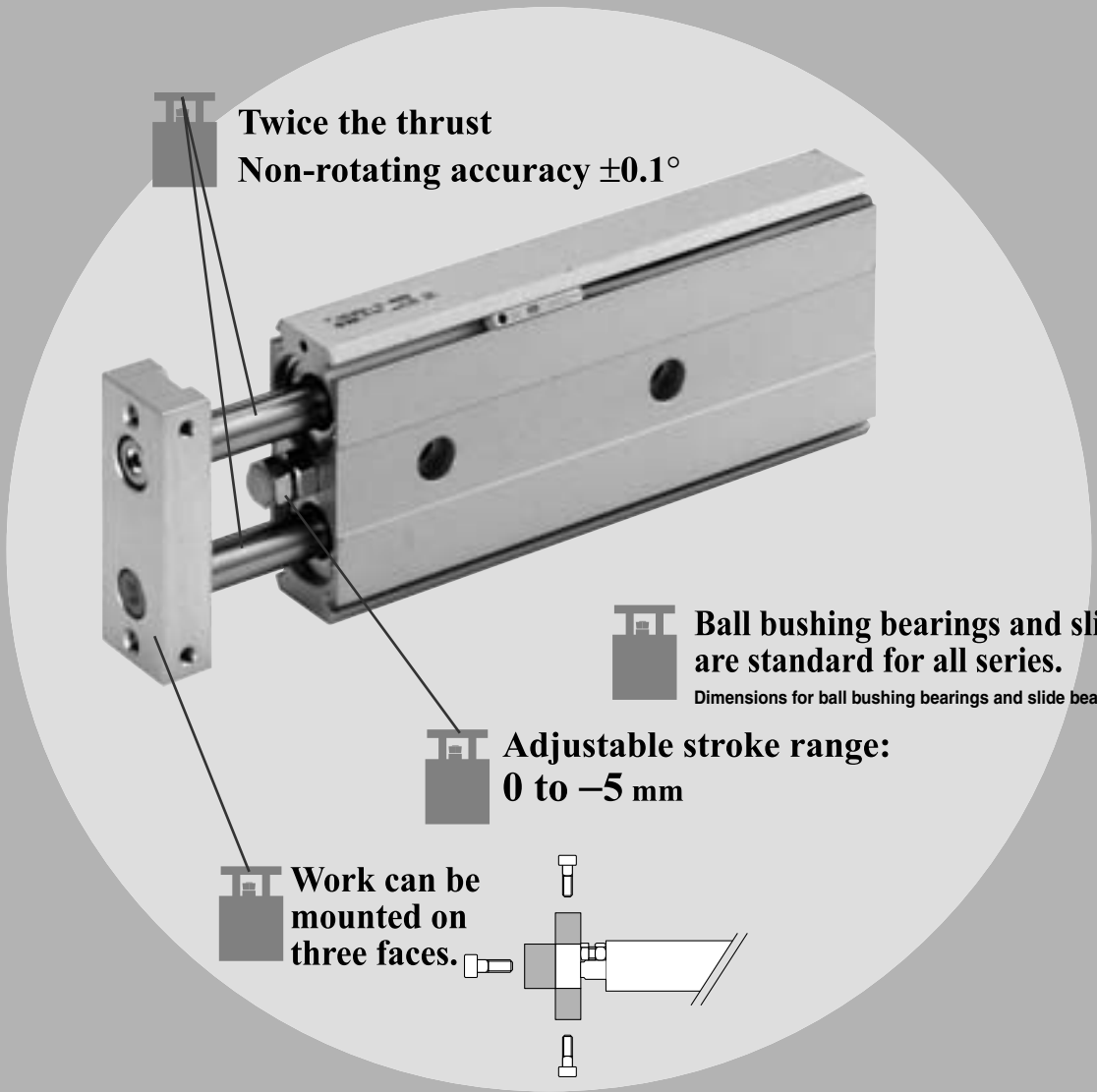
# Dual Rod Cylinder

## *Series* CXSJ/CXS

### ø6, ø10, ø15, ø20, ø25, ø32

# Dual rod cylinder with guide function suitable for pick & place applications.

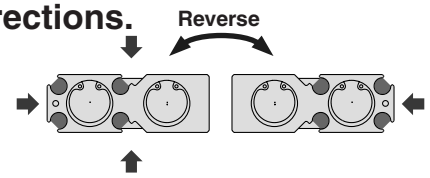



### Series Variations

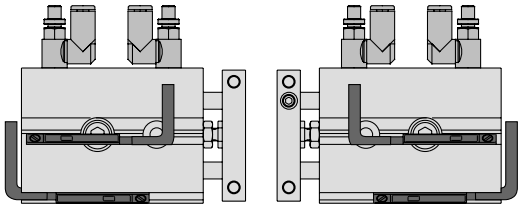
| Series | | Bore size (mm) 6 10 15 20 25 32 | Axial foot piping | Clean Series 10- 11- 12- | Page |
|---|---|---|---|---|---|
| Compact type | CXSJ | | | | P.549 |
| Basic type | CXS | | (ø6, ø10 only) | (Ball bushing bearing only) | P.561 |
| With air cushion | CXS | | (ø6 only) | (Ball bushing bearing only) | P.571 |
| With end lock | CXS | | | | P.578 |
| Double rod type | CXSW | | | | P.585 |

# Compact Type *Series CXSJ*

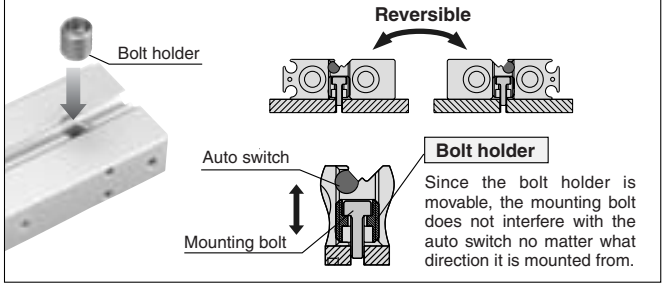
## Auto switch can be installed from 3 directions.



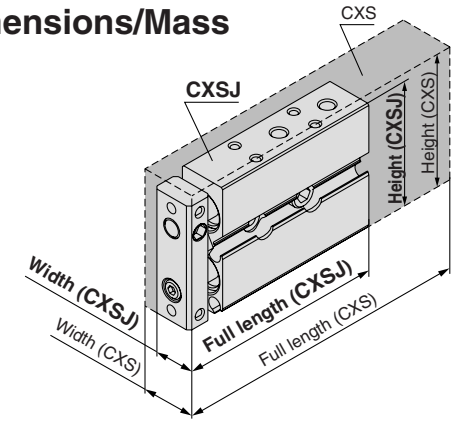

## Symmetric mounting



**Reverse mounting mechanism**



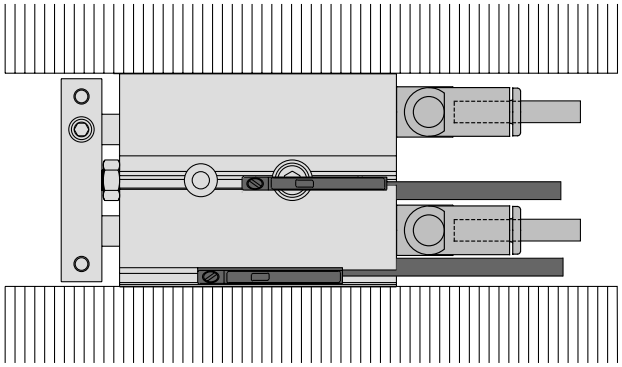

## Dimensions/Mass




| Bore size (mm) | Series | Dimensions (mm) | | | Mass (kg) Note) |
|---|---|---|---|---|---|
| | | Height | Width | Full length | |
| ø6 | **CXSJ□6** | **13.4** | **32** | **42 + Stroke** | **0.057** |
| | CXS□6 | 16 | 37 | 58.5 + Stroke | 0.095 |
| ø10 | **CXSJ□10** | **15** | **42** | **56 + Stroke** | **0.114** |
| | CXS□10 | 17 | 46 | 72 + Stroke | 0.170 |
| ø15 | **CXSJ□15** | **19** | **54** | **70 + Stroke** | **0.219** |
| | CXS□15 | 20 | 58 | 79 + Stroke | 0.280 |
| ø20 | **CXSJ□20** | **24** | **62** | **84 + Stroke** | **0.371** |
| | CXS□20 | 25 | 64 | 94 + Stroke | 0.440 |
| ø25 | **CXSJ□25** | **29** | **73** | **87 + Stroke** | **0.544** |
| | CXS□25 | 30 | 80 | 96 + Stroke | 0.660 |
| ø32 | **CXSJ□32** | **37** | **94** | **100.5 + Stroke** | **1.078** |
| | CXS□32 | 38 | 98 | 112 + Stroke | 1.230 |

Note) Slide bearing, 20 mm strokes

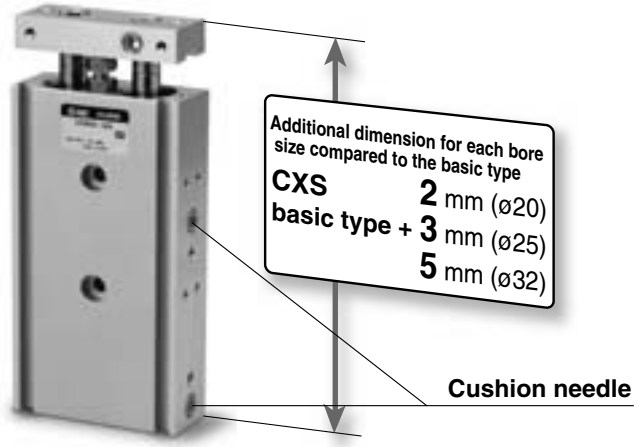
## Axial piping available (ø6, ø10)



## Allowable kinetic energy, allowable load, and non-rotating accuracy are equivalent to those of CXS basic type.

# With air cushion
## Series CXS: ø20, ø25, ø32

### Air cushion only minimally adds to full length dimension, compared with the standard type cylinder.

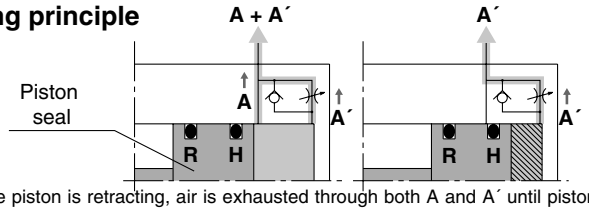



1 Improved allowable kinetic energy:
**Two to three times that of the standard type**
2 Improved noise reduction:
**Reduction of more than 6 dB is possible**

### Unique air cushion mechanism with no cushion ring

**Elimination of the cushion ring used in conventional type air cushions has made it possible to reduce the overall length of the cylinder while retaining all the advantages of a compact profile.**

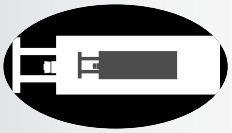
**Working principle**



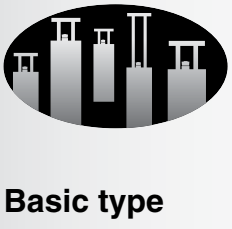

1. When the piston is retracting, air is exhausted through both A and A´ until piston seal H passes air passage A.
2. After piston seal H has passed air passage A, air is exhausted only through A´. The section marked with slanted lines becomes a cushion chamber, and an air cushion effect is achieved.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

### Clean Series
**11-CXSJ Series/ø6, ø10**
**12-**

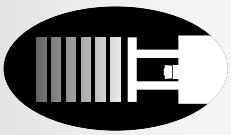
| Series | Type | Bearing type |
|---|---|---|
| 11-CXSJ | Vacuum specifications | Slide bearing<br>Ball bushing bearing |
| 12-CXSJ | Relieving type<br>Special treatment | Ball bushing bearing |



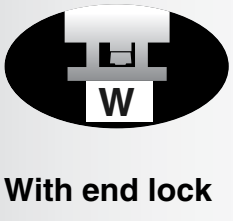
**Compact type**
***Series CXSJ***
**ø6, ø10, ø15, ø20, ø25, ø32**



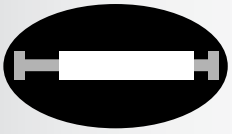
**Basic type**
***Series CXS***
**ø6, ø10, ø15, ø20, ø25, ø32**



**With air cushion**
***Series CXS***
**ø20, ø25, ø32**




**With end lock**
***Series CXS***
**ø6, ø10, ø15, ø20, ø25, ø32**



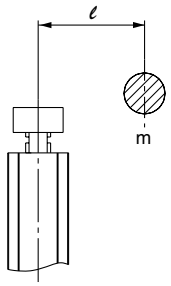
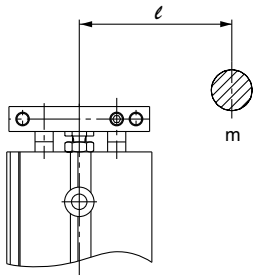
**Double rod type**
***Series CXSW***
**ø6, ø10, ø15, ø20, ø25, ø32**

# *Series CXSJ*
# Model Selection

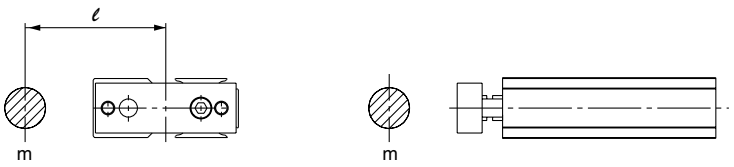
**⚠Caution Theoretical output must be confirmed separately, referring to the table on page 550.**

## Model Selection

### Vertical Mounting

| Mounting orientation |  |  | | |
|---|---|---|---|---|
| Max. speed (mm/s) | Up to 200 | Up to 400 | Up to 600 | Up to 800 |
| Stroke (mm) | All strokes | | | |
| Selection graph ø6 | 1 | 2 | 3 | 4 |
| Selection graph ø10 | 1 | 2 | 3 | 4 |
| Selection graph ø15 | 1 | 2 | 3 | 4 |
| Selection graph ø20 | 1 | 2 | 3 | 4 |
| Selection graph ø25 | 1 | 2 | 3 | 4 |
| Selection graph ø32 | 1 | 2 | 3 | 4 |

### Horizontal Mounting

| Mounting orientation |  ∗ Refer to the caution notes below. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Stroke (mm) | Up to 10 | | Up to 30 | | Up to 50 | | Up to 75 | | Up to 100 | |
| Max. speed (mm/s) | Up to 400 | Over 400 | Up to 400 | Over 400 | Up to 400 | Over 400 | Up to 400 | Over 400 | Up to 400 | Over 400 |
| Selection graph ø6 | 5 | | 6 | | 7 | | 14 | | 15 | |
| Selection graph ø10 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 15 | |
| Selection graph ø15 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 15 | |
| Selection graph ø20 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 15 | |
| Selection graph ø25 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 15 | |
| Selection graph ø32 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 15 | |

∗ The maximum speeds for ø6 to ø32 are: ø6, 10: up to 800 mm/s; ø15, 20: up to 700 mm/s; ø25, 32: up to 600 mm/s

## ⚠Caution

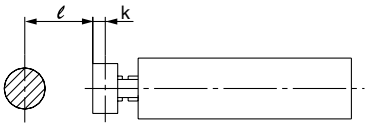
If the cylinder is horizontally mounted and the plate end does not reach the load's center of gravity, use the formula below to calculate the imaginary stroke ℓ′ that includes the distance between the load's center of gravity and the plate end. Select the graph that corresponds to the imaginary stroke ℓ′.

Imaginary stroke ℓ′ = (Stroke) + k + ℓ
k: Distance between the center and end of the plate

| | |
|---|---|
| **ø6** | 2.75 mm |
| **ø10** | 4 mm |
| **ø15** | 5 mm |
| **ø20** | 6 mm |
| **ø25** | |
| **ø32** | 8 mm |

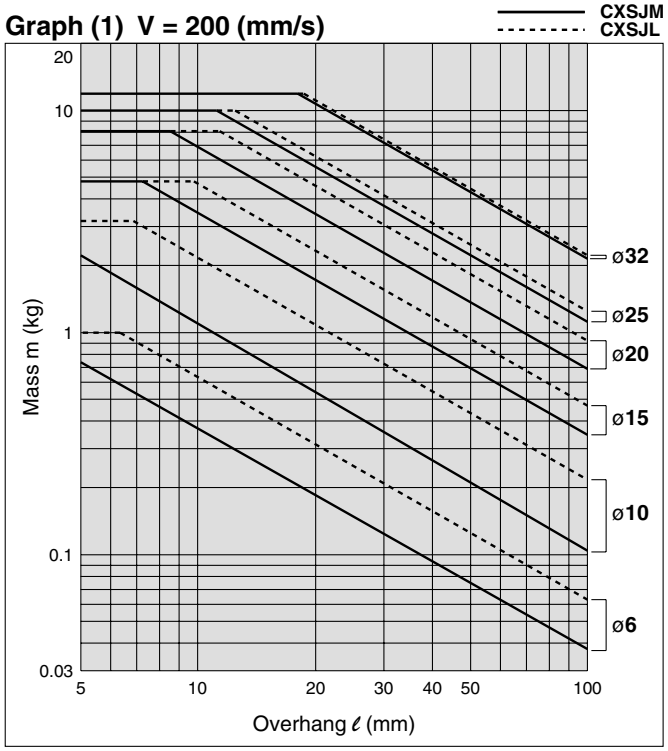
(Example)
① When using CXSJM6-10 and ℓ = 15 mm:
Imaginary stroke ℓ′ = 10 + 2.75 + 15 = 27.75
Therefore, the graph used for your model selection should be the one for CXSJM6-30 6).

② When using CXSJL25-50 and ℓ = 10 mm:
Imaginary stroke ℓ′ = 50 + 6 + 15 = 71
Therefore, the graph used for your model selection should be the one for CXSJL25-75 14).

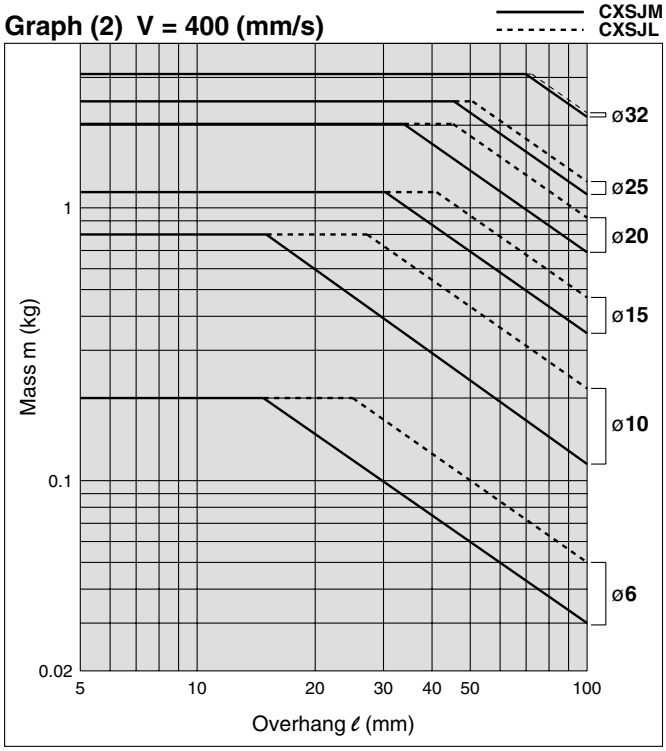


## Vertical Mounting

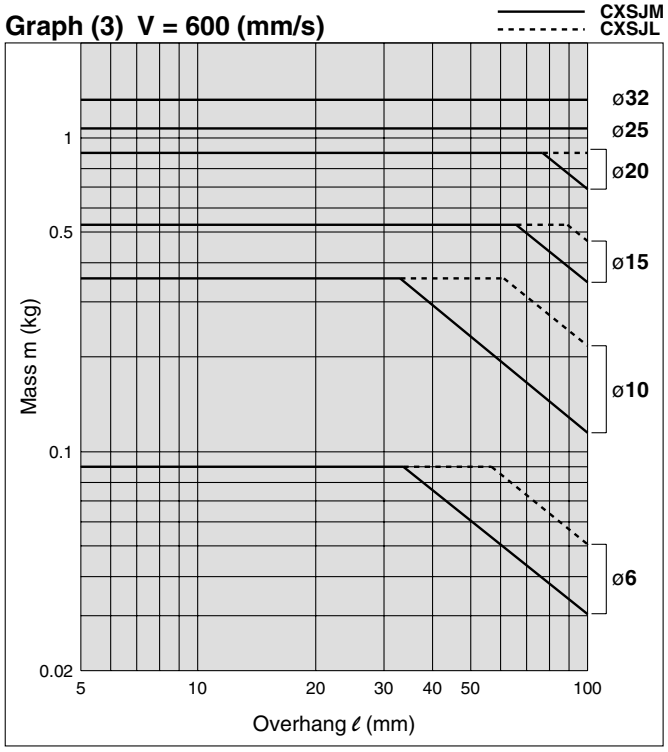
**Graph (1) V = 200 (mm/s)**



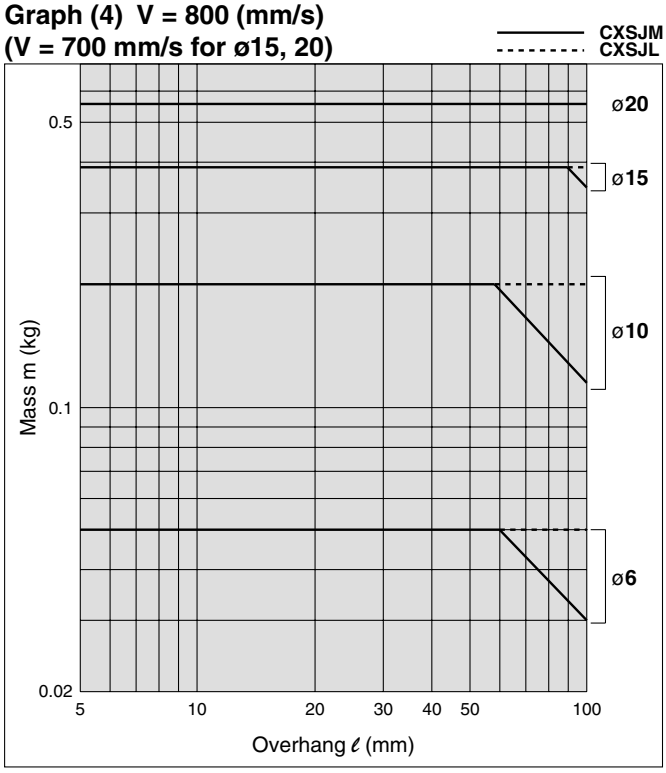

**Graph (2) V = 400 (mm/s)**




**Graph (3) V = 600 (mm/s)**



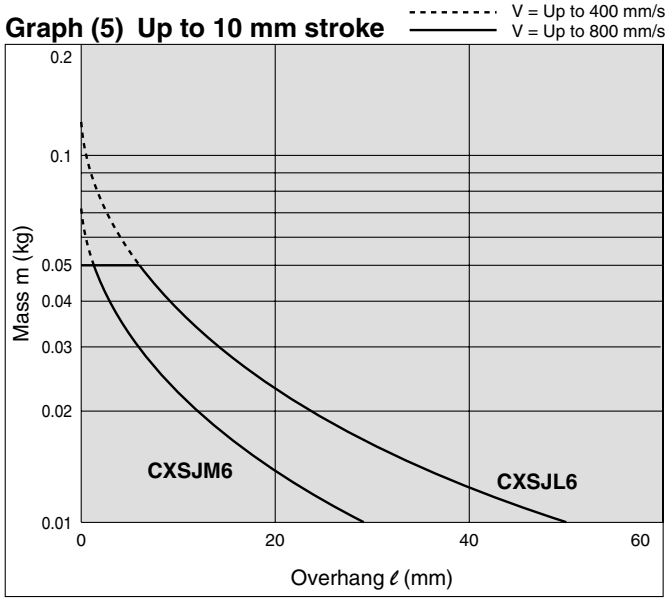

**Graph (4) V = 800 (mm/s)**
**(V = 700 mm/s for ø15, 20)**



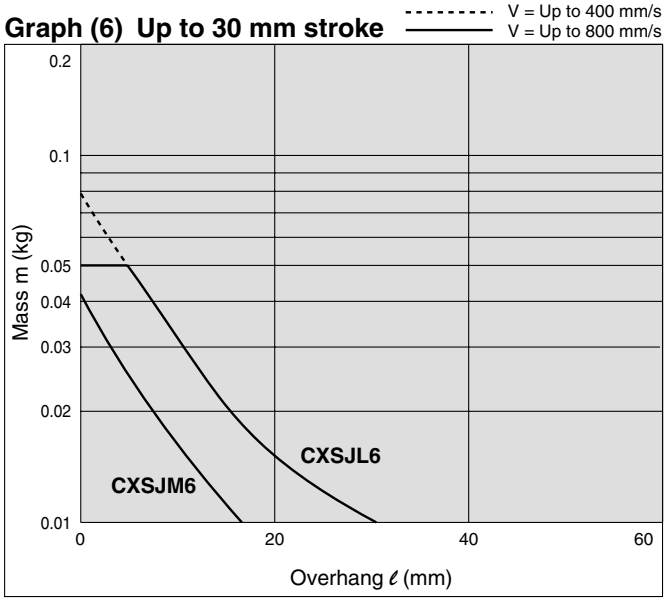

Note) V = 700 mm/s for ø15, ø20.

## Horizontal Mounting

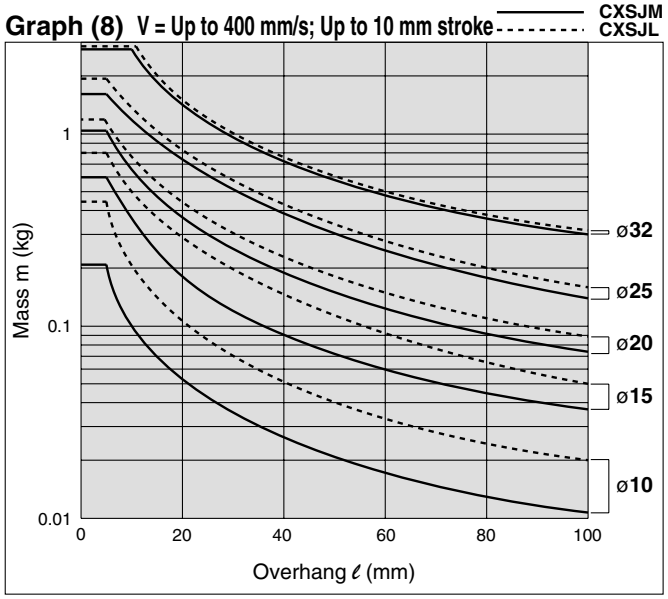
### Graph (5) Up to 10 mm stroke



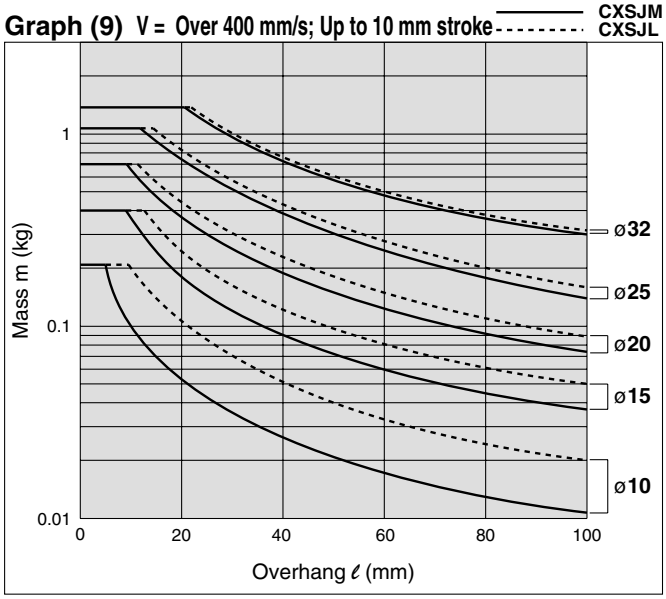

### Graph (6) Up to 30 mm stroke



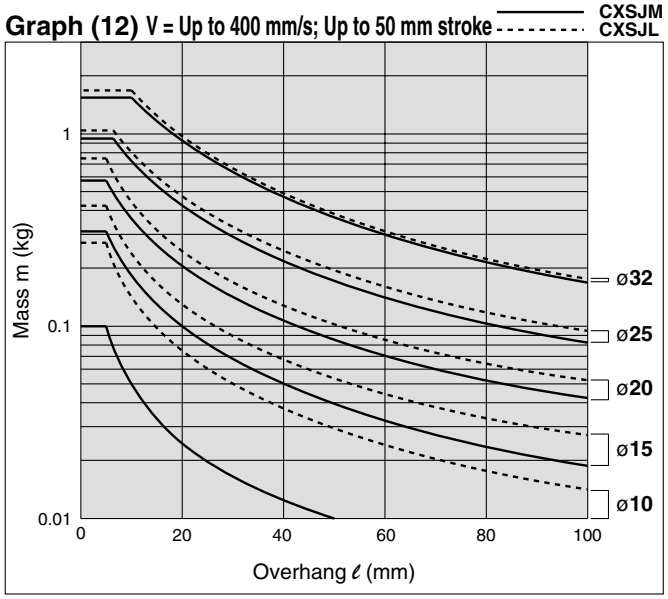

### Graph (8) V = Up to 400 mm/s; Up to 10 mm stroke



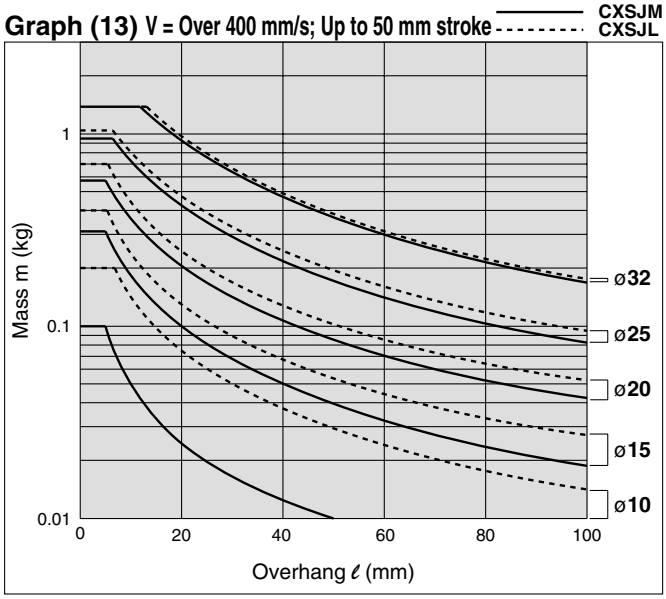

### Graph (9) V = Over 400 mm/s; Up to 10 mm stroke



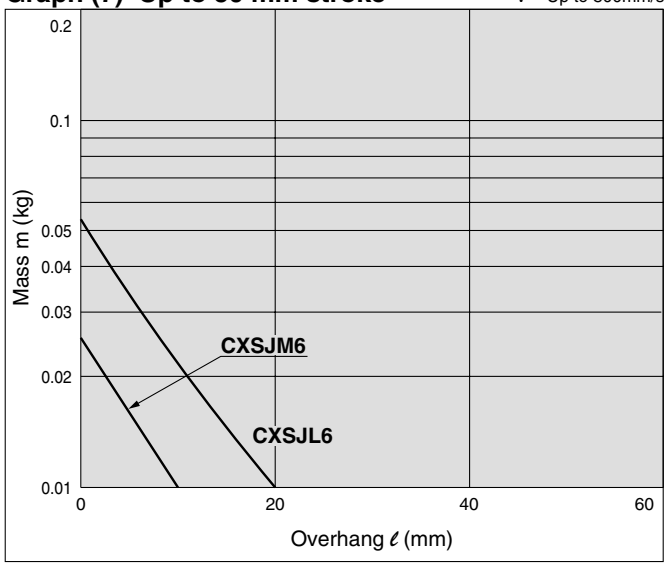

### Graph (12) V = Up to 400 mm/s; Up to 50 mm stroke



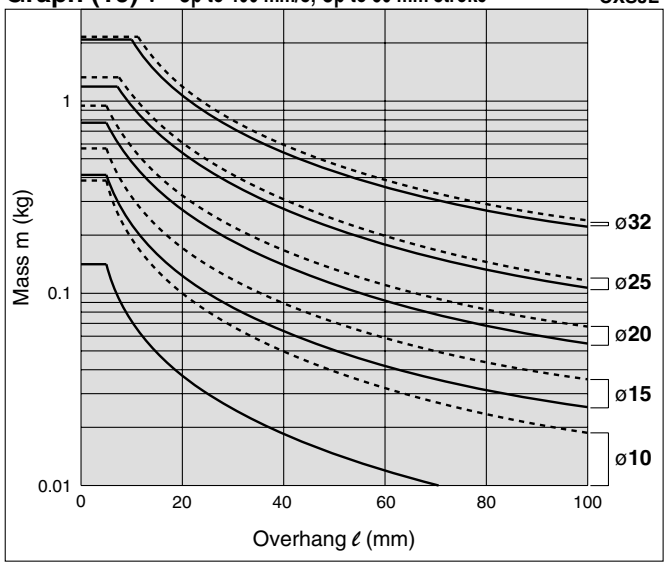

### Graph (13) V = Over 400 mm/s; Up to 50 mm stroke



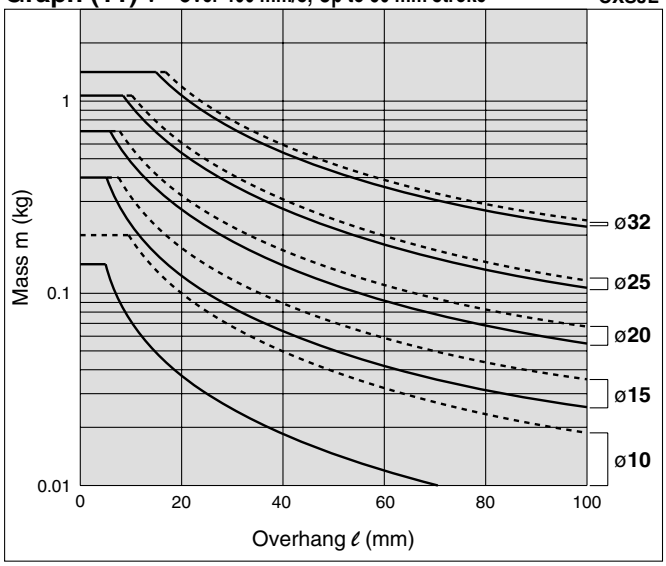
**Graph (7) Up to 50 mm stroke** ——— V = Up to 800mm/s



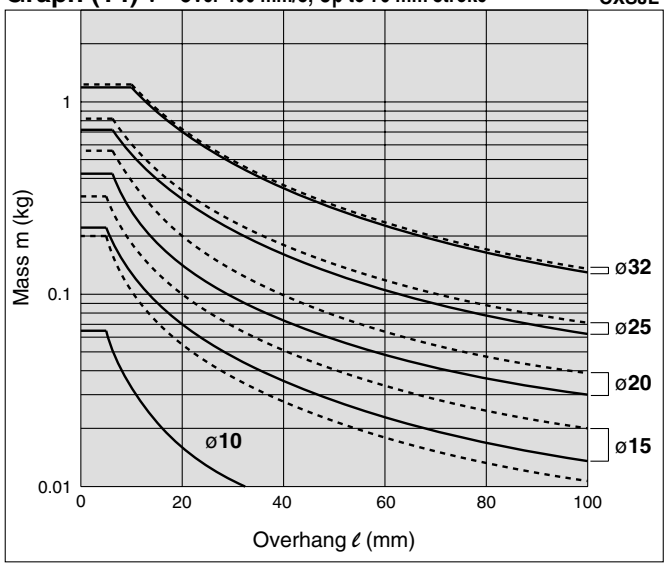

**Graph (10) V = Up to 400 mm/s; Up to 30 mm stroke** ——— CXSJM - - - - - CXSJL



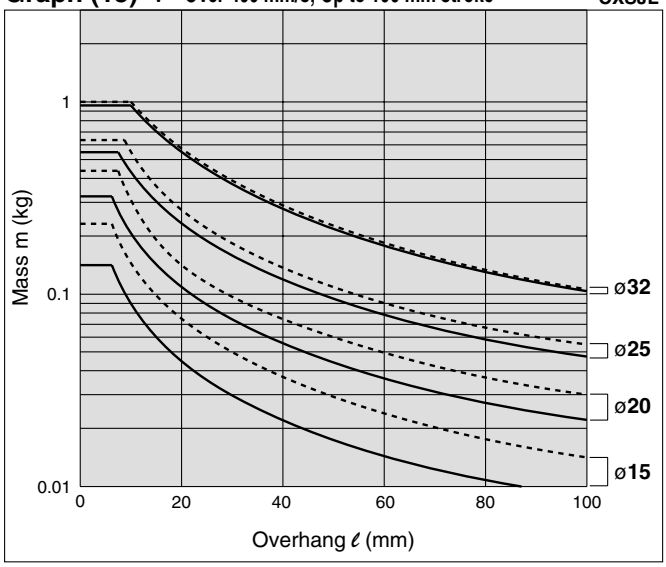

**Graph (11) V = Over 400 mm/s; Up to 30 mm stroke** ——— CXSJM - - - - - CXSJL




**Graph (14) V = Over 400 mm/s; Up to 75 mm stroke** ——— CXSJM - - - - - CXSJL




**Graph (15) V = Over 400 mm/s; Up to 100 mm stroke** ——— CXSJM - - - - - CXSJL

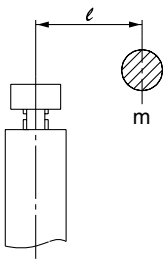
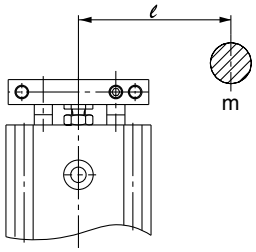


# Model Selection/Basic Type

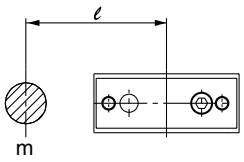
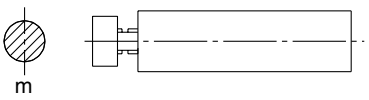
**⚠ Caution** **Confirmation of theoretical output is required separately.**
**Refer to "Theoretical Output" on page 562.**

## Basic Type: CXS

### Vertical Mounting

| Mounting orientation | |  | | |  | |
|---|---|---|---|---|---|---|
| Max. speed (mm/s) | | Up to 100 | Up to 200 | Up to 300 | Up to 400 | Up to 600 | Up to 700 (Up to 800) |
| Stroke (mm) | | All strokes | | | | | |
| Selection graph | ø6 | (1) | | (2) | | | |
| | ø10 | | (3) | | (4) | (5) | (6) |
| | ø15 | | | | | | |
| | ø20 | | | | | | |
| | ø25 | | | | | | |
| | ø32 | | | | | | |

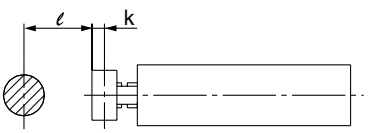
### Horizontal Mounting

| Mounting orientation | |  |  ∗ Refer to the caution notes below. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke (mm) | | Up to 10 | | | | Up to 30 | | | | Up to 50 | | | | Up to 75 | | | | Up to 100 | | | |
| Max. speed (mm/s) | | Up to 100 | Up to 300 | Up to 400 | Over 400 | Up to 100 | Up to 300 | Up to 400 | Over 400 | Up to 100 | Up to 300 | Up to 400 | Over 400 | Up to 100 | Up to 300 | Up to 400 | Over 400 | Up to 100 | Up to 300 | Up to 400 | Over 400 |
| Selection graph | ø6 | (7) | | | | (8) | | | | (9) | | | | | | | | | | | |
| | ø10 | | | | | | | | | | | | | | | | | | | | |
| | ø15 | | | | | | | | | | | | | | | | | | | | |
| | ø20 | | | (10) | (11) | | | (12) | (13) | | | (14) | (15) | | | (16) | | | | (17) | |
| | ø25 | | | | | | | | | | | | | | | | | | | | |
| | ø32 | | | | | | | | | | | | | | | | | | | | |

∗ The maximum speeds for ø10 to ø32 are: ø10: up to 800 mm/s; ø15, 20: up to 700 mm/s; ø25, 32: Up to 600 mm/s

## ⚠ Caution

If the cylinder is horizontally mounted and the plate end does not reach the load's center of gravity, use the formula below to calculate the imaginary stroke ℓ′ that includes the distance between the load's center of gravity and the plate end. Select the graph that corresponds to the imaginary stroke ℓ′.




Imaginary stroke ℓ′ = (Stroke) + k + ℓ
k: Distance between the center and end of the plate

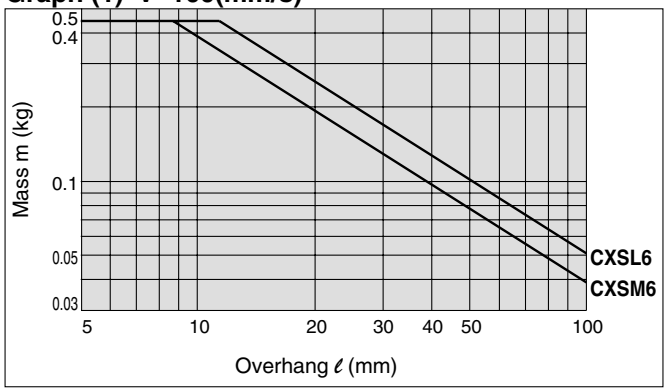
| | |
|---|---|
| ø6 | 2.75 mm |
| ø10 | 4 mm |
| ø15 | 5 mm |
| ø20 | 6 mm |
| ø25 | |
| ø32 | 8 mm |

(Example)
When using CXSM6-10 and ℓ = 15 mm:
Imaginary stroke ℓ′ = 10 + 2.75 + 15 = 27.75
Therefore, the graph used for your model selection should be the one for CXSM6-30.

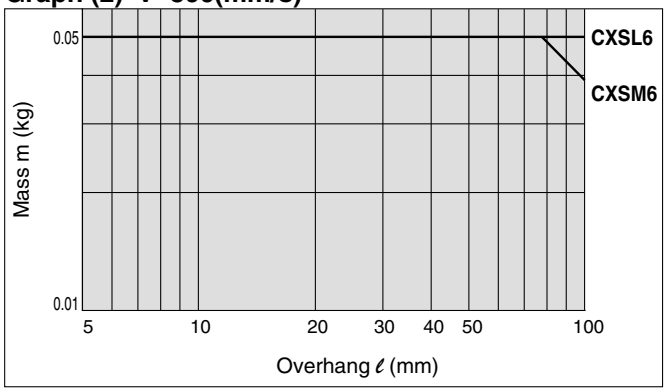
## Vertical Mounting

### ø6

**Graph (1) V=100(mm/s)**

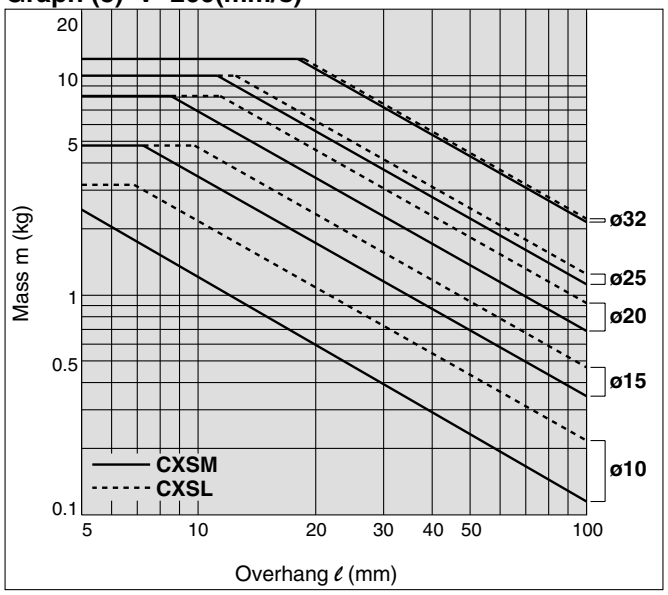



**Graph (2) V=300(mm/s)**

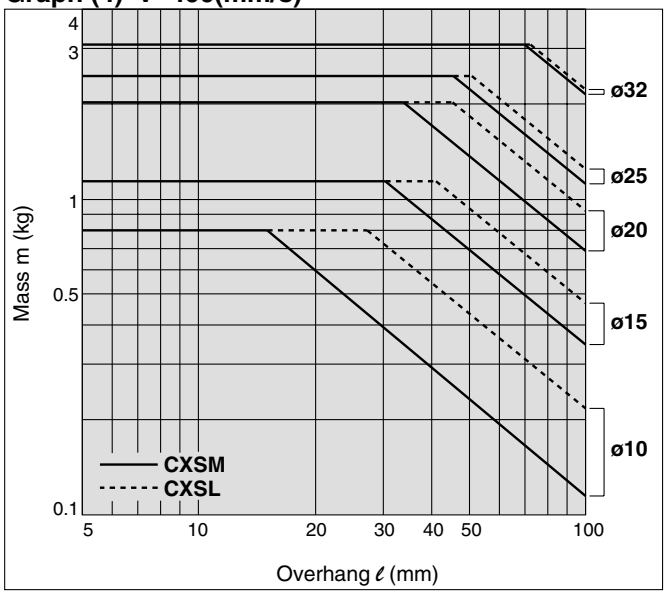



### ø10 to ø32

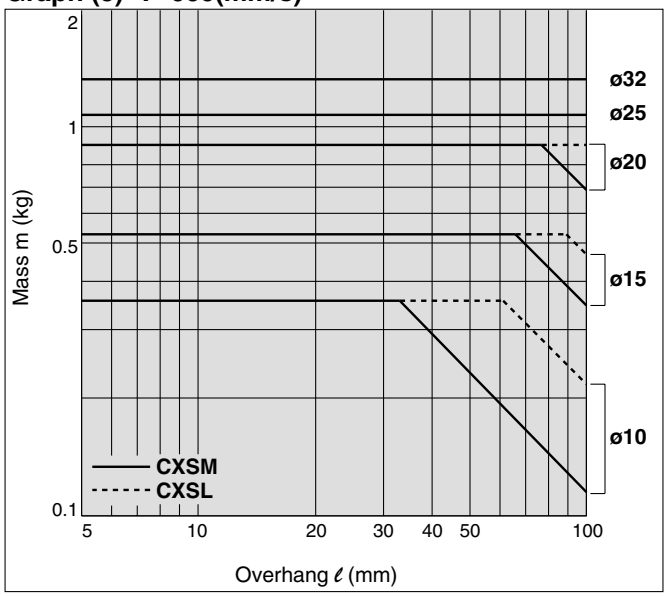
**Graph (3) V=200(mm/s)**



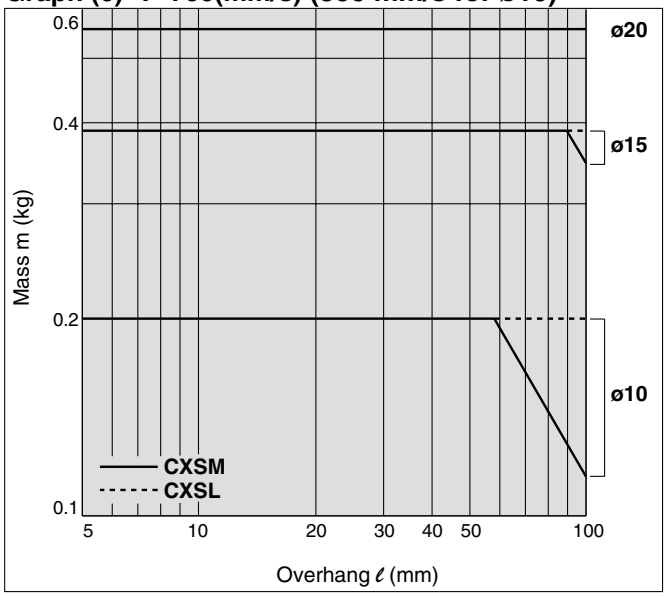

**Graph (4) V=400(mm/s)**




**Graph (5) V=600(mm/s)**



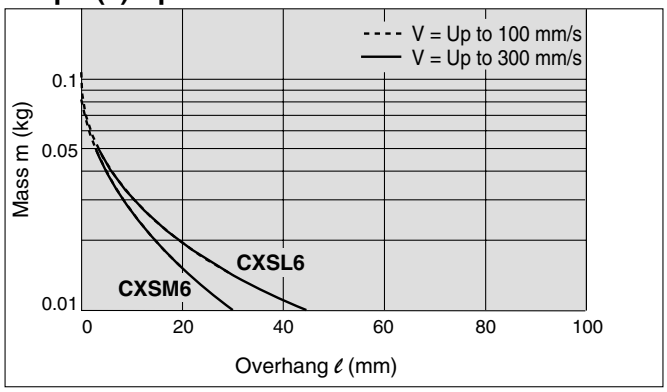

**Graph (6) V=700(mm/s) (800 mm/s for ø10)**



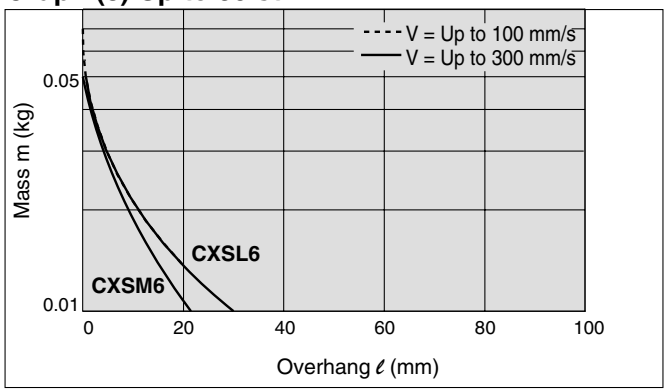
## Horizontal Mounting

### ø6

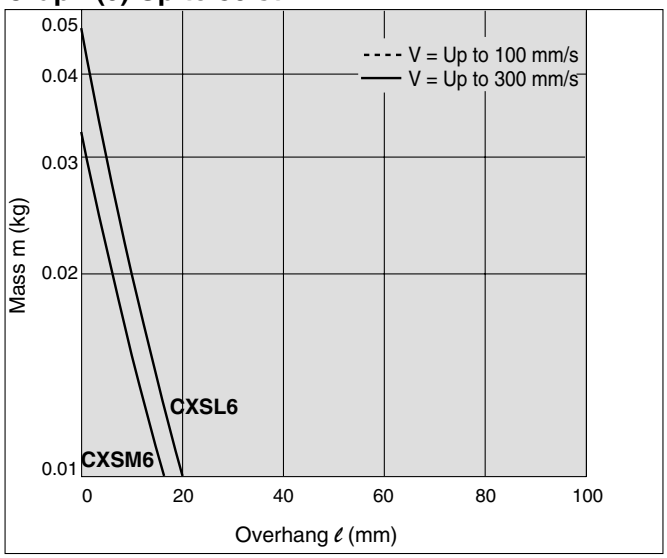
**Graph (7) Up to 10 st**




**Graph (8) Up to 30 st**

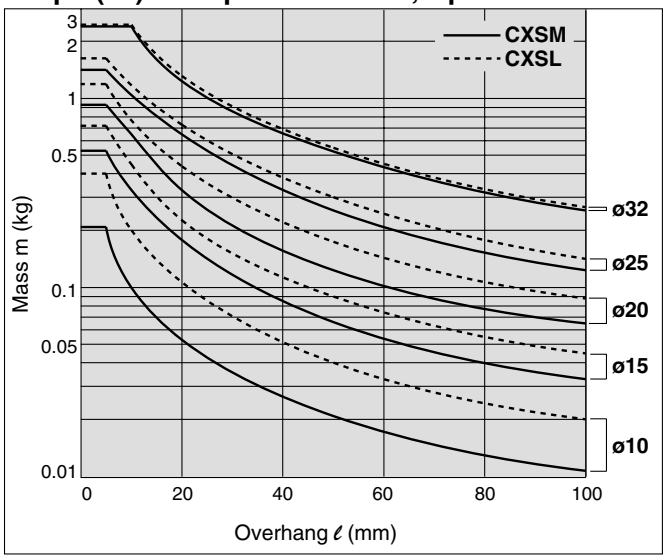



**Graph (9) Up to 50 st**

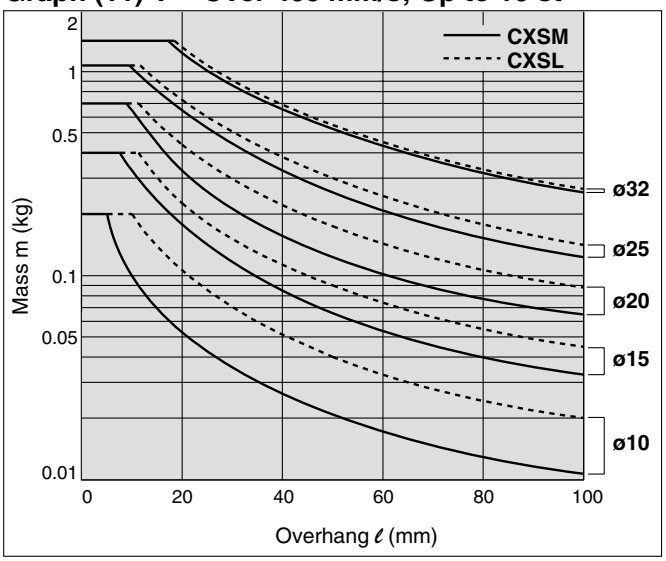



### ø10 to ø32

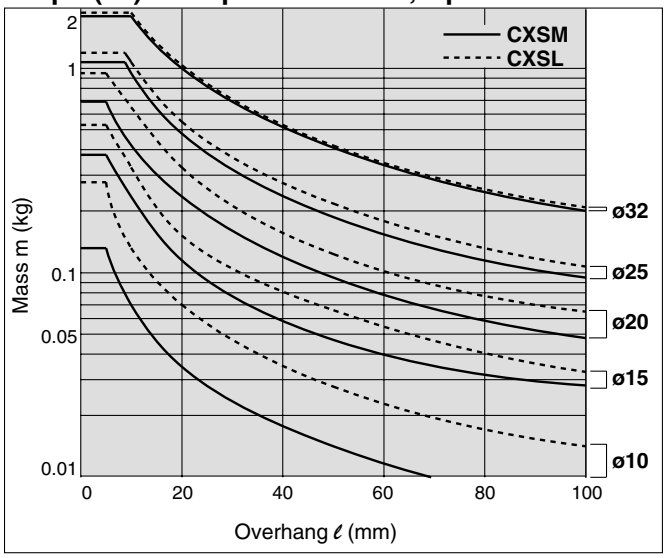
**Graph (10) V = Up to 400 mm/s; Up to 10 st**




**Graph (11) V = Over 400 mm/s; Up to 10 st**



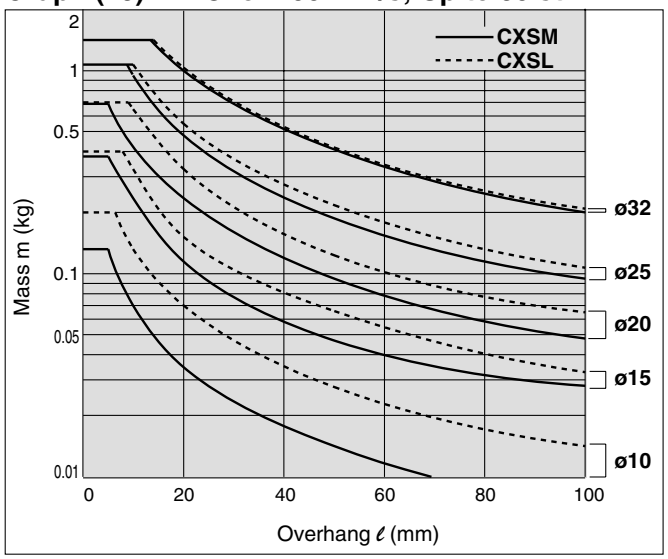

**Graph (12) V = Up to 400 mm/s; Up to 30 st**



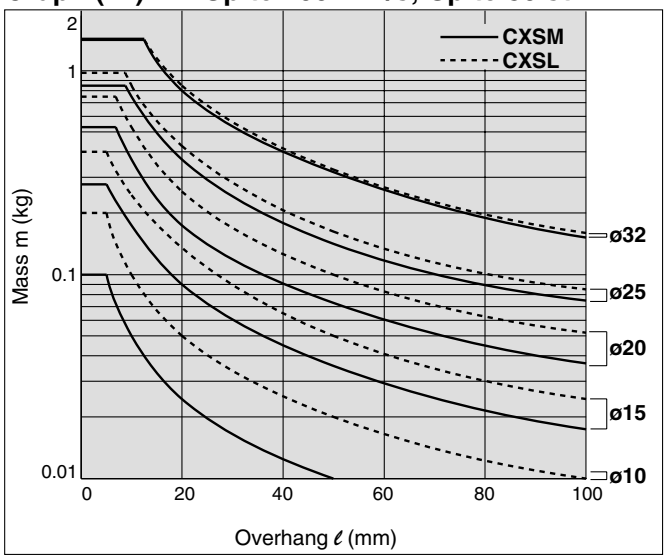
## Horizontal Mounting

### ø10 to ø32

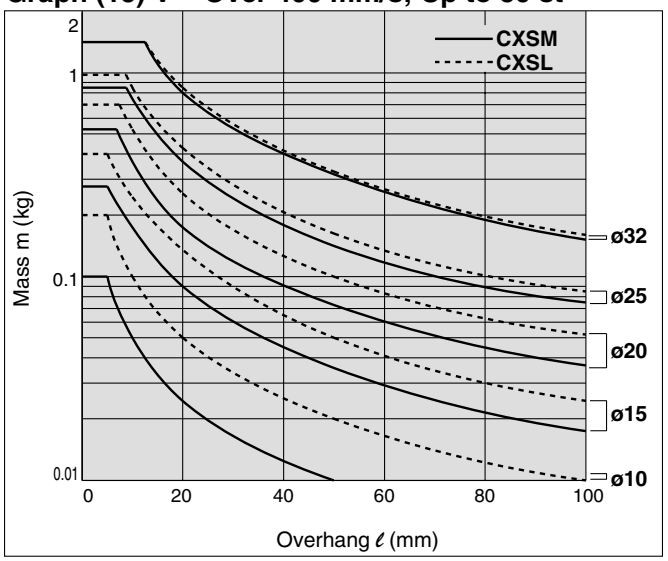
**Graph (13) V = Over 400 mm/s; Up to 30 st**



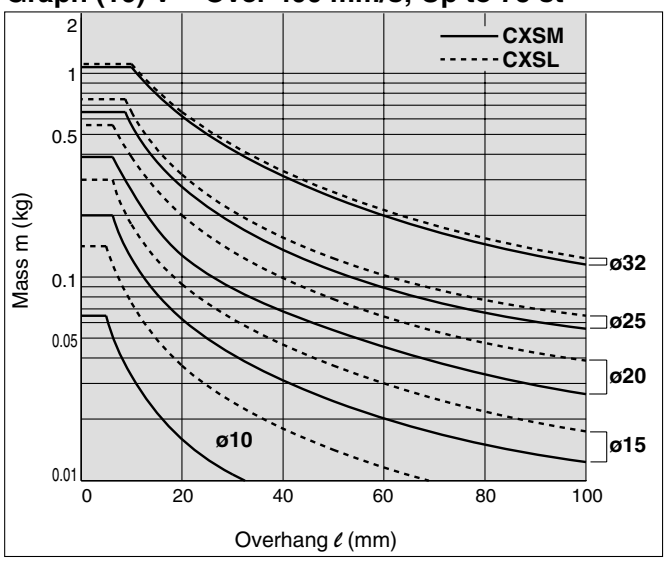

**Graph (14) V = Up to 400 mm/s; Up to 50 st**



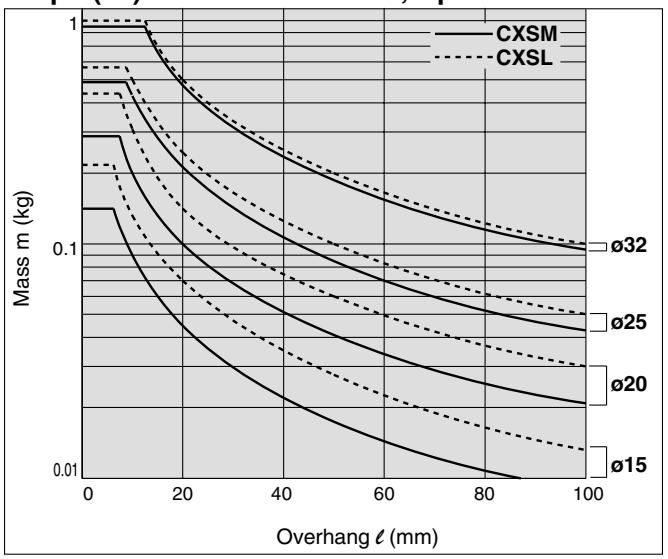

**Graph (15) V = Over 400 mm/s; Up to 50 st**




**Graph (16) V = Over 400 mm/s; Up to 75 st**




**Graph (17) V = Over 400 mm/s; Up to 100 st**

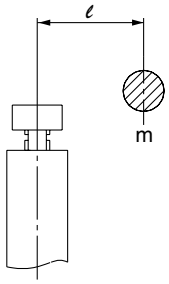
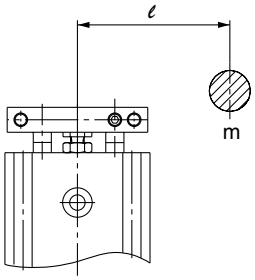


# Model Selection/With Air Cushion

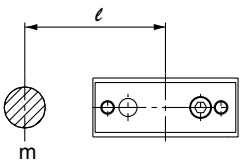
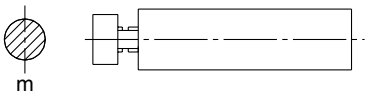
**⚠ Caution** **Confirmation of theoretical output is required separately.**
**Refer to "Theoretical Output Table" on page 571.**

## With Air Cushion: CXS

### Vertical Mounting

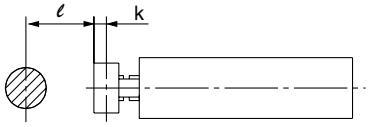
| Mounting orientation | |  | |  | | |
|---|---|---|---|---|---|---|
| Max. speed (mm/s) | | Up to 200 | Up to 400 | Up to 600 | Up to 800 | Up to 1000 |
| Stroke (mm) | | All strokes | | | | |
| Selection graph | ø**20** | (1) | (2) | (3) | (4) | (5) |
| | ø**25** | | | | | |
| | ø**32** | | | | | |

### Horizontal Mounting

| Mounting orientation | |   ∗ Refer to the caution notes below. | | | | | |
|---|---|---|---|---|---|---|---|
| Stroke (mm) | | Up to 10 | | Up to 30 | | Up to 50 | Up to 75 | Up to 100 |
| Max. speed (mm/s) | | Up to 800 | Up to 1000 | Up to 800 | Up to 1000 | Up to 1000 | Up to 1000 | Up to 1000 |
| Selection graph | ø**20** | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | ø**25** | | | | | | | |
| | ø**32** | | | | | | | |

## ⚠ Caution

If the cylinder is horizontally mounted and the plate end does not reach the load's center of gravity, use the formula below to calculate the imaginary stroke ℓ′ that includes the distance between the load's center of gravity and the plate end. Select the graph that corresponds to the imaginary stroke ℓ′.



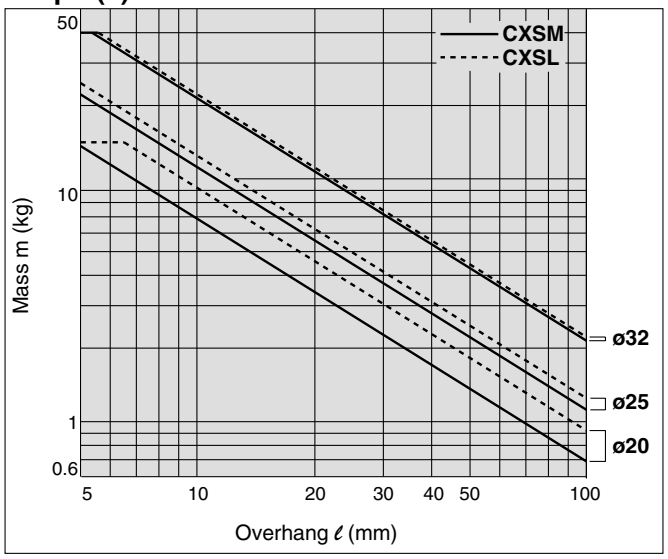

Imaginary stroke ℓ′ = (Stroke) + k + ℓ
k: Distance between the center and the end of the plate

| | |
|---|---|
| ø**20** | 6 mm |
| ø**25** | |
| ø**32** | 8 mm |

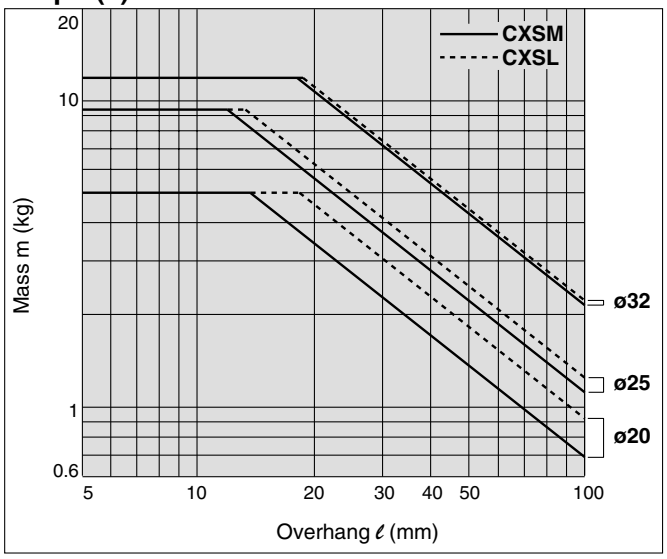
(Example)
When using CXSM20-10 and ℓ = 10 mm:
Imaginary stroke ℓ′ = 10 + 6 + 10 = 26
Therefore, the graph used for your model selection should be the one for CXSM20-30.

## Vertical Mounting

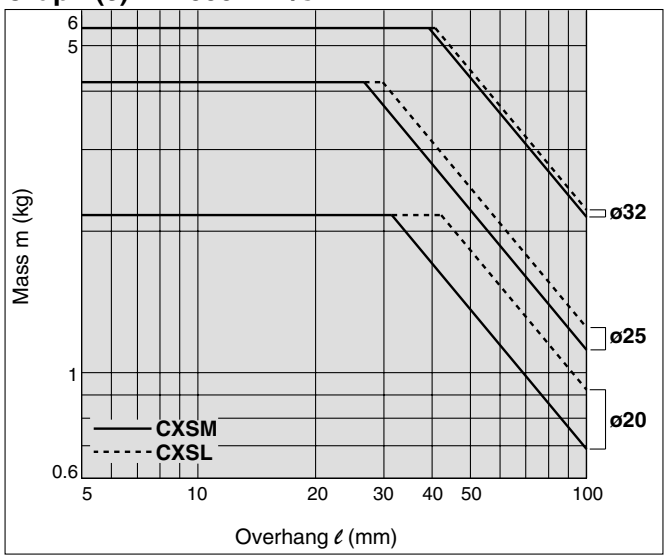
### Graph (1) V = 200 mm/s



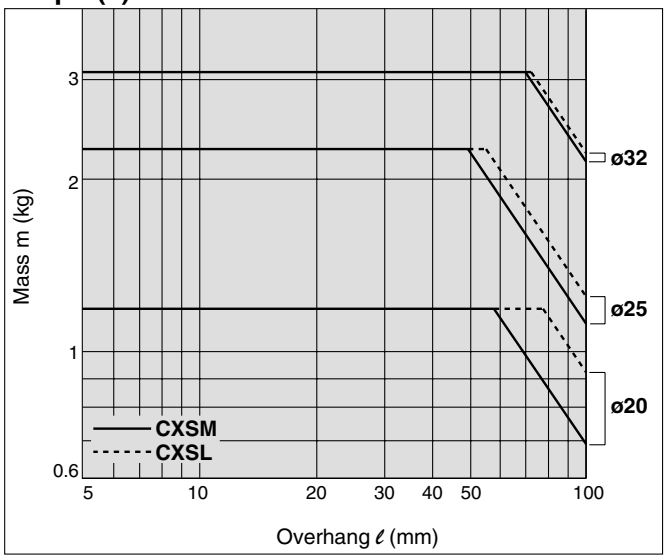

### Graph (2) V = 400 mm/s



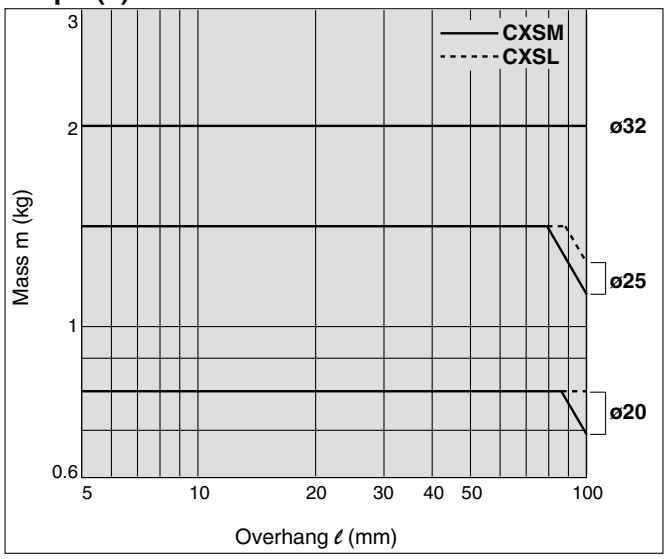

### Graph (3) V = 600 mm/s




### Graph (4) V = 800 mm/s

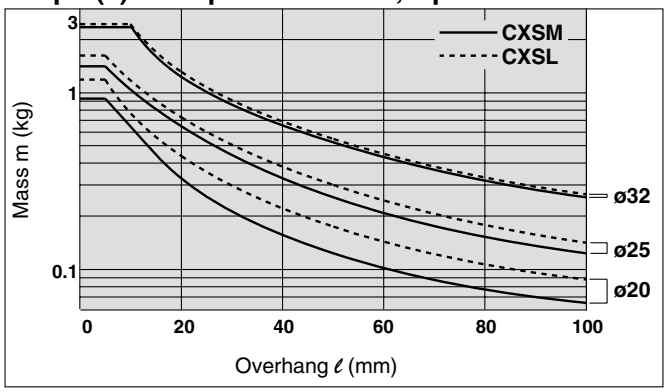



### Graph (5) V = 1000 mm/s

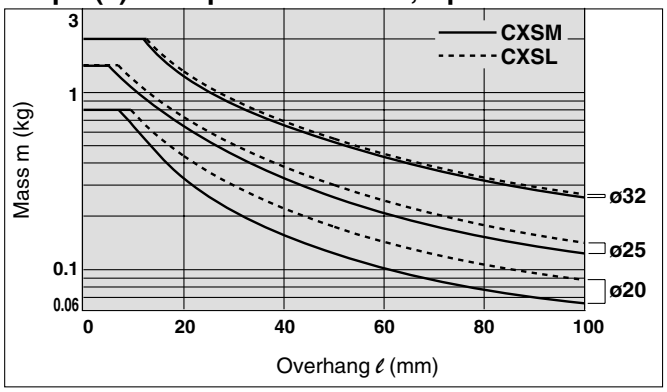


## Horizontal Mounting

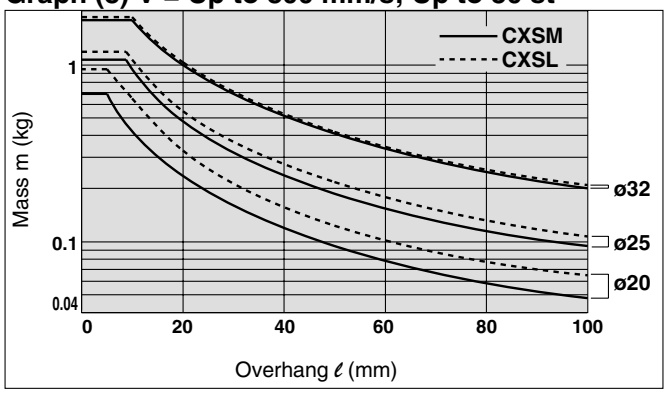
### Graph (6) V = Up to 800 mm/s; Up to 10 st



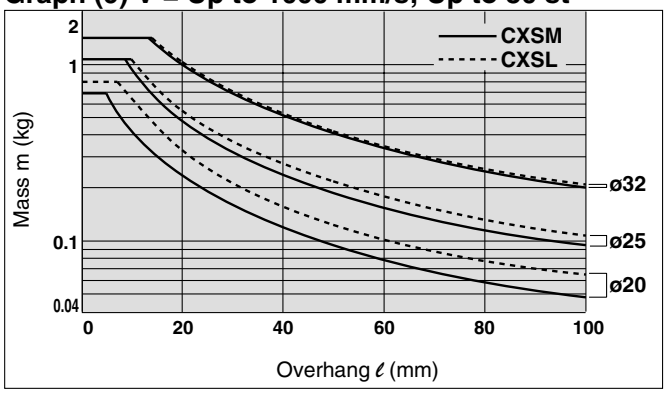

### Graph (7) V = Up to 1000 mm/s; Up to 10 st



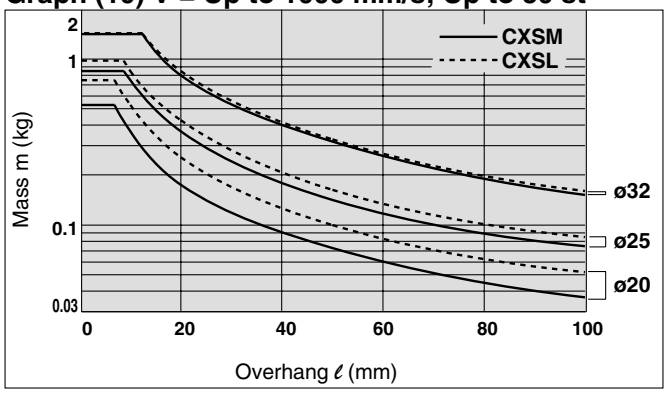

### Graph (8) V = Up to 800 mm/s; Up to 30 st



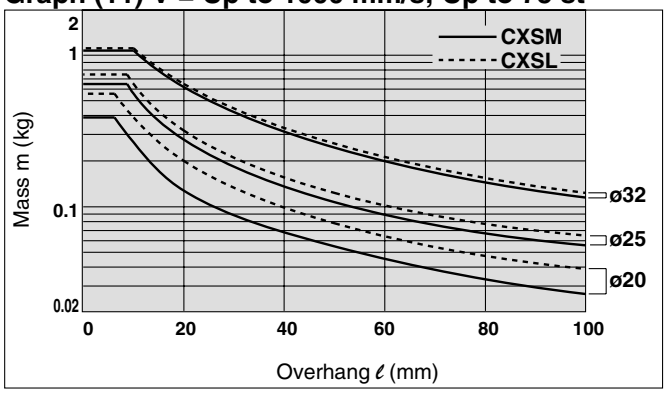

### Graph (9) V = Up to 1000 mm/s; Up to 30 st



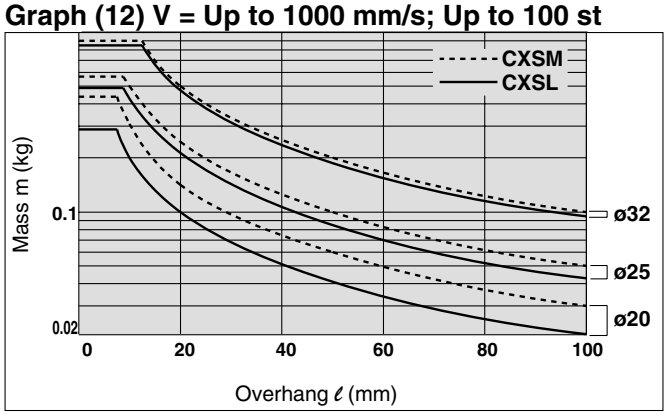

### Graph (10) V = Up to 1000 mm/s; Up to 50 st




### Graph (11) V = Up to 1000 mm/s; Up to 75 st




### Graph (12) V = Up to 1000 mm/s; Up to 100 st



# Dual Rod Cylinder/Compact Type

# *Series CXSJ*

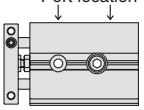
## ø6, ø10, ø15, ø20, ø25, ø32

## How to Order

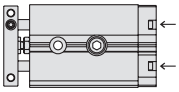
**Piping**

| | |
|---|---|
| Nil | Standard (ø6 to ø32) |
| P | Axial (ø6, ø10) |

Standard piping — Port location



Axial piping




**Port thread type**

| | | |
|---|---|---|
| Nil | M thread | ø6 to ø25 |
| | Rc 1/8 | ø32 |
| TN | NPT 1/8 | |
| TF | G 1/8 | |

**CXSJ M 6 ☐ P – 50 – M9BW S – ☐**

**Compact type**

**Bearing type**

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

**Number of auto switches**

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

**Made to Order**
(Refer to the below.)

**Auto switch**

| | |
|---|---|
| Nil | Without auto switch (with built-in magnet) |

∗ Refer to the below table for auto switch model numbers.

**Bore size / Stroke** (mm)

| Bore size | Standard stroke |
|---|---|
| 6 | 10, 20, 30, 40, 50 |
| 10 | 10, 20, 30, 40, 50, 75 |
| 15 | 10, 20, 30, 40, 50, 75, 100 |
| 20 | |
| 25 | |
| 32 | |

**Made to Order**
**(For details, refer to pages 1851 to 1954.)**

| Symbol | Specifications |
|---|---|
| XB6 | Heat resistant cylinder (–10 to 150°C) |
| XB13 | Low speed cylinder (5 to 50 mm/s) |
| XC6 Note) | Made of stainless steel |
| XC19 | Intermediate stroke (spacer) |
| XC22 | Fluoro rubber seals |

Note) Slide bearing type (M) only

## Applicable Auto Switches/ Refer to pages 1719 to 1827 for detailed auto switch specifications.

| Type | Special function | Electrical entry | Indicator light | Wiring (output) | Load voltage DC | Load voltage AC | Auto switch model: Perpendicular | Auto switch model: In-line | Lead wire length (m)∗ 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state 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 display) | | | 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 display) | | | 3-wire (NPN) | 5 V, 12 V | | M9NAV** | M9NA** | ○ | ○ | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | M9PAV** | M9PA** | ○ | ○ | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | M9BAV** | M9BA** | ○ | ○ | ● | ○ | ○ | — | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equiv.) | — | 5 V | — | A96V | A96 | ● | — | ● | — | — | IC circuit | — |
| | | | | 2-wire | 24 V | 12 V | 100 V | A93V | A93 | ● | — | ● | — | — | — | Relay, PLC |
| | | | None | | | 5 V, 12 V | 100 V or less | A90V | A90 | ● | — | ● | — | — | IC circuit | |

∗∗ 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 M9NWM
3 m ····· L M9NWL
5 m ····· Z M9NWZ

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

- Since there are applicable auto switches other than listed, refer to page 559 for details.
- For details about switch with pre-wired connector, refer to pages 1784 and 1785.

∗ Auto switches are shipped together (not assembled).

## Specifications

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **Fluid** | Air (Non-lube) | | | | | |
| **Proof pressure** | 1.05 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa | | | | | |
| **Minimum operating pressure** | 0.15 MPa | 0.1 MPa | | 0.05 MPa | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 30 to 800 mm/s | | 30 to 700 mm/s | | 30 to 600 mm/s | |
| **Cushion** | Rubber bumper on both ends | | | | | |
| **Stroke adjustable range** | 0 to –5 mm compared to the standard stroke | | | | | |
| **Port size** | M3 x 0.5 | M5 x 0.8 | | | | Rc (NPT, PF) 1/8 |
| **Allowable kinetic energy** | 0.016 J | 0.064 J | 0.095 J | 0.17 J | 0.27 J | 0.32 J |

## Standard Stroke

(mm)

| Model | Standard stroke | Manufacturable stroke range |
|---|---|---|
| **CXSJ□6** | 10, 20, 30, 40, 50 | 60 to 100 |
| **CXSJ□10** | 10, 20, 30, 40, 50, 75 | 80 to 150 |
| **CXSJ□15** | 10, 20, 30, 40, 50, 75, 100 | 110 to 150 |
| **CXSJ□20, 25, 32** | | 110 to 200 |

∗ Strokes beyond the standard stroke range are available as a special order.

## Theoretical Output

(N)

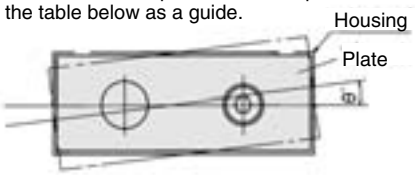
| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm²) | Operating pressure (MPa) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.15 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| **CXSJ□6** | **4** | OUT | 56 | — | 8.4 | 11.2 | 16.8 | 22.4 | 28.0 | 33.6 | 39.2 |
| | | IN | 31 | — | 4.6 | 6.2 | 9.3 | 12.4 | 15.5 | 18.6 | 21.7 |
| **CXSJ□10** | **6** | OUT | 157 | 15.7 | — | 31.4 | 47.1 | 62.8 | 78.5 | 94.2 | 110 |
| | | IN | 100 | 10.0 | — | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 |
| **CXSJ□15** | **8** | OUT | 353 | 35.3 | — | 70.6 | 106 | 141 | 177 | 212 | 247 |
| | | IN | 252 | 25.2 | — | 50.4 | 75.6 | 101 | 126 | 151 | 176 |
| **CXSJ□20** | **10** | OUT | 628 | 62.8 | — | 126 | 188 | 251 | 314 | 377 | 440 |
| | | IN | 471 | 47.1 | — | 94.2 | 141 | 188 | 236 | 283 | 330 |
| **CXSJ□25** | **12** | OUT | 982 | 98.2 | — | 196 | 295 | 393 | 491 | 589 | 687 |
| | | IN | 756 | 75.6 | — | 151 | 227 | 302 | 378 | 454 | 529 |
| **CXSJ□32** | **16** | OUT | 1608 | 161 | — | 322 | 482 | 643 | 804 | 965 | 1126 |
| | | IN | 1206 | 121 | — | 241 | 362 | 482 | 603 | 724 | 844 |

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

## Operating Conditions

### Non-rotating Accuracy

Non-rotating accuracy θ° without a load should be less than or equal to the value provided in the table below as a guide.

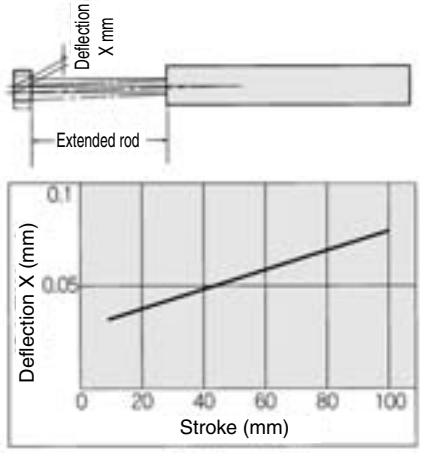



| Bore size (mm) | ø6 to ø32 |
|---|---|
| **CXSJM** (Slide bearing) | ±0.1° |
| **CXSJL** (Ball bushing bearing) | |

### CXSJ□6 to 32

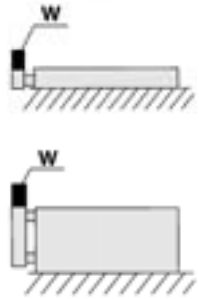
### Deflection at the Plate End

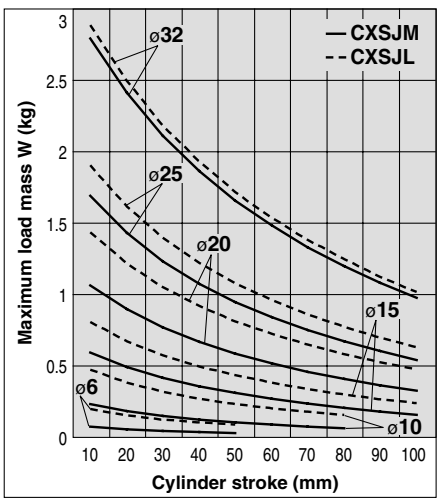
An approximate plate-end deflection X without a load is shown in the graph below.




### Maximum Load Mass

When the cylinder is mounted as shown in the diagrams below, the maximum load mass W should not exceed the values illustrated in the graph immediately




## Mass

(kg)

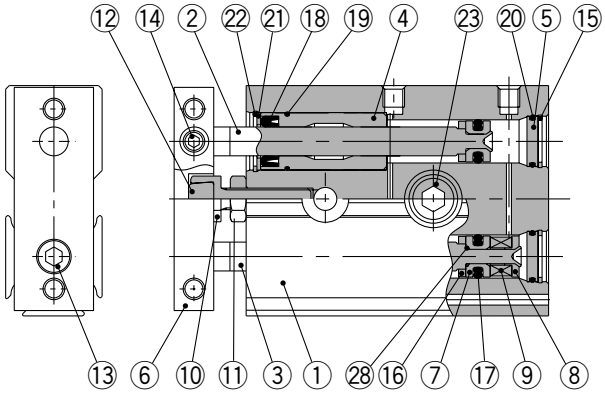
| Model | Standard stroke (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 |
| **CXSJM6** | 0.047 | 0.057 | 0.067 | 0.077 | 0.087 | — | — |
| **CXSJL6** | 0.048 | 0.058 | 0.068 | 0.078 | 0.088 | — | — |
| **CXSJM10** | 0.099 | 0.114 | 0.129 | 0.144 | 0.159 | 0.198 | — |
| **CXSJL10** | 0.106 | 0.121 | 0.136 | 0.151 | 0.166 | 0.205 | — |
| **CXSJM15** | 0.198 | 0.219 | 0.240 | 0.261 | 0.282 | 0.335 | 0.387 |
| **CXSJL15** | 0.218 | 0.239 | 0.260 | 0.281 | 0.302 | 0.355 | 0.407 |
| **CXSJM20** | 0.345 | 0.371 | 0.397 | 0.423 | 0.449 | 0.514 | 0.579 |
| **CXSJL20** | 0.375 | 0.401 | 0.427 | 0.453 | 0.479 | 0.544 | 0.609 |
| **CXSJM25** | 0.506 | 0.544 | 0.582 | 0.620 | 0.658 | 0.753 | 0.848 |
| **CXSJL25** | 0.516 | 0.554 | 0.592 | 0.630 | 0.668 | 0.763 | 0.858 |
| **CXSJM32** | 1.022 | 1.078 | 1.134 | 1.190 | 1.246 | 1.386 | 1.526 |
| **CXSJL32** | 1.032 | 1.088 | 1.144 | 1.200 | 1.256 | 1.396 | 1.536 |

Note) For axial piping of CXSJ□6P-□ and CXSJ□10P-□, please add the following mass. CXSJ□6P-□: 0.009 kg, CXSJ□10P-□: 0.014 kg

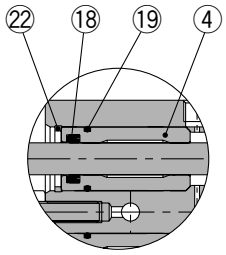
## Construction: Standard Piping

### CXSJM (Slide bearing)

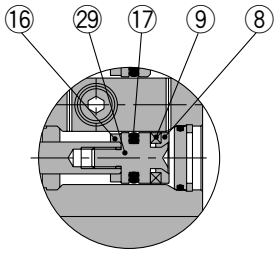
**CXSJM6**




**CXSJM10**



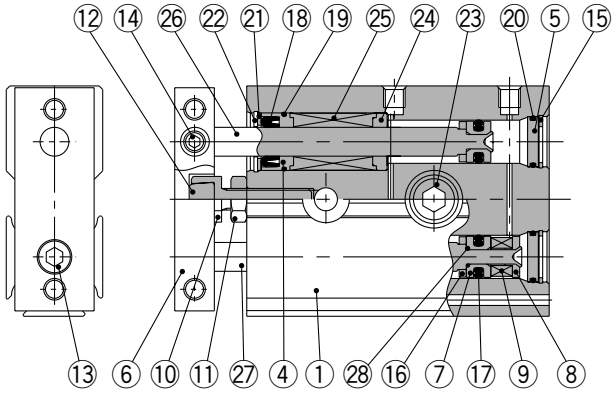

Rod cover



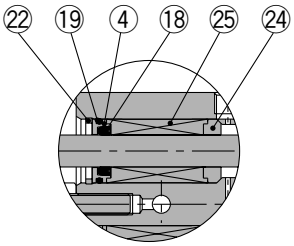

Piston rod B-side piston

### CXSJL (Ball bushing bearing)

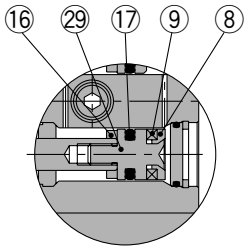
**CXSJL6**




**CXSJL10**




Rod cover




Piston rod B-side piston

### Component Parts: Standard Piping

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Carbon steel Note) | Hard chromium electroplated |
| 3 | **Piston rod B** | Carbon steel Note) | Hard chromium electroplated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Head cover** | Aluminum alloy | Anodized |
| 6 | **Plate** | Aluminum alloy | Glossy, self-coloring hard anodized |
| 7 | **Piston A** | Aluminum alloy | Chromated |
| 8 | **Piston B** | Aluminum alloy | Chromated |
| 9 | **Magnet** | — | |
| 10 | **Bumper bolt** | Carbon steel | Nickel plated |
| 11 | **Hexagon nut** | Carbon steel | Nickel plated |
| 12 | **Bumper** | Polyurethane | |
| 13 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 14 | **Hexagon socket head set screw** | Chromium steel | Nickel plated |
| 15 | **Retaining ring** | Special steel | Phosphate coated |

Note) Stainless steel for CXSJM6.

| No. | Description | Material | Note |
|---|---|---|---|
| 16 | **Bumper B** | Polyurethane | |
| 17 | **Piston seal** | NBR | |
| 18 | **Rod seal** | NBR | |
| 19 | **O-ring** | NBR | |
| 20 | **O-ring** | NBR | |
| 21 | **Seal retainer** | Stainless steel | |
| 22 | **Retaining ring B** | Special steel | Phosphate coated |
| 23 | **Bolt holder** | Stainless steel | |
| 24 | **Bearing spacer** | Aluminum bearing alloy | |
| 25 | **Ball bushing** | — | |
| 26 | **Piston rod A** | Special steel | Hard chromium electroplated |
| 27 | **Piston rod B** | Special steel | Hard chromium electroplated |
| 28 | **O-ring** | NBR | |
| 29 | **Piston C** | Stainless steel | |
| 30 | **Bumper holder** | Resin | |

### Replacement Parts/ Seal Kit

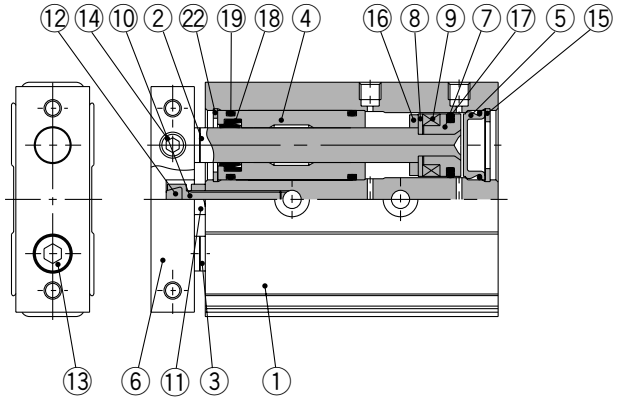
| Model | Seal kit no. | Contents |
|---|---|---|
| **CXSJM6** | CXSJM6-PS | Set of nos. above ⑰, ⑱, and ⑳ |
| **CXSJL6** | CXSJL6-PS | |
| **CXSJM10** | CXSJM10-PS | |
| **CXSJL10** | CXSJL10-PS | |

∗ Seal kit includes ⑰, ⑱, and ⑳. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

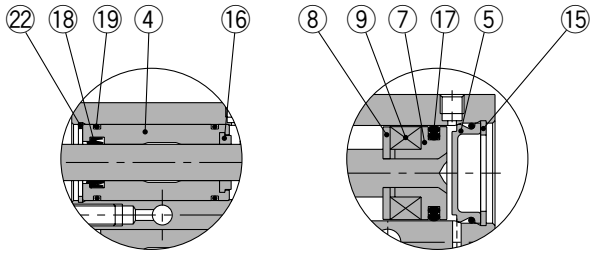
## Construction: Standard Piping

### CXSJM (Slide bearing)

**CXSJM15**



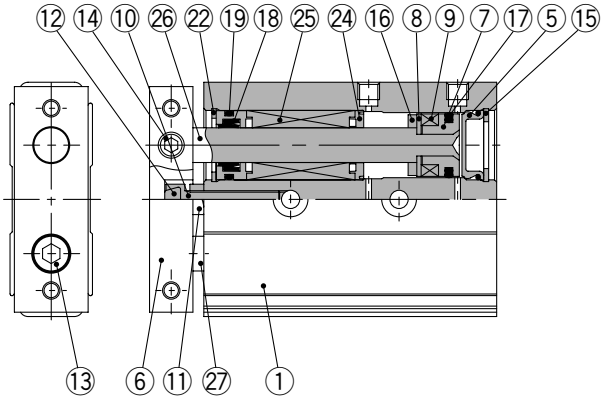

**CXSJM20 to 32**



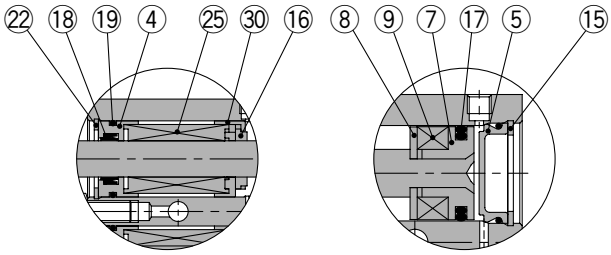

Rod cover　　Head cover

### CXSJL (Ball bushing bearing)

**CXSJL15**




**CXSJL20 to 32**




Rod cover　　Head cover

### Component Parts: Standard Piping

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Carbon steel | Hard chromium electroplated |
| 3 | **Piston rod B** | Carbon steel | Hard chromium electroplated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Head cover** | Special steel | |
| 6 | **Plate** | Aluminum alloy | Glossy, self-coloring hard anodized |
| 7 | **Piston A** | Aluminum alloy | Chromated |
| 8 | **Piston B** | Stainless steel | |
| 9 | **Magnet** | — | |
| 10 | **Bumper bolt** | Carbon steel | Nickel plated |
| 11 | **Hexagon nut** | Carbon steel | Nickel plated |
| 12 | **Bumper** | Polyurethane | |
| 13 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 14 | **Hexagon socket head set screw** | Chromium steel | Nickel plated |
| 15 | **Retaining ring** | Special steel | Phosphate coated |
| 16 | **Bumper B** | Polyurethane | |
| 17 | **Piston seal** | NBR | |
| 18 | **Rod seal** | NBR | |
| 19 | **O-ring** | NBR | |
| 20 | **O-ring** | NBR | |
| 21 | **Seal retainer** | Stainless steel | |
| 22 | **Retaining ring B** | Special steel | Phosphate coated |
| 23 | **Bolt holder** | Stainless steel | |
| 24 | **Bearing spacer** | Resin | |
| 25 | **Ball bushing** | — | |
| 26 | **Piston rod A** | Special steel | Hard chromium electroplated |
| 27 | **Piston rod B** | Special steel | Hard chromium electroplated |
| 28 | **O-ring** | NBR | |
| 29 | **Piston C** | Stainless steel | |
| 30 | **Bumper holder** | Resin | |

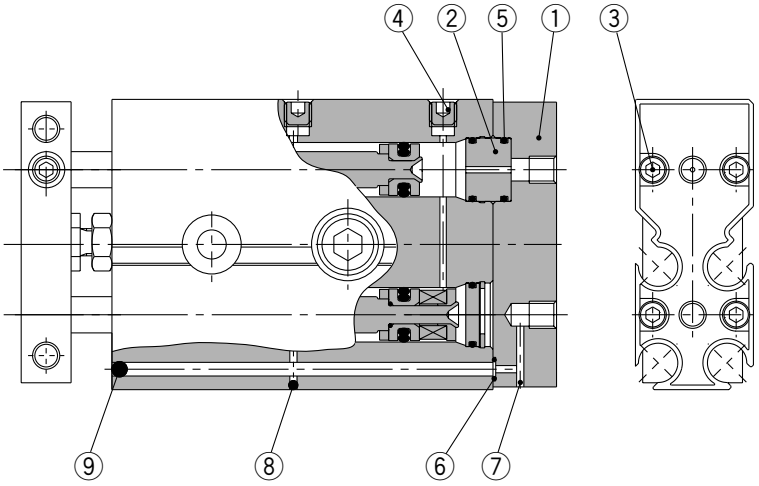
### Replacement Parts/ Seal Kit

| Model | Seal kit no. | Contents |
|---|---|---|
| **CXSJM15** | CXSM15-PS | Set of nos. above ⑰, ⑱, and ⑲ |
| **CXSJM20** | CXSM20-PS | |
| **CXSJM25** | CXSM25-PS | |
| **CXSJM32** | CXSM32-PS | |
| **CXSJL15** | CXSL15APS | |
| **CXSJL20** | CXSL20APS | |
| **CXSJL25** | CXSL25APS | |
| **CXSJL32** | CXSL32APS | |

∗ Seal kit includes ⑰, ⑱, and ⑲. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

## Construction: Axial Piping

### CXSJ□6P, CXSJ□10P




**Component Parts: Axial Piping**

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Cover** | Aluminum alloy | Hard anodized |
| 2 | **Adapter** | Aluminum alloy | Anodized |
| 3 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 4 | **Hexagon socket head plug** | Chromium steel | Nickel plated |
| 5 | **O-ring** | NBR | |
| 6 | **O-ring** | NBR | |
| 7 | **Steel ball** | Special steel | Hard chromium electroplated |
| 8 | **Steel ball** | Special steel | Hard chromium electroplated |
| 9 | **Steel ball** | Special steel | Hard chromium electroplated |

∗ Parts other than those listed above are the same as those of CXSJ basic type.

## Clean Series

There are two types of cylinders, relieving type and vacuum type, available for a clean room environment. The relieving type specification with the double-seal construction of the rod section allows the cylinder to channel exhaust through the relief port directly to the outside of a clean room environment. The vacuum type specification allows for the application of a vacuum on the rod section while forced exhaust of air takes place through the vacuum port to the outside of a clean room environment.

### How to Order

**11** – **CXSJ** **M** **Bore size** – **Stroke** – **Auto switch**

**Bore size / Stroke**

| | |
|---|---|
| **6** | 10, 20, 30, 40, 50 |
| **10** | 10, 20, 30, 40, 50 |

**Bearing type**

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

∗ 12- series is compatible with the ball bushing bearing type only.

**Clean room specifications**

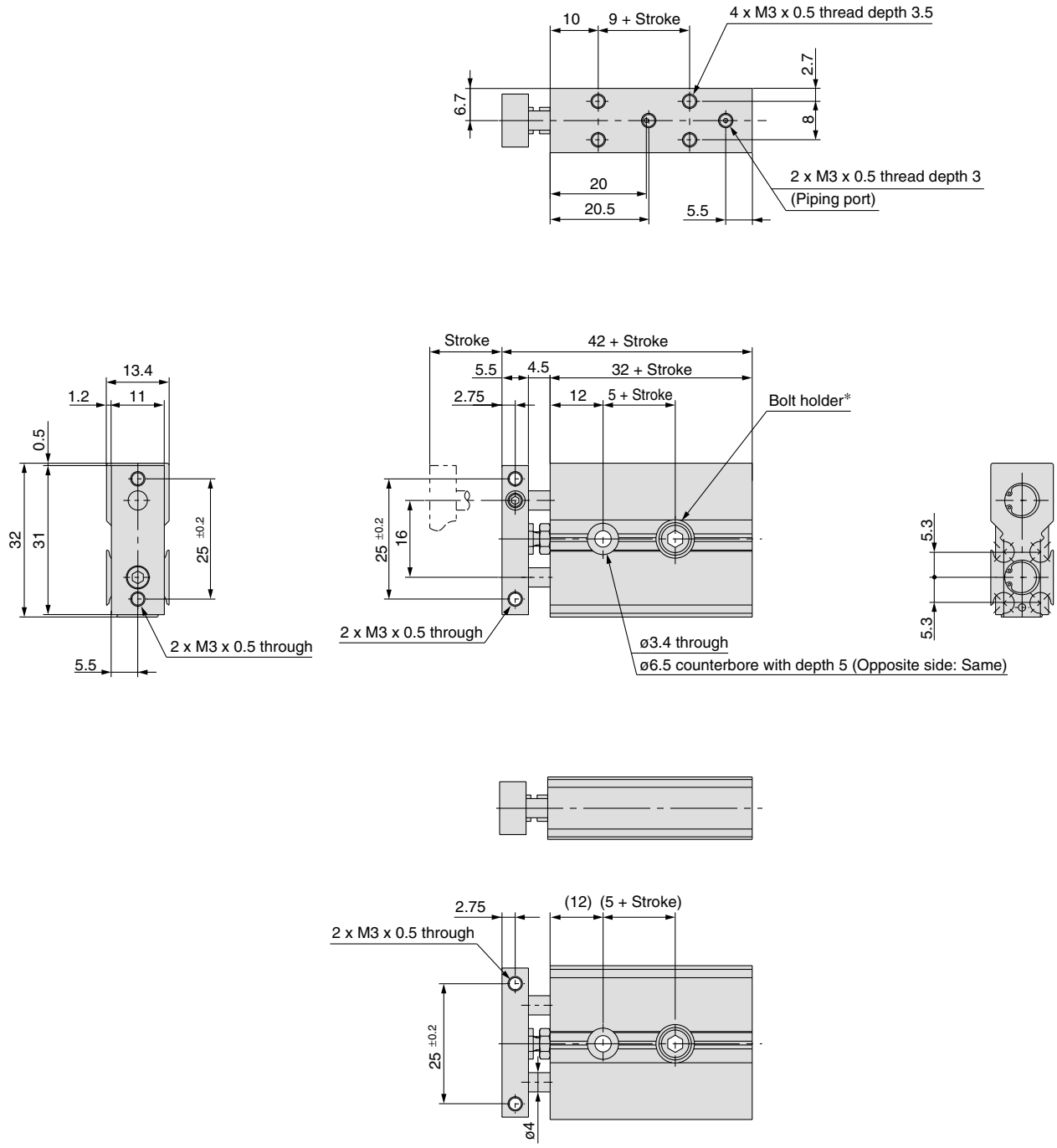
| | |
|---|---|
| **11** | Vacuum type |
| **12** | Relieving type (with specially treated sliding parts) |

**Specifications**

| Bore size (mm) | **6** | **10** |
|---|---|---|
| **Proof pressure** | 1.05 MPa | |
| **Maximum operating pressure** | 0.7 MPa | |
| **Minimum operating pressure** | 0.15 MPa | 0.1 MPa |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | |
| **Piston speed** | 30 to 400 mm/s | |
| **Stroke adjustable range** | 0 to –5 mm compared to the standard stroke | |
| **Bearing type** | Slide bearing, Ball bushing bearing | |

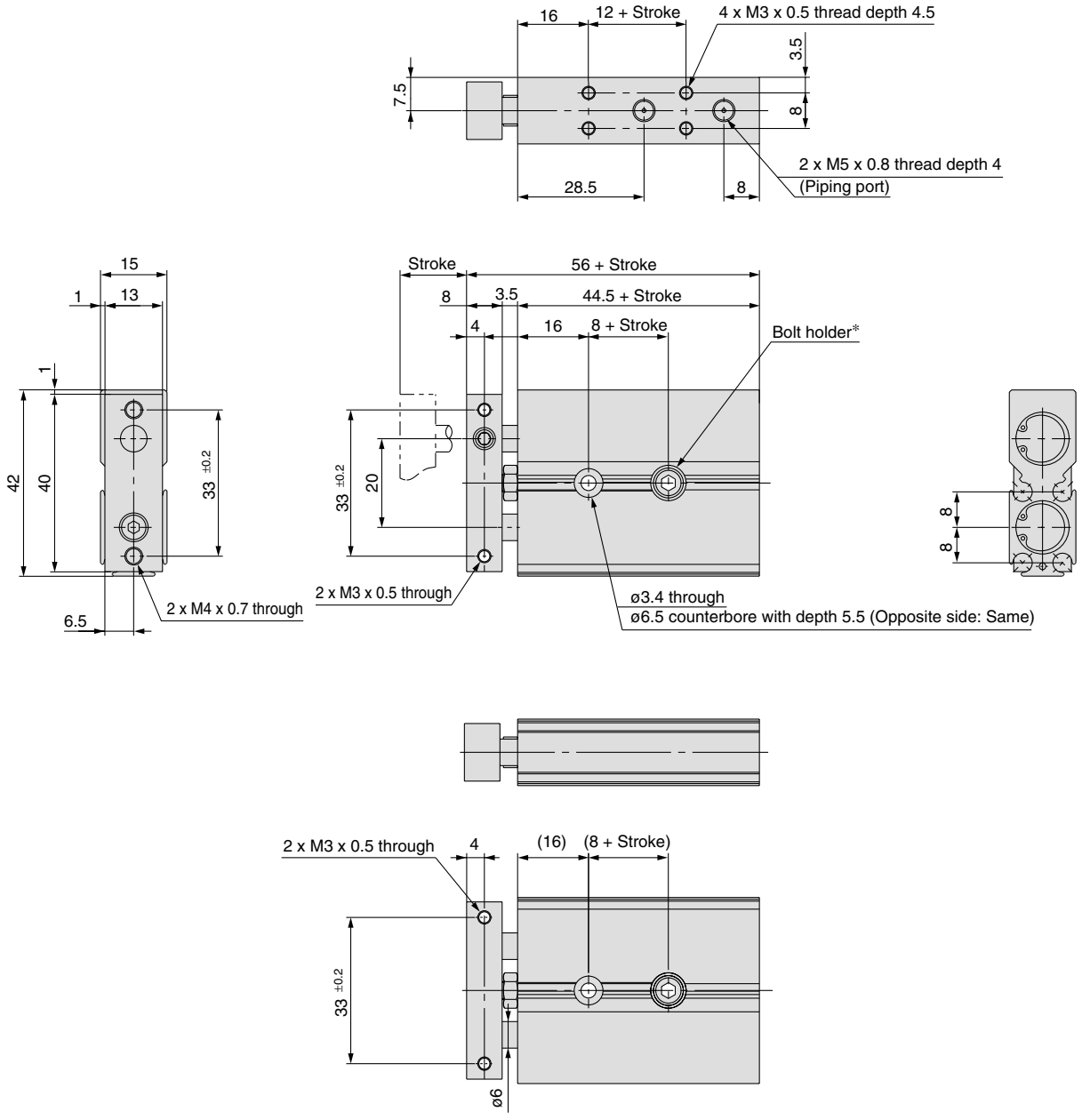
∗ Refer to “SMC Pneumatic Clean Series” catalog for dimensions.

## Dimensions: ø6 Standard Piping




* For bolt holder, refer to page 560, “Mounting”.

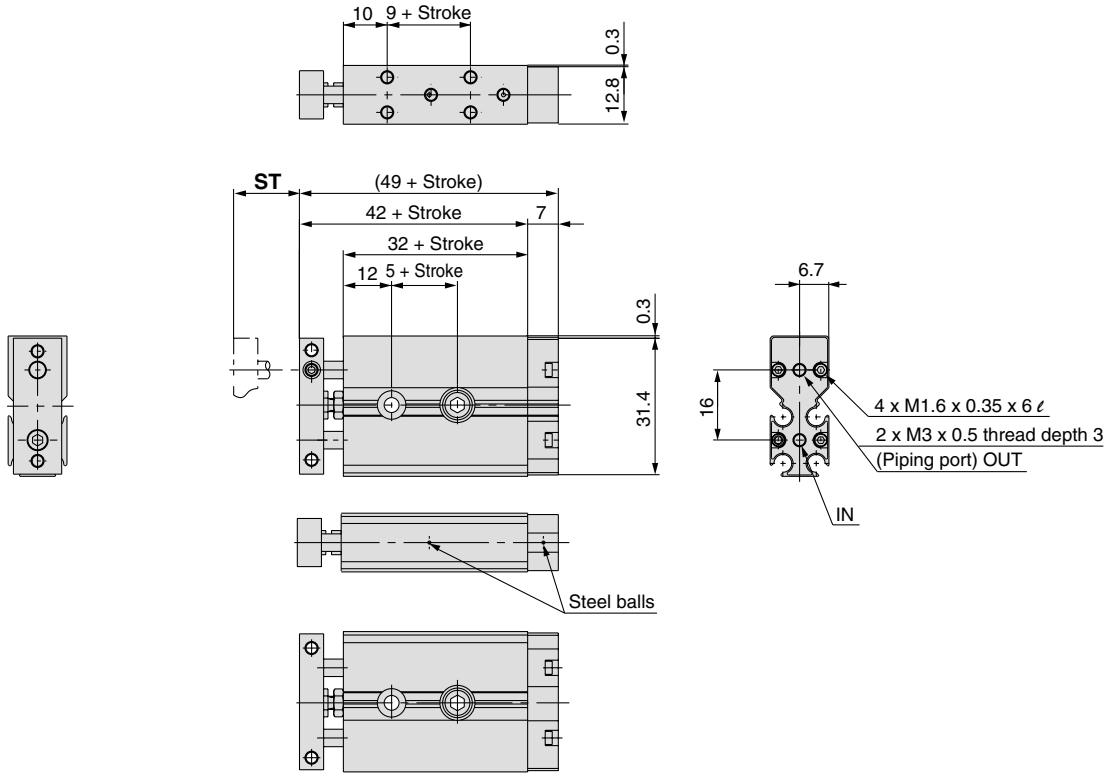
## Dimensions: ø10 Standard Piping



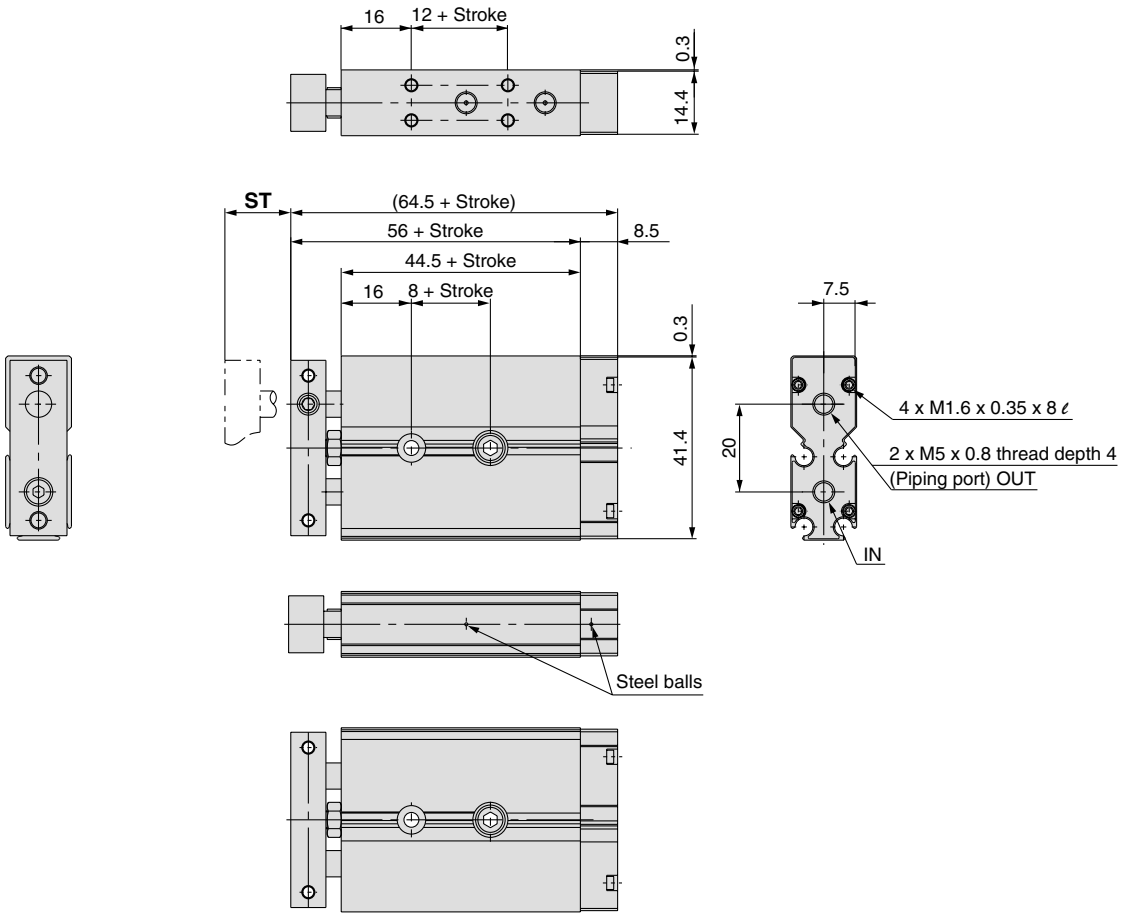

∗ For bolt holder, refer to page 560, “Mounting”.

## Dimensions: ø6, ø10 Axial Piping

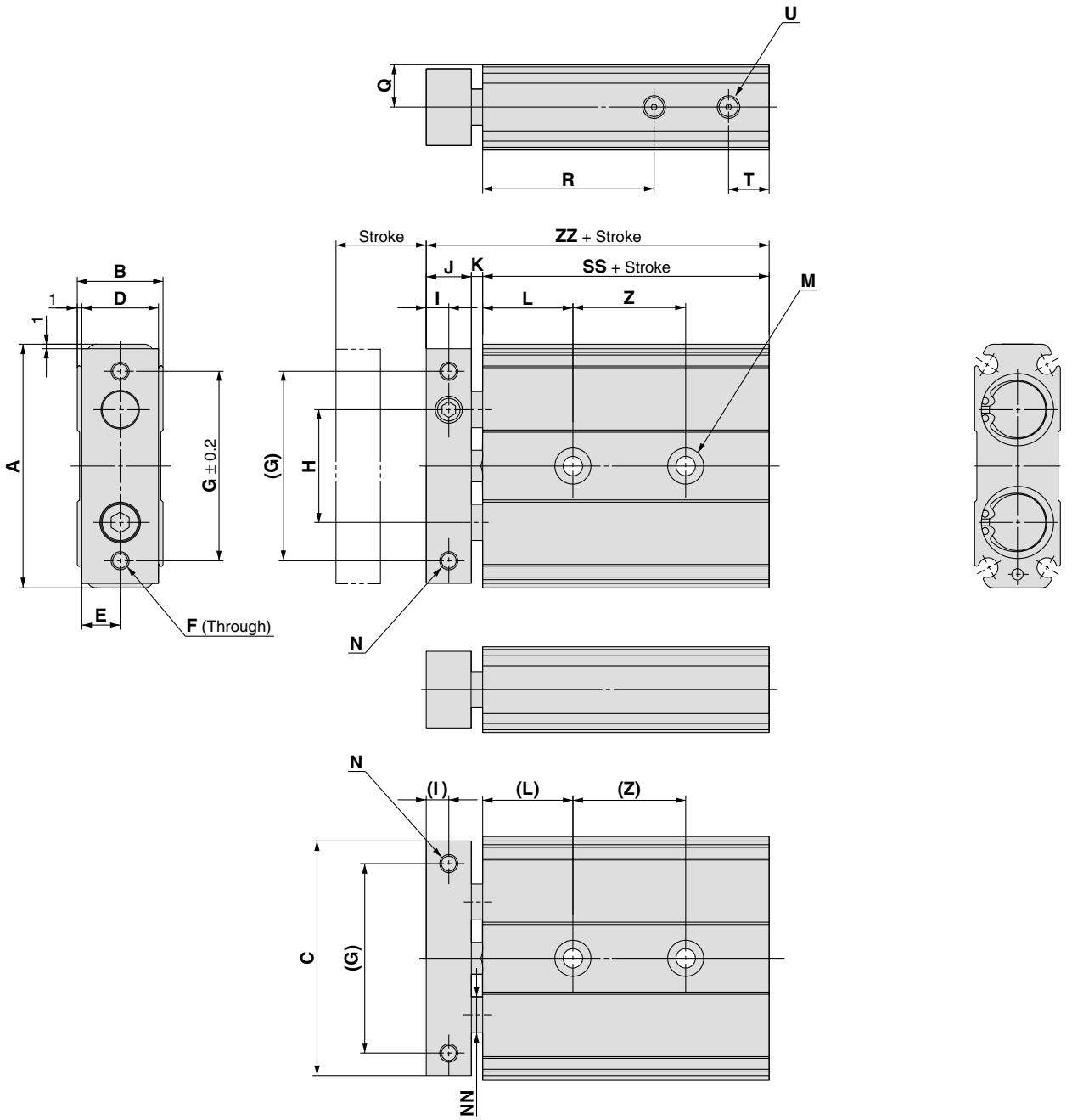
### CXSJ□6P




### CXSJ□10P



## Dimensions: ø15 to 32 Standard Piping

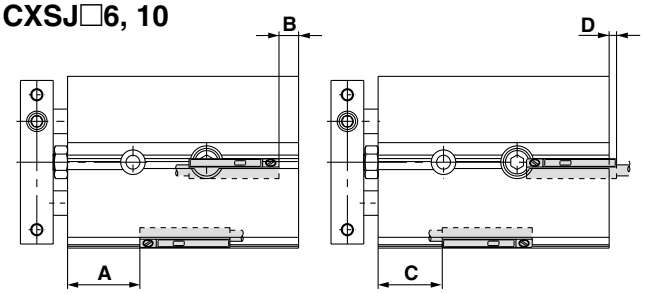



| Bore size (mm) | A | B | ZZ | C | D | E | F | G | H | I | J | K | L | M | N | NN | Q | R | T | U | SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15** | 54 | 19 | 70 | 52 | 17 | 8.5 | 2 x M5 x 0.8 | 42 | 25 | 5 | 10 | 2.5 | 20 | 2 x 2 x ø4.3 through 2 x 2 x ø8 counterbore with depth 4.3 | 2 x M4 x 0.7 with thread depth 6 | ø8 | 9.5 | 38 | 9 | 2 x M5 x 0.8 with thread depth 4 | 57.5 |
| **20** | 62 | 24 | 84 | 60 | 22 | 11 | 2 x M5 x 0.8 | 50 | 29 | 6 | 12 | 4.5 | 25 | 2 x 2 x ø5.5 through 2 x 2 x ø9.5 counterbore with depth 5.3 | 2 x M4 x 0.7 with thread depth 6 | ø10 | 12 | 45 | 9 | 2 x M5 x 0.8 with thread depth 4 | 67.5 |
| **25** | 73 | 29 | 87 | 71 | 27 | 13.5 | 2 x M6 x 1.0 | 60 | 35 | 6 | 12 | 4.5 | 30 | 2 x 2 x ø6.5 through 2 x 2 x ø11 counterbore with depth 6.3 | 2 x M5 x 0.8 with thread depth 7.5 | ø12 | 14.5 | 46 | 9 | 2 x M5 x 0.8 with thread depth 4 | 70.5 |
| **32** | 94 | 37 | 100.5 | 92 | 35 | 17.5 | 2 x M6 x 1.0 | 75 | 45 | 8 | 16 | 4 | 30 | 2 x 2 x ø6.5 through 2 x 2 x ø11 counterbore with depth 6.3 | 2 x M5 x 0.8 with thread depth 7.5 | ø16 | 18.5 | 56 | 10 | 2 x Rc1/8 with thread depth 5 | 80.5 |

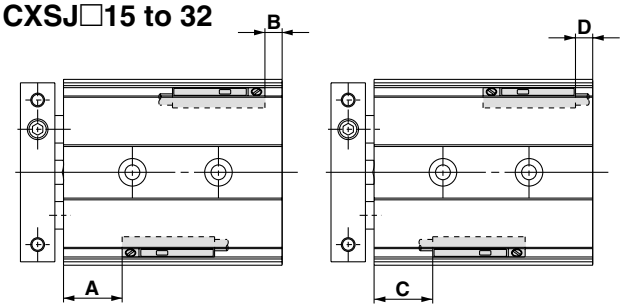
| Symbol / Stroke / Bore size (mm) | Z | | | |
|---|---|---|---|---|
| | 10, 20 | 30, 40, 50 | 75 | 100 |
| **15** | 25 | 35 | 45 | 55 |
| **20** | 30 | 40 | 60 | 60 |
| **25** | 30 | 40 | 60 | 60 |
| **32** | 40 | 50 | 70 | 70 |

## Auto Switch Proper Mounting Position for Stroke End Detection

### CXSJ□6, 10




### CXSJ□15 to 32




**Electrical entry direction: Inward**

**Electrical entry direction: Outward**

### Operating Range

(mm)

| Auto switch model | Bore size | | | | | |
|---|---|---|---|---|---|---|
| | 6 | 10 | 15 | 20 | 25 | 32 |
| D-A9□, D-A9□V | 5 | 6 | 6 | 7.5 | 8 | 9 |
| D-M9□, D-M9□V<br>D-M9□A, D-M9□AV<br>D-M9□W, D-M9□WV | 2.5 | 3 | 3.5 | 4.5 | 4.5 | 5 |

∗ The operating ranges are provided as guidelines including hystereses and are not guaranteed values (assuming approximately ±30% variations).
They may vary significantly with ambient environments.

### Auto Switch Proper Mounting Position

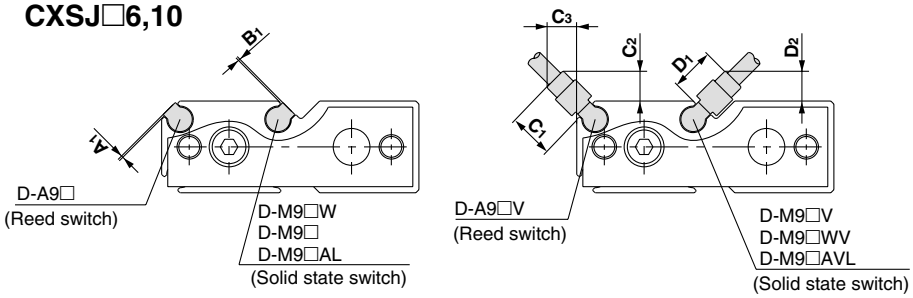
| Bore size (mm) | D-A90, D-A96 | | | | D-A93 | | | | D-M9□, D-M9□W<br>D-M9□AVL | | | | D-M9□V, D-M9□WV | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | A | B | C | D | A | B | C | D | A | B | C | D |
| 6 | 15.5 | — | 13.5 | 5.5 | 15.5 | — | 11 | 8 | 19.5 | 0.5 | 9.5 | 9.5 | 19.5 | 0.5 | 11.5 | 7.5 |
| 10 | 25.5 | — | 23.5 | 3 | 25.5 | — | 21 | 5.5 | 29.5 | 3 | 19.5 | 7 | 29.5 | 3 | 21.5 | 5 |
| 15 | 31.5 | 6 | 29.5 | 4 | 31.5 | 6 | 27 | 1.5 | 35.5 | 10 | 25.5 | 0 | 35.5 | 10 | 27.5 | 2 |
| 20 | 39 | 9 | 37 | 7 | 39 | 9 | 34.5 | 4.5 | 43 | 13 | 33 | 3 | 43 | 13 | 35 | 5 |
| 25 | 40 | 11 | 38 | 9 | 40 | 11 | 35.5 | 6.5 | 44 | 15 | 34 | 5 | 44 | 15 | 36 | 7 |
| 32 | 49 | 11.5 | 47 | 9.5 | 49 | 11.5 | 44.5 | 7 | 53 | 15.5 | 43 | 5.5 | 53 | 15.5 | 45 | 7.5 |

| Bore size (mm) | D-M9□AL | | | |
|---|---|---|---|---|
| | A | B | C | D |
| 6 | 19.5 | 0.5 | 7.5 | 11.5 |
| 10 | 29.5 | 3 | 17.5 | 9 |
| 15 | 35.5 | 10 | 23.5 | 2 |
| 20 | 43 | 13 | 31 | 5 |
| 25 | 44 | 15 | 32 | 7 |
| 32 | 53 | 15.5 | 41 | 7.5 |

Note 1) ø6: D-A90, A96, A93, F9BAL
ø10: D-A90, A96, A93
Only outward electrical entry (D dimension) is available.
Note 2) Minus value in D column (ø15, ø20, ø25, ø32) means that the auto switches are to be mounted beyond the cylinder body edges.
Note 3) When setting an auto switch, confirm the operation and adjust its mounting position.

## Auto switch mounting dimensions

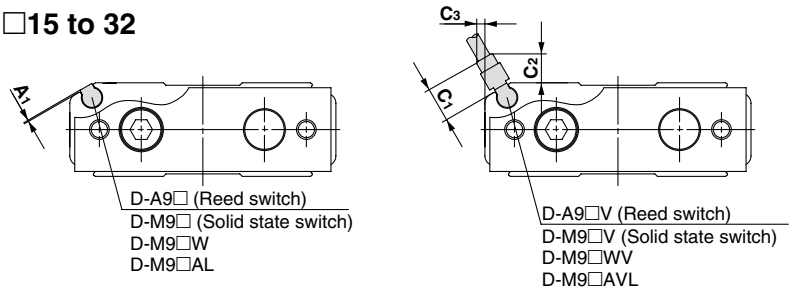
### CXSJ□6,10




(mm)

| Auto switch model | Symbol | Bore size | |
|---|---|---|---|
| | | 6 | 10 |
| D-A9□ | $A_1$ | 1 | 1 |
| D-M9□, D-M9□W | $B_1$ | 1 | 1 |
| D-M9□AL | $B_1$ | 2 | 2 |
| D-A9□V | $C_1$, $D_1$ | 5.5 | 5.5 |
| | $C_2$, $C_3$, $D_2$ | 4 | 4 |
| D-M9□V, D-M9□WV | $C_1$, $D_1$ | 8 | 8 |
| D-M9□AVL | $C_2$, $C_3$, $D_2$ | 6 | 6 |

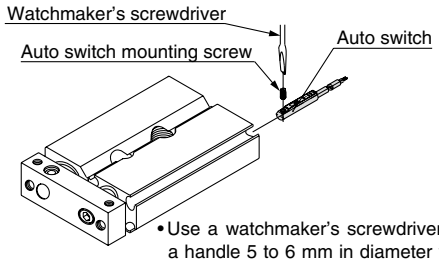
### CXSJ□15 to 32




(mm)

| Auto switch model | Symbol | Bore size | | | |
|---|---|---|---|---|---|
| | | 15 | 20 | 25 | 32 |
| D-M9□, D-M9□W | $A_1$ | 1 | 1 | 1 | 1 |
| D-M9□AL | $A_1$ | 2 | 2 | 2 | 2 |
| D-A9□V | $C_1$ | 5.5 | 5.5 | 5.5 | 5.5 |
| D-M9□WV | $C_2$ | 4.5 | 4.5 | 4.5 | 4.5 |
| D-M9□AVL | $C_3$ | 1 | — | — | — |

## Auto Switch Mounting



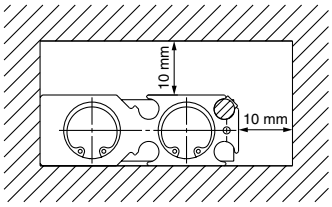

• Use a watchmaker's screwdriver with a handle 5 to 6 mm in diameter when tightening the auto switch mounting screw.

**Tightening Torque of Auto Switch Mounting Screw** (N·m)

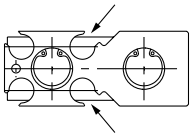
| Auto switch model | Tightening torque |
|---|---|
| **D-A9□(V)** | 0.10 to 0.20 |
| **D-M9□(V)**<br>**D-M9□W(V)** | 0.05 to 0.15 |

### ⚠Caution

① **Avoid proximity to magnetic objects.**
When magnetic substances such as iron (including flange brackets) are in close proximity to an auto switch cylinder (auto switch mounting side), be sure to provide a clearance between the magnetic substance and the cylinder body as shown in the drawing below. If the clearance is less than 10 mm, the auto switch may not function properly.




② **For CXSJ□6/10, the switch cannot be attached or detached from the plate side if the middle groove (indicated by arrows in the figure on the right) is used. (It will interfere with the bumper bolt at the end of the groove.)**



Other than the applicable auto switches listed in "How to Order," the following auto switches can be mounted.
∗ Normally closed (NC = b contact), solid state auto switches (D-F9G and D-F9H type) are also available. For details, refer to page 1746.

# Series CXSJ
# Specific Product Precautions

**Be sure to read before handling.**
**Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.**

## Mounting

### ⚠ Caution

**1. Make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less).**

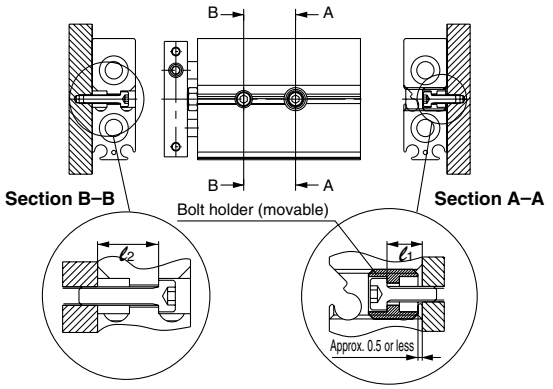
Dual-rod cylinders can be mounted from 3 directions, however, make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less). Otherwise, the accuracy of the piston rod operation is not achieved, and malfunctioning can occur.

**2. The piston rod must be retracted when mounting the cylinder.**

Scratches or gouges in the piston rod may lead to damaged bearings and seals and cause malfunctions or air leakage.

**3. CXSJ** (ø6, ø10)

Adjust the bolt holder using a hexagon wrench 3 mm in width across flats so that it does not protrude from the cylinder surface (approx. 0.5 mm depth from the cylinder surface to the top of the holder). If the bolt holder is not properly adjusted, it can interfere with the switch rail, hindering the auto switch mounting. The required length of the mounting bolt for a bolt holder and mounting hole in the rod cover side varies depending on the bearing surface position for the mounting bolt. Refer to dimensions $\ell_1$ and $\ell_2$ provided below to select the appropriate mounting bolt length.




| | $\ell_1$ (mm) | $\ell_2$ (mm) | Applicable mounting bolt size |
|---|---|---|---|
| **CXSJ□6** | 5 | 8.4 | M3 |
| **CXSJ□10** | 5 | 9.5 | M3 |

Be sure to mount the cylinder to the bolt holder. If it is operated without using the bolt holder, the bolt holder may drop.

## Piping

### ⚠ Caution

**1. For axial piping, the side port of the standard cylinder is plugged. However, a plugged port can be switched according to the operating conditions. When switching the plugged port, check the air leakage. If small air leakage is detected, order the below plugs, and reassemble it.**

Plug part no.: (ø6) MTS08-08-P6830
(ø10) CXS10-08-28747A

## Stroke Adjustment

### ⚠ Caution

**1. After adjusting the stroke, make sure to tighten the hexagon nut to prevent it from loosening.**

Dual-rod cylinders have a bolt to adjust 0 to –5 mm strokes on the retracted end (IN).
Loosen the hexagon nut to adjust the stroke; however, make sure to tighten the hexagon nut after making an adjustment.

**2. Never operate a cylinder with its bumper bolt removed. Also, do not attempt to tighten the bumper bolt without using a nut.**

If the bumper bolt is removed, the piston hits the head cover causing damage to the cylinder. Therefore, do not use a cylinder without a bumper bolt.
Furthermore, if the bumper bolt is tightened without a nut, the piston seal is caught in the leveled part, damaging the seal.

**3. A bumper at the end of the bumper bolt is replaceable.**

In case of a missing bumper, or a bumper has a permanent settling, use the right part numbers for ordering.

| Bore size (mm) | 6, 10, 15 | 20, 25 | 32 |
|---|---|---|---|
| Part no. | CXS10-34A 28747 | CXS20-34A 28749 | CXS32-34A 28751 |
| Qty. | 1 | | |

## Disassembly and Maintenance

### ⚠ Caution

**1. Never use a cylinder with its plate removed.**

When removing the hexagon socket head cap screw on the end plate, the piston rod must be secured to prevent from rotating. However, if the sliding parts of the piston rod are scratched and gouged, a malfunction may occur.

**2. When disassembling and reassembling the cylinder, contact SMC or refer to the separate instruction manual.**

### ⚠ Warning

**1. Take precautions when your hands are near the plate and housing.**

When the cylinder is operated, take extra precautions to avoid getting your hands and fingers caught between the plate and housing, that can cause a bodily injury.

## Operating Environment

### ⚠ Caution

**1. Do not operate the cylinder in a pressurized environment.**

The pressurized air may flow inside the cylinder due to its construction.

**2. Do not use as a stopper. This may cause malfunction. When using as a stopper, select a stopper cylinder (Series RS) or a compact guide cylinder (Series MGP).**

## Speed Adjustment

### ⚠ Caution

**1. When CXSJ□6 is operated at a low speed, adjust the speed with an IN/OUT control by installing two dual speed controllers due to the small cylinder capacity. This can prevent the cylinder from ejecting.**

# Dual Rod Cylinder
# Basic Type
# *Series CXS*
## ø6, ø10, ø15, ø20, ø25, ø32

## How to Order

**Thread type**

| Symbol | Type | Bore size |
|---|---|---|
| Nil | M thread | ø6 to ø20 |
| | Rc 1/8 | ø25,ø32 |
| TN | NPT 1/8 | |
| TF | G 1/8 | |

**CXS M 20 ☐ – 100 – Y7BW ☐ – ☐**

**Made to Order**
Refer to page 562 for details.

**Bearing type**

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

**Number of auto switches**

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

**Bore size/Stroke (mm)**

| Bore size | Standard stroke (mm) |
|---|---|
| 6 | 10, 20, 30, 40, 50 |
| 10 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75 |
| 15, 20<br>25, 32 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 |

**Auto switch**

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

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

### Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage DC | Load voltage AC | Auto switch model Perpendicular | Auto switch model In-line | Lead wire length (m) ∗ 0.5 (Nil) | 3 (L) | 5 (Z) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | Y69A | Y59A | ● | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | Y7PV | Y7P | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | Y69B | Y59B | ● | ● | ○ | ○ | — | |
| | Diagnostic indication (2-color indication) | | | 3-wire (NPN) | 5 V, 12 V | | Y7NWV | Y7NW | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | Y7PWV | Y7PW | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | Y7BWV | Y7BW | ● | ● | ○ | ○ | — | |
| | Water resistant (2-color indication) | | | | | | — | Y7BA** | — | ● | ○ | ○ | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | — | Z76 | ● | ● | — | — | IC circuit | — |
| | | | None | 2-wire | 24 V | 12 V | 100 V | — | Z73 | ● | ● | ● | — | — | Relay, PLC |
| | | | | | | | 100 V or less | — | Z80 | ● | ● | — | — | IC circuit | |

** 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) Y59A
3 m ····· L (Example) Y59AL
5 m ····· Z (Example) Y59AZ

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

- Since there are other applicable auto switches than listed, refer to page 569 for details.
- For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
- Auto switches are shipped together (not assembled).

## Specifications

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **Fluid** | Air (Non-lube) | | | | | |
| **Proof pressure** | 1.05 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa | | | | | |
| **Minimum operating pressure** | 0.15 MPa | 0.1 MPa | | 0.05 MPa | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 30 to 300 mm/s | 30 to 800 mm/s | 30 to 700 mm/s | | 30 to 600 mm/s | |
| **Cushion** | Rubber bumper | | | | | |
| **Stroke adjustable range** | 0 to –5 mm compared to the standard stroke | | | | | |
| **Port size** | M5 x 0.8 | | | | Rc 1/8 | |
| **Bearing type** | Slide bearing, Ball bushing bearing (Same dimensions for both) | | | | | |
| **Allowable kinetic energy** | 0.0023 J | 0.064 J | 0.095 J | 0.17 J | 0.27 J | 0.32 J |

### Made to Order Specifications
**(For details, refer to pages 1851 to 1954 and 2003.)**

| Symbol | Specifications |
|---|---|
| **-XB6** | Heat resistant cylinder (–10 to 150°C) |
| **-XB9** | Low speed cylinder (10 to 50 mm/s) |
| **-XB11** | Long stroke type |
| **-XB13** | Low speed cylinder (5 to 50 mm/s) |
| **-XB19** | High speed specification |
| **-XC22** | Fluororubber seals |
| **-X593** | Without plate |

## Standard Stroke

(mm)

| Model | Standard stroke | Long stroke |
|---|---|---|
| **CXS□6** | 10, 20, 30, 40, 50 | 60, 70, 75, 80, 90, 100 |
| **CXS□10** | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75 | 80, 90, 100, 110, 120, 125, 150 |
| **CXS□15** | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 | 110, 120, 125, 150 |
| **CXS□20** | | 110, 120, 125, 150, 175, 200 |
| **CXS□25** | | |
| **CXS□32** | | |

∗ Refer to “Made to Order Specifications” for stroke which exceeds the standard stroke length.
Non-standard strokes for a size ø6 cylinder are available as a special order.

## Theoretical Output

(N)

| Model | Rod size (mm) | Operating direction | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.15 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| **CXS□6** | 4 | OUT | 56 | — | 8.4 | 11.2 | 16.8 | 22.4 | 28.0 | 33.6 | 39.2 |
| | | IN | 31 | — | 4.6 | 6.2 | 9.3 | 12.4 | 15.5 | 18.6 | 21.7 |
| **CXS□10** | 6 | OUT | 157 | 15.7 | — | 31.4 | 47.1 | 62.8 | 78.5 | 94.2 | 110 |
| | | IN | 100 | 10.0 | — | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 |
| **CXS□15** | 8 | OUT | 353 | 35.3 | — | 70.6 | 106 | 141 | 177 | 212 | 247 |
| | | IN | 252 | 25.2 | — | 50.4 | 75.6 | 101 | 126 | 151 | 176 |
| **CXS□20** | 10 | OUT | 628 | 62.8 | — | 126 | 188 | 251 | 314 | 377 | 440 |
| | | IN | 471 | 47.1 | — | 94.2 | 141 | 188 | 236 | 283 | 330 |
| **CXS□25** | 12 | OUT | 982 | 98.2 | — | 196 | 295 | 393 | 491 | 589 | 687 |
| | | IN | 756 | 75.6 | — | 151 | 227 | 302 | 378 | 454 | 529 |
| **CXS□32** | 16 | OUT | 1608 | 161 | — | 322 | 482 | 643 | 804 | 965 | 1126 |
| | | IN | 1206 | 121 | — | 241 | 362 | 482 | 603 | 724 | 844 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

## Mass

(kg)

| Model | Standard stroke (mm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 |
| **CXSM 6** | 0.081 | — | 0.095 | — | 0.108 | — | 0.122 | — | 0.135 | — | — | — | — | — | — |
| **CXSL 6** | 0.081 | — | 0.095 | — | 0.108 | — | 0.122 | — | 0.135 | — | — | — | — | — | — |
| **CXSM10** | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | 0.20 | 0.21 | 0.22 | 0.23 | 0.25 | 0.27 | 0.28 | — | — | — |
| **CXSL 10** | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | 0.20 | 0.21 | 0.22 | 0.23 | 0.25 | 0.27 | 0.28 | — | — | — |
| **CXSM15** | 0.25 | 0.265 | 0.28 | 0.29 | 0.30 | 0.315 | 0.33 | 0.345 | 0.36 | 0.39 | 0.42 | 0.435 | 0.45 | 0.48 | 0.51 |
| **CXSL 15** | 0.27 | 0.285 | 0.30 | 0.31 | 0.32 | 0.335 | 0.35 | 0.365 | 0.38 | 0.41 | 0.44 | 0.455 | 0.47 | 0.50 | 0.53 |
| **CXSM20** | 0.40 | 0.42 | 0.44 | 0.46 | 0.48 | 0.495 | 0.51 | 0.53 | 0.55 | 0.585 | 0.62 | 0.64 | 0.66 | 0.70 | 0.74 |
| **CXSL 20** | 0.43 | 0.445 | 0.46 | 0.48 | 0.50 | 0.515 | 0.53 | 0.55 | 0.57 | 0.605 | 0.64 | 0.66 | 0.68 | 0.715 | 0.75 |
| **CXSM25** | 0.61 | 0.635 | 0.66 | 0.69 | 0.72 | 0.745 | 0.77 | 0.80 | 0.83 | 0.89 | 0.95 | 0.97 | 0.995 | 1.06 | 1.10 |
| **CXSL 25** | 0.62 | 0.645 | 0.67 | 0.70 | 0.73 | 0.755 | 0.78 | 0.81 | 0.84 | 0.895 | 0.955 | 0.98 | 1.005 | 1.065 | 1.11 |
| **CXSM32** | 1.15 | 1.19 | 1.23 | 1.275 | 1.32 | 1.36 | 1.40 | 1.45 | 1.49 | 1.58 | 1.665 | 1.71 | 1.755 | 1.84 | 1.93 |
| **CXSL 32** | 1.16 | 1.205 | 1.25 | 1.295 | 1.34 | 1.38 | 1.42 | 1.465 | 1.51 | 1.595 | 1.68 | 1.72 | 1.765 | 1.855 | 1.94 |

## Clean Series

There are two types of cylinders, relieving type and vacuum type, available for a clean room environment. The relieving type specification with the double-seal construction of the rod section allows the cylinder to channel exhaust through the relief port directly to the outside of a clean room environment. The vacuum type specification allows for the application of a vacuum on the rod section while forced exhaust of air takes place through the vacuum port to the outside of a clean room environment.

### How to Order

**12** – **CXS** **L** | **Bore size** | – | **Stroke** | – | **Auto switch**

**Clean room specifications**

| | |
|---|---|
| **10** | Relieving type |
| **11** | Vacuum type |
| **12** | Relieving type (With specially treated sliding parts) |

**Ball bushing bearing**

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

* 12- series is compatible with the ball bushing bearing type only.

### Specifications

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **Proof pressure** | 1.05 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa | | | | | |
| **Minimum operating pressure** | 0.15 MPa | 0.1 MPa | | 0.05 MPa | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 30 to 400 mm/s | | | | | |
| **Stroke adjustable range** | 0 to –5 mm compared to the standard stroke | | | | | |
| **Bearing type** | Ball bushing bearing | | | | | |

Refer to "Pneumatic Clean Series" catalog for dimensions.

## Copper and Fluorine-free (For CRT manufacturing process)

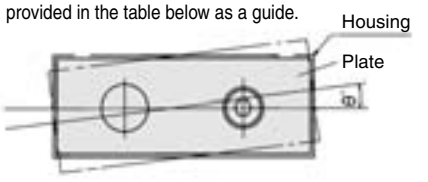
To prevent the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

Note) Since the standard cylinders are essentially copper and fluorine-free, those are conforming to 20- specifications. However, in the event of combined specifications, it is likely to happen non-conformity to 20-specifications. (e.g. combination between 20- and -XB9 (-XB13)) In order to avoid such a non-conformity, we distinguish the model no. from the one for standard products by prefixing 20-.

## Operating Conditions

### Non-rotating Accuracy

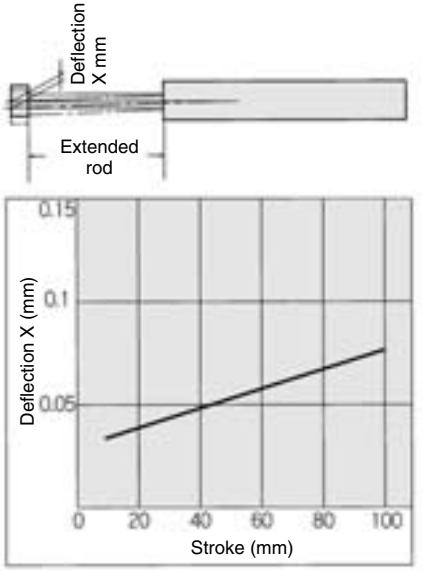
Non-rotating accuracy θ° at the retracted end and without a load should be less than or equal to the value provided in the table below as a guide.




| Bore size (mm) | ø6 to ø32 |
|---|---|
| **CXSM** (Slide bearing) | ±0.1° |
| **CXSL** (Ball bushing bearing) | |

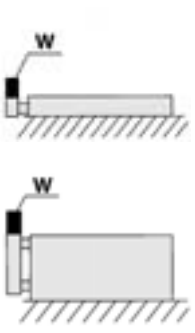
### CXS□6 to 32
### Deflection at the Plate End

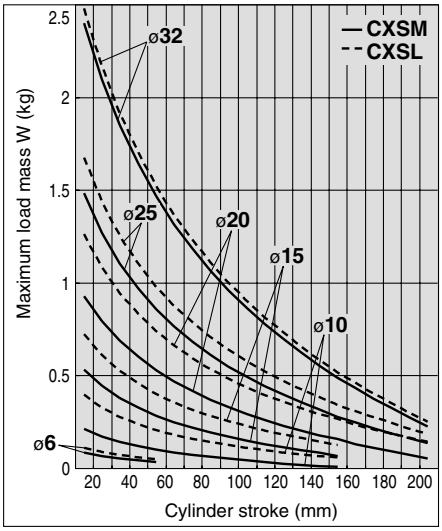
An approximate plate-end deflection X without a load is shown in the graph below.




### Maximum Load Mass

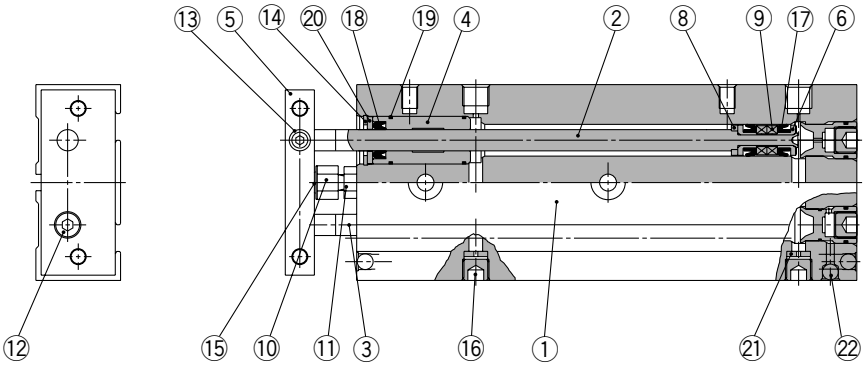
When the cylinder is mounted as shown in the diagrams below, the maximum load mass W should not exceed the values illustrated in the graph immediately following the diagrams.



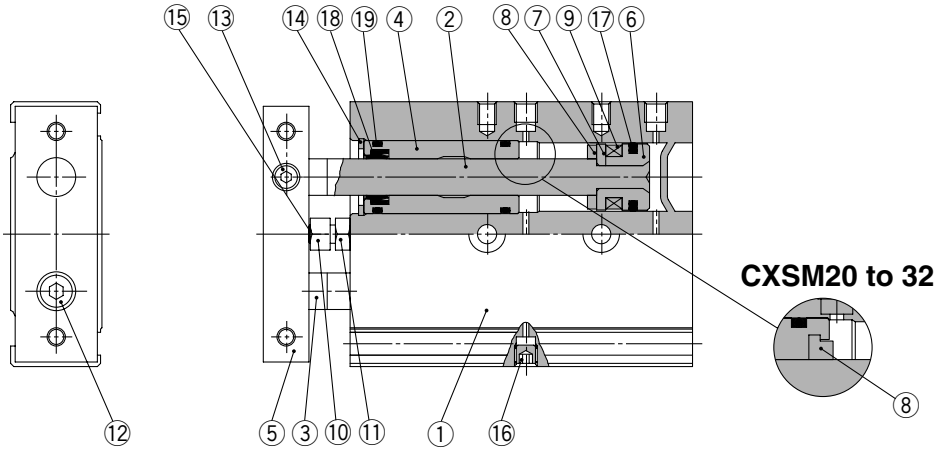



## Construction: Slide Bearing

### CXSM6




### CXSM10 to 32




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Carbon steel (1) | Hard chrome plated |
| 3 | **Piston rod B** | Carbon steel (1) | Hard chrome plated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Plate** | Aluminum alloy | Anodized |
| 6 | **Piston A** | Aluminum alloy | Chromated |
| 7 | **Piston B** | Aluminum alloy | Chromated |
| 8 | **Bumper** | Polyurethane | |
| 9 | **Magnet** | — | |
| 10 | **Bumper bolt** | Carbon steel | Nickel plated |
| 11 | **Hexagon nut** | Carbon steel | Nickel plated |
| 12 | **Hexagon socket head cap screw** | Chromium steel | Zinc chromated |
| 13 | **Hexagon socket head set screw** | Chromium steel | Zinc chromated |
| 14 | **Retaining ring** | Special steel | Phosphate coating |

Note 1) Stainless steel for CXSM6.

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 15 | **Bumper** | Polyurethane | |
| 16 | **Plug** | Chromium steel | Nickel plated |
| 17 | **Piston seal** | NBR | |
| 18 | **Rod seal** | NBR | |
| 19 | **O-ring** | NBR | |
| 20 | **Seal retainer** | Aluminum alloy | |
| 21 | **Port spacer** | Aluminum alloy | |
| 22 | **Steel ball** | Special steel | Hard chrome plated |

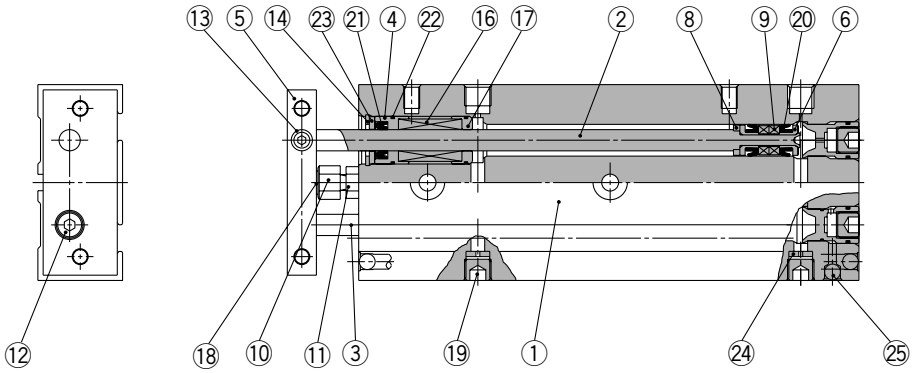
### Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|---|---|---|
| **6** | CXSM 6-PS | Set of nos. above ⑰, ⑱ and ⑲ |
| **10** | CXSM 10 A PS | |
| **15** | CXSM 15-PS | |
| **20** | CXSM 20-PS | |
| **25** | CXSM 25-PS | |
| **32** | CXSM 32-PS | |

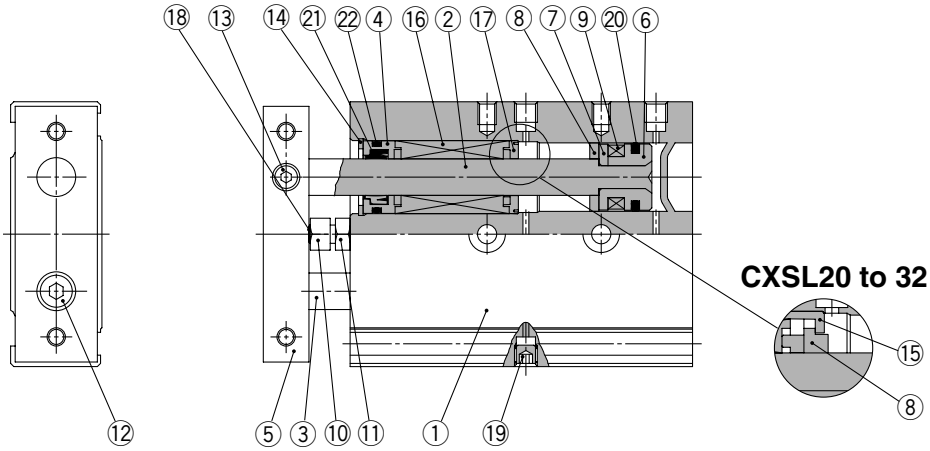
∗ Seal kit includes ⑰, ⑱ and ⑲. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

## Construction: Ball Bushing Bearing

### CXSL6




### CXSL10 to 32




### Component Parts: Standard Piping

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Special steel | Hard chrome plated |
| 3 | **Piston rod B** | Special steel | Hard chrome plated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Plate** | Aluminum alloy | Anodized |
| 6 | **Piston A** | Aluminum alloy | Chromated |
| 7 | **Piston B** | Aluminum alloy | Chromated |
| 8 | **Bumper** | Polyurethane | |
| 9 | **Magnet** | — | |
| 10 | **Bumper bolt** | Carbon steel | Nickel plated |
| 11 | **Hexagon nut** | Carbon steel | Nickel plated |
| 12 | **Hexagon socket head cap screw** | Chromium steel | Zinc chromated |
| 13 | **Hexagon socket head set screw** | Chromium steel | Zinc chromated |
| 14 | **Retaining ring** | Special steel | Phosphate coating |
| 15 | **Bumper holder** | Synthetic resin | |

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 16 | **Ball bushing** | — | |
| 17 | **Bearing spacer** | Synthetic resin(1) | |
| 18 | **Bumper** | Polyurethane | |
| 19 | **Plug** | Chromium steel | Nickel plated |
| 20 | **Piston seal** | NBR | |
| 21 | **Rod seal** | NBR | |
| 22 | **O-ring** | NBR | |
| 23 | **Seal retainer** | Aluminum alloy | |
| 24 | **Port spacer** | Aluminum alloy | |
| 25 | **Steel ball** | Special steel | Hard chrome plated |

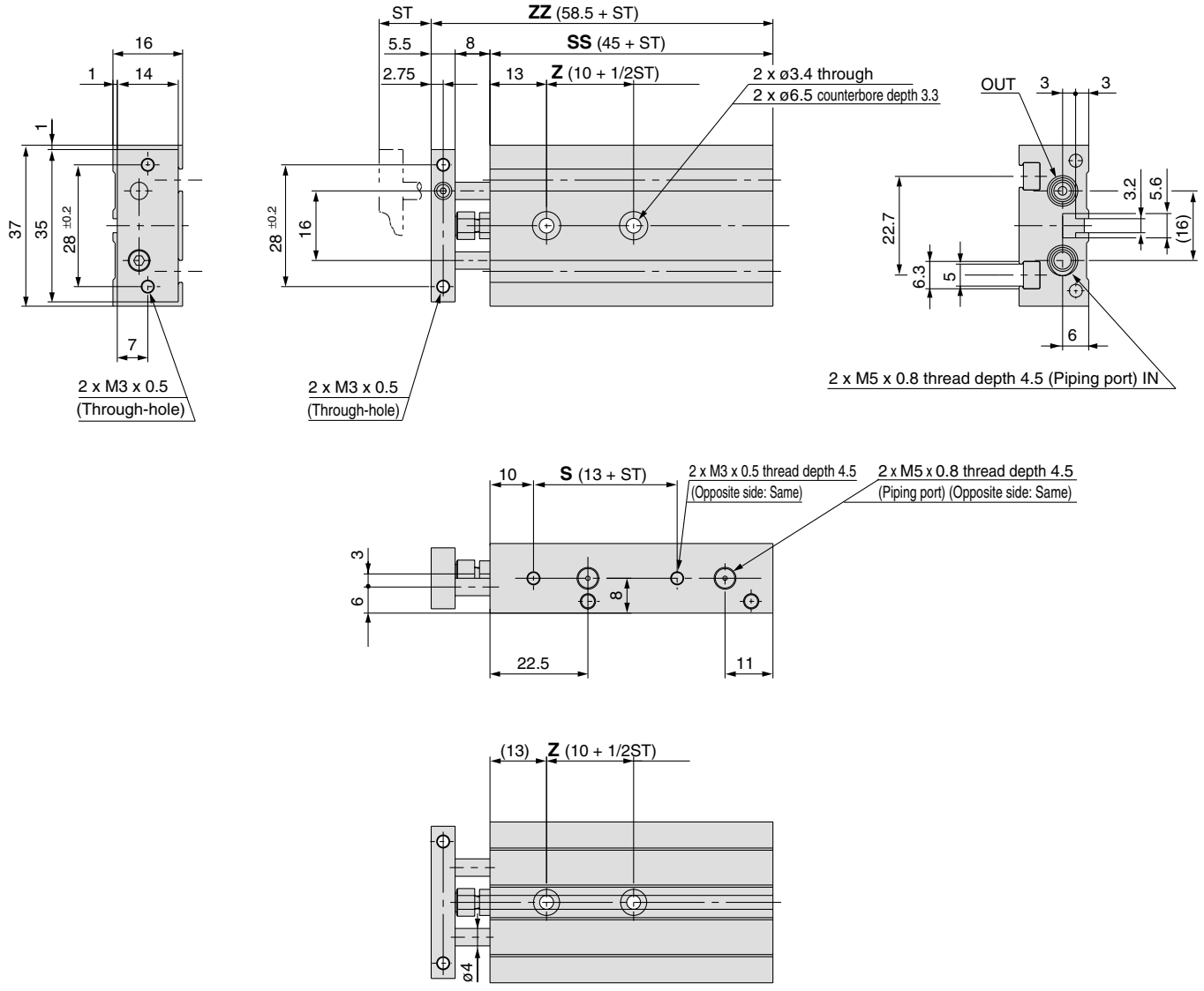
Note 1) Aluminum bearing alloy for CXSL6.

### Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|---|---|---|
| **6** | CXSL 6 – PS | Set of nos. above ⑳, ㉑ and ㉒ |
| **10** | CXSL 10 B PS | |
| **15** | CXSL 15 A PS | |
| **20** | CXSL 20 A PS | |
| **25** | CXSL 25 A PS | |
| **32** | CXSL 32 A PS | |

∗ Seal kit includes ⑳, ㉑ and ㉒. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

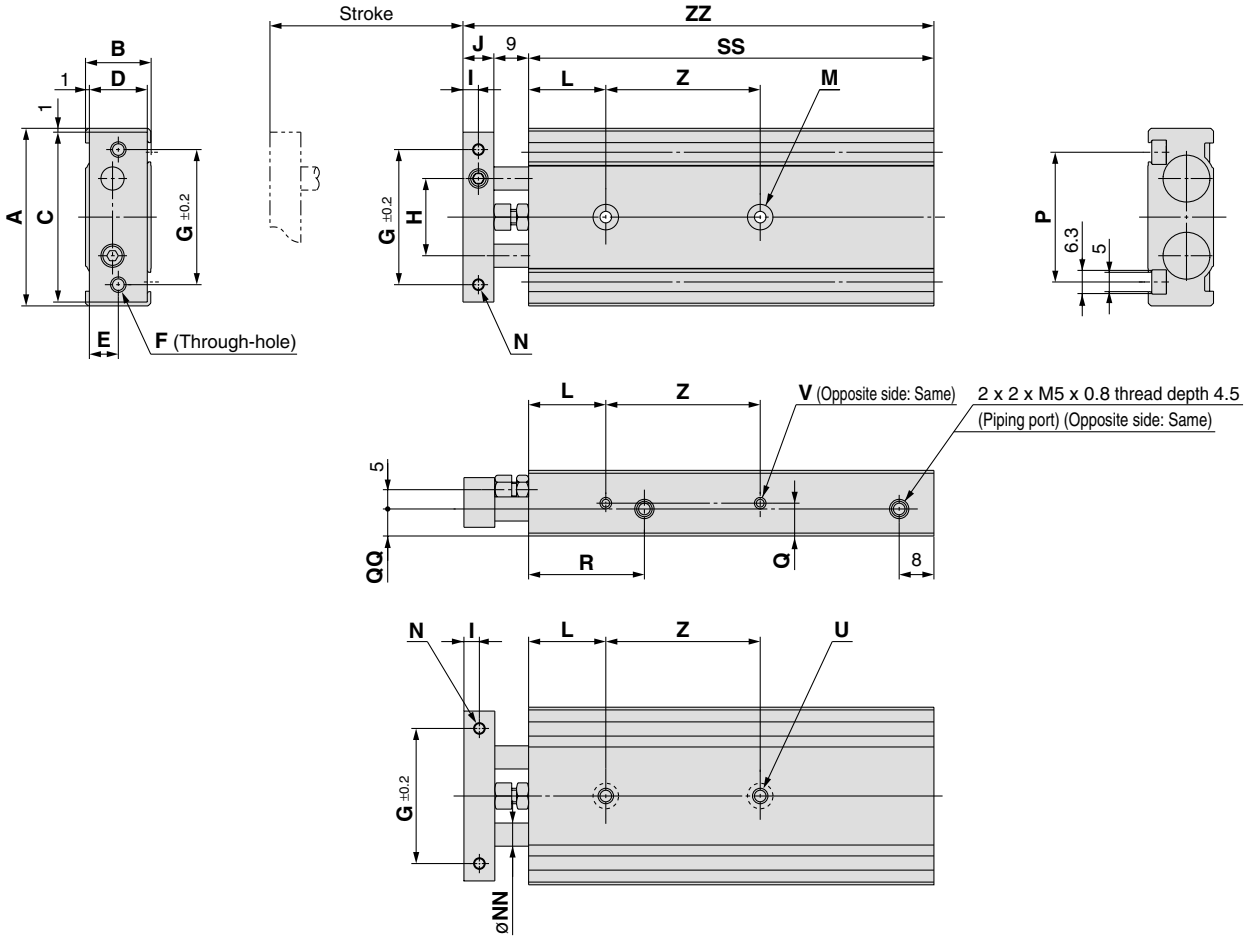
## Dimensions: ø6




(mm)

| Model | Stroke | Z | S | SS | ZZ |
|---|---|---|---|---|---|
| **CXS□6-10** | 10 | 15 | 23 | 55 | 68.5 |
| **CXS□6-20** | 20 | 20 | 33 | 65 | 78.5 |
| **CXS□6-30** | 30 | 25 | 43 | 75 | 88.5 |
| **CXS□6-40** | 40 | 30 | 53 | 85 | 98.5 |
| **CXS□6-50** | 50 | 35 | 63 | 95 | 108.5 |

## Dimensions: ø10, ø15



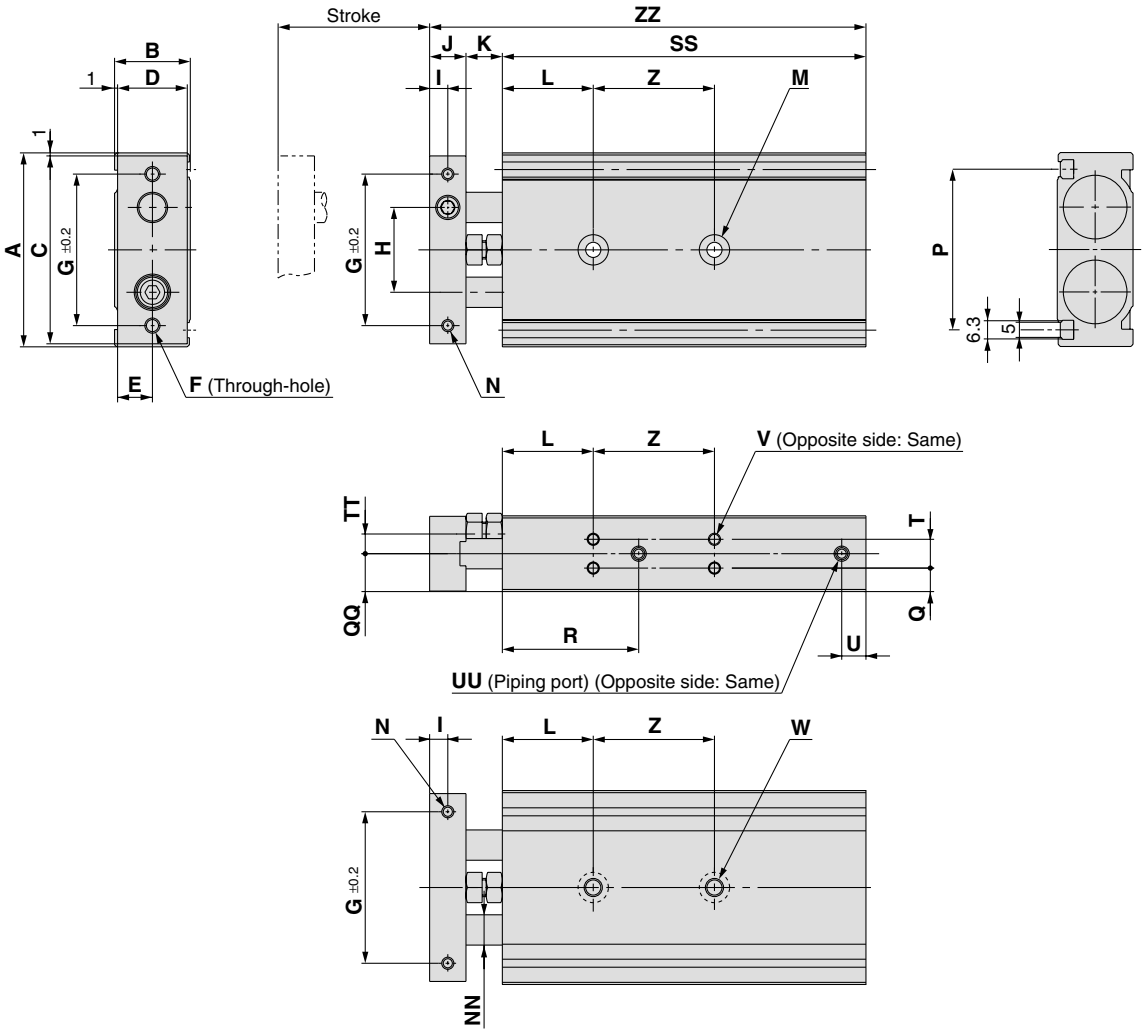

(mm)

| Model | A | B | C | D | E | F | G | H | I | J | L | M | N | NN | P | Q | QQ | R | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CXS□10** | 46 | 17 | 44 | 15 | 7.5 | 2 x M4 x 0.7 | 35 | 20 | 4 | 8 | 20 | 2 x ø3.4 through<br>2 x ø6.5 counter-bore depth 3.3 | 2 x M3 x 0.5 thread depth 5 | ø6 | 33.6 | 8.5 | 7 | 30 | 2 x M4 x 0.7 thread depth 7 | 4 x M3 x 0.5 thread depth 4.5 |
| **CXS□15** | 58 | 20 | 56 | 18 | 9 | 2 x M5 x 0.8 | 45 | 25 | 5 | 10 | 30 | 2 x ø4.3 through<br>2 x ø8 counter-bore depth 4.4 | 2 x M4 x 0.7 thread depth 6 | ø8 | 48 | 10 | 10 | 38.5 | 2 x M5 x 0.8 thread depth 8 | 4 x M4 x 0.7 thread depth 5 |

### Dimensions by Stroke

| Model \ Symbol / Stroke | SS | | | | | | | | | | | | | | | Z | | | | | ZZ | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 | 10, 15<br>20, 25 | 30, 35,<br>40, 45, 50 | 60, 70, 75 | 80 | 90, 100 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 |
| **CXS□10** | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 115 | 125 | 130 | – | – | – | 30 | 40 | 50 | – | – | 82 | 87 | 92 | 97 | 102 | 107 | 112 | 117 | 122 | 132 | 142 | 147 | – | – | – |
| **CXS□15** | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 120 | 130 | 135 | 140 | 150 | 160 | 25 | 35 | 45 | 45 | 55 | 89 | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 129 | 139 | 149 | 154 | 159 | 169 | 179 |

## Dimensions: ø20, ø25, ø32




(mm)

| Model | A | B | C | D | E | F | G | H | I | J | K | L | M | N | NN | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CXS□20** | 64 | 25 | 62 | 23 | 11.5 | 2 x M5 x 0.8 | 50 | 28 | 6 | 12 | 12 | 30 | 2 x ø5.5 through<br>2 x ø9.5 counterbore depth 5.3 | 2 x M4 x 0.7<br>thread depth 6 | ø10 | 53 |
| **CXS□25** | 80 | 30 | 78 | 28 | 14 | 2 x M6 x 1.0 | 60 | 35 | 6 | 12 | 12 | 30 | 2 x ø6.9 through<br>2 x ø11 counterbore depth 6.3 | 2 x M5 x 0.8<br>thread depth 7.5 | ø12 | 64 |
| **CXS□32** | 98 | 38 | 96 | 36 | 18 | 2 x M6 x 1.0 | 75 | 44 | 8 | 16 | 14 | 30 | 2 x ø6.9 through<br>2 x ø11 counterbore depth 6.3 | 2 x M5 x 0.8<br>thread depth 8 | ø16 | 76 |

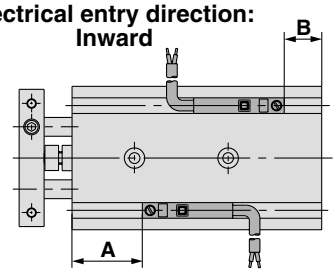
| Model | Q | QQ | R | T | TT | U | UU | V | W |
|---|---|---|---|---|---|---|---|---|---|
| **CXS□20** | 7.75 | 12.5 | 45 | 9.5 | 6.5 | 8 | 4 x M5 x 0.8<br>thread depth 4.5 | 8 x M4 x 0.7<br>thread depth 5.5 | 2 x M6 x 1.0<br>thread depth 10 |
| **CXS□25** | 8.5 | 15 | 46 | 13 | 9 | 9 | 4 x Rc 1/8<br>thread depth 6.5 | 8 x M5 x 0.8<br>thread depth 7.5 | 2 x M8 x 1.25<br>thread depth 12 |
| **CXS□32** | 9 | 19 | 56 | 20 | 11.5 | 10 | 4 x Rc 1/8<br>thread depth 6.5 | 8 x M5 x 0.8<br>thread depth 7.5 | 2 x M8 x 1.25<br>thread depth 12 |

### Dimensions by Stroke

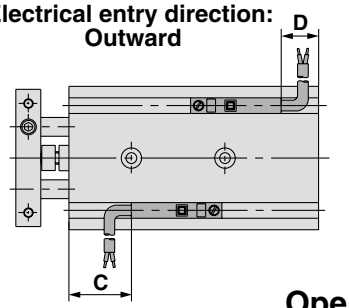
| Symbol / Stroke / Model | SS | | | | | | | | | | | | | | | Z | | | ZZ | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 | 10, 15, 20, 25 | 30, 35, 40, 45, 50 | 60, 70, 75, 80, 90, 100 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 |
| **CXS□20** | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 130 | 140 | 145 | 150 | 160 | 170 | 30 | 40 | 60 | 104 | 109 | 114 | 119 | 124 | 129 | 134 | 139 | 144 | 154 | 164 | 169 | 174 | 184 | 194 | | | |
| **CXS□25** | 82 | 87 | 92 | 97 | 102 | 107 | 112 | 117 | 122 | 132 | 142 | 147 | 152 | 162 | 172 | 30 | 40 | 60 | 106 | 111 | 116 | 121 | 126 | 131 | 136 | 141 | 146 | 156 | 166 | 171 | 176 | 186 | 196 | | | |
| **CXS□32** | 92 | 97 | 102 | 107 | 112 | 117 | 122 | 127 | 132 | 142 | 152 | 157 | 162 | 172 | 182 | 40 | 50 | 70 | 122 | 127 | 132 | 137 | 142 | 147 | 152 | 157 | 162 | 172 | 182 | 187 | 192 | 202 | 212 | | | |

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

**Electrical entry direction: Inward**




**Electrical entry direction: Outward**




| Bore size (mm) | A | B | D-Z7/Z8, D-Y7□W D-Y5□, D-Y7□ | | D-Y6□, D-Y7□V D-Y7□WV | | D-Y7BAL | |
|---|---|---|---|---|---|---|---|---|
| | | | C | D | C | D | C | D |
| **6** | 15.5 | 4.5 | 11.5 (10) | 0.5 (–1) | 13 | 2 | 5.5 | –5.5 |
| **10** | 22.5 | 7.5 | 18.5 (17) | 3.5 (2) | 20 | 5 | 12.5 | –2.5 |
| **15** | 30.5 | 4.5 | 26.5 (25) | 0.5 (–1) | 28 | 2 | 20.5 | –5.5 |
| **20** | 38 | 7 | 34 (32.5) | 3 (1.5) | 36 | 4.5 | 28 | –3 |
| **25** | 38 | 9 | 34 (32.5) | 5 (3.5) | 36 | 6.5 | 28 | –1 |
| **32** | 48 | 9 | 44 (42.5) | 5 (3.5) | 46 | 6.5 | 38 | –1 |

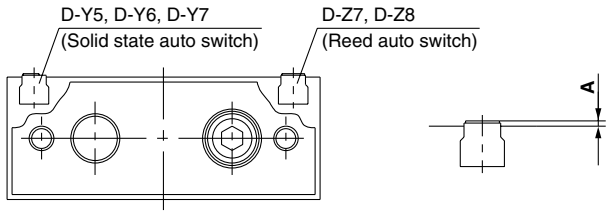
Lead wire entry is inward prior to shipment.
Note 1) Negative figures in the table D indicate how much the load wires protrude from the cylinder body.
Note 2) ( ): Denotes the dimensions of D-Z73.
Note 3) Adjust the auto switch after confirming the operating conditions in the actual setting.

## Operating Range

| Auto switch model | Bore size (mm) | | | | | |
|---|---|---|---|---|---|---|
| | **6** | **10** | **15** | **20** | **25** | **32** |
| **D-Z7□/Z80** | 9 | 7 | 9 | 9 | 9 | 11 |
| **D-Y59□, D-Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL** | 3 | 3 | 3.5 | 3.5 | 4 | 4.5 |

∗ 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.

## Dimensions for Mounting of Auto Switch



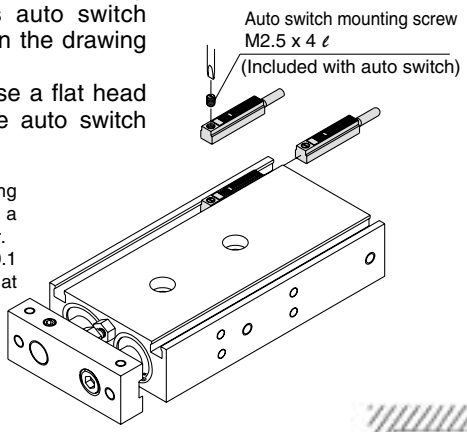

### A Dimension

| Auto switch model | Bore size (mm) | | | | | |
|---|---|---|---|---|---|---|
| | **6** | **10** | **15** | **20** | **25** | **32** |
| **D-Y59A/Y7P/Y59B** | 0.7 | | 0.2 | | | |
| **D-Y69A/Y7PV/Y69B** | | | | | | |
| **D-Y7NWV/Y7PWV/Y7BWV** | | | | | | |
| **D-Y7NW/Y7PW/Y7BW D-Y7BAL** | | | | | | |
| **D-Z7, D-Z8** | 1.2 | | 0.7 | | | |

## Auto Switch Mounting

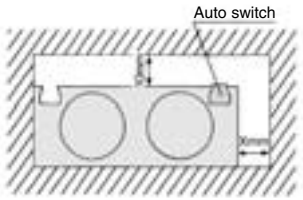
When mounting and securing auto switches, they should be inserted into the cylinder's auto switch mounting rail from the direction shown in the drawing below.
After setting in the mounting position, use a flat head watchmaker's screwdriver to tighten the auto switch mounting screw that is included.

Note) When tightening an auto switch mounting screw, use a watchmakers' screwdriver with a handle of approximately 5 to 6 mm in diameter. Also, tighten with a torque of about 0.05 to 0.1 N·m. As a guide, turn about 90° past the point at which tightening can first be felt.




## ⚠Caution

**1. Avoid proximity to magnetic objects**
When magnetic substances such as iron (including flange brackets) are in close proximity to a cylinder body with an auto switch, be sure to provide a clearance between the magnetic substance and the cylinder body as shown in the drawing below. If the clearance is less than the values noted in the table below, the auto switch may not function properly.




| Bore size | **X** (mm) |
|---|---|
| **ø6** | 0 |
| **ø10** | 0 |
| **ø15** | 10 |
| **ø20** | 10 |
| **ø25** | 0 |
| **ø32** | 0 |

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.
For detailed specifications, refer to pages 1719 to 1827.

∗ Normally closed (NC = b contact), solid state auto switch (D-Y7G/Y7H type) are also available. For details, refer to page 1748.

# Series CXS
# Specific Product Precautions

**Be sure to read before handling.**
**Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.**

## Mounting

### ⚠ Caution

**1. Make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less).**
Dual rod cylinders can be mounted from 3 directions, however, make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less). Otherwise, the accuracy of the piston rod operation is not achieved, and malfunctioning can occur.

**2. Piston rod must be retracted when mounting the cylinder.**
Scratches or gouges in the piston rod may lead to damaged bearings and seals and cause malfunctions or air leakage.

## Piping

### ⚠ Caution

**1. Plug the appropriate supply port(s) according to the operating conditions.**
Dual-rod cylinders have 2 supply ports for each operating direction (3 supply ports for ø6 only). Plug the appropriate supply port according to the operating conditions. However, when switching the plugged port, verify air leakage. If small air leakage is detected, order the below plugs, and ressemble it.

Plug part no.: (ø6)CXS10-08-28747A
(ø10 to ø20)CXS20-08-28749
(ø25 to ø32)CYP025-08B29449(Rc 1/8)
CXS25-08-A3025A(NPT 1/8)
CXS25-08-A3911(G 1/8)

## Stroke Adjustment

### ⚠ Caution

**1. After adjusting the stroke, make sure to tighten the hexagon nut to prevent it from loosening.**
Dual rod cylinders have a bolt to adjust 0 to –5 mm strokes on the retracted end (IN).
Loosen the hexagon nut to adjust the stroke; however, make sure to tighten the hexagon nut after making an adjustment.

**2. Never operate a cylinder with its bumper bolt removed. Also, do not attempt to tighten the bumper bolt without using a nut.**
If the bumper bolt is removed, the piston hits the head cover causing damage to the cylinder. Therefore, do not use a cylinder without a bumper bolt.
Furthermore, if the bumper bolt is tightened without a nut, the piston seal is caught in the leveled part, damaging the seal.

## Stroke Adjustment

### ⚠ Caution

**3. A bumper at the end of the bumper bolt is replaceable.**
In case a missing bumper, or a bumper has a permanent settling, use following part numbers for ordering.

| Bore size (mm) | 6, 10, 15 | 20, 25 | 32 |
|---|---|---|---|
| Part no. | CXS10-34A 28747 | CXS20-34A 28749 | CXS32-34A 28751 |
| Qty. | 1 | | |

## Disassembly and Maintenance

### ⚠ Caution

**1. Never use a cylinder with its plate removed.**
When removing the hexagon socket head cap screw on the end plate, the piston rod must be secured to prevent from rotating. However, if the sliding parts of the piston rod are scratched and gouged, a malfunction may occur. If the plate is not required for your application, use the cylinder that does not come with a plate, available through made-to-order (-X593) on page 2003.

**2. When disassembling and reassembling the cylinder, please contact SMC or refer to the separate instruction manual.**

### ⚠ Warning

**1. Take precautions when your hands are near the plate and housing.**
Take sufficient care to avoid getting your hands or fingers caught when the cylinder is operated.

## Operating Environment

### ⚠ Caution

**1. Do not operate the cylinder in a pressurized environment.**
The pressurized air may flow inside the cylinder due to its construction.

**2. Do not use as a stopper. This may cause malfunction. When using as a stopper, select a stopper cylinder (Series RS) or a compact guide cylinder (Series MGP).**

## Speed Adjustment

### ⚠ Caution

**1. When CXSJ□6 is operated at a low speed, adjust the speed with an IN/OUT control by installing two dual speed controllers due to the small cylinder capacity. This can prevent the cylinder from ejecting.**

# Dual Rod Cylinder With Air Cushion

# *Series CXS*

## ø20, ø25, ø32

## How to Order

**Thread type**

| Symbol | Type | Bore size |
|---|---|---|
| Nil | M thread | ø20 |
| | Rc | ø25, ø32 |
| TN | NPT | |
| TF | G | |

**CXS M 20 ☐ – 100 A – Y7BW ☐**

**Dual Rod Cylinder**

**Bearing type**

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

**Bore size/Stroke (mm)**

| Bore size | Stroke |
|---|---|
| 20 | 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 |
| 25, 32 | 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 |

**Air cushion**

**Auto switch**

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

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

**Number of auto switches**
**(No. of auto switch)**

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

## Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage DC | Load voltage AC | Auto switch model: Perpendicular | Auto switch model: In-line | Lead wire length (m) ∗ 0.5 (Nil) | 3 (L) | 5 (Z) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | Y69A | Y59A | ● | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | Y7PV | Y7P | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | Y69B | Y59B | ● | ● | ○ | ○ | — | |
| | Diagnostic indication (2-color indication) | | | 3-wire (NPN) | 5 V, 12 V | | Y7NWV | Y7NW | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | Y7PWV | Y7PW | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | Y7BWV | Y7BW | ● | ● | ○ | ○ | — | |
| | Water resistant (2-color indication) | | | | | | — | Y7BA∗∗ | — | ● | ○ | ○ | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | — | Z76 | ● | ● | — | — | IC circuit | — |
| | | | None | 2-wire | 24 V | 12 V | 100 V | — | Z73 | ● | ● | ● | — | — | Relay, PLC |
| | | | | | | | 100 V or less | — | Z80 | ● | ● | — | — | IC circuit | |

∗∗ 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) Y59A
3 m ····· L (Example) Y59AL
m ····· Z (Example) Y59AZ

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

• Since there are other applicable auto switches than listed, refer to page 569 for details.
• For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
• Auto switches are shipped together (not assembled).

## ⚠ Precautions

**Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.**

### Selection

## ⚠ Caution

**1. Operate the cylinder until the stroke end.**
If the stroke is restricted by the external stopper and clamp workpiece, effective cushioning and noise reduction will not be achieved.

**2. Adjust the cushion needles to absorb the kinetic energy during the cushion stroke so that excessive kinitic energy does not remain when the piston reaches the stroke end.**
If the piston reaches the stroke end with excessive kinetic energy remaining (more than the values given in table (1) below) due to an improper adjustment, excessive impact will occur, causing damage to machinery.

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

| Bore size (mm) | 20 | 25 | 32 |
|---|---|---|---|
| Piston speed (mm/s) | 50 to 700 | 50 to 600 | 50 to 600 |
| Allowable kinetic energy (J) | 0.17 | 0.27 | 0.32 |

### Cushion Needle Adjustment

## ⚠ Caution

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

| Bore size (mm) | 20 | 25 | 32 |
|---|---|---|---|
| Rotations | 2.5 rotations or less | | 3 rotations or less |

Use a 3 mm flat head watchmakers screwdriver to adjust the cushion needles to the fully closed position, as this will cause damage to the seals. The adjusting range for the cushion needles must be between the fully closed position and the open position ranges indicated in the table above. A retaining mechanism prevents the cushion needles from slipping out; however, they may spring out during operation if they are rotated beyond the ranges shown above.

Precautions for selection standard, mounting, piping, and operating environment are same as for the standard series.

## Specifications

| Bore size (mm) | 20 | 25 | 32 |
|---|---|---|---|
| **Fluid** | Air (Non-lube) | | |
| **Proof pressure** | 1.05 MPa | | |
| **Maximum operating pressure** | 0.7 MPa | | |
| **Minimum operating pressure** | 0.1 MPa | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | |
| **Piston speed** | 50 to 1000 mm/s | | |
| **Port size** | M5 x 0.8 | Rc 1/8 (NPT 1/8, G 1/8) | |
| **Bearing type** | Slide bearing, Ball bushing bearing (Same dimensions for both) | | |
| **Cushion** | Air cushion (Both ends) | | |

## Cushion mechanism

| Bore size (mm) | Effective cushion length (mm) | Absorbable kinetic energy (J) |
|---|---|---|
| **20** | 5.9 | 0.40 |
| **25** | 5.7 | 0.75 |
| **32** | 5.6 | 1.0 |

∗ Maximum load mass is the same as the standard type.

## Standard Stroke

(mm)

| Model | Standard stroke |
|---|---|
| **CXS□20** | 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 |
| **CXS□25**<br>**CXS□32** | 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100 |

## Theoretical Output

(N)

| Model | Rod size (mm) | Operating direction | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| **CXS□20** | 10 | OUT | 628 | 62.8 | 126 | 188 | 251 | 314 | 377 | 440 |
| | | IN | 471 | 47.1 | 94.2 | 141 | 188 | 236 | 283 | 330 |
| **CXS□25** | 12 | OUT | 982 | 98.2 | 196 | 295 | 393 | 491 | 589 | 687 |
| | | IN | 756 | 75.6 | 151 | 227 | 302 | 378 | 454 | 529 |
| **CXS□32** | 16 | OUT | 1608 | 161 | 322 | 482 | 643 | 804 | 965 | 1126 |
| | | IN | 1206 | 121 | 241 | 362 | 482 | 603 | 724 | 844 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

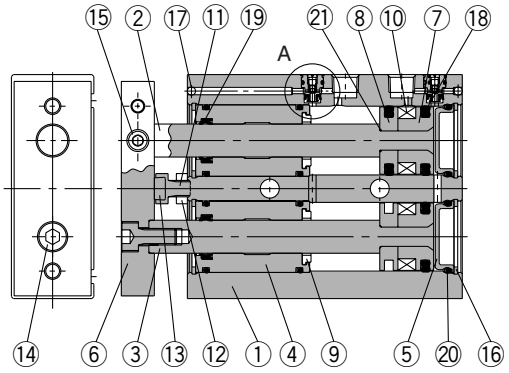
## Mass

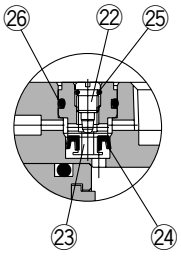
(kg)

| Model | Standard stroke (mm) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 |
| **CXSM20-□A** | 0.50 | 0.52 | 0.54 | 0.56 | 0.58 | 0.60 | 0.62 | 0.66 | 0.70 | 0.715 | 0.735 | 0.755 | 0.815 |
| **CXSL20-□A** | 0.52 | 0.54 | 0.56 | 0.58 | 0.60 | 0.62 | 0.64 | 0.68 | 0.72 | 0.735 | 0.755 | 0.775 | 0.835 |
| **CXSM25-□A** | — | 0.78 | 0.80 | 0.82 | 0.84 | 0.86 | 0.88 | 0.92 | 0.96 | 0.98 | 1.00 | 1.04 | 1.08 |
| **CXSL25-□A** | — | 0.79 | 0.81 | 0.83 | 0.85 | 0.87 | 0.89 | 0.93 | 0.97 | 0.99 | 1.01 | 1.05 | 1.09 |
| **CXSM32-□A** | — | 1.48 | 1.53 | 1.575 | 1.62 | 1.67 | 1.72 | 1.82 | 1.92 | 1.96 | 2.06 | 2.14 | 2.20 |
| **CXSL32-□A** | — | 1.51 | 1.55 | 1.60 | 1.64 | 1.69 | 1.74 | 1.84 | 1.94 | 1.98 | 2.08 | 2.16 | 2.22 |

## Construction

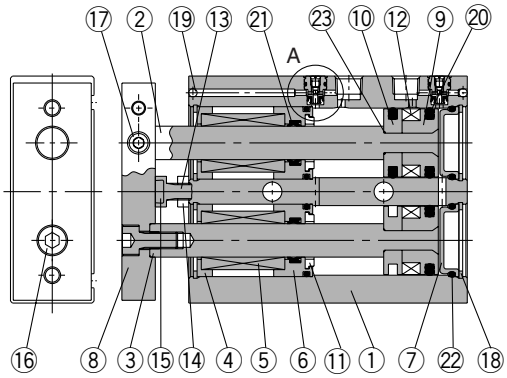
### CXSM/With air cushion

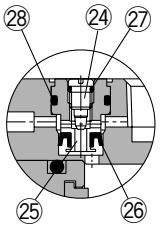



**Close-up of A**

### CXSL/With air cushion




**Close-up of A**

### Component Parts: CXSM

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Carbon steel | Hard chrome plated |
| 3 | **Piston rod B** | Carbon steel | Hard chrome plated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Head cover** | Special steel | Electroless nickel plated |
| 6 | **Plate** | Aluminum alloy | Glossy, self-coloring |
| 7 | **Piston A** | Aluminum alloy | Chromated |
| 8 | **Piston B** | Aluminum alloy | Chromated |
| 9 | **Bumper B** | Polyurethane | |
| 10 | **Magnet** | — | |
| 11 | **Bumper bolt** | Carbon steel | Nickel plated |
| 12 | **Hexagon nut** | Carbon steel | Nickel plated |
| 13 | **Bumper** | Polyurethane | |
| 14 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 15 | **Hexagon socket head set screw** | Chromium steel | Nickel plated |
| 16 | **Retaining ring** | Special steel | Phosphate coated |
| 17 | **Steel ball** | Special steel | Nickel plated |
| 18 | **Piston seal** | NBR | |
| 19 | **Rod seal** | NBR | |
| 20 | **O-ring** | NBR | |
| 21 | **O-ring** | NBR | |
| 22 | **Cushion needle** | Stainless steel | |
| 23 | **Check seal retainer** | Copper alloy | |
| 24 | **Check seal** | NBR | |
| 25 | **Needle gasket** | NBR | |
| 26 | **Check gasket** | NBR | |

### Component Parts: CXSL

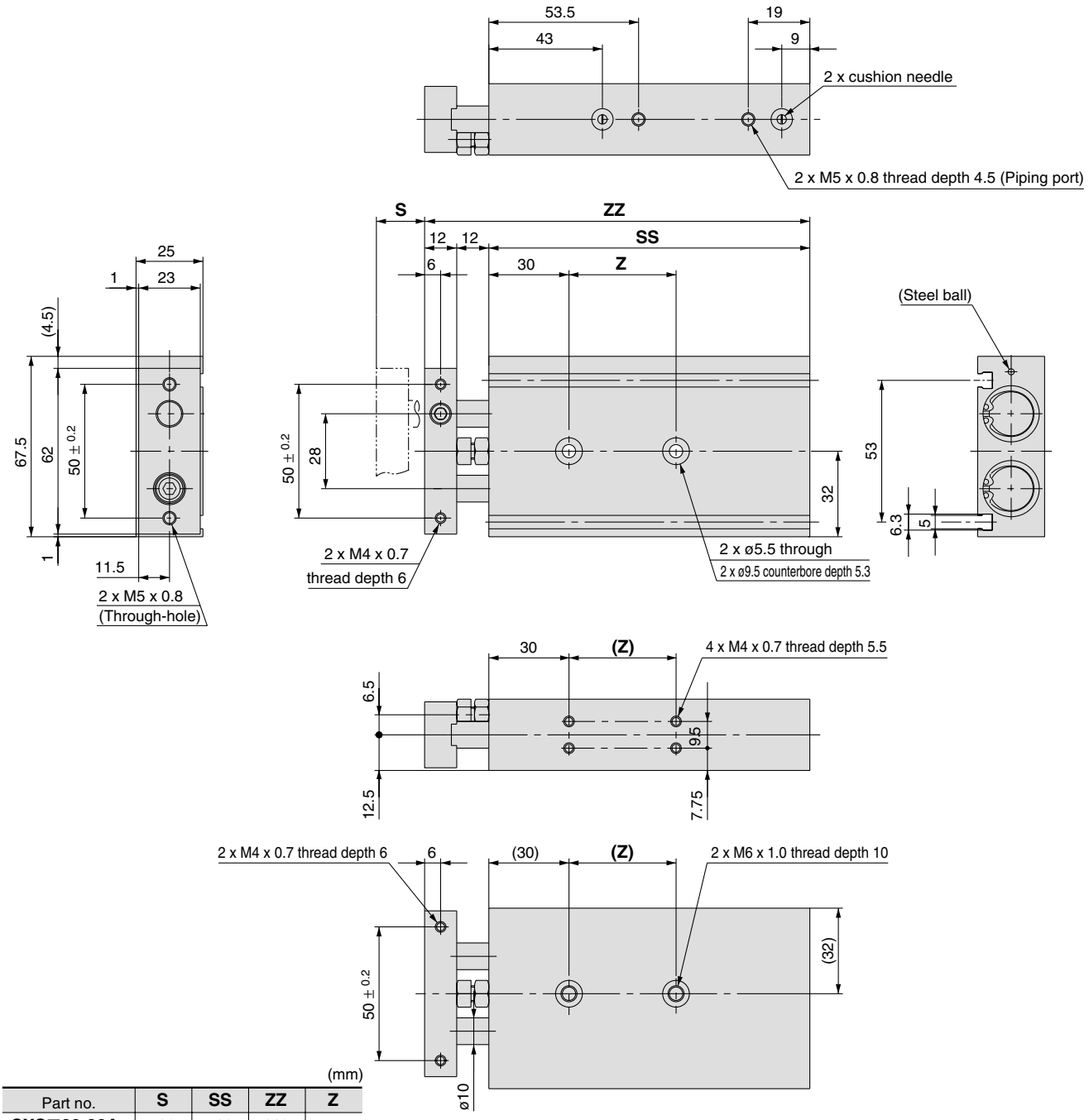
| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod A** | Special steel | Hard chrome plated |
| 3 | **Piston rod B** | Special steel | Hard chrome plated |
| 4 | **Bearing spacer** | Aluminum alloy | |
| 5 | **Ball bushing** | — | |
| 6 | **Bumper holder** | Aluminum alloy | |
| 7 | **Head cover** | Special steel | Electroless nickel plated |
| 8 | **Plate** | Aluminum alloy | Glossy, self-coloring |
| 9 | **Piston A** | Aluminum alloy | Chromated |
| 10 | **Piston B** | Aluminum alloy | Chromated |
| 11 | **Bumper B** | Polyurethane | |
| 12 | **Magnet** | — | |
| 13 | **Bumper bolt** | Carbon steel | Nickel plated |
| 14 | **Hexagon nut** | Carbon steel | Nickel plated |
| 15 | **Bumper** | Polyurethane | |
| 16 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 17 | **Hexagon socket head set screw** | Chromium steel | Nickel plated |
| 18 | **Retaining ring** | Special steel | Phosphate coated |
| 19 | **Steel ball** | Special steel | Nickel plated |
| 20 | **Piston seal** | NBR | |
| 21 | **Rod seal** | NBR | |
| 22 | **O-ring** | NBR | |
| 23 | **O-ring** | NBR | |
| 24 | **Cushion needle** | Stainless steel | |
| 25 | **Check seal retainer** | Copper alloy | |
| 26 | **Check seal** | NBR | |
| 27 | **Needle gasket** | NBR | |
| 28 | **Check gasket** | NBR | |

### Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|---|---|---|
| **20** | CXS□20A-PS | Set of nos. above ⑱, ⑲ and ⑳ |
| **25** | CXS□25A-PS | |
| **32** | CXS□32A-PS | |

∗ Seal kit includes ⑱, ⑲ and ⑳. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

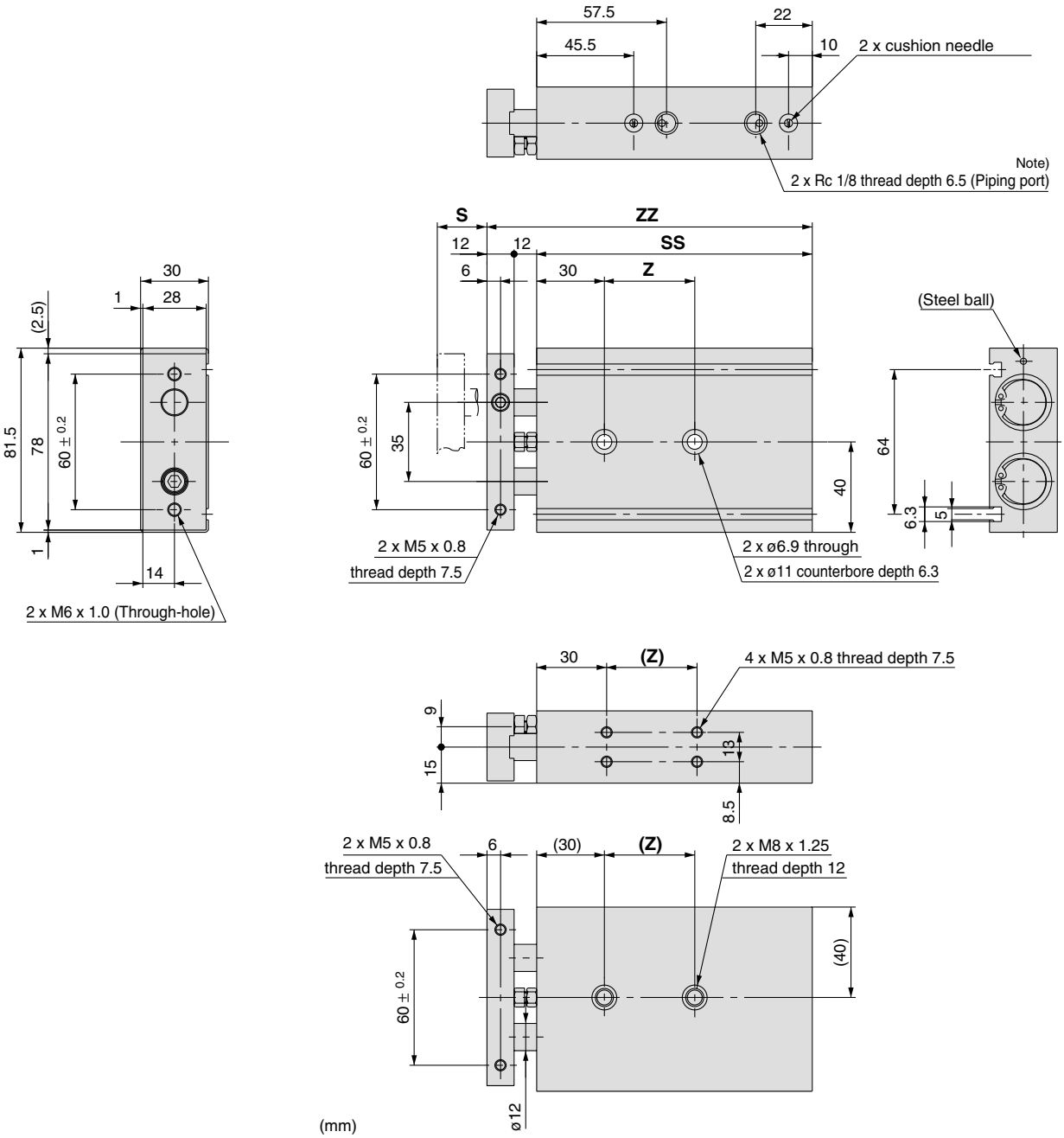
## Dimensions: ø20




(mm)

| Part no. | S | SS | ZZ | Z |
|---|---|---|---|---|
| **CXS□20-20A** | 20 | 92 | 116 | 30 |
| **CXS□20-25A** | 25 | 97 | 121 | |
| **CXS□20-30A** | 30 | 102 | 126 | 40 |
| **CXS□20-35A** | 35 | 107 | 131 | |
| **CXS□20-40A** | 40 | 112 | 136 | |
| **CXS□20-45A** | 45 | 117 | 141 | |
| **CXS□20-50A** | 50 | 122 | 146 | |
| **CXS□20-60A** | 60 | 132 | 156 | 60 |
| **CXS□20-70A** | 70 | 142 | 166 | |
| **CXS□20-75A** | 75 | 147 | 171 | |
| **CXS□20-80A** | 80 | 152 | 176 | |
| **CXS□20-90A** | 90 | 162 | 186 | |
| **CXS□20-100A** | 100 | 172 | 196 | |

## Dimensions: ø25

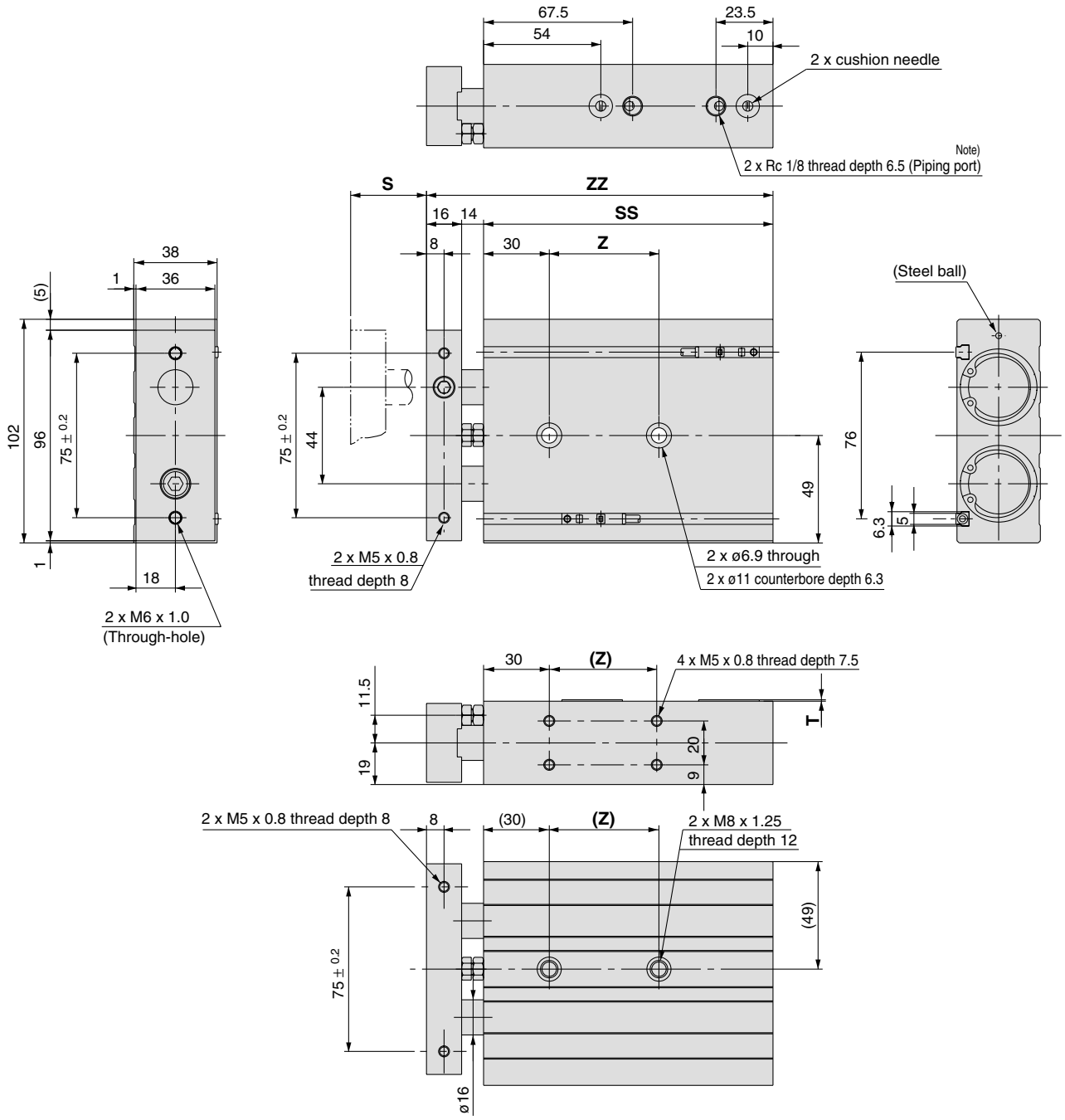



(mm)

| Part no. | S | SS | ZZ | Z |
|---|---|---|---|---|
| **CXS□25-25A** | 25 | 100 | 124 | 30 |
| **CXS□25-30A** | 30 | 105 | 129 | 40 |
| **CXS□25-35A** | 35 | 110 | 134 | |
| **CXS□25-40A** | 40 | 115 | 139 | |
| **CXS□25-45A** | 45 | 120 | 144 | |
| **CXS□25-50A** | 50 | 125 | 149 | |
| **CXS□25-60A** | 60 | 135 | 159 | 60 |
| **CXS□25-70A** | 70 | 145 | 169 | |
| **CXS□25-75A** | 75 | 150 | 174 | |
| **CXS□25-80A** | 80 | 155 | 179 | |
| **CXS□25-90A** | 90 | 165 | 189 | |
| **CXS□25-100A** | 100 | 175 | 199 | |

Note) For port threads TN and TF, only the piping port type varies.

## Dimensions: ø32



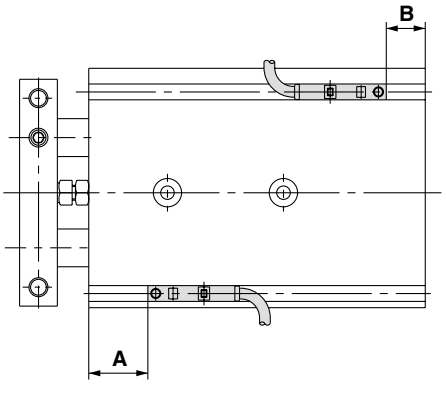

(mm)

| Part no. | S | SS | ZZ | Z |
|---|---|---|---|---|
| **CXS□32-25A** | 25 | 112 | 142 | 40 |
| **CXS□32-30A** | 30 | 117 | 147 | 50 |
| **CXS□32-35A** | 35 | 122 | 152 | |
| **CXS□32-40A** | 40 | 127 | 157 | |
| **CXS□32-45A** | 45 | 132 | 162 | |
| **CXS□32-50A** | 50 | 137 | 167 | |
| **CXS□32-60A** | 60 | 147 | 177 | 70 |
| **CXS□32-70A** | 70 | 157 | 187 | |
| **CXS□32-75A** | 75 | 162 | 192 | |
| **CXS□32-80A** | 80 | 167 | 197 | |
| **CXS□32-90A** | 90 | 177 | 207 | |
| **CXS□32-100A** | 100 | 187 | 217 | |

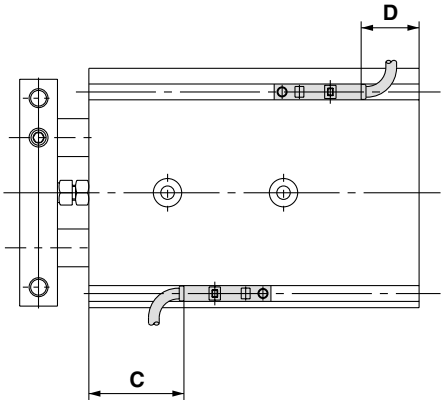
Note) For port threads TN and TF, only the piping port type varies.

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

**Electrical entry direction: Inward**




**Electrical entry direction: Outward**




| Bore size (mm) | A | B | D-Z7/Z8, D-Y7□W D-Y5□, D-Y7□ | | D-Y6□, D-Y7□V D-Y7□WV | | D-Y7BAL | |
|---|---|---|---|---|---|---|---|---|
| | | | C | D | C | D | C | D |
| **20** | 40.5 | 6.5 | 36.5(35) | 2.5(1) | 38.5 | 4 | 30.5 | –3.5 |
| **25** | 42 | 8 | 38(36.5) | 4(2.5) | 40 | 5.5 | 32 | –2 |
| **32** | 52.5 | 9.5 | 48.5(47) | 5.5(4) | 50.5 | 7 | 42.5 | –0.5 |

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

**As for auto switch mounting dimensions, auto switch mounting method and its operating range, those are the same as basic type. Refer to page 569.**

# Dual Rod Cylinder
# With End Lock for Retraction Side

# *Series CXS*

**ø6, ø10, ø15, ø20, ø25, ø32**

## How to Order

**Thread type**

| Symbol | Type | Bore size |
|---|---|---|
| **Nil** | M thread | ø6 to ø20 |
| | Rc 1/8 | ø25, ø32 |
| **TN** | NPT 1/8 | |
| **TF** | G 1/8 | |

**CXS M 10 ☐ – 50 R – Y7BW ☐**

**Bearing type**

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

**Bore size/Stroke (mm)**

| Bore size (mm) | Stroke (mm) |
|---|---|
| **6**, **10**, **15** | 10, 20, 30, 40, 50 |
| **20**, **25**, **32** | 10, 20, 30, 40, 50, 75, 100 |

**With end lock for retraction side**

**Number of auto switches**

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

**Auto switch**

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

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

**Applicable Auto Switch**/Refer to pages 1719 to 1827 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage DC | | Load voltage AC | Auto switch model Perpendicular | Auto switch model In-line | Lead wire length (m) ∗ 0.5 (Nil) | 3 (L) | 5 (Z) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | **Y69A** | **Y59A** | ● | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | | **Y7PV** | **Y7P** | ● | ● | ○ | ○ | | |
| | | | | 2-wire | | 12 V | | **Y69B** | **Y59B** | ● | ● | ○ | ○ | — | |
| | Diagnostic indication (2-color indication) | | | 3-wire (NPN) | | 5 V, 12 V | | **Y7NWV** | **Y7NW** | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | | **Y7PWV** | **Y7PW** | ● | ● | ○ | ○ | | |
| | | | | 2-wire | | 12 V | | **Y7BWV** | **Y7BW** | ● | ● | ○ | ○ | — | |
| | Water resistant (2-color indication) | | | | | | | — | **Y7BA**∗∗ | — | ● | ○ | ○ | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | — | **Z76** | ● | ● | — | — | IC circuit | — |
| | | | None | 2-wire | 24 V | 12 V | 100 V | — | **Z73** | ● | ● | ● | — | — | Relay, PLC |
| | | | | | | | 100 V or less | — | **Z80** | ● | ● | — | — | IC circuit | |

∗∗ 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) Y59A
3 m ····· L (Example) Y59AL
5 m ····· Z (Example) Y59AZ

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

• Since there are other applicable auto switches than listed, refer to page 569 for details.
• For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
• Auto switches are shipped together (not assembled).

## Specifications

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **Fluid** | Air (Non-lube) | | | | | |
| **Proof pressure** | 1.05 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa | | | | | |
| **Minimum operating pressure** | 0.3 MPa | | | | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 30 to 300mm/s | 30 to 800mm/s | 30 to 700mm/s | | 30 to 600mm/s | |
| **Cushion** | Bumper is standard on both ends | | | | | |
| **Port size** | M5 x 0.8 | | | | Rc 1/8 | |
| **Bearing type** | Slide bearing, Ball bushing bearing (Same dimensions for both) | | | | | |
| **Allowable kinetic energy** | 0.0023 J | 0.064 J | 0.095 J | 0.17 J | 0.27 J | 0.32 J |

## Lock Specifications

| **Lock specifications** | Rear end lock | | | | | |
|---|---|---|---|---|---|---|
| **Bore size (mm)** | **6** | **10** | **15** | **20** | **25** | **32** |
| **Maximum holding force (N)** | 14.7 | 39.2 | 98.1 | 157 | 235 | 382 |
| **Manual release** | Non-lock type | | | | | |

∗ Maximum load mass is the same as the standard type.

## Standard Stroke

(mm)

| Model | Standard stroke |
|---|---|
| **CXS□ 6** | 10, 20, 30, 40, 50 |
| **CXS□10** | |
| **CXS□15** | |
| **CXS□20** | 10, 20, 30, 40, 50, 75, 100 |
| **CXS□25** | |
| **CXS□32** | |

∗ Strokes which exceed the standard stroke length will be available as special goods.

## Theoretical Output

(N)

| Model | Rod size (mm) | Operating direction | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.15 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| **CXS□ 6** | 4 | OUT | 56 | — | 8.4 | 11.2 | 16.8 | 22.4 | 28.0 | 33.6 | 39.2 |
| | | IN | 31 | — | 4.6 | 6.2 | 9.3 | 12.4 | 15.5 | 18.6 | 21.7 |
| **CXS□10** | 6 | OUT | 157 | 15.7 | — | 31.4 | 47.1 | 62.8 | 78.5 | 94.2 | 110 |
| | | IN | 100 | 10.0 | — | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 |
| **CXS□15** | 8 | OUT | 353 | 35.3 | — | 70.6 | 106 | 141 | 177 | 212 | 247 |
| | | IN | 252 | 25.2 | — | 50.4 | 75.6 | 101 | 126 | 151 | 176 |
| **CXS□20** | 10 | OUT | 628 | 62.8 | — | 126 | 188 | 251 | 314 | 377 | 440 |
| | | IN | 471 | 47.1 | — | 94.2 | 141 | 188 | 236 | 283 | 330 |
| **CXS□25** | 12 | OUT | 982 | 98.2 | — | 196 | 295 | 393 | 491 | 589 | 687 |
| | | IN | 756 | 75.6 | — | 151 | 227 | 302 | 378 | 454 | 529 |
| **CXS□32** | 16 | OUT | 1608 | 161 | — | 322 | 482 | 643 | 804 | 965 | 1126 |
| | | IN | 1206 | 121 | — | 241 | 362 | 482 | 603 | 724 | 844 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

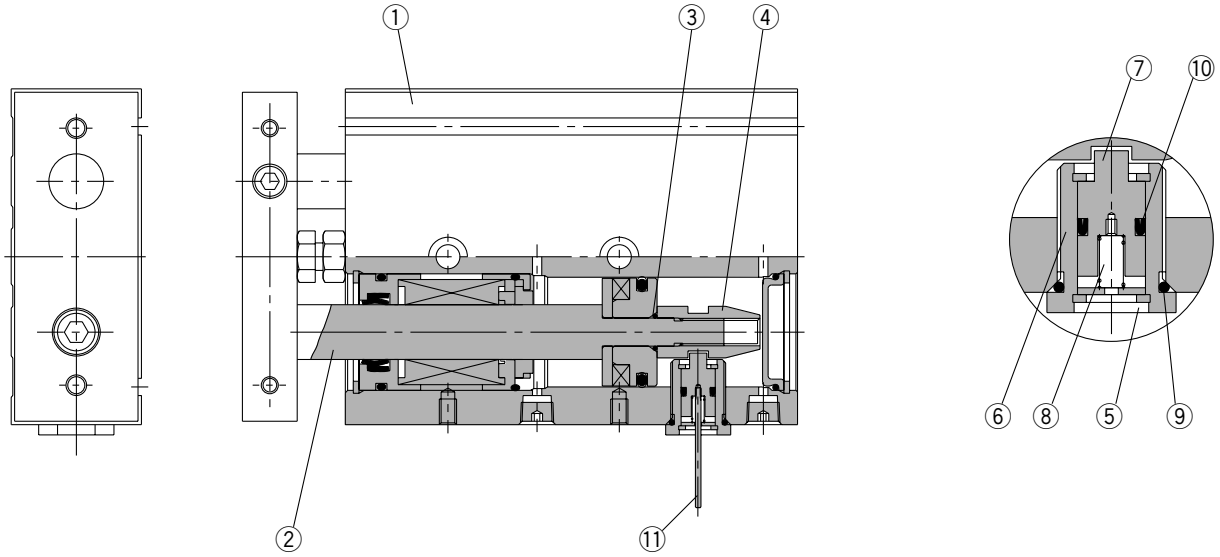
## Mass

(kg)

| Model | Standard stroke (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 |
| **CXSM6-□R** | 0.105 | 0.12 | 0.135 | 0.15 | 0.165 | — | — |
| **CXSL6-□R** | 0.105 | 0.12 | 0.135 | 0.15 | 0.165 | — | — |
| **CXSM10-□R** | 0.18 | 0.2 | 0.225 | 0.25 | 0.27 | — | — |
| **CXSL10-□R** | 0.18 | 0.2 | 0.225 | 0.25 | 0.27 | — | — |
| **CXSM15-□R** | 0.3 | 0.33 | 0.355 | 0.38 | 0.41 | — | — |
| **CXSL15-□R** | 0.32 | 0.35 | 0.375 | 0.4 | 0.43 | — | — |
| **CXSM20-□R** | 0.465 | 0.5 | 0.54 | 0.58 | 0.62 | 0.715 | 0.815 |
| **CXSL20-□R** | 0.485 | 0.52 | 0.56 | 0.60 | 0.64 | 0.735 | 0.835 |
| **CXSM25-□R** | 0.72 | 0.76 | 0.8 | 0.84 | 0.88 | 0.98 | 1.08 |
| **CXSL25-□R** | 0.73 | 0.77 | 0.81 | 0.85 | 0.89 | 0.99 | 1.09 |
| **CXSM32-□R** | 1.33 | 1.43 | 1.53 | 1.62 | 1.72 | 1.96 | 2.2 |
| **CXSL32-□R** | 1.35 | 1.45 | 1.55 | 1.64 | 1.74 | 1.98 | 2.22 |

## Construction: Slide Bearing

### CXSM6




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | Aluminum alloy | Hard anodized |
| 2 | **Piston rod B** | Carbon steel | Hard chrome plated |
| 3 | **O-ring** | NBR | |
| 4 | **Lock rod** | Special steel | |
| 5 | **Retaining ring** | Special steel | |
| 6 | **Lock holder** | Aluminum alloy | |
| 7 | **Lock pin** | Special steel | |
| 8 | **Lock spring** | Piano wire | |
| 9 | **O-ring** | NBR | |
| 10 | **Rod seal** | NBR | |
| 11 | **Manual lever** | Special steel | |

∗ Parts other than those listed above are the same as those for standard type.

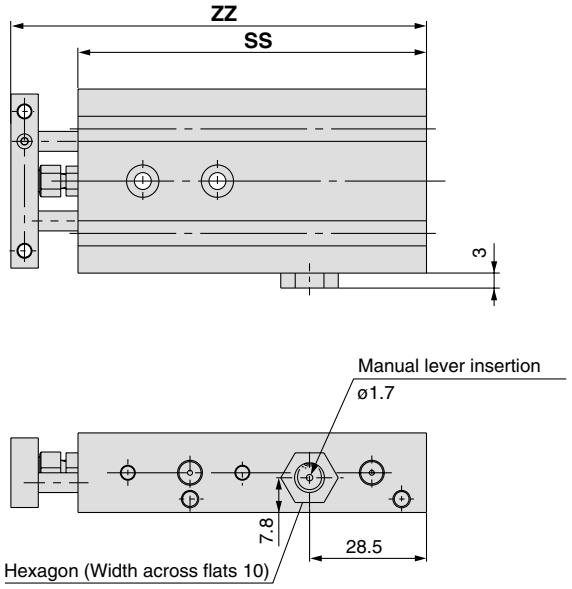
### Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|---|---|---|
| 6 | CXSRM6-PS | Includes the kit components of the seal kit featured on page 565 plus items ⑨ and ⑩ from the parts list above. |
| | CXSRL6APS | |
| 10 | CXSRM10-PS | |
| | CXSRL10APS | |
| 15 | CXSRM15-PS | |
| | CXSRL15APS | |
| 20 | CXSRM20-PS | |
| | CXSRL20APS | |
| 25 | CXSRM25-PS | |
| | CXSRL25APS | |
| 32 | CXSRM32-PS | |
| | CXSRL32APS | |

∗ Seal kits includes the basic type seal (page 565), ⑨ and ⑩. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.:GR-S-010** (10 g)

## Dimensions: ø6, ø10, ø15

### CXS□6-□R

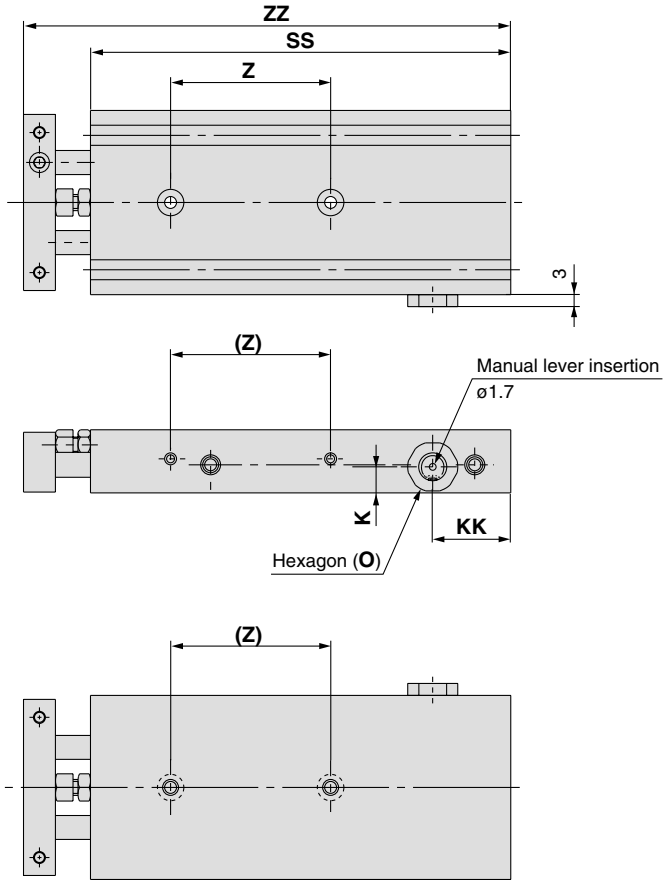



(mm)

| Model | SS | ZZ |
|---|---|---|
| **CXS□6-10R** | 75 | 88.5 |
| **CXS□6-20R** | 85 | 98.5 |
| **CXS□6-30R** | 95 | 108.5 |
| **CXS□6-40R** | 105 | 118.5 |
| **CXS□6-50R** | 115 | 128.5 |

∗ Dimensions other than those listed above are the same as for the standard type.

### CXS□$^{10}_{15}$-□R




(mm)

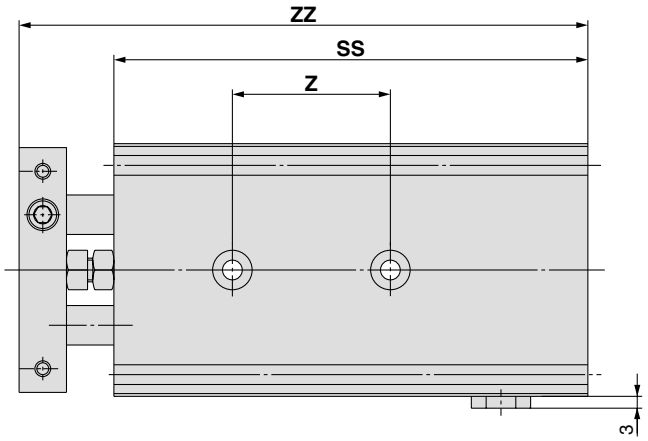
| Model | K | O |
|---|---|---|
| **CXS□10-□R** | 6.5 | Width across flats 12 |
| **CXS□15-□R** | 8.5 | Width across flats 13 |

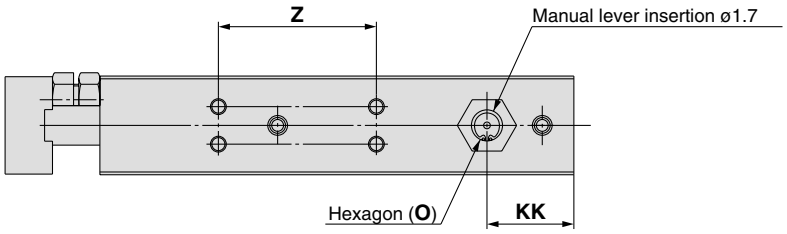
(mm)

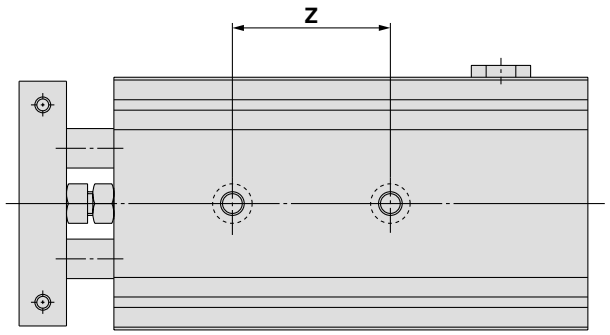
| Symbol / Stroke / Model | KK | | | | | SS | | | | | Z | | | | | ZZ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 10 | 20 | 30 | 40 | 50 | 10 | 20 | 30 | 40 | 50 | 10 | 20 | 30 | 40 | 50 |
| **CXS□10-□R** | 19.5 | | | 24.5 | | 80 | 90 | 100 | 115 | 125 | 30 | 40 | | 50 | | 97 | 107 | 117 | 132 | 142 |
| **CXS□15-□R** | 20.5 | | | | | 90 | 100 | 110 | 120 | 130 | 35 | | | 45 | | 109 | 119 | 129 | 139 | 149 |

∗ Dimensions other than those listed above are the same as for the standard type.

## Dimensions: ø20, ø25, ø32




(mm)

| Model | O |
|---|---|
| **CXS□20-□R** | Width across flats13 |
| **CXS□25-□R** | Width across flats16 |
| **CXS□32-□R** | Width across flats19 |

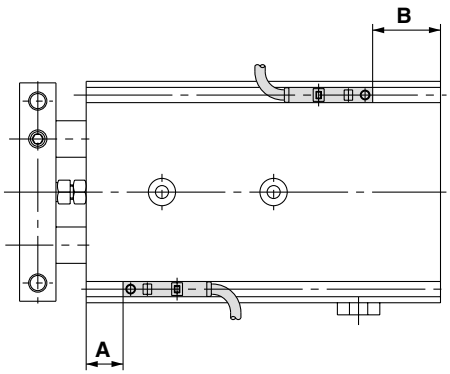
(mm)

| Model \ Symbol / Stroke | KK | | | | | | | SS | | | | | | | Z | | | | | | | ZZ | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 10 | 20 | 30 | 40 | 50 | 75 | 100 |
| **CXS□20-□R** | 22 | | | | | 27 | 22 | 100 | 110 | 120 | 130 | 140 | 170 | 190 | 40 | | | 60 | | | 80 | 124 | 134 | 144 | 154 | 164 | 194 | 214 |
| **CXS□25-□R** | 24.5 | | 29.5 | | 24.5 | | | 107 | 117 | 132 | 142 | 147 | 172 | 197 | 40 | | 60 | | | | 80 | 131 | 141 | 156 | 166 | 171 | 196 | 221 |
| **CXS□32-□R** | 29 | | | | | 34 | 49 | 122 | 132 | 142 | 152 | 162 | 192 | 232 | 50 | | 70 | | | 90 | | 152 | 162 | 172 | 182 | 192 | 222 | 262 |

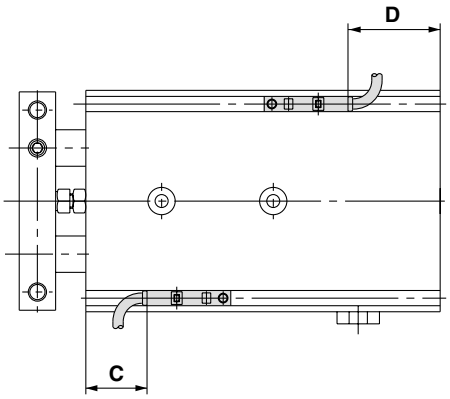
∗ Dimensions other than those listed above are the same as for the standard type.

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

**Electrical entry direction: Inward**




**Electrical entry direction: Outward**




| Bore size (mm) | A | B | D-Z7/Z8, D-Y7□W D-Y5□, D-Y7□ | | D-Y6□, D-Y7□V D-Y7□WV | | D-Y7BAL | |
|---|---|---|---|---|---|---|---|---|
| | | | C | D | C | D | C | D |
| **6** | 15.5 | 24.5 | 11.5 (10) | 20.5 (19) | 13 | 22 | 5.5 | 14.5 |
| **10** | 22.5 | 22.5 | 18.5 (17) | 18.5 (17) | 20 | 20 | 12.5 | 12.5 |
| **15** | 30.5 | 24.5 | 26.5 (25) | 20.5 (19) | 28 | 22 | 20.5 | 14.5 |
| **20** | 38 | 27 | 34 (32.5) | 23 (21.5) | 36 | 24.5 | 28 | 17 |
| **25** | 38 | 34 | 34 (32.5) | 30 (28.5) | 36 | 31.5 | 28 | 24 |
| **32** | 48 | 39 | 44 (42.5) | 35 (33.5) | 46 | 6.5 | 38 | 29 |

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

**As for auto switch mounting dimensions, auto switch mounting method and its operating range, those are the same as basic type. Refer to page 569.**

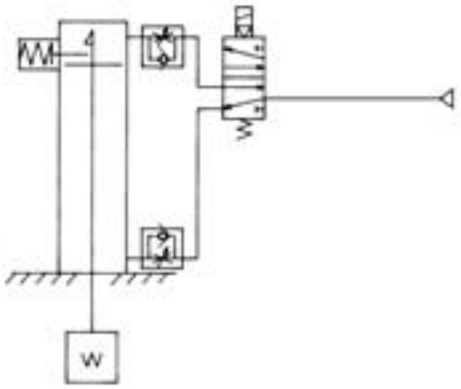
# Series CXS
# With End Lock for Retraction Side
# Specific Product Precautions

**Be sure to read before handling.**
**Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.**

## Recommended Pneumatic Circuit

### ⚠ Caution

**●This is necessary for the proper operation and release of the lock.**




## Handling Precautions

### ⚠ Caution

1. **Do not use 3 position solenoid valves.**
   Avoid using in combination with 3 position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Even after being locked, the lock may be released after some time, due to air leakage from the solenoid valve entering the cylinder.
2. **Back pressure is required to release the end lock.**
   Be sure that air is supplied to the cylinder side without the locking mechanism (For cylinders with a double lock, the side with an unlocked piston rod) before starting operation, as shown in the drawing on the left. The lock may not be released. (➔ Refer to the section on releasing the lock.)
3. **Release the lock when mounting and adjusting the cylinder.**
   An attempt to mount or adjust a cylinder while it is locked can damage the lock.
4. **Operate with a load ratio of 50% or less.**
   If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
5. **Do not operate multiple cylinders in synchronization.**
   Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.
6. **Install speed controllers as they will be meter-out control.**
   When they are used under meter-in control, the lock may not be released.
7. **Never adjust the retracting stroke using a bumper bolt or external stopper. The lock will not function.**

## Operating Pressure

### ⚠ Caution

1. Apply a pressure more than 0.3 MPa to the port on the side with the locking mechanism. The pressure is necessary to release the lock.

## Exhaust Speed

### ⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

## Releasing the lock

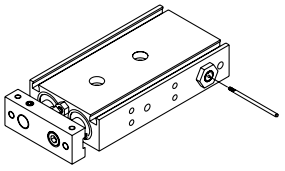
### ⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the Recommended Pneumatic Circuit.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the slide table is extremely dangerous.

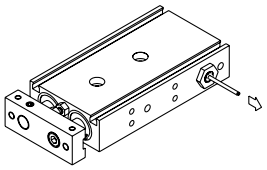
## Manual Release

**Manual release (Non-locking type)**

1. Insert the manual lever and screw it into the lock holder assembly. If the lever is screwed in sidelong, it may damage the lock spring.



2. To unlock, pull the manual lever in the direction of the arrow. Release the manual lever to return the cylinder to a ready-to-lock state.



3. The manual lever (ø1.6 x 35 ℓ, tip part: M1.6 x 0.35 x 3 ℓ) is included with the cylinder. If additional manual levers are required, use the following part number to place an order: CXS06-48BK2777 (for all series).

### ⚠ Caution

Do not use the cylinder while the manual lever is screwed in. It may damage the lock mechanism.

# Dual Rod Cylinder
# Double Rod Type
# *Series CXSW*
## ø6, ø10, ø15, ø20, ø25, ø32

## How to Order

**Thread type**

| Symbol | Type | Bore size |
|---|---|---|
| **Nil** | M thread | ø6 to ø20 |
| | Rc 1/8 | ø25, ø32 |
| **TN** | NPT 1/8 | |
| **TF** | G 1/8 | |

**CXS W L 20 ☐ – 100 – Y7BW ☐**

**Double rod type**

**Bearing type**

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

**Bore size/Stroke (mm)**

| Bore size | Standard stroke |
|---|---|
| **6** | 10, 20, 30, 40, 50 |
| **10, 15** | 10, 20, 30, 40, 50 |
| **20, 25, 32** | 10, 20, 30, 40, 50, 75, 100 |

**Auto switch**

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

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

**Nimber of auto switches**

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

## Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage DC | Load voltage AC | Auto switch model: Perpendicular | Auto switch model: In-line | Lead wire length (m) ∗ 0.5 (Nil) | 3 (L) | 5 (Z) | Pre-wired connector | Applicable load | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | **Y69A** | **Y59A** | ● | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | **Y7PV** | **Y7P** | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | **Y69B** | **Y59B** | ● | ● | ○ | ○ | — | |
| | Diagnostic indication (2-color indication) | | | 3-wire (NPN) | 24 V | 5 V, 12 V | **Y7NWV** | **Y7NW** | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | **Y7PWV** | **Y7PW** | ● | ● | ○ | ○ | | |
| | | | | 2-wire | 12 V | | **Y7BWV** | **Y7BW** | ● | ● | ○ | ○ | — | |
| | Water resistant (2-color indication) | | | | | | — | **Y7BA**∗∗∗ | — | ● | ○ | ○ | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | **Z76** | ● | ● | — | — | IC circuit | — |
| | | | None | 2-wire | 24 V | 12 V | — | **Z73** | ● | ● | ● | — | — | Relay, PLC |
| | | | | | | 100 V or less | — | **Z80** | ● | ● | — | — | IC circuit | |

∗∗∗ 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) Y59A
3 m ····· L (Example) Y59AL
5 m ····· Z (Example) Y59AZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ ø10, 15, 20 are not applicable. Please consult with SMC separately.

- Since there are other applicable auto switches than listed, refer to page 569 for details.
- For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
- Auto switches are shipped together (not assembled).

## Specifications

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **Fluid** | Air (Non-lube) | | | | | |
| **Proof pressure** | 1.05 MPa | | | | | |
| **Maximum operating pressure** | 0.7 MPa | | | | | |
| **Minimum operating pressure** | 0.15 MPa | | | 0.1 MPa | | |
| **Ambient and fluid temperature** | –10 to 60°C (No freezing) | | | | | |
| **Piston speed** | 50 to 500 mm/s | | | | | |
| **Cushion** | Bumper is standard on both ends | | | | | |
| **Stroke adjustable range** | 0 to –10 mm compared to the standard stroke (Extended end: 5 mm, Retracted end: 5 mm) | | | | | |
| **Port size** | M5 x 0.8 | | | | Rc 1/8 | |
| **Bearing type** | Slide bearing, Ball bushing bearing (Same dimensions for both) | | | | | |

## Standard Stroke

(mm)

| Model | Standard stroke | Long stroke |
|---|---|---|
| **CXSW□ 6** | 10, 20, 30, 40, 50 | — |
| **CXSW□10** | 10, 20, 30, 40, 50 | 75, 100, 125, 150 |
| **CXSW□15** | | |
| **CXSW□20** | 10, 20, 30, 40, 50, 75, 100 | 125, 150, 175, 200 |
| **CXSW□25** | | |
| **CXWS□32** | | |

∗ For long strokes, it will be made-to-order. (–XB11)

## Theoretical Output

(N)

| Model | Rod size (mm) | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| **CXSW□ 6** | 4 | 31 | 4.6 | 6.2 | 9.3 | 12.4 | 15.5 | 18.6 | 21.7 |
| **CXSW□10** | 6 | 100 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| **CXSW□15** | 8 | 252 | 25.2 | 50.4 | 75.6 | 101 | 126 | 151 | 176 |
| **CXSW□20** | 10 | 471 | 47.1 | 94.2 | 141 | 188 | 236 | 283 | 330 |
| **CXSW□25** | 12 | 756 | 75.6 | 151 | 227 | 302 | 378 | 454 | 529 |
| **CXSW□32** | 16 | 1206 | 121 | 241 | 362 | 482 | 603 | 724 | 844 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

## Mass

(kg)

| Model | Standard stroke (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 |
| **CXSWM 6** | 0.11 | 0.13 | 0.14 | 0.16 | 0.17 | — | — |
| **CXSWL 6** | 0.12 | 0.13 | 0.15 | 0.16 | 0.18 | — | — |
| **CXSWM10** | 0.24 | 0.26 | 0.28 | 0.30 | 0.32 | 0.37 | 0.42 |
| **CXSWL 10** | 0.25 | 0.27 | 0.29 | 0.31 | 0.33 | 0.38 | 0.43 |
| **CXSWM15** | 0.43 | 0.45 | 0.48 | 0.51 | 0.54 | 0.61 | 0.68 |
| **CXSWL 15** | 0.47 | 0.50 | 0.52 | 0.55 | 0.58 | 0.65 | 0.42 |
| **CXSWM20** | 0.71 | 0.74 | 0.78 | 0.82 | 0.85 | 0.95 | 1.04 |
| **CXSWL 20** | 0.75 | 0.79 | 0.82 | 0.86 | 0.90 | 0.99 | 1.08 |
| **CXSWM25** | 1.06 | 1.11 | 1.17 | 1.22 | 1.28 | 1.41 | 1.55 |
| **CXSWL 25** | 1.07 | 1.12 | 1.18 | 1.23 | 1.29 | 1.42 | 1.56 |
| **CXSWM32** | 2.04 | 2.12 | 2.21 | 2.29 | 2.38 | 2.59 | 2.81 |
| **CXSWL 32** | 2.06 | 2.15 | 2.23 | 2.32 | 2.41 | 2.62 | 2.83 |

Made to Order

### Made to Order Specifications

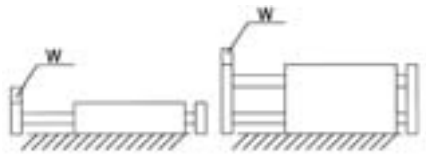
**(For details, refer to page 1861.)**

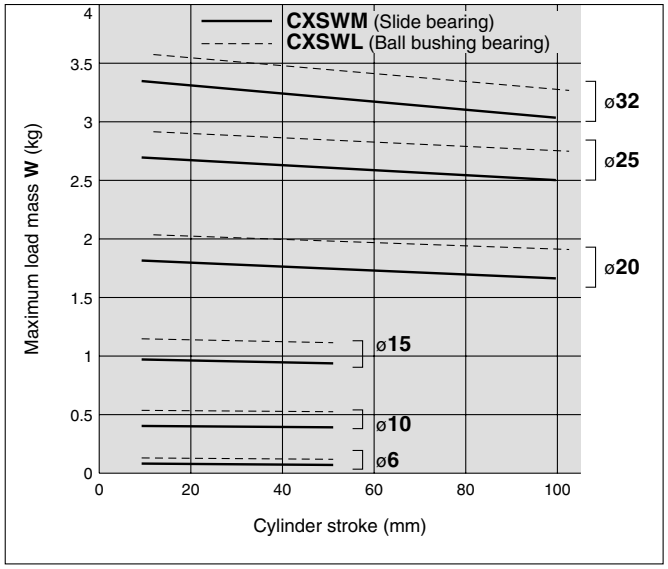
| Symbol | Specifications |
|---|---|
| **–XB11** | Long stroke |

## Operating Conditions

### Maximum Load Mass

When the cylinder is mounted as shown in the diagrams below, the maximum load mass W should not exceed the values illustrated in the graph immediately following the diagrams.

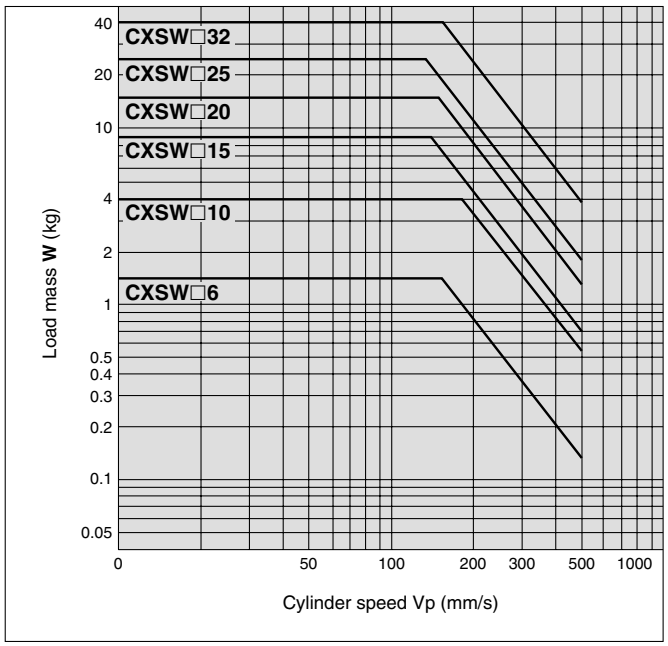



Note) Please consult with SMC regarding the maximum load mass for long strokes depending on your specific usage conditions.

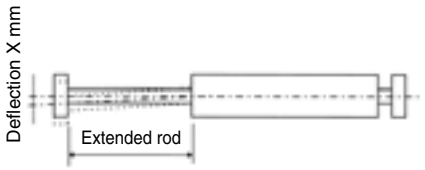
### Allowable Kinetic Energy

Operate a vertically mounted cylinder with a load mass and cylinder speed not exceeding the ranges shown in the graph below. A horizontally mounted cylinder should also be operated with a load mass less than the ranges given in the graph at left. Cylinder speed should be adjusted using a speed controller.




### Deflection at the Plate End

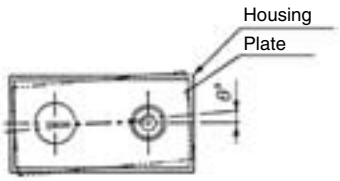
An approximate plate-end deflection X without a load is shown in the table below.




| Bore size (mm) | **6 to 32** |
|---|---|
| **CXSWM** (Slide bearing) | ±0.03 mm |
| **CXSWL** (Ball bushing bearing) | |

### Non-rotating accuracy

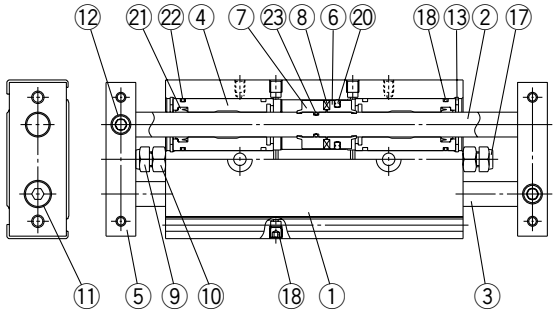
Non-rotating accuracy θ° without a load should be less than or equal to the value provided in the table below as a guide.

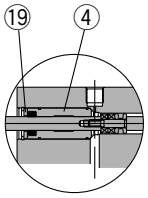



| Bore size (mm) | **6 to 32** |
|---|---|
| **CXSWM** (Slide bearing) | ±0.1° |
| **CXSWL** (Ball bushing bearing) | |

## Construction

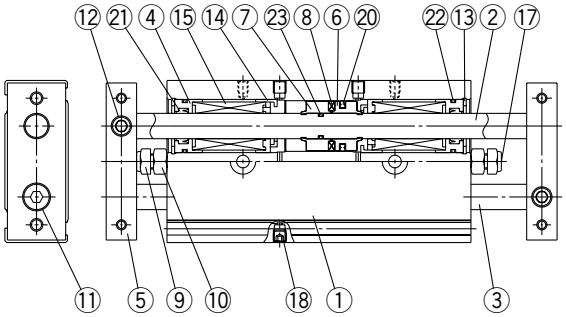
### CXSWM (Slide bearing)

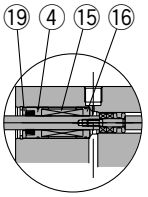


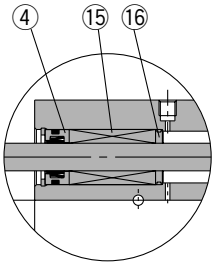

**CXSWM6**

### CXSWL (Ball bushing bearing)



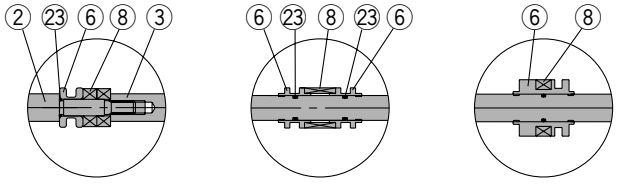




**CXSWL6**




**CXSWL10, 15**

**(Piston part)**




**CXSW□6** **CXSW□10** **CXSW□25, 32**

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Housing** | luminum alloy | ard anodized |
| 2 | **Piston rod A** | Carbon steel | Hard chrome plated |
| 3 | **Piston rod B** | Carbon steel | Hard chrome plated |
| 4 | **Rod cover** | Aluminum bearing alloy | |
| 5 | **Plate** | Aluminum alloy | Hard anodized |
| 6 | **Piston A** | Aluminum alloy | Chromated |
| 7 | **Piston B** | Aluminum alloy | Chromated |
| 8 | **Magnet** | — | |
| 9 | **Bumper bolt** | Carbon steel | Nickel plated |
| 10 | **Hexagon nut** | Carbon steel | Nickel plated |
| 11 | **Hexagon socket head cap screw** | Chromium steel | Nickel plated |
| 12 | **Hexagon socket head set screw** | Chromium steel | Nickel plated |

Note) Piston rod for CXSL is quenched.

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 13 | **Retaining ring** | Special steel | Phosphate coated |
| 14 | **Bumper holder** | Synthetic resin | |
| 15 | **Ball bushing** | — | |
| 16 | **Bearing spacer** | Synthetic resin | |
| 17 | **Bumper** | Polyurethane | |
| 18 | **Plug** | Chromium steel | Nickel plated |
| 19 | **Seal retainer** | Aluminum alloy | |
| 20* | **Piston seal** | NBR | |
| 21* | **Rod seal** | NBR | |
| 22* | **O-ring** | NBR | |
| 23 | **O-ring** | NBR | |

∗ For CXSWL6, aluminum bearing alloy is used for ⑯.

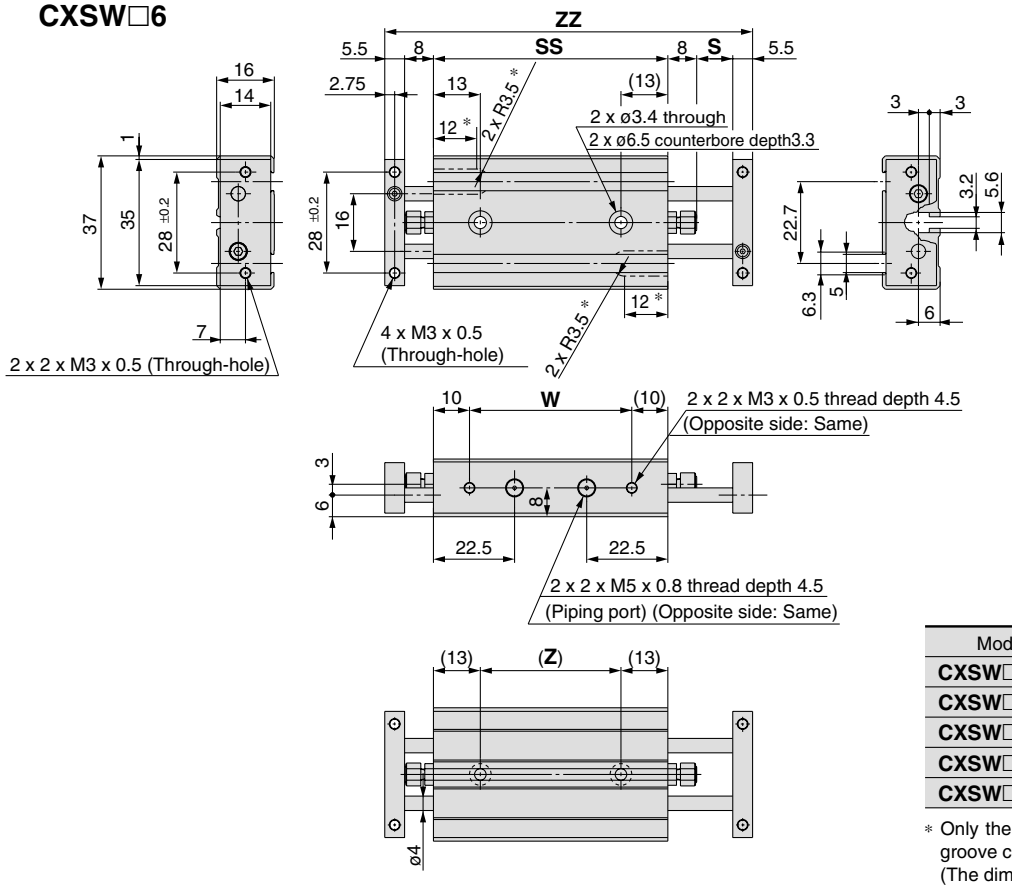
### Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|---|---|---|
| 6 | CXSWM6-PS | Set of nos. above ⑳, ㉑ and ㉒ |
| | CXSWL6-PS | |
| 10 | CXSWM10-PS | |
| | CXSWL10APS | |
| 15 | CXSWM15-PS | |
| | CXSWL15APS | |
| 20 | CXSWM20-PS | |
| | CXSWL20APS | |
| 25 | CXSWM25-PS | |
| | CXSWL25APS | |
| 32 | CXSWM32-PS | |
| | CXSWL32APS | |

∗ Seal kit includes ⑳ to ㉒. To order them, use the order number given in the left table.
∗ Since the seal kit does not include a grease pack, order it separately.
**Grease pack part no.: GR-S-010** (10 g)

## Dimensions: ø6, ø10

### CXSW□6

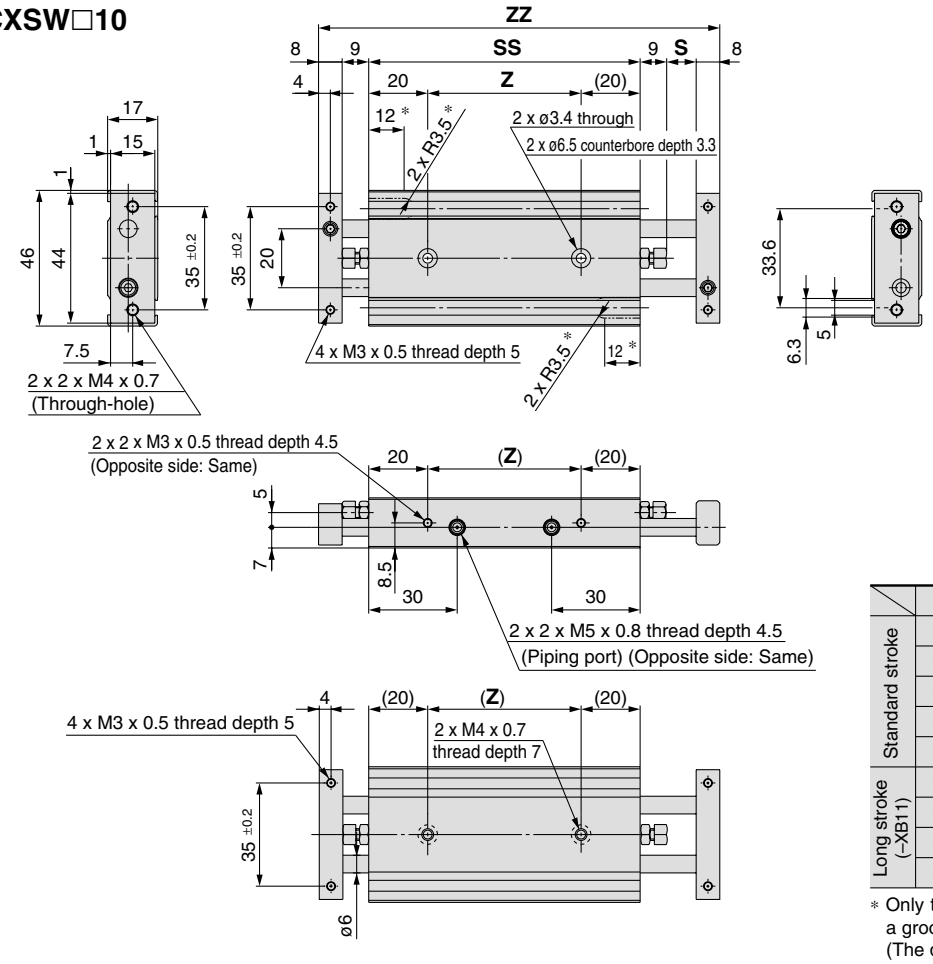



(mm)

| Model | S | SS | ZZ | Z | W |
|---|---|---|---|---|---|
| **CXSW□6-10** | 10 | 66 | 103 | 40 | 46 |
| **CXSW□6-20** | 20 | 76 | 123 | 50 | 56 |
| **CXSW□6-30** | 30 | 86 | 143 | 60 | 66 |
| **CXSW□6-40** | 40 | 96 | 163 | 70 | 76 |
| **CXSW□6-50** | 50 | 106 | 183 | 80 | 86 |

∗ Only the CXSW□6-10 and the CXSW□6-20 have a groove cut out for installing auto switches.
(The dimensions are marked "∗".)

### CXSW□10



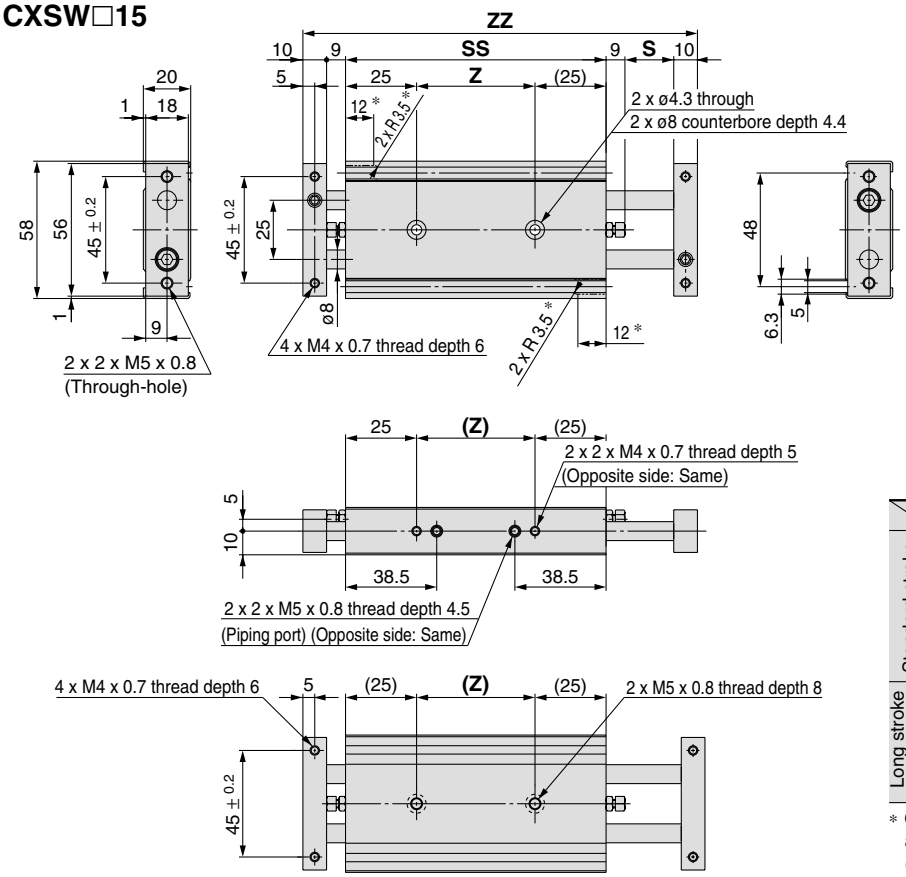

(mm)

| | Model | S | SS | ZZ | Z |
|---|---|---|---|---|---|
| Standard stroke | **CXSW□10-10** | 10 | 92 | 136 | 52 |
| | **CXSW□10-20** | 20 | 102 | 156 | 62 |
| | **CXSW□10-30** | 30 | 112 | 176 | 72 |
| | **CXSW□10-40** | 40 | 122 | 196 | 82 |
| | **CXSW□10-50** | 50 | 132 | 216 | 92 |
| Long stroke (-XB11) | **CXSW□10-75** | 75 | 157 | 266 | 117 |
| | **CXSW□10-100** | 100 | 182 | 316 | 142 |
| | **CXSW□10-125** | 125 | 207 | 366 | 167 |
| | **CXSW□10-150** | 150 | 232 | 416 | 192 |

∗ Only the CXSW□10-10 and the CXSW□10-20 have a groove cut out for installing auto switches.
(The dimensions are marked "∗".)

## Dimensions: ø15, ø20

### CXSW□15

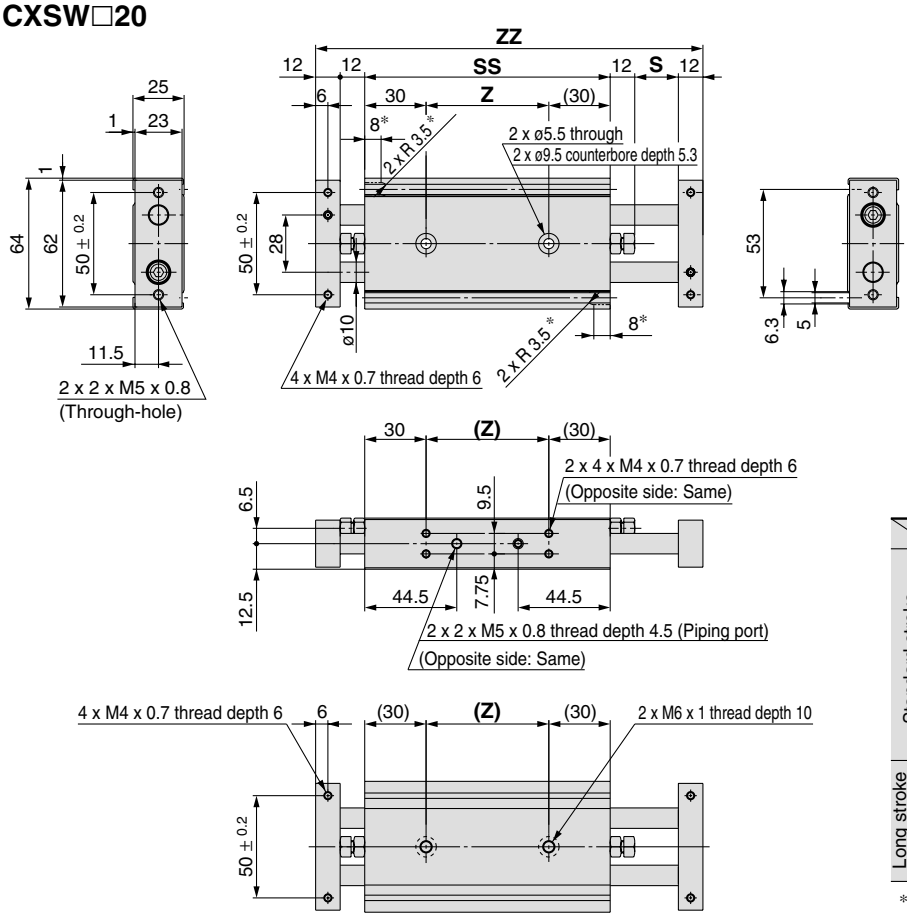



(mm)

| | Model | S | SS | ZZ | Z |
|---|---|---|---|---|---|
| Standard stroke | **CXSW□15-10** | 10 | 105 | 153 | 55 |
| | **CXSW□15-20** | 20 | 115 | 173 | 65 |
| | **CXSW□15-30** | 30 | 125 | 193 | 75 |
| | **CXSW□15-40** | 40 | 135 | 213 | 85 |
| | **CXSW□15-50** | 50 | 145 | 233 | 95 |
| Long stroke (-XB11) | **CXSW□15-75** | 75 | 170 | 283 | 120 |
| | **CXSW□15-100** | 100 | 195 | 333 | 145 |
| | **CXSW□15-125** | 125 | 220 | 383 | 170 |
| | **CXSW□15-150** | 150 | 245 | 433 | 195 |

∗ Only the CXSW□15-10 and the CXSW□15-20 have a groove cut out for installing auto switches.
(The dimensions are marked "∗".)

### CXSW□20



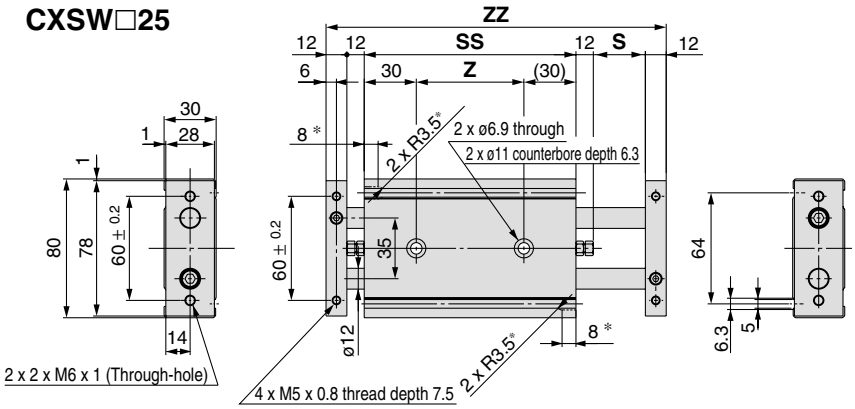

(mm)

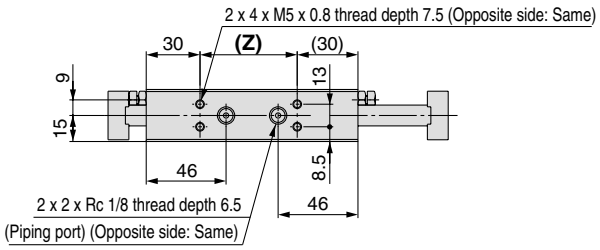
| | Model | S | SS | ZZ | Z |
|---|---|---|---|---|---|
| Standard stroke | **CXSW□20-10** | 10 | 120 | 178 | 60 |
| | **CXSW□20-20** | 20 | 130 | 198 | 70 |
| | **CXSW□20-30** | 30 | 140 | 218 | 80 |
| | **CXSW□20-40** | 40 | 150 | 238 | 90 |
| | **CXSW□20-50** | 50 | 160 | 258 | 100 |
| | **CXSW□20-75** | 75 | 185 | 308 | 125 |
| | **CXSW□20-100** | 100 | 210 | 358 | 150 |
| Long stroke (-XB11) | **CXSW□20-125** | 125 | 235 | 408 | 175 |
| | **CXSW□20-150** | 150 | 260 | 458 | 200 |
| | **CXSW□20-175** | 175 | 285 | 508 | 225 |
| | **CXSW□20-200** | 200 | 310 | 558 | 250 |

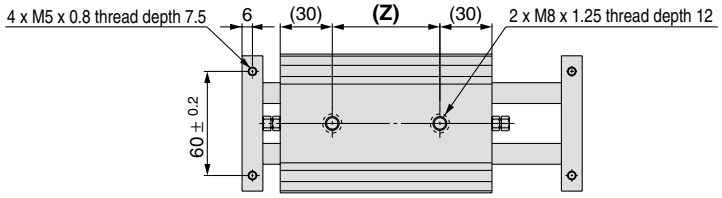
∗ Only the CXSW□20-10 has a groove cut out for installing auto switches.
(The dimensions are marked "∗".)

## Dimensions: ø25, ø32

### CXSW□25



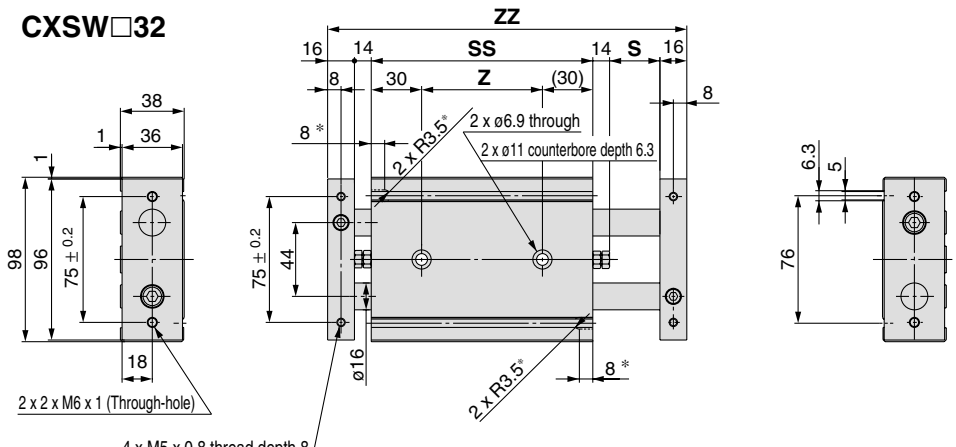



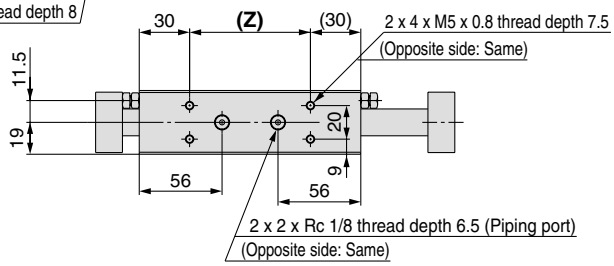

(mm)

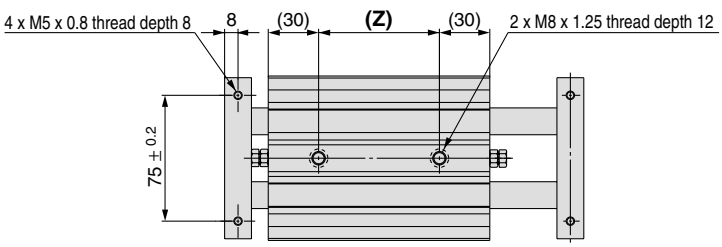
| | Model | S | SS | ZZ | Z |
|---|---|---|---|---|---|
| Standard stroke | **CXSW□25-10** | 10 | 122 | 180 | 62 |
| | **CXSW□25-20** | 20 | 132 | 200 | 72 |
| | **CXSW□25-30** | 30 | 142 | 220 | 82 |
| | **CXSW□25-40** | 40 | 152 | 240 | 92 |
| | **CXSW□25-50** | 50 | 162 | 260 | 102 |
| | **CXSW□25-75** | 75 | 187 | 310 | 127 |
| | **CXSW□25-100** | 100 | 212 | 360 | 152 |
| Long stroke (-XB11) | **CXSW□25-125** | 125 | 237 | 410 | 177 |
| | **CXSW□25-150** | 150 | 262 | 460 | 202 |
| | **CXSW□25-175** | 175 | 287 | 510 | 227 |
| | **CXSW□25-200** | 200 | 312 | 560 | 252 |

* Only the CXSW□25-10 has a groove cut out for installing auto switches.
(The dimensions are marked "*".)

### CXSW□32



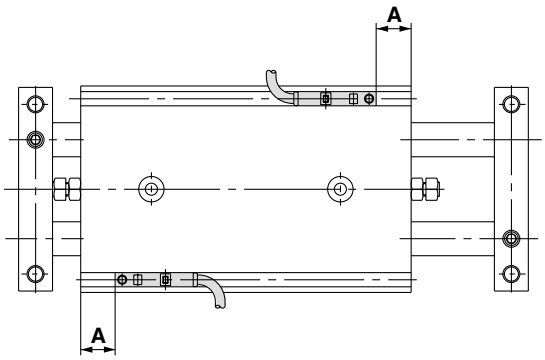

(mm)

| | Model | S | SS | ZZ | Z |
|---|---|---|---|---|---|
| Standard stroke | **CXSW□32-10** | 10 | 143 | 213 | 83 |
| | **CXSW□32-20** | 20 | 153 | 233 | 93 |
| | **CXSW□32-30** | 30 | 163 | 253 | 103 |
| | **CXSW□32-40** | 40 | 173 | 273 | 113 |
| | **CXSW□32-50** | 50 | 183 | 293 | 123 |
| | **CXSW□32-75** | 75 | 208 | 343 | 148 |
| | **CXSW□32-100** | 100 | 233 | 393 | 173 |
| Long stroke (-XB11) | **CXSW□32-125** | 125 | 258 | 443 | 198 |
| | **CXSW□32-150** | 150 | 283 | 493 | 223 |
| | **CXSW□32-175** | 175 | 308 | 543 | 248 |
| | **CXSW□32-200** | 200 | 333 | 593 | 273 |

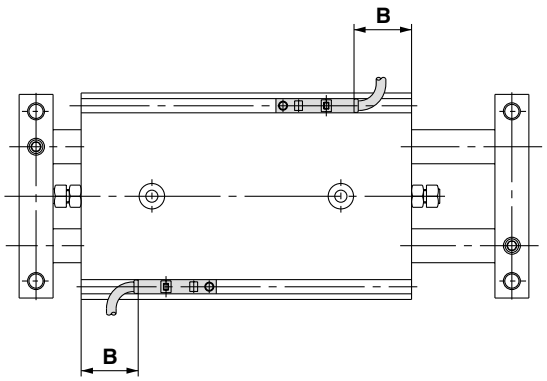
* Only the CXSW□32-10 has a groove cut out for installing auto switches.
(The dimensions are marked "*".)

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

**Electrical entry direction: Inward**




**Electrical entry direction: Outward**




| Bore size (mm) | A | D-Z7/Z8, D-Y7□W<br>D-Y5□, D-Y7□ | D-Y6□, D-Y7□V<br>D-Y7□WV | D-Y7BAL |
|---|---|---|---|---|
| | | B | B | B |
| **6** | 13.8 | 9.8(8.3) | 11.3 | 3.8 |
| **10** | 28.5 | 24.5(23) | 26 | — |
| **15** | 35 | 31(29.5) | 32.5 | — |
| **20** | 42.5 | 38.5(37) | 40.5 | — |
| **25** | 43.5 | 39.5(38) | 41.5 | 33.5 |
| **32** | 54 | 50(48.5) | 52 | 44 |

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

**As for auto switch mounting dimensions, auto switch mounting method and its operating range, those are the same as basic type. Refer to page 569**