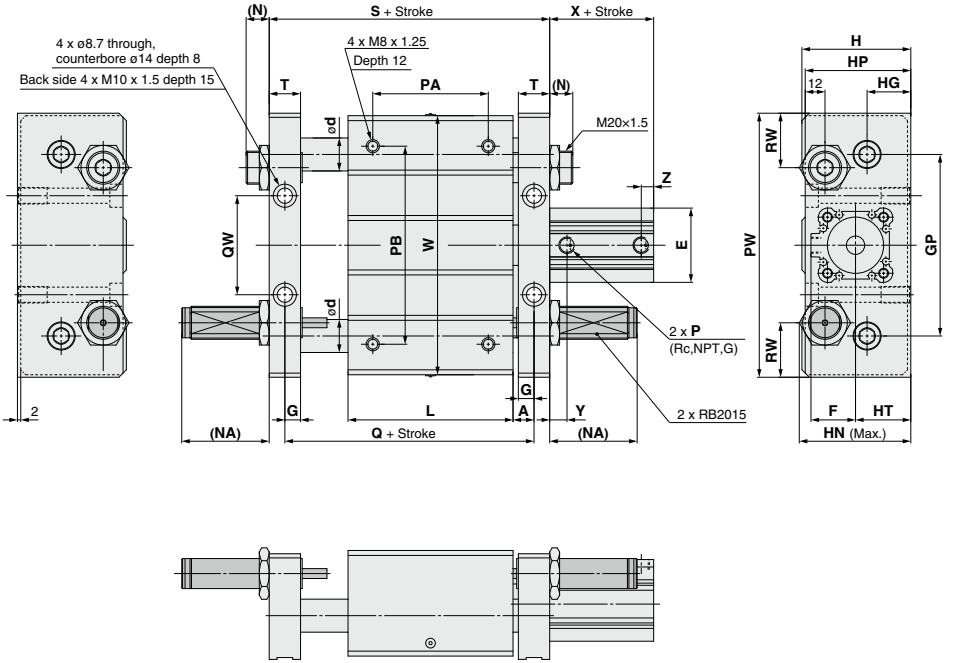
* PA dimension is the center sorted factor of the L dimension.

### Long Stroke

(mm)

| Bore size (mm) | Stroke range (mm) | X | Y | Z |
|---|---|---|---|---|
| **12** | 50, 75, 100 | 32 | 7.5 | 7.5 |
| **16** | 50, 75, 100 | 32 | 7.5 | 7.5 |
| **20** | 75, 100, 125, 150, 175, 200 | 41 | 8 | 8 |
| **25** | 75, 100, 125, 150, 175, 200, 250, 300 | 44 | 9 | 9 |

## Dimensions: ø32, ø40




(mm)

| Bore size (mm) | Standard stroke (mm) | A | d | | E | F | G | GP | H | HG | HN | HP | HT | L | (N) | (NA) | P[Note)] | PA* | PB | PW | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Slide | Ball bushing | | | | | | | | | | | | | | | | | |
| **32** | 25, 50, 75, 100 | 10.5 | 28 | 20 | 45 | 27 | 9.5 | 110 | 66 | 26.5 | 67.6 | 64 | 33.5 | 100 | 14 | 53 | 1/8 | 70 | 120 | 160 | 121 |
| **40** | 25, 50, 75, 100 | 11.5 | 36 | 25 | 52 | 31 | 10.5 | 130 | 78 | 30.5 | 77.6 | 74 | 40.5 | 136 | 12 | 51 | 1/8 | 90 | 140 | 190 | 159 |

| Bore size (mm) | QW | RW | S | T | W | X | Y | Z |
|---|---|---|---|---|---|---|---|---|
| **32** | 60 | 33 | 140 | 19 | 157 | 33 | 10 | 7.5 |
| **40** | 84 | 35 | 180 | 21 | 187 | 39.5 | 12.5 | 7.5 |

∗ PA dimension is the center sorted factor of the L dimension.

Note) Rc, NPT and G ports can be selected.

### Long Stroke

(mm)

| Bore size (mm) | Stroke range (mm) | X | Y | Z |
|---|---|---|---|---|
| **32** | 125, 150, 175, 200, 250, 300 | 45.5 | 10 | 10 |
| **40** | 125, 150, 175, 200, 250, 300 | 55 | 12.5 | 12.5 |

# Auto Switch Mounting 1

## Minimum Stroke for Mounting of Auto Switch

(mm)

| Application | No. of auto switches mounted \ Auto switch model | D-M9□V | D-A9□V | D-A9□ | D-M9□WV<br>D-M9□AV | D-M9□ | D-M9□W<br>D-M9□A | D-P3DWA |
|---|---|---|---|---|---|---|---|---|
| CXT□12 to CXT□25 | 1 | 5 | 5 | 10 | 10 | 15 | 20 | 15 |
| | 2 | 5 | 10 | 10 | 10 | 15 | 20 | 15 |
| CXT□32 to 40 | 1 | 5 | 5 | 10 | 10 | 10 | 15 | 15 |
| | 2 | 5 | 10 | 10 | 15 | 10 | 15 | 15 |

∗ D-P3DW is compatible with ø25 to ø40.

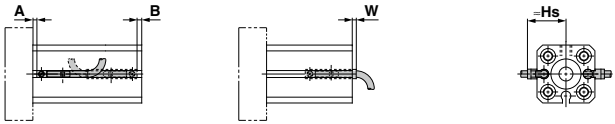
(mm)

| Application | No. of auto switches mounted \ Auto switch model | D-F7□V<br>D-J79C | D-A7□<br>D-A8□<br>D-A73C<br>D-A80C | D-F7□WV<br>D-F7BAV | D-A7□H<br>D-A80H<br>D-F7□<br>D-J79 | D-A79W | D-F7□W<br>D-J79W<br>D-F7BA<br>D-F7NT<br>D-F79F |
|---|---|---|---|---|---|---|---|
| CXT□32 to 40 | 1 | 5 | 5 | 10 | 15 | 15 | 20 |
| | 2 | 5 | 10 | 15 | 15 | 20 | 20 |

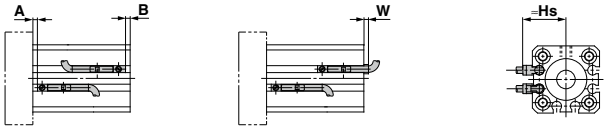
## Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

**D-M9□**
**D-M9□W**
**D-M9□A**
**D-M9□V**
**D-M9□WV**
**D-M9□AV**
**D-A9□**
**D-A9□V**
**D-P3DWA□**

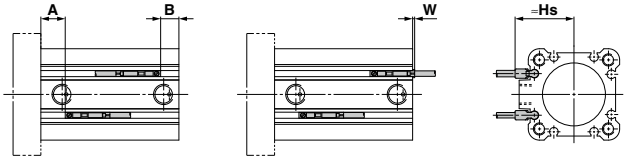
**ø12**




**ø16, 20, 25**




**ø32, 40**




### Proper Auto Switch Mounting Position/Standard Stroke

(mm)

| Auto switch model \ Bore size | D-M9□/M9□V<br>D-M9□W/M9□WV | | | D-M9□A<br>D-M9□AV | | | D-A9□<br>D-A9□V | | | D-P3DWA | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | W | A | B | W | A | B | W | A | B |
| 12 | 5.5 | 4.5 | 5.5 | 5.5 | 4.5 | 7.5 | 1.5 | 0 | 1.5 (4) | — | — |
| 16 | 6 | 4 | 6 | 6 | 4 | 8 | 2 | 0 | 2 (4.5) | — | — |
| 20 | 10 | 7.5 | 2.5 | 10 | 7.5 | 4.5 | 6 | 3.5 | –1.5 (1) | — | — |
| 25 | 11 | 9.5 | 0.5 | 11 | 9.5 | 2.5 | 7 | 5.5 | –3.5 (–1) | 6.5 | 5 |
| 32 | 12 | 9 | 1 | 12 | 9 | 3 | 8 | 5 | –3 (–0.5) | 7.5 | 4.5 |
| 40 | 16 | 11.5 | –1.5 | 16 | 11.5 | 0.5 | 12 | 7.5 | –5.5 (–3) | 11.5 | 7 |

### Proper Auto Switch Mounting Position/Long Stroke

(mm)

| Auto switch model \ Bore size | D-M9□/M9□V<br>D-M9□W/M9□WV | | | D-M9□A<br>D-M9□AV | | | D-A9□<br>D-A9□V | | | D-P3DWA | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | W | A | B | W | A | B | W | A | B |
| 12 | 9 | 11 | –1 | 9 | 11 | 1 | 5 | 7 | -5 (-2.5) | — | — |
| 16 | 9.5 | 10.5 | –0.5 | 9.5 | 10.5 | 1.5 | 5.5 | 6 | -4.5 (-2) | — | — |
| 20 | 13 | 16 | –6 | 13 | 16 | –4 | 9 | 11.5 | -10 (-7.5) | — | — |
| 25 | 14 | 18 | –8 | 14 | 18 | –6 | 10 | 13.5 | -12 (-9.5) | 6.5 | 5 |
| 32 | 12.5 | 20.5 | –10.5 | 12.5 | 20.5 | –8.5 | 8.5 | 16.5 | -14.5 (-12) | 8 | 16 |
| 40 | 16 | 26.5 | –16.5 | 16 | 26.5 | –14.5 | 12 | 22.5 | -20.5 (-18) | 11.5 | 22 |

Note 1) ( ): Denotes the values of D-A93.
Note 2) W is applicable when mounting D-A9□, D-M9□, D-M9□W and D-M9□A.
Note 3) Adjust the auto switch after confirming the operating conditions in the actual setting.

### Auto Switch Mounting Height/ Standard Stroke, Long Stroke

(mm)

| Auto switch model \ Bore size | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V | D-P3DWA |
|---|---|---|---|
| | Hs | Hs | Hs |
| 12 | 19 | 17 | — |
| 16 | 21 | 19 | — |
| 20 | 24 | 22.5 | — |
| 25 | 26 | 24.5 | 33 |
| 32 | 29 | 27 | 35.5 |
| 40 | 32.5 | 30.5 | 39 |

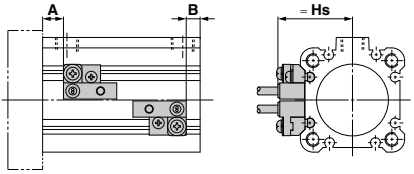
## Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

**D-A7□**
**D-A80**
**D-A73C**
**D-A80C**
**D-A79W**
**D-A7□H**
**D-A80H**

**D-F7□**
**D-J79**
**D-F7□W**
**D-J79W**
**D-F7BA**
**D-F79F**
**D-F7NT**

**D-F7□V**
**D-J79C**
**D-F7□WV**
**D-F7BAV**

**ø32, 40**




### Auto Switch Proper Mounting Position/Standard Stroke

(mm)

| Auto switch model / Bore size | D-A73<br>D-A80 | | D-A72/A7□H<br>D-A80H/A73C<br>D-A80C/F7□/J79<br>D-F7□W/J79W<br>D-F7□V/F7□WV<br>D-F79F/J79C<br>D-F7BA/F7BAV | | D-A79W | | D-F7NT | |
|---|---|---|---|---|---|---|---|---|
| | A | B | A | B | A | B | A | B |
| **32** | 9 | 6 | 9.5 | 6.5 | 6.5 | 3.5 | 14.5 | 10.5 |
| **40** | 13 | 8.5 | 13.5 | 9 | 10.5 | 6 | 18.5 | 13 |

### Auto Switch Proper Mounting Position/Long Stroke

(mm)

| Auto switch model / Bore size | D-A73<br>D-A80 | | D-A72/A7□H<br>D-A80H/A73C<br>D-A80C/F7□/J79<br>D-F7□W/J79W<br>D-F7□V/F7□WV<br>D-F79F/J79C<br>D-F7BA/F7BAV | | D-A79W | | D-F7NT | |
|---|---|---|---|---|---|---|---|---|
| | A | B | A | B | A | B | A | B |
| **32** | 9.5 | 17.5 | 10 | 18 | 7 | 15 | 15 | 23 |
| **40** | 13 | 23.5 | 13.5 | 24 | 10.5 | 21 | 18.5 | 29 |

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

### Auto Switch Mounting Height/Standard Stroke, Long Stroke

(mm)

| Auto switch model / Bore size | D-A7□<br>D-A80 | D-A7□H<br>D-A80H<br>D-F7□<br>D-J79<br>D-F7□W<br>D-J79W<br>D-F79F<br>D-F7BA<br>D-F7NT | D-A73C<br>D-A80C | D-A79W | D-F7□V<br>D-F7□WV<br>D-F7BV | D-J79C |
|---|---|---|---|---|---|---|
| | Hs | Hs | Hs | Hs | Hs | Hs |
| **32** | 31.5 | 32.5 | 38.5 | 34 | 35 | 38 |
| **40** | 35 | 36 | 42 | 37.5 | 38.5 | 41.5 |

## Operating Range

(mm)

| Auto switch model | Bore size | | | | | |
|---|---|---|---|---|---|---|
| | 12 | 16 | 20 | 25 | 32 | 40 |
| **D-M9□/M9□V**<br>**D-M9□W/M9□WV**<br>**D-M9□A/M9□AV** | 2.5 | 4 | 5.5 | 5.5 | 6 | 5.5 |
| **D-A9□/A9□V** | 6 | 7.5 | 10 | 10 | 9.5 | 9.5 |
| **D-F7□/F7□V**<br>**D-J79/J79C**<br>**D-F7□W/F7□WV**<br>**D-J79W**<br>**D-F7BA/F7BAV**<br>**D-F7NT/F79F** | — | — | — | — | 6 | 6 |
| **D-A7□/A80** | — | — | — | — | 12 | 11 |
| **D-A79W** | — | — | — | — | 13 | 14 |
| **D-P3DWA** | — | — | — | 6 | 6 | 6 |

∗ Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion)
There may be the case it will vary substantially depending on an ambient environment.
∗ Auto switch mounting brackets BQ2-012 are not used for sizes over ø32 of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types. The above values indicate the operating range when mounted with the current auto switch installation groove.

# *CXT Series*
# Auto Switch Mounting 2

## Auto Switch Mounting Bracket: Part No.

| Applicable auto switch | D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV<br>D-A9□/A9□V | D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV<br>D-F7BA/F7BAV/F79F/F7NT<br>D-A7□/A80/A7□H/A80H/A73C/A80C/A79W | D-P3DWA |
|---|---|---|---|
| Bore size (mm) | ø12 to ø40 | ø32, ø40 | ø25, ø40 |
| Auto switch mounting bracket part no. | — | BQ5-032 | — |
| Auto switch mounting bracket fitting parts lineup/Weight | — | ● Auto switch fixing screw (M2.5 x 10L)<br>● Auto switch mounting screw (M3 x 8L)<br>● Auto switch spacer<br>● Auto switch mounting nut<br>Weight: 3.5 g | — |
| Auto switch mounting surface | Surfaces with auto switch mounting slot<br>ø12 / ø16 / ø20, ø25 / ø32, ø40 | A/B/C side except port side<br>Port side<br>C A B | Surfaces with auto switch mounting slot |
| Mounting of auto switch | Auto switch mounting screw / Auto switch<br>● When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter.<br>**Tightening torque for auto switch mounting screw** (N·m)<br>Auto switch model / Tightening torque<br>D-M9□(V), D-M9□W(V), D-A93: 0.05 to 0.15<br>D-M9□A(V): 0.05 to 0.10<br>D-A9□(V) (Excludes the D-A93): 0.10 to 0.20 | ①Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position.<br>②With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut.<br>③Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole.<br>④Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer.<br>⑤Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m.<br>⑥Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m.<br>⑦The detection position can be changed under the conditions in step ⑤.<br>Auto switch mounting screw (M3 x 0.5 x 8L)<br>Auto switch<br>Auto switch fixing screw (M2.5 x 0.45 x 10L)<br>Auto switch spacer<br>Auto switch mounting nut | ①Insert the mounting bracket into the mating groove of the cylinder tube.<br>②Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12L).*<br>③If the detecting position is changed, go back to step ①.<br>Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.<br>Note 2) The tightening torque for the hexagon socket head cap screw (M2.5 x 12L) is 0.2 to 0.3 N·m.<br>Hexagon socket head cap screw (M2.5 x 12L) (Included with auto switch) |

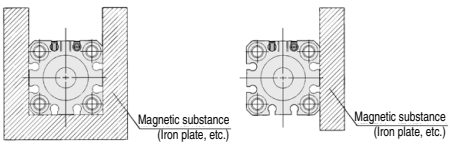
Note ) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

### Other Applicable Auto Switches
/Refer to pages 1289 to 1383 for the detailed specifications of auto switches.

| Auto switch type | Model | Electrical entry (Fetching direction) | Features |
|---|---|---|---|
| Reed | D-A73 | Grommet (Perpendicular) | — |
| | D-A80 | | Without indicator light |
| | D-A73H, A76H | Grommet (In-line) | — |
| | D-A80H | | Without indicator light |
| Solid state | D-F7NV, F7PV, F7BV | Grommet (Perpendicular) | — |
| | D-F7NWV, F7BWV | | Diagnostic indication (2-color indicator) |
| | D-F7BAV | | Water resistant (2-color indicator) |
| | D-F79, F7P, J79 | Grommet (In-line) | — |
| | D-F79W, F7PW, J79W | | Diagnostic indication (2-color indicator) |
| | D-F7BA | | Water resistant (2-color indicator) |
| | D-F7NT | | With timer |

∗ For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1358 and 1359 for details.
∗ Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1308.
∗ D-A7/A8/F7/J7 types cannot be mounted on ø12 to ø25.

• If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the graph on the below (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable.



# Made to Order: Individual Specifications

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.

Symbol

## 1 Adjustable Stroke -X138

The stroke adjustment range may be expanded with a long adjustment bolt.

### How to Order

CXT | Standard model no. | — X138

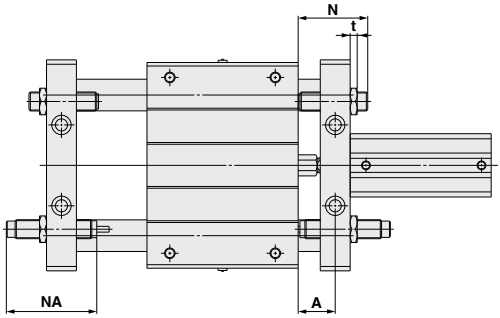
X138: Adjustable stroke

### Specifications

| Model | CXT□12, 16 | CXT□20, 25 | CXT□32 | CXT□40 |
|---|---|---|---|---|
| **Stroke adjustment range** | –26 mm (Single side –13 mm) | –28 mm (Single side –14 mm) | –44 mm (Single side –22 mm) | –40 mm (Single side –20 mm) |

∗ Specifications other than the above are the same as the standard type.

### Dimensions (Dimensions other than those below are the same as the standard type.)




(mm)

| Cylinder bore (mm) | A | N | NA | t |
|---|---|---|---|---|
| **12** | 8.5 to 21.5 | 32 | 40.8 | 4 |
| **16** | 7.5 to 20.5 | 32 | 40.8 | 4 |
| **20** | 9.5 to 23.5 | 37 | 46.7 | 4 |
| **25** | 9.5 to 23.5 | 39 | 67.3 | 6 |
| **32** | 10.5 to 32.5 | 49 | 73.2 | 6 |
| **40** | 11.5 to 31.5 | 49 | 73.2 | 6 |

Symbol

## 2 Fluororubber Seal (Cylinder unit only) -X777

Fluororubber is used only for the cylinder unit seal.

### How to Order

CXT | Standard model no. | — X777

X777: Fluororubber seal (Cylinder unit only)

### Specifications

| Seal material | Fluororubber (Cylinder unit only) |
|---|---|

∗ Specifications other than the above are the same as the standard type.

# *CXT Series*
# Specific Product Precautions

**Be sure to read this before handling the products.**
**Refer to page 8 for safety instructions and pages 9 to 18 for actuator and auto switch precautions.**

## Operating Precautions

### ⚠Caution

1. **Make sure not to apply to the slide block a load that exceeds the value that has been calculated in the selection procedures.**
2. **Operate the cylinder securing it by its plates, not by securing it by its slide block.**
3. **The clearance between the slide block and the plate at the stroke end is approximately 1 mm to 6 mm. It could be extremely dangerous, as there is the risk of getting your fingers caught.**
   Install a cover as necessary.
4. **At both stroke ends, adjust the damper portion at the end of the adjusting bolt so that it comes in contact with the slide block. (The clearance between the slide block and the plate must be 1 mm or more.)**
   If it is operated without making any contact, the piston rod of the actuating cylinder or the connecting hardware (adapter) could become damaged by an excessive impact, or the slide block could collide with the plate and create an abnormal noise.
5. **The load weight or operating speed will be limited if only the adjusting bolt is used.**
   Refer to the section on "Allowable load when only the adjustment bolt is used" on page 711
6. **This product cannot be used in an environment in which the piston rod and the guide shaft surfaces will be exposed to water (hot water), coolant, cutting chips, or dust.**
7. **The slide block bearings must be greased periodically. Inject grease (Class 1 or 2 lithium soap grease consistency) through the grease inlet.**
   Note) On those with a cylinder bore of ø12, apply grease to the guide shaft.
8. **To operate the cylinder, use a non-lubricating air supply.**
   Use turbine oil Class 1 (ISO VG32), if lubricated. (Using machine oil or spindle oil are not allowed.)

## Mounting

### ⚠Caution

1. **While a high level of flatness is desired for the surface on which the cylinder is to be mounted, if sufficient flatness cannot be attained, use shims to adjust the installation of the cylinder so that the slide block can operate throughout its stroke under the minimum operating pressure.**
2. **Do not scratch or gouge the piston rod of the actuating cylinder, as this could damage the rod seal and lead to air leaks.**
   The same applies to the guide shaft.
3. **Make sure not to apply shocks or excessive moment to the slide block of the ball bushing type.**
4. **The port direction of the actuating cylinder can be changed in 90° increments by removing the four bolts that secure the cylinder in place.**
   After changing the direction, verify the operation at the minimum operating pressure.
5. **Before the installation, thoroughly flush out the piping to prevent dust or cutting chips from entering the cylinder.**
6. **The mounting position of the adjusting bolt and the shock absorber cannot be inverted due to the constraints imposed by the locating pin for the shock absorber that is provided on the slide block.**

## Handling on Shock Absorber

### ⚠Caution

1. **The RB series (SMC made) shock absorbers can absorb a wide range of energy without requiring adjustment. (No adjustment screw is provided.)**
2. **The screw at the bottom is not for adjustment.**
   Never turn this screw as it could cause an oil leak (lowered performance).
3. **Do not scratch the surface of the shock absorber rod because doing so could affect the shock absorber's durability or lead to poor retraction.**

* For detailed specifications about the shock absorber, refer to the **Web Catalog**.

## Service Life and Replacement Period of Shock Absorber

### ⚠Caution

**1.Allowable operating cycle under the specifications set in this catalog is shown below.**

1.2 million cycles RB08□□
2 million cycles RB10□□ to RB2725

Note) Specified service life (suitable replacement period) is the value at room temperature (20 to 25°C). The period may vary depending on the temperature and other conditions. In some cases the absorber may need to be replaced before the allowable operating cycle above.