

# Air Cylinder

## CJ2 Series

ø6, ø10, ø16

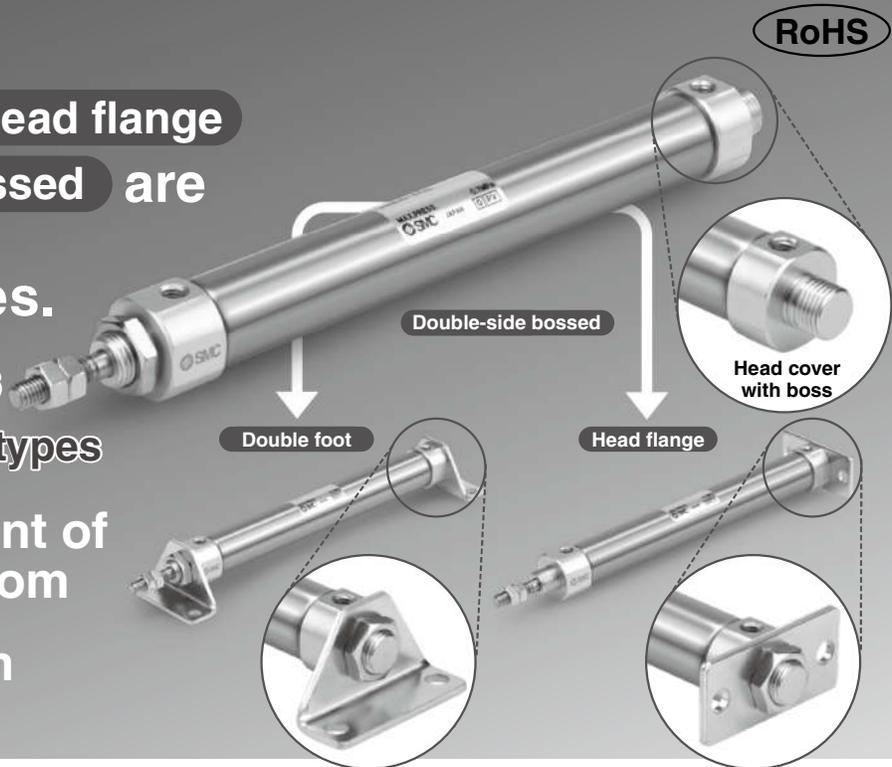
Double foot Head flange  
Double-side bossed are added to the mounting types.

4 types → 7 types

For ø6, 3 types → 6 types

Improved amount of mounting freedom

Head cover with boss is added.

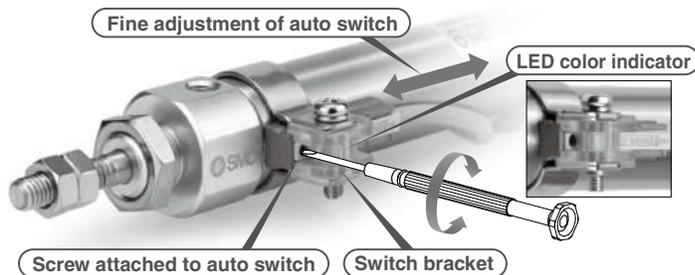


- CJ1
- CJP
- CJ2**
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

### Easy fine adjustment of auto switch position

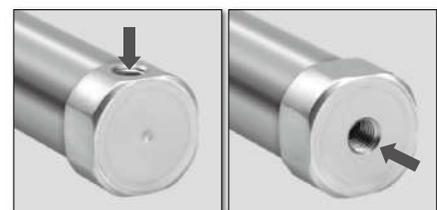
Fine adjustment of the auto switch position is possible by simply loosening the screw attached to the auto switch.

Transparent switch bracket improves visibility of indicator LED.



### Head cover port location "Perpendicular to axis" is newly added to ø6.

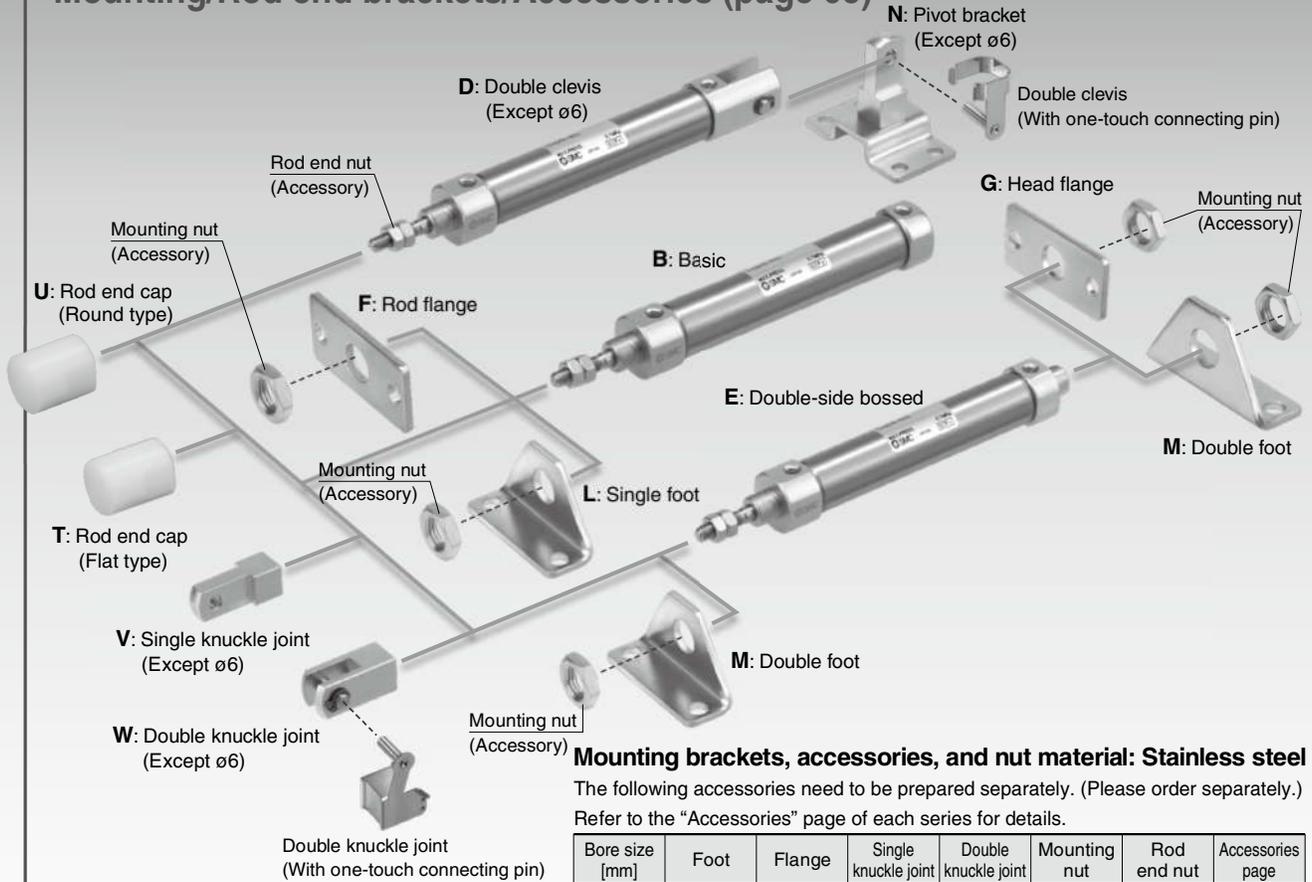
Improved piping flexibility



ø6	●	○
ø10	○	○
ø16	○	○



## Mounting/Rod end brackets/Accessories (page 63)



**Mounting brackets, accessories, and nut material: Stainless steel**

The following accessories need to be prepared separately. (Please order separately.) Refer to the "Accessories" page of each series for details.

Bore size [mm]	Foot	Flange	Single knuckle joint	Double knuckle joint	Mounting nut	Rod end nut	Accessories page
10, 16	○*	○*	○	○	○*	○	p. 63-1

\*: Except bore size 10.

## Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately

Note) Mounting bracket is shipped together with the product, but not assembled.

Example) **CDJ2D16-50Z- N W -M9BW-B**

Pivot bracket	
<b>Nil</b>	None
<b>N</b>	Pivot bracket is shipped together with the product, but not assembled.

\*: Only for the double clevis type ( $\phi 10$  and  $\phi 16$ )

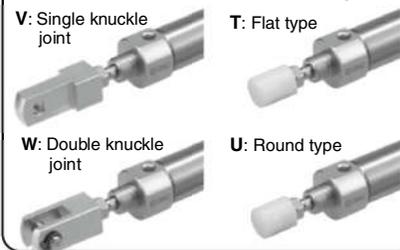
**N: Kit of pivot bracket and double clevis**



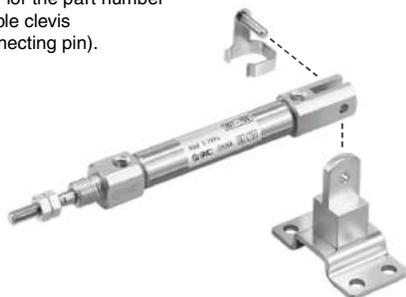
Rod end bracket	
<b>Nil</b>	None
<b>V</b>	Single knuckle joint
<b>W</b>	Double knuckle joint
<b>T</b>	Rod end cap (Flat type)
<b>U</b>	Rod end cap (Round type)

\*: V/W:  $\phi 10$  and  $\phi 16$  only

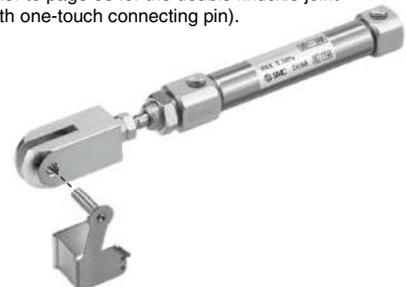
**With rod end bracket**      **Rod end cap**



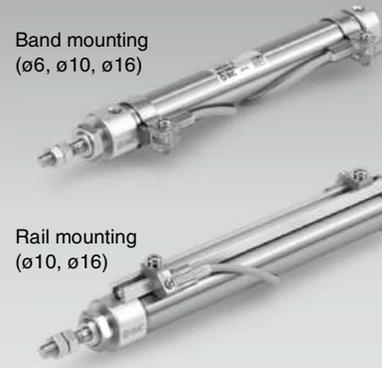
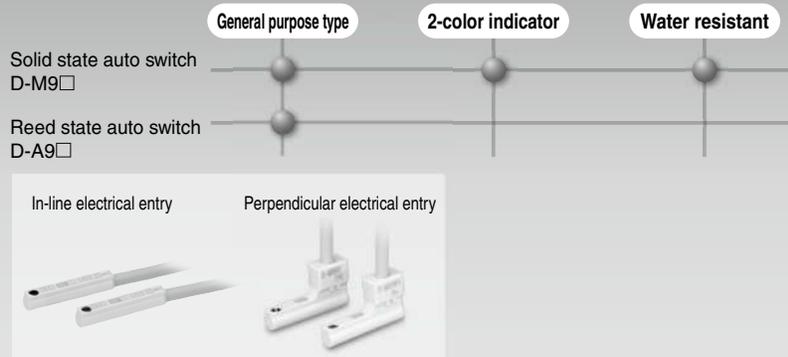
Refer to page 151-1 for the part number (-X2838) of the double clevis (with one-touch connecting pin).



Refer to page 63 for the double knuckle joint (with one-touch connecting pin).



## Compact auto switches



- CJ1**
- CJP**
- CJ2**
- JCM**
- CM2**
- CM3**
- CG1**
- CG3**
- JMB**
- MB**
- MB1**
- CA2**
- CS1**
- CS2**

### Stroke Variations

Bore size [mm]	Standard stroke									
	15	30	45	60	75	100	125	150	175	200
6	●	●	●	●	●	●	●	●	●	●
10	●	●	●	●	●	●	●	●	●	●
16	●	●	●	●	●	●	●	●	●	●

### Series Variations

Series	Action	Type	Bore size [mm]			Variations		Page
			6	10	16	Built-in magnet	Air cushion	
Standard <b>CJ2-Z</b>	Double acting	Single rod	●	●	●	●	●	46
	Double acting	Double rod	●	●	●	●	●	64
	Single acting	Single rod (Spring return /extend)	●	●	●	●	●	71
Non-rotating rod <b>CJ2K-Z</b>	Double acting	Single rod	●	●	●	●	●	88
	Single acting	Single rod (Spring return /extend)	●	●	●	●	●	95
Built-in speed controller <b>CJ2Z-Z</b>	Double acting	Single rod	●	●	●	●	●	107
	Double acting	Double rod	●	●	●	●	●	114
Direct mount <b>CJ2R-Z</b>	Double acting	Single rod	●	●	●	●	●	119
	Single acting	Single rod (Spring return /extend)	●	●	●	●	●	123
Direct mount, Non-rotating rod <b>CJ2RK-Z</b>	Double acting	Single rod	●	●	●	●	●	127
	Single acting	Single rod (Spring return /extend)	●	●	●	●	●	130
With end lock <b>CBJ2</b>	Double acting	Single rod	●	●	●	●	●	134
Smooth Cylinder <b>CJ2Y-Z</b>	Double acting	Single rod	●	●	●	●	●	Best Pneumatics No. 2-3
Low Speed Cylinder <b>CJ2X-Z</b>	Double acting	Single rod	●	●	●	●	●	Best Pneumatics No. 2-3

\*: The air cylinder with end lock has the same shape as the current product.

\*: Air cushion is only available for ø10 and ø16.

- D-□**
- X□**
- Technical Data

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### ■ Air Cylinder: Standard Type Double Acting, Double Rod CJ2W Series

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### ■ Air Cylinder: Standard Type Single Acting, Spring Return/Extend CJ2 Series

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### ■ Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod CJ2K Series

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### ■ Air Cylinder: Non-rotating Rod Type Single Acting, Spring Return/Extend CJ2K Series

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### ■ Air Cylinder: Built-in Speed Controller Type Double Acting, Single Rod CJ2Z Series

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■ **Air Cylinder: Built-in Speed Controller Type**  
**Double Acting, Double Rod CJ2ZW Series**

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CJ1  
 CJP  
**CJ2**



■ **Air Cylinder: Direct Mount Type**  
**Double Acting, Single Rod CJ2R Series**

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JCM  
**CM2**  
**CM3**



■ **Air Cylinder: Direct Mount Type**  
**Single Acting, Spring Return/Extend CJ2R Series**

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CG3  
**JMB**  
**MB**



■ **Air Cylinder: Direct Mount, Non-rotating Rod Type**  
**Double Acting, Single Rod CJ2RK Series**

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CG1  
**CG3**  
**JMB**  
**MB**  
**MB1**  
**CA2**  
**CS1**  
**CS2**



■ **Air Cylinder: Direct Mount, Non-rotating Rod Type**  
**Single Acting, Spring Return/Extend CJ2RK Series**

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■ **Air Cylinder: With End Lock CBJ2 Series**

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D-□  
 -X□  
 Technical Data

# Combinations of Standard Products and Made to Order Specifications

## CJ2 Series

- : Standard
- ◎ : Made to Order
- : Special product (Please contact SMC for details.)
- : Not available

Series	CJ2 (Standard type)				CJ2K (Non-rotating rod type)			
	Double acting		Single acting		Double acting	Single acting		
Action/ Type	Single rod	Double rod	Single rod (spring return)	Single rod (spring extend)	Single rod	Single rod (spring return)	Single rod (spring extend)	
Page	46	64	71		88	95		

Symbol	Specifications	Applicable bore size	ø6 to ø16				ø10, ø16			
<b>Standard</b>	<b>Standard</b>	ø6 to ø16	●	●	●	●	●	●	●	
<b>D</b>	<b>Built-in magnet</b>		●	●	●	●	●	●	●	
<b>CJ2□-□A</b>	<b>Air cushion</b>	ø10, ø16	●	●	—	—	—	—	—	
<b>10-, 11-</b>	<b>Clean series*1</b>	ø6 to ø16	●	●*9	○	○	—	—	—	
<b>25A-</b>	<b>Copper (Cu) and Zinc (Zn)-free*5</b>	ø10, ø16	●	○	○	○	○	○	○	
<b>XB6</b>	<b>Heat resistant cylinder (-10 to 150°C)*3, 4</b>	ø6 to ø16	◎	◎	○	○	○	○	○	
<b>XB7</b>	<b>Cold resistant cylinder (-40 to 70°C)*3, 4</b>		◎	◎	○	○	○	○	○	
<b>XB9</b>	<b>Low speed cylinder (10 to 50 mm/s)*4</b>		◎	—	—	—	—	—	—	
<b>XB13</b>	<b>Low speed cylinder (5 to 50 mm/s)</b>	ø6	◎	—	—	—	—	—	—	
<b>XC3</b>	<b>Special port position*2, 4</b>	ø6 to ø16	◎	○	—	—	◎	—	—	
<b>XC8</b>	<b>Adjustable stroke cylinder/ Adjustable extension type*4</b>	ø10, ø16	◎	—	○	○	○	○	○	
<b>XC9</b>	<b>Adjustable stroke cylinder/ Adjustable retraction type*4</b>		◎	—	○	—	◎	○	—	
<b>XC10</b>	<b>Dual stroke cylinder/Double rod type*4</b>		◎	—	○	○	◎	○	○	
<b>XC11</b>	<b>Dual stroke cylinder/Single rod type*4</b>		◎	—	—	—	○	—	—	
<b>XC22</b>	<b>Fluororubber seal*4</b>	ø6 to ø16	◎	◎	◎	◎	◎	○	○	
<b>XC51</b>	<b>With hose nipple</b>		◎	◎	◎	◎	◎	◎	◎	
<b>XC85</b>	<b>Grease for food processing equipment</b>	ø10, ø16	◎	◎	◎	◎	◎	◎	◎	
<b>X446</b>	<b>PTFE grease</b>		◎	◎	◎	◎	◎	◎	◎	
<b>X773</b>	<b>Short pitch mounting</b>	ø6	—	—	◎	—	—	—	—	
<b>X2838</b>	<b>Double clevis (With one-touch connecting pin)*11</b>	ø10, ø16	◎	—	◎	◎	◎	◎	◎	

\*1: Mounting type: Not compatible with the clevis type.  
 An auto switch is available in the band mounting type only.  
 \*2: An auto switch is available in the band mounting type only.  
 \*3: The products with an auto switch are not compatible.  
 \*4: The products with an air cushion are not compatible.  
 \*5: For details, refer to the **Web Catalog**.

\*6: The shape is the same as the current product.  
 \*7: Available only for locking at head end.  
 \*8: Available only for locking at rod end.  
 \*9: ø10 and ø16 only  
 \*10: Copper and fluorine-free [20-] are available as standard products.  
 \*11: Not compatible with the air cushion or rail mounting type auto switches.

	CJ2Z (Built-in speed controller type)		CJ2R (Direct mount type)			CJ2RK (Direct mount, Non-rotating rod type)			CBJ2 (With end lock)*6	CJ2Y Smooth Cylinder	CJ2X Low Speed Cylinder	Symbol
	Double acting		Double acting	Single acting		Double acting	Single acting		Double acting	Double acting	Double acting	
	Single rod	Double rod	Single rod	Single rod (spring return)	Single rod (spring extend)	Single rod	Single rod (spring return)	Single rod (spring extend)	Single rod	Single rod	Single rod	
	107	114	119	123		127	130		134	Best Pneumatics No. 2-3	Best Pneumatics No. 2-3	
	ø10, ø16								ø16	ø10, ø16	ø10, ø16	
	●	●	●	●	●	●	●	●	●	●	●	Standard
	●	●	●	●	●	●	●	●	●	●	●	D
	—	—	○	—	—	—	—	—	—	—	—	CJ2□-□A
	—	—	●	○	○	—	—	—	○*7	—	—	10-, 11-
	○	○	○	○	○	○	○	○	○	○	○	25A-
	○	○	○	○	○	○	○	○	○	—	—	XB6
	○	○	○	○	○	○	○	○	—	—	—	XB7
	—	—	—	—	—	—	—	—	○	—	—	XB9
	—	—	—	—	—	—	—	—	—	—	—	XB13
	—	—	○	—	—	○	—	—	○	◎	○	XC3
	○	—	○	○	○	○	○	○	—	—	—	XC8
	—	—	◎	○	—	◎	○	—	○*8	◎	—	XC9
	○	—	○	○	○	○	○	○	○	○	—	XC10
	—	—	○	—	—	○	—	—	○*8	—	—	XC11
	○	○	◎	○	○	○	○	○	○	—	—	XC22
	◎	◎	◎	◎	◎	◎	◎	◎	—	—	—	XC51
	◎	◎	◎	◎	◎	◎	◎	◎	—	—	—	XC85
	◎	◎	◎	◎	◎	◎	◎	◎	—	—	—	X446
	—	—	—	—	—	—	—	—	—	—	—	X773
	—	—	—	—	—	—	—	—	—	○	○	X2838

- CJ1
- CJP
- CJ2**
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

- D-□
- X□
- Technical Data

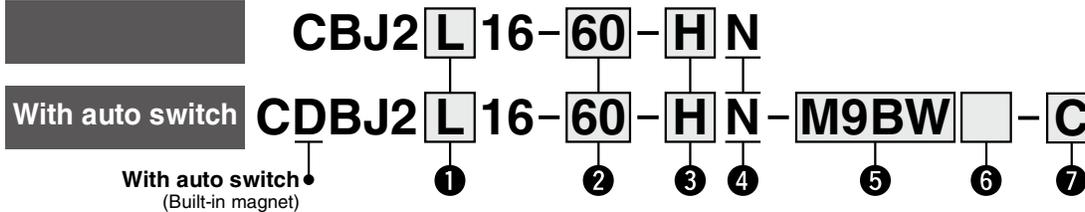
# Air Cylinder: With End Lock

# CBJ2 Series

ø16

RoHS

## How to Order



### ① Mounting

B	Basic
L	Axial foot
F	Rod flange
D	Double clevis**

\*: Foot/Flange brackets are shipped together with the product, but not assembled.

\*\*: Rod end lock only.

### ⑥ Number of auto switches

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

### ② Cylinder standard stroke [mm]

Refer to "Standard Strokes" on page 135.

### ⑤ Auto switch

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

\*: For applicable auto switches, refer to the table below.

★ Enter the auto switch mounting type (A or B) even when a built-in magnet cylinder without an auto switch is required.

### ⑦ Auto switch mounting bracket

\*: This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

### ③ Lock position

H	Head end lock
R	Rod end lock

### ④ Manual release

N	Non-locking type
---	------------------

### Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting) or "-B" (Band mounting) to the end of part number for cylinder with auto switch.

Example	Rail mounting	CDBJ2B16-45-HN-A
	Band mounting	CDBJ2B16-60-HN-B

\*: For rail mounting, screws and nuts for 2 auto switches come with the rail.

\*: Refer to page 148 for auto switch mounting brackets.

## Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model				Lead wire length [m]					Pre-wired connector	Applicable load			
					DC	AC	Band mounting		Rail mounting		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
							Perpendicular	In-line	Perpendicular	In-line										
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	—	M9NV	M9N	M9NV	M9N	●	●	●	○	○	IC circuit				
				3-wire (PNP)			M9PV	M9P	M9PV	M9P	●	●	●	○	○					
		2-wire		M9BV			M9B	M9BV	M9B	●	●	●	○	○	—					
		—		H7C			J79C	—	●	—	●	●	○	○						
	Diagnostic indication (2-color indicator)	Grommet	Yes	3-wire (NPN)	24 V	—	M9NVV	M9NV	M9NVV	M9NV	●	●	●	○	○	IC circuit				
				3-wire (PNP)			M9PWW	M9PW	M9PWW	M9PW	●	●	●	○	○					
	2-wire	M9BWW		M9BW			M9BWW	M9BW	●	●	●	○	○	—						
	3-wire (NPN)	M9NAV*1		M9NA*1			M9NAV*1	M9NA*1	○	○	●	○	○							
	Water resistant (2-color indicator)	Grommet	Yes	3-wire (PNP)	24 V	—	M9PAV*1	M9PA*1	M9PAV*1	M9PA*1	○	○	●	○	○	IC circuit				
				2-wire			M9BAV*1	M9BA*1	M9BAV*1	M9BA*1	○	○	●	○	○					
With diagnostic output (2-color indicator)	Grommet	Yes		4-wire (NPN)			24 V	—	—	H7NF	—	F79F	●	—	●		○	○	IC circuit	
				—					—	—	—	●	—	●	○		○			
Reed auto switch	—		Grommet	Yes	3-wire (NPN equivalent)	24 V			—	A96V	A96	A96V	A96	●	—	●	—	—		IC circuit
					—					—	A72	A72H	●	—	●	—	—			
		100 V			A93V*2		A93	A93V*2		A93	●	●	●	●	—					
		Connector	No		2-wire		100 V or less	24 V		—	A90V	A90	A90V	A90	●	—	●	—	—	IC circuit
							—				—	C73C	A73C	—	●	—	●	●	●	
							24 V or less				—	C80C	A80C	—	●	—	●	●	●	
Grommet	Yes	—	24 V	—		—	—		A79W		—	—	●	—	●	—	—	IC circuit		
		—				—	—		—		●	—	●	—	—					
		—				—	—		—		●	—	●	—	—					

\*1: Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

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

\*: Lead wire length symbols: 0.5 m..... Nil (Example) M9NV  
 1 m..... M (Example) M9NVW  
 3 m..... L (Example) M9NVL  
 5 m..... Z (Example) M9NVZ  
 None..... N (Example) H7CN

\*: Since there are other applicable auto switches than listed, refer to page 149 for details.

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

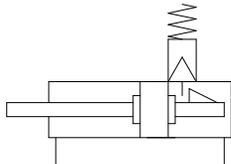
\*: The D-A9□/M9□/A7□/A80□/F7□/J7□ auto switches are shipped together, (but not assembled). (However, when the D-A9□/M9□ types are selected, only auto switch mounting brackets are assembled before being shipped.)

\*: When the D-A9□/M9□ types are mounted on a rail, order auto switch mounting brackets separately. Refer to page 148 for details.

The CJ2 air cylinder is equipped with end lock function.



**Symbol**  
Rubber bumper



## Specifications

Bore size [mm]	<b>16</b>
Action	Double acting, Single rod
Fluid	Air
Proof pressure	1 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.15 MPa*
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C (No freezing)
Cushion	Rubber bumper
Lubrication	Not required (Non-lube)
Stroke length tolerance	+1.0 0
Piston speed	50 to 750 mm/s
Allowable kinetic energy	0.090 J

\*: 0.06 MPa for parts other than the lock unit.

## Lock Specifications

Lock position	Head end, Rod end
Holding force (Max.)	98 N
Lock release pressure	0.15 MPa or less
Backlash	1 mm or less
Manual release	Non-locking type

## Standard Strokes

Bore size	Standard stroke [mm]
<b>16</b>	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

\*: Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)

\*: Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

## Mounting Brackets/Part No.

Mounting bracket	Bore size [mm]
	<b>16</b>
Foot	CJ-L016B
Flange	CJ-F016B
Pivot bracket (T-bracket) <sup>Note 1)</sup>	CJ-T016B

Note 1) The pivot bracket (T-bracket) is used with double clevis (D).

Note 2) Stainless steel mounting brackets and accessories are also available.

Refer to page 63-1 for details.

Refer to pages 142 to 149 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

### Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to [the IDK series in the Best Pneumatics No. 6](#).

**CJ1**

**CJP**

**CJ2**

**JCM**

**CM2**

**CM3**

**CG1**

**CG3**

**JMB**

**MB**

**MB1**

**CA2**

**CS1**

**CS2**

**D**

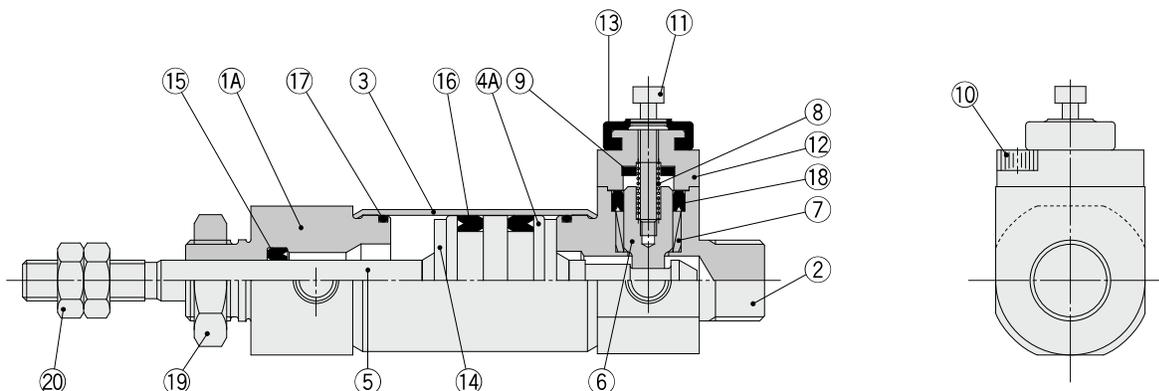
**-X**

Technical Data

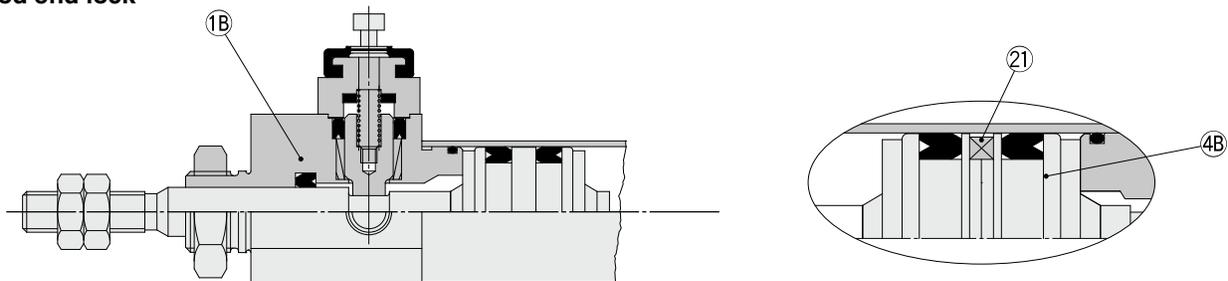
# CBJ2 Series

## Construction (Not able to disassemble)

### Head end lock



### Rod end lock



With auto switch

### Component Parts

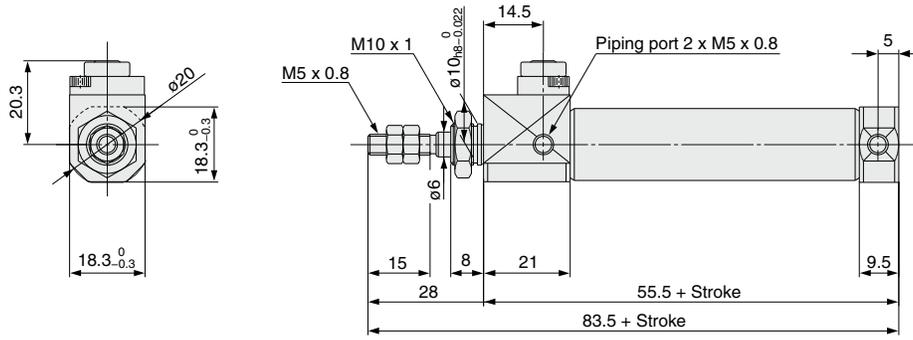
No.	Description	Material	Note
1A	Rod cover	Aluminum alloy	
1B	Rod cover	Stainless steel	
2	Head cover	Aluminum alloy	
3	Cylinder tube	Stainless steel	
4A	Piston	Aluminum alloy	
4B	Piston B	Aluminum alloy	
5	Piston rod	Carbon steel	
6	Locking piston	Carbon steel	
7	Locking bushing	Copper alloy	
8	Lock spring	Spring steel	
9	Bumper	Urethane	
10	Hexagon socket head cap screw	Alloy steel	

No.	Description	Material	Note
11	Hexagon socket head cap screw	Alloy steel	
12	Cap	Aluminum alloy	
13	Rubber cap	Synthetic rubber	
14	Bumper	Urethane	
15	Rod seal	NBR	
16	Piston seal	NBR	
17	Tube gasket	NBR	
18	Locking piston seal	NBR	
19	Mounting nut	Brass	
20	Rod end nut	Rolled steel	
21	Magnet	—	

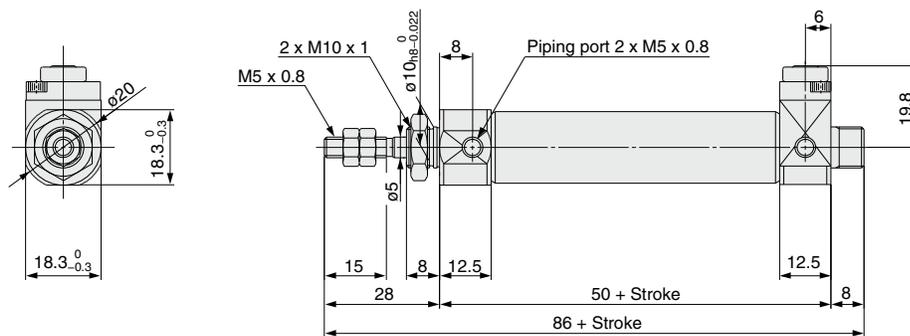
**Dimensions**

**Basic**

With rod end lock: C□BJ2B16-□-RN



With head end lock: C□BJ2B16-□-HN



- CJ1
- CJP
- CJ2**
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

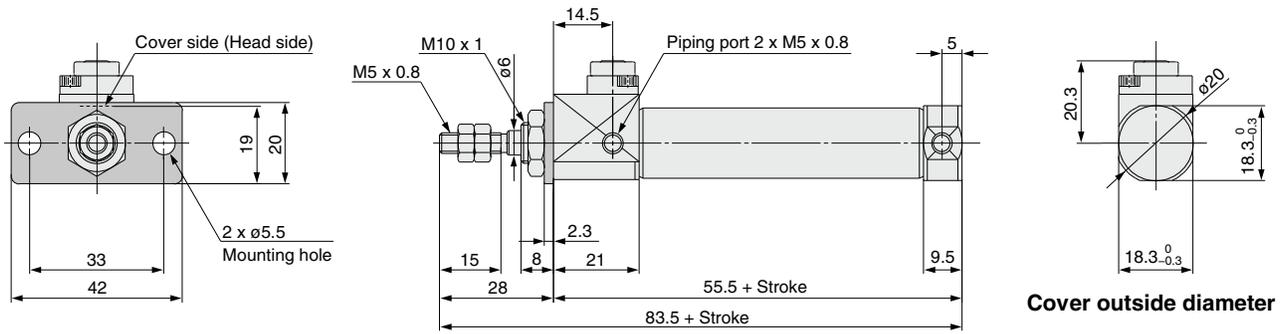
- D-□
- X□
- Technical Data

# CBJ2 Series

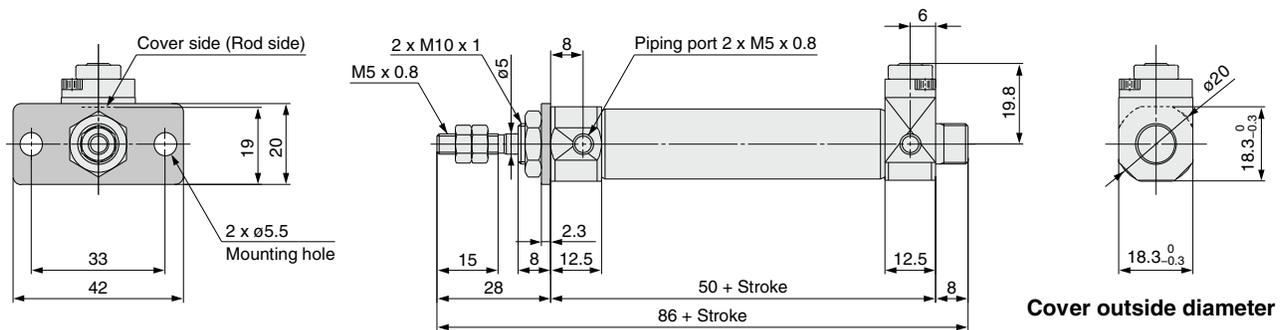
## Dimensions

### Flange

With rod end lock: C□BJ2F16-□-RN



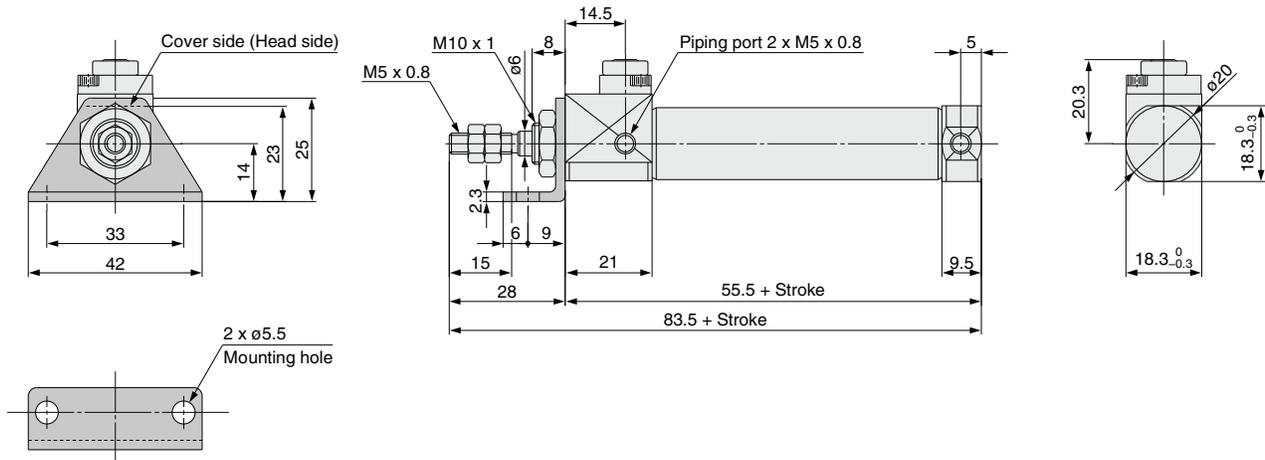
With head end lock: C□BJ2F16-□-HN



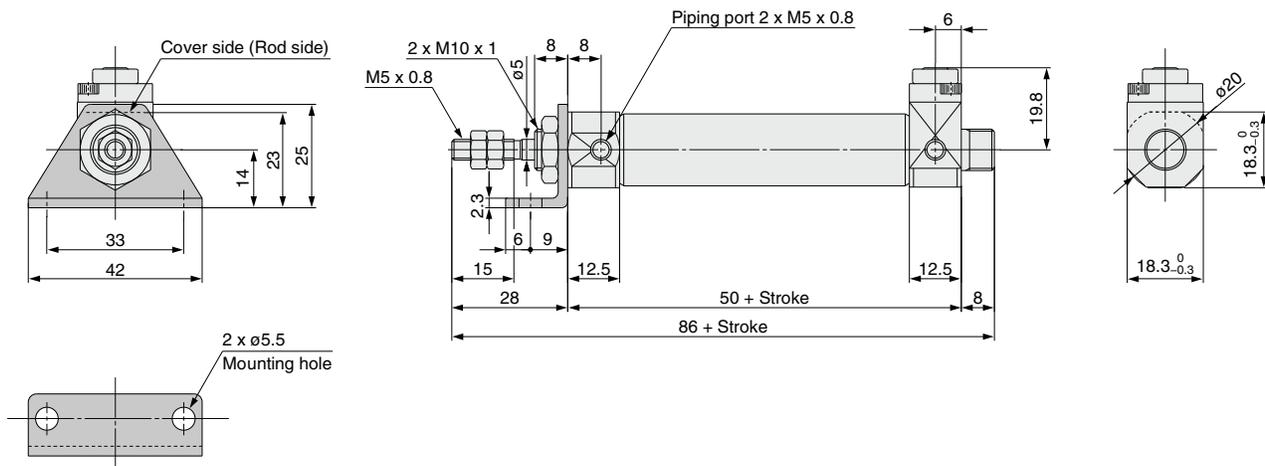
## Dimensions

### Axial foot

With rod end lock: C□BJ2L16-□-RN



With head end lock: C□BJ2L16-□-HN



CJ1

CJP

**CJ2**

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-□

-X□

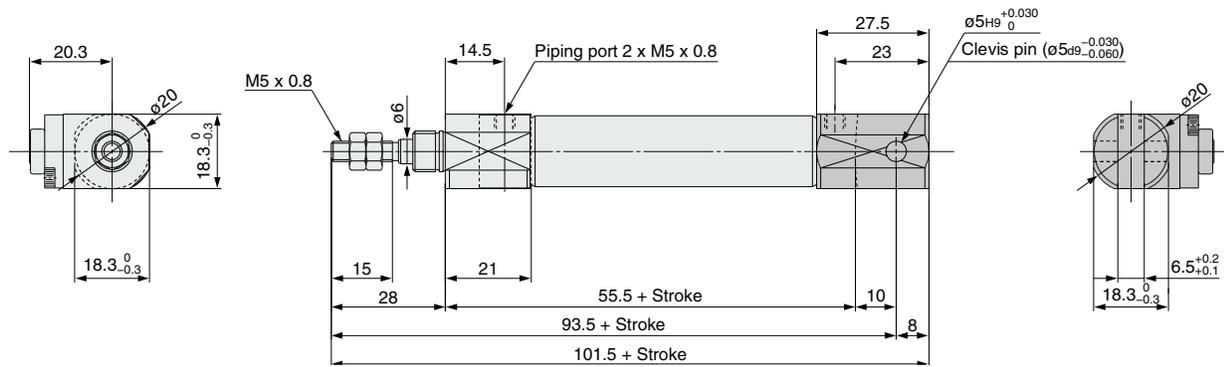
Technical  
Data

# CBJ2 Series

## Dimensions

### Double clevis

With rod end lock: C□BJ2D16-□-RN





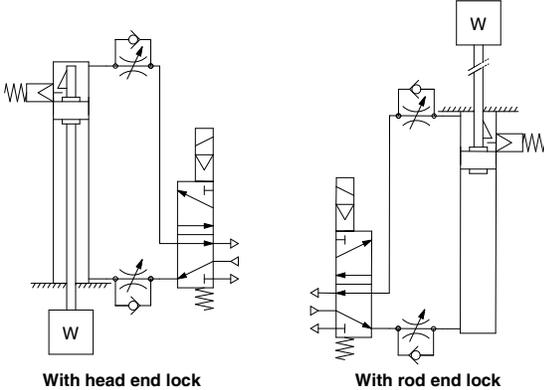
# CBJ2 Series Specific Product Precautions

Be sure to read this before handling the products. Please consult with SMC for products outside these specifications.

## Use Recommended Air Pressure Circuit.

### ⚠ Caution

- It is necessary for proper locking and unlocking.



## Selection

### ⚠ Caution

- Do not use a 3-position solenoid valve.**  
Avoid using this cylinder in combination with a 3-position solenoid valve (particularly the closed center metal seal type). If air pressure becomes sealed inside the port on the side that contains the lock mechanism, the lock will not engage. Even if the lock is engaged at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to disengage as time elapses.
- Back pressure is necessary for unlocking.**  
Before starting, make sure that air is supplied to the side that is not equipped with a lock mechanism as shown in the diagram above. Otherwise, the lock may not disengage. (Refer to "Lock Disengagement.")
- Disengage the lock before installing or adjusting the cylinder.**  
The lock could become damaged if the cylinder is installed with its lock engaged.
- Operate the cylinder at a load ratio of 50% or less.**  
The lock might not disengage or might become damaged if a load ratio of 50% is exceeded.
- Do not synchronize multiple cylinders.**  
Do not operate two or more end lock cylinders synchronized to move a single workpiece because one of the cylinder locks may not be able to disengage when required.
- Operate the speed controller under meter-out control.**  
If operated under meter-in control, the lock might not disengage.
- On the side that has a lock, make sure to operate at the stroke end of the cylinder.**  
The lock might not engage or disengage if the piston of the cylinder has not reached the stroke end.
- The position adjustment of the auto switch should be performed at two positions; a position determined by the stroke and a position after the backlash movement (by 1 mm).**  
When a 2-color indicator switch is adjusted to show green at the stroke end, the indication may turn red when the cylinder returns by the backlash. This, however, is not an error.

## Operating Pressure

### ⚠ Caution

Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

## Exhaust Air Speed

### ⚠ Caution

The lock will engage automatically if the air pressure at the port on the side that has the lock mechanism becomes 0.05 MPa or less. Be aware that if the piping on the side that has the lock mechanism is narrow and long, or if the speed controller is located far from the cylinder port, the exhaust air speed could become slower, involving a longer time for the lock to engage. A similar result will ensure if the silencer that is installed on the exhaust port of the solenoid valve becomes clogged.

## Lock Disengagement

### ⚠ Warning

To disengage the lock, make sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended air pressure circuit.) If the lock is disengaged when the port on the side that does not contain a lock mechanism is in the exhausted state and the load is being applied to the lock mechanism, undue force will be applied to the lock mechanism, and it may damage the lock mechanism. Also, it could be extremely dangerous, because the piston rod could move suddenly.

## Manual Disengagement

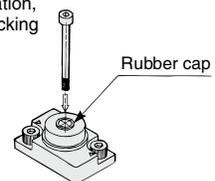
### ⚠ Caution

#### Non-locking type manual release

Insert the bolt, which is provided as an accessory part, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to disengage the lock. Releasing the bolt will re-engage the lock. The bolt size, pulling force, and the stroke are listed below.

Bore size [mm]	Thread size	Pulling force [N]	Stroke [mm]
16	M2 x 0.4 x 20 L or more	4.9	2

Bolt should be detached under normal operation, otherwise it may cause malfunction of the locking feature.



CJ1

CJP

**CJ2**

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-

-X

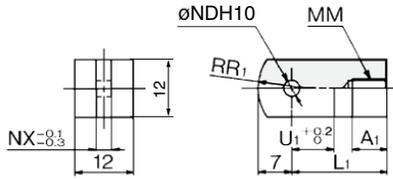
Technical  
Data

# CJ2 Series

# Dimensions of Accessories (Options)

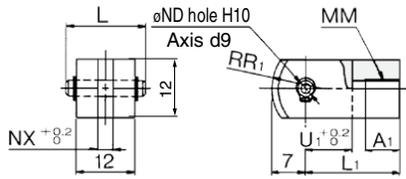
## Single Knuckle Joint

Material: Rolled steel



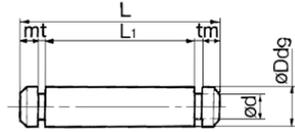
## Double Knuckle Joint

Material: Rolled steel



## Knuckle Pin

Material: Stainless steel



[mm]

Part no.	Applicable bore size	A <sub>1</sub>	L <sub>1</sub>	MM	NDH10	NX	R <sub>1</sub>	U <sub>1</sub>
I-J010C	10	8	21	M4 x 0.7	3.3 <sup>+0.048</sup> <sub>0</sub>	3.1	8	9
I-J016C	16	8	25	M5 x 0.8	5 <sup>+0.048</sup> <sub>0</sub>	6.4	12	14

[mm]

Part no.	Applicable bore size	A <sub>1</sub>	L	L <sub>1</sub>	MM
Y-J010C	10	8	15.2	21	M4 x 0.7
Y-J016C	16	11	16.6	21	M5 x 0.8

Part no.	NDd9	NDH10	NX	R <sub>1</sub>	U <sub>1</sub>
Y-J010C	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	3.3 <sup>+0.048</sup> <sub>0</sub>	3.2	8	10
Y-J016C	5 <sup>-0.030</sup> <sub>-0.060</sub>	5 <sup>+0.048</sup> <sub>0</sub>	6.5	12	10

[mm]

Part no.	Applicable bore size	Dd9	d	L	L <sub>1</sub>	m	t	Included retaining ring
CD-J010	10	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	3	15.2	12.2	1.2	0.3	Type C 3.2
IY-J015	16	5 <sup>-0.030</sup> <sub>-0.060</sub>	4.8	16.6	12.2	1.5	0.7	Type C 5

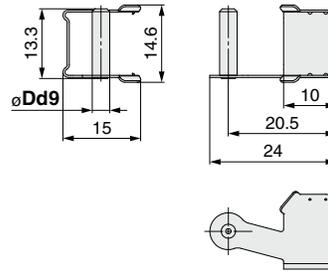
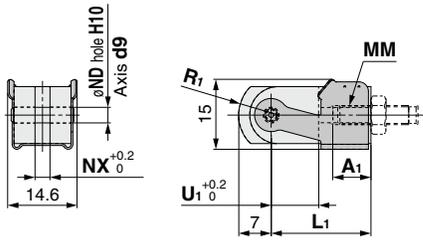
\*: For ø10, a clevis pin is diverted.  
 \*: Retaining rings are included with a knuckle pin.

\*: A knuckle pin and retaining rings are included.

## Double Knuckle Joint (With One-touch Connecting Pin)

## One-touch Connecting Pin for Double Knuckle Joint

Material: Stainless steel



[mm]

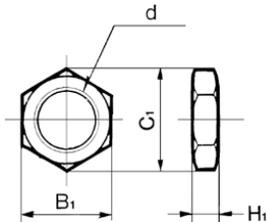
Part no.	Applicable bore size	A <sub>1</sub>	L <sub>1</sub>	MM	NDd9	NDH10	NX	R <sub>1</sub>	U <sub>1</sub>
Y-J10	10	8	21	M4 x 0.7	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	3.3 <sup>+0.048</sup> <sub>0</sub>	3.2	8	10
Y-J16	16	11	21	M5 x 0.8	5 <sup>-0.030</sup> <sub>-0.060</sub>	5 <sup>+0.048</sup> <sub>0</sub>	6.5	12	10

[mm]

Part no.	Applicable bore size	Dd9
IY-J10	10	3.3 <sup>-0.030</sup> <sub>-0.060</sub>
IY-J16	16	5 <sup>-0.030</sup> <sub>-0.060</sub>

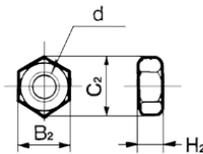
## Mounting Nut

Material: Carbon steel



## Rod End Nut

Material: Carbon steel



[mm]

Part no.	Applicable bore size	B <sub>1</sub>	C <sub>1</sub>	d	H <sub>1</sub>
SNJ-006C	6	8	9.2	M6 x 1.0	4
SNJ-010C	10	11	12.7	M8 x 1.0	4
SNJ-016C	16	14	16.2	M10 x 1.0	4
SNKJ-016C*	16	17	19.6	M12 x 1.0	4

[mm]

Part no.	Applicable bore size	B <sub>2</sub>	C <sub>2</sub>	d	H <sub>2</sub>
NTJ-006B	6	5.5	6.4	M3 x 0.5	2.4
NTJ-010C	10	7	8.1	M4 x 0.7	3.2
NTJ-015C	16	8	9.2	M5 x 0.8	4

\*: For ø16 non-rotating type. (Use SNJ-016C for ø10 non-rotating type.)

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

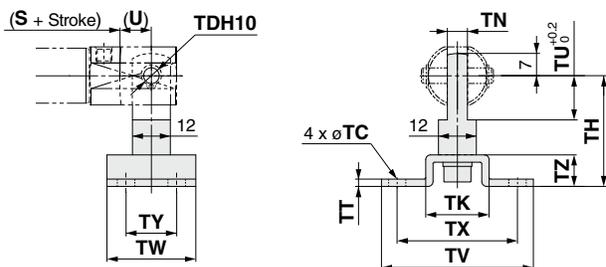
CS2

D-□

-X□

Technical Data

## Pivot Bracket (T-bracket)



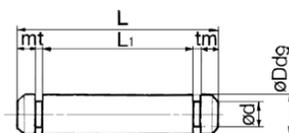
Part no.	Applicable bore size	TC	TDH10	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T010C	10	4.5	3.3 <sup>+0.048</sup> <sub>0</sub>	29	18	3.1	2	9	40	22	32	12	8
CJ-T016C	16	5.5	5 <sup>+0.048</sup> <sub>0</sub>	35	20	6.4	2.3	14	48	28	38	16	10

\*: A T-bracket includes a T-bracket base, single knuckle joint, hexagon socket head bolt and spring washer.

\*: For dimensions of (U) and (S + Stroke), refer to the double clevis drawing on page 60.

## Clevis Pin

Material: Stainless steel



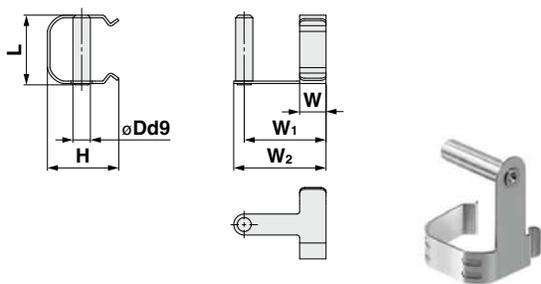
Part no.	Applicable bore size	Dd9	d	L	L <sub>1</sub>	m	t	Included retaining ring
CD-J010	10	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	3	15.2	12.2	1.2	0.3	Type C 3.2
CD-Z015	16	5 <sup>-0.030</sup> <sub>-0.060</sub>	4.8	22.7	18.3	1.5	0.7	Type C 5
CD-JA010*	10	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	3	18.2	15.2	1.2	0.3	Type C 3.2

\*: For ø10 double clevis type, with air cushion and built-in speed controller.

\*: Retaining rings are included with a clevis pin.

## One-touch Connecting Pin for Double Clevis

Material: Stainless steel



Part no.	Applicable bore size	Dd9	H	L	W
CD-J10	10	3.3 <sup>-0.030</sup> <sub>-0.060</sub>	13.4	13.2	4
CD-J16	16	5 <sup>-0.030</sup> <sub>-0.060</sub>	18.2	19.5	5

Part no.	W <sub>1</sub>	W <sub>2</sub>	Note
CD-J10	12	15	Cannot be mounted on cylinders with air cushion, or rail mounting type auto switches.
CD-J16	15	18	

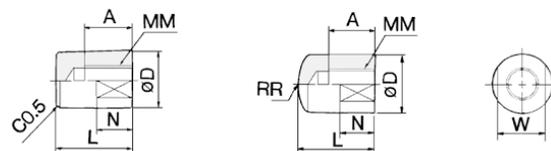
\*: Please pay attention to the applicable cylinder.

## Rod End Cap

Material: Polyacetal

Flat type/CJ-CF□□□

Round type/CJ-CR□□□



Part no.		Applicable bore size	A		D		L		MM		N		R		W	
Flat type	Round type		6	8	10	12	13	15	M3 x 0.5	M4 x 0.7	M5 x 0.8	5	6	7	8	10
CJ-CF006	CJ-CR006	6	6	8	11	M3 x 0.5	5	8	6							
CJ-CF010	CJ-CR010	10	8	10	13	M4 x 0.7	6	10	8							
CJ-CF016	CJ-CR016	16	10	12	15	M5 x 0.8	7	12	10							

## Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Part No. (Dimensions: Same as standard type)

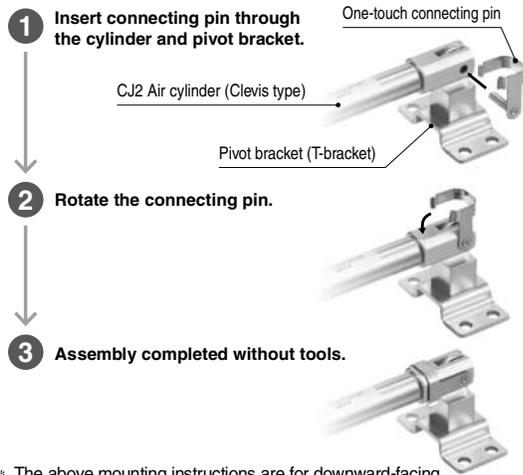
Bore size [mm]	Foot	Flange	Single knuckle joint	Double knuckle joint*	Mounting nut	Rod end nut
10	—	—	I-J010SUS	Y-J010SUS	—	NTJ-010SUS
16	CJ-L016SUS	CJ-F016SUS	I-J016SUS	Y-J016SUS	SNJ-016SUS	NTJ-016SUS

\*: A knuckle pin and retaining rings are shipped together.

## Precautions

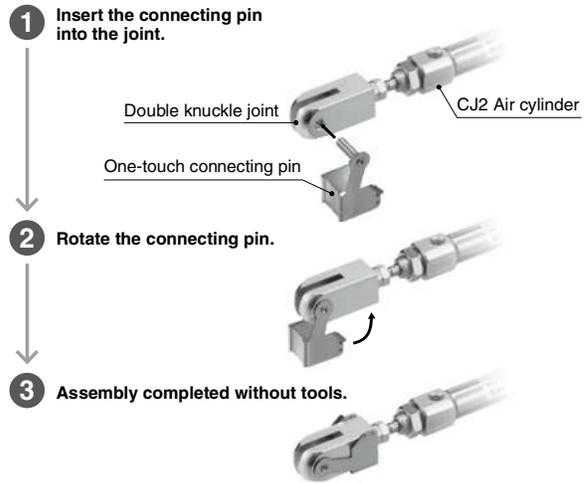
### Assembly Procedures

#### 1. Double Clevis (With One-touch Connecting Pin) (CD-J□)



\* The above mounting instructions are for downward-facing ports. Refer to the following for upward-facing ports.

#### 2. Double Knuckle Joint (With One-touch Connecting Pin) (IY-J□)



CJ1

CJP

**CJ2**

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

### How to Mount the Double Clevis (With One-touch Connecting Pin)

When connecting a double clevis cylinder to a pivot bracket (T-bracket), it is recommended that the pivot bracket (T-bracket) and the cylinder be connected with the one-touch connecting pin first, before fastening the pivot bracket.

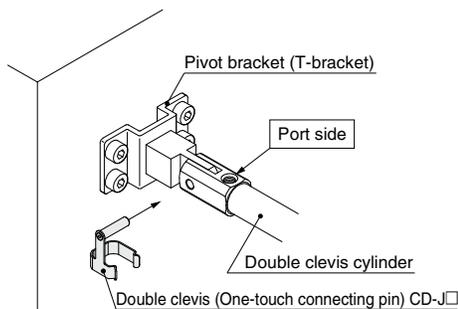
When connecting the cylinder after the pivot bracket (T-bracket) has been fastened, mount the cylinder according to the following procedure.

### ⚠ Warning

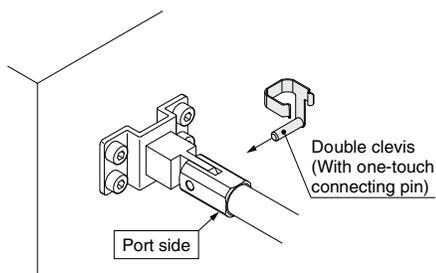
For assembling the clevis type to the pivot bracket, refer to the figure below.

1. Insert the double clevis (One-touch connecting pin) from the direction in the figure.

When port is facing upward

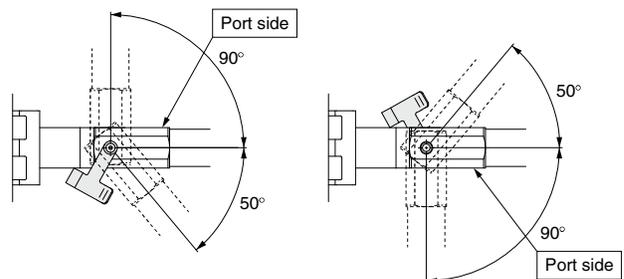


When port is facing downward

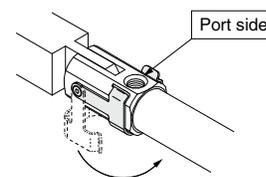


### ⚠ Warning

\* Perform the mounting within the following range.



2. Push the one-touch connecting pin into the cylinder body (Double clevis) until it clicks and is firmly fastened.



\* Attach the double knuckle joint within 180° (±90° from center). Other mounting methods are the same as the above.

D-□

-X□

Technical Data

# CJ2 Series

# Auto Switch Mounting

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

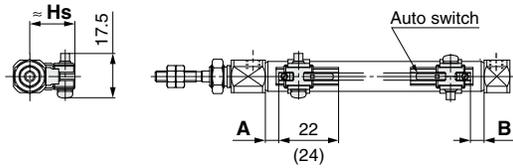
### Solid state auto switch

<Band mounting>

D-M9□

D-M9□W

D-M9□A

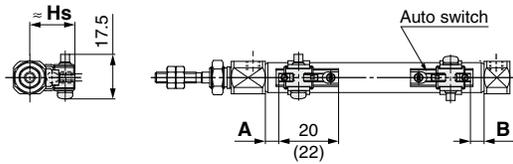


( ): Dimension of the D-M9□A.  
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V

D-M9□MV

D-M9□AV



( ): Dimension of the D-M9□AV.  
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

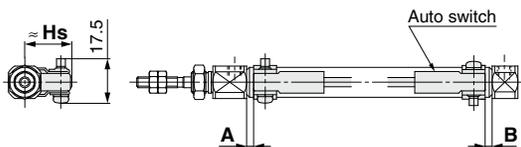
D-H7□

D-H7□W

D-H7BA

D-H7NF

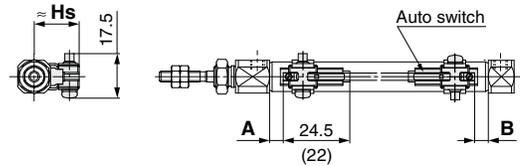
D-H7C



### Reed auto switch

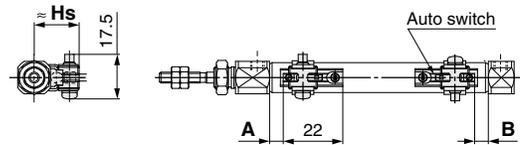
<Band mounting>

D-A9□



( ): Dimension of the D-A96.  
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

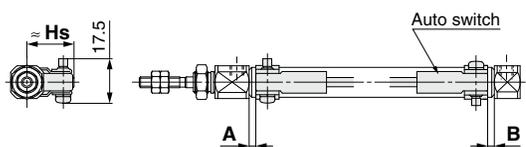
D-A9□V



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80

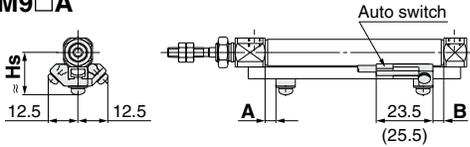
D-C73C□/C80C



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

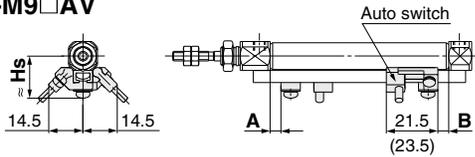
<Rail mounting>

D-M9□  
D-M9□W  
D-M9□A



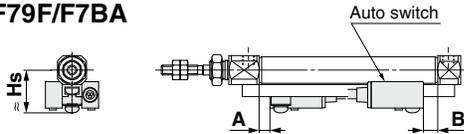
( ) : Dimension of the D-M9□A.

D-M9□V  
D-M9□WV  
D-M9□AV

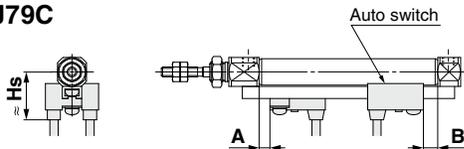


( ) : Dimension of the D-M9□AV.

D-F7□/J79  
D-F7□W/J79W  
D-F79F/F7BA

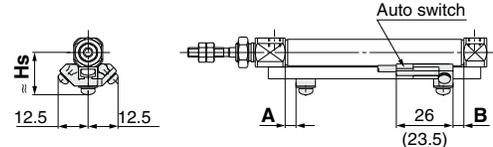


D-F7□V/F7□WV  
D-F7BAV  
D-J79C



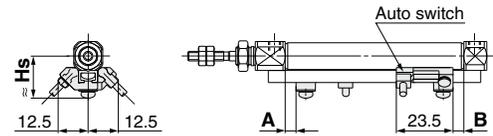
<Rail mounting>

D-A9□

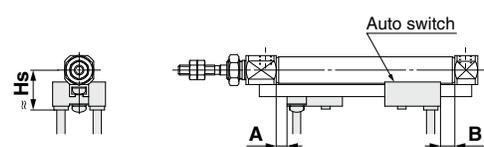


( ) : Dimension of the D-A96.

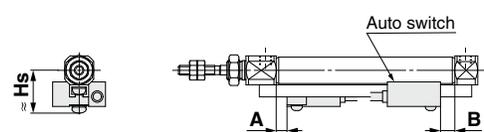
D-A9□V



D-A7□/A80  
D-A73C/A80C  
D-A79W



D-A7□H/A80H



- CJ1
- CJP
- CJ2**
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

- D-□
- X□
- Technical Data

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

### Auto Switch Proper Mounting Position (Single acting type excluded) [mm]

Auto switch model	Band mounting							
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-H7□ D-H7C D-H7NF D-H7□W D-H7BA		D-C7□ D-C80 D-C73C D-C80C	
Bore size	A	B	A	B	A	B	A	B
6	5.5 (4.5) [12]	5.5 (4.5) [4]	1.5 (0.5) [8]	1.5 (0.5) [0]	1 (7.5)	1 (0)	2 (8.5)	2 (0.5)
10	(5) 6	(5) 6	(1) 2	(1) 2	1.5	1.5	2.5	2.5
16	(5.5) 6.5	(5.5) 6.5	(1.5) 2.5	(1.5) 2.5	2	2	3	3

※: The values in ( ) are measured from the end of the auto switch mounting bracket.

※: The values in [ ] for bore size ø6 are for the double rod type (CJ2W series).

[mm]

Auto switch model	Rail mounting											
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C D-F7BA D-F7BAV D-A7□H/A80H D-A73C/A80C		D-F7NT		D-A7□ D-A80		D-A79W	
Bore size	A	B	A	B	A	B	A	B	A	B	A	B
6	—	—	—	—	—	—	—	—	—	—	—	—
10	4.5	4.5	0.5	0.5	3.5	3.5	8.5	8.5	3	3	0.5	0.5
16	5	5	1	1	4	4	9	9	3.5	3.5	1	1

※: Adjust the auto switch after confirming the operating condition in the actual setting.

### Auto Switch Mounting Height

[mm]

Auto switch model	Band mounting							
	D-M9□ D-M9□W D-M9□A D-A9□		D-M9□V D-M9□WV D-M9□AV D-A9□V		D-H7□/H7□W D-H7NF D-H7BA D-C7□/C80		D-H7C	D-C73C D-C80C
Bore size	Hs		Hs		Hs		Hs	Hs
6	15		16		15		18	17.5
10	17		18		17		20	19.5
16	20.5		21		20.5		23.5	23

[mm]

Auto switch model	Rail mounting									
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ D-A9□V		D-F7□/J79 D-F7□W/J79W D-F7BA/F79F D-F7NT D-A7□H/A80H		D-F7□V D-F7□WV D-F7BAV		D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W
Bore size	Hs		Hs		Hs		Hs	Hs	Hs	Hs
6	—		—		—		—	—	—	—
10	17.5		17.5		20		23	16.5	23.5	19
16	21		20.5		23		26	19.5	26.5	22

**Auto Switch Proper Mounting Position (Detection at stroke end)  
and Its Mounting Height/Single Acting, Spring Return Type (S)**

**Auto Switch Proper Mounting Position: Spring Return Type (S)**

- Standard Type (CDJ2□□□-□SZ)
- Non-rotating Rod Type (CDJ2K□□□-□SZ)
- Direct Mount Type (CDJ2R□□□-□SZ)
- Direct Mount, Non-rotating Rod Type (CDJ2RK□□□-□SZ)

Auto switch model		Bore size	A dimensions									B	
			5 to 9 st	10 to 15 st	16 to 30 st	31 to 45 st	46 to 60 st	61 to 75 st	76 to 100 st	101 to 125 st	126 to 150 st		
Band mounting	D-M9□	6	—	12	21	25	39	—	—	—	—	5.5	
	D-M9□W/M9□WV D-M9□A/M9□AV	10	—	13	20.5	32.5	44.5	—	—	—	—	6	
		16	—	12.5	21	33	45	51	75	93	105	6.5	
	D-M9□V	6	12	12	21	25	39	—	—	—	—	5.5	
		10	13	13	20.5	32.5	44.5	—	—	—	—	6	
		16	12.5	12.5	21	33	45	51	75	93	105	6.5	
	D-A9□	6	—	8	17	21	35	—	—	—	—	1.5	
		10	—	9	16.5	28.5	40.5	—	—	—	—	2	
		16	—	8.5	17	29	41	47	71	89	101	2.5	
	D-A9□V	6	8	8	17	21	35	—	—	—	—	1.5	
		10	9	9	16.5	28.5	40.5	—	—	—	—	2	
		16	8.5	8.5	17	29	41	47	71	89	101	2.5	
	D-H7□/H7C D-H7□W/H7BA D-H7NF	6	—	7.5	16.5	20.5	34.5	—	—	—	—	1	
		10	—	8.5	16	28	40	—	—	—	—	1.5	
		16	—	8	16.5	28.5	40.5	46.5	70.5	88.5	100.5	2	
	D-C7□/C80 D-C73C D-C80C	6	—	8.5	17.5	21.5	35.5	—	—	—	—	2	
		10	—	9.5	17	29	41	—	—	—	—	2.5	
		16	—	9	17.5	29.5	41.5	47.5	71.5	89.5	101.5	3	
	Rail mounting	D-M9□ D-M9□W/M9□WV D-M9□A/M9□AV	10	—	11.5	19	31	43	—	—	—	—	4.5
			16	—	11	19.5	31.5	43.5	49.5	73.5	91.5	103.5	5
			10	11.5	11.5	19	31	43	—	—	—	—	4.5
		D-M9□V	16	11	11	19.5	31.5	43.5	49.5	73.5	91.5	103.5	5
			10	—	7.5	15	27	39	—	—	—	—	0.5
		D-A9□	16	—	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5	1
10			7.5	7.5	15	27	39	—	—	—	—	0.5	
D-A9□V		16	7	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5	1	
		10	10.5	10.5	18	30	42	—	—	—	—	3.5	
D-F7□/F7□V D-J79/J79C D-A7□H/A80H D-A73C/A80C		16	10	10	18.5	30.5	42.5	48.5	72.5	90.5	102.5	4	
		10	—	10.5	18	30	42	—	—	—	—	3.5	
D-F7□W/J79W D-F7□WV/F79F D-F7BA/F7BAV		16	—	10	18.5	30.5	42.5	48.5	72.5	90.5	102.5	4	
		10	—	15.5	23	35	47	—	—	—	—	8.5	
D-F7NT		16	—	15	23.5	35.5	47.5	53.5	77.5	95.5	107.5	9	
		10	10	10	17.5	29.5	41.5	—	—	—	—	3	
D-A7□/A80		16	9.5	9.5	18	30	42	48	72	90	102	3.5	
		10	—	7.5	15	27	39	—	—	—	—	0.5	
D-A79W		16	—	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5	1	

※: In the actual setting, adjust them after confirming the auto switch performance.

- CJ1
- CJP
- CJ2**
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

- D-□
- X□
- Technical Data

# CJ2 Series

## Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height/Single Acting, Spring Extend Type (T)

### Auto Switch Proper Mounting Position: Spring Extend Type (T)

- Standard Type (CDJ2□□□-□TZ)
- Non-rotating Rod Type (CDJ2K□□□-□TZ)
- Direct Mount Type (CDJ2R□□□-□TZ)
- Direct Mount, Non-rotating Rod Type (CDJ2RK□□□-□TZ)

[mm]

Auto switch model	Bore size	A	B dimensions										
			5 to 9 st	10 to 15 st	16 to 30 st	31 to 45 st	46 to 60 st	61 to 75 st	76 to 100 st	101 to 125 st	126 to 150 st		
Band mounting	D-M9□ D-M9□W/M9□WV D-M9□A/M9□AV	6	5.5	—	12	21	25	39	—	—	—	—	
		10	6	—	13	20.5	32.5	44.5	—	—	—	—	
		16	6.5	—	12.5	21	33	45	51	75	93	105	
	D-M9□V	6	5.5	12	12	21	25	39	—	—	—	—	
		10	6	13	13	20.5	32.5	44.5	—	—	—	—	
		16	6.5	12.5	12.5	21	33	45	51	75	93	105	
	D-A9□	6	1.5	—	8	17	21	35	—	—	—	—	
		10	2	—	9	16.5	28.5	40.5	—	—	—	—	
		16	2.5	—	8.5	17	29	41	47	71	89	101	
	D-A9□V	6	1.5	8	8	17	21	35	—	—	—	—	
		10	2	9	9	16.5	28.5	40.5	—	—	—	—	
		16	2.5	8.5	8.5	17	29	41	47	71	89	101	
	D-H7□/H7C D-H7□W/H7BA D-H7NF	6	1	—	7.5	16.5	20.5	34.5	—	—	—	—	
		10	1.5	—	8.5	16	28	40	—	—	—	—	
		16	2	—	8	16.5	28.5	40.5	46.5	70.5	88.5	100.5	
	D-C7□/C80 D-C73C D-C80C	6	2	—	8.5	17.5	21.5	35.5	—	—	—	—	
		10	2.5	—	9.5	17	29	41	—	—	—	—	
		16	3	—	9	17.5	29.5	41.5	47.5	71.5	89.5	101.5	
	Rail mounting	D-M9□ D-M9□W/M9□WV D-M9□A/M9□AV	10	4.5	—	11.5	19	31	43	—	—	—	—
			16	5	—	11	19.5	31.5	43.5	49.5	73.5	91.5	103.5
			10	4.5	11.5	11.5	19	31	43	—	—	—	—
		D-M9□V	16	5	11	11	19.5	31.5	43.5	49.5	73.5	91.5	103.5
			10	0.5	—	7.5	15	27	39	—	—	—	—
		D-A9□	16	1	—	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5
10			0.5	7.5	7.5	15	27	39	—	—	—	—	
D-A9□V		16	1	7	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5	
		10	3.5	10.5	10.5	18	30	42	—	—	—	—	
D-F7□/F7□V D-J79/J79C D-A7□H/A80H D-A73C/A80C		16	4	10	10	18.5	30.5	42.5	48.5	72.5	90.5	102.5	
		10	3.5	—	10.5	18	30	42	—	—	—	—	
D-F7□W/J79W D-F7□WV/F79F D-F7BA/F7BAV		16	4	—	10	18.5	30.5	42.5	48.5	72.5	90.5	102.5	
		10	8.5	—	15.5	23	35	47	—	—	—	—	
D-F7NT		16	9	—	15	23.5	35.5	47.5	53.5	77.5	95.5	107.5	
		10	3	10	10	17.5	29.5	41.5	—	—	—	—	
D-A7□/A80		16	3.5	9.5	9.5	18	30	42	48	72	90	102	
		10	0.5	—	7.5	15	27	39	—	—	—	—	
D-A79W		16	1	—	7	15.5	27.5	39.5	45.5	69.5	87.5	99.5	

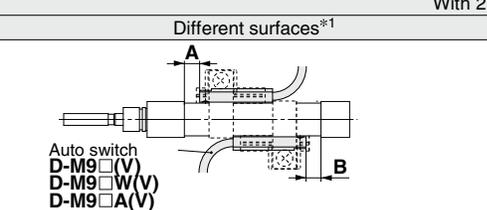
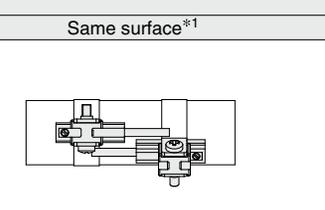
※: In the actual setting, adjust them after confirming the auto switch performance.

## Minimum Stroke for Auto Switch Mounting

		[mm]				
Auto switch mounting	Auto switch model	Number of auto switches				
		With 1 pc.	With 2 pcs.		With n pcs. (n: Number of auto switches)	
			Different surfaces	Same surface	Different surfaces	Same surface
Band mounting	D-M9□ D-M9□W D-M9□A D-A9□	10	15*1	45*1	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	45 + 15 (n - 2) (n = 2, 3, 4, 5...)
	D-M9□V	5	15*1	35	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	35 + 25 (n - 2) (n = 2, 3, 4, 5...)
	D-M9□WV D-M9□AV	10	15*1	35	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	35 + 25 (n - 2) (n = 2, 3, 4, 5...)
	D-A9□V	5	10	35	$10 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	35 + 25 (n - 2) (n = 2, 3, 4, 5...)
	D-H7□/H7□W D-H7BA D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	60 + 22.5 (n - 2) (n = 2, 3, 4, 5...)
	D-C7□ D-C80	10	15	50	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	50 + 20 (n - 2) (n = 2, 3, 4, 5...)
	D-H7C D-C73C D-C80C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*3	50 + 27.5 (n - 2) (n = 2, 3, 4, 5...)
Rail mounting	D-M9□V	5	—	5	—	10 + 10 (n - 2) (n = 4, 6...)*4
	D-A9□V	5	—	10	—	10 + 15 (n - 2) (n = 4, 6...)*4
	D-M9□ D-A9□	10 (5)*5	—	10	—	15 + 15 (n - 2) (n = 4, 6...)*4
	D-M9□WV D-M9□AV	10	—	15	—	15 + 15 (n - 2) (n = 4, 6...)*4
	D-M9□W	15 (10)*5	—	15	—	20 + 15 (n - 2) (n = 4, 6...)*4
	D-M9□A	15 (10)*5	—	20 (15)*5	—	20 + 15 (n - 2) (n = 4, 6...)*4
	D-F7□ D-J79	5	—	5	—	15 + 15 (n - 2) (n = 4, 6...)*4
	D-F7□V D-J79C	5	—	5	—	10 + 10 (n - 2) (n = 4, 6...)*4
	D-F7□W/J79W D-F7BA/F79F/F7NT	10	—	15	—	15 + 20 (n - 2) (n = 4, 6...)*4
	D-F7□WV D-F7BAV	10	—	15	—	10 + 15 (n - 2) (n = 4, 6...)*4
	D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	—	10	—	15 + 10 (n - 2) (n = 4, 6...)*4
	D-A7□H D-A80H	5	—	10	—	15 + 15 (n - 2) (n = 4, 6...)*4
	D-A79W	10	—	15	—	10 + 15 (n - 2) (n = 4, 6...)*4

- \*3: When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.  
 \*4: When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation. However, the minimum even number is 4. So, 4 is used for the calculation when "n" is 1 to 3.  
 \*5: The dimension stated in ( ) shows the minimum mountable stroke when the auto switch does not project from the end face of the cylinder body and the lead wire bending space is not hindered.

\*1: Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces*1	Same surface*1
		
D-M9□/M9□W/M9□A	Less than 20 stroke*2	Less than 55 stroke*2
D-A9□	—	Less than 50 stroke*2

\*2: Minimum stroke for auto switch mounting in types other than those mentioned in \*1.

CJ1

CJP

**CJ2**

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-□

-X□

Technical Data

## Operating Range

Auto switch model		Bore size [mm]			
		6	10	16	
Band mounting	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	2	2.5	3	
	D-A9□	4.5	6	7	
	D-H7□/H7□W D-H7BA/H7NF	3	4	4	
	D-H7C	5	8	9	
	D-C7□/C80/C73C/C80C	6	7	7	
	Rail mounting	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	—	3	3.5
		D-A9□/A9□V	—	6	6.5
D-F7□/J79/F7□W/J79W D-F7□V/F7□WV/F79F D-J79C/F7BA/F7BAV D-F7NT		—	5	5	
D-A7□/A80/A7H/A80H D-A73C/A80C		—	8	9	
D-A79W		—	11	13	

\*: Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

## Auto Switch Mounting Brackets/Part No.

Auto switch mounting	Auto switch model	Bore size [mm]		
		6	10	16
Band mounting	D-M9□ D-M9□V D-M9□W D-M9□WV D-A9□ D-A9□V	BJ6-006 (A set of a, b, d, f)	BJ6-010 (A set of a, b, c, d)	BJ6-016 (A set of a, b, c, d)
	D-M9□A*2 D-M9□AV*2	BJ6-006S (A set of a, b, d, g)	BJ6-010S (A set of a, b, d, e)	BJ6-016S (A set of a, b, d, e)
Band mounting				
Band mounting	D-H7□/H7□W D-H7BA/H7NF D-C7□/C80 D-C73C/C80C	BJ2-006 (A set of band and screw)	BJ2-010 (A set of band and screw)	BJ2-016 (A set of band and screw)
Rail mounting	*4 D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A*4 D-M9□AV*4 D-A9□ D-A9□V	BQ2-012 (S) (A set of a and b)		BQ2-012 (S) (A set of a and b)

\*1: Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please contact SMC regarding other chemicals.

\*2: As the indicator LED is projected from the auto switch unit, indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

\*3: When the cylinder is shipped, the auto switch mounting bracket and the auto switch will be included.

\*4: For D-M9□A(V), order the BQ2-012S, which uses stainless steel mounting screws.

### Band Mounting Brackets Set Part No.

Set part no.	Contents	Bore size [mm]		
		6	10	16
BJ2-□□□	• Auto switch mounting band (a) • Auto switch mounting screw (b)	BJ2-006	BJ2-010	BJ2-016
BJ4-1	• Switch bracket (White/PBT) (e) • Switch holder (d)	—	●	●
BJ4-2	• Switch bracket (Black/PBT) (g) • Switch holder (d)	●	—	—
BJ5-1	• Switch bracket (Transparent/Nylon) (c)*1 • Switch holder (d)	—	●	●
BJ5-2	• Switch bracket (Transparent blue/Nylon) (f)*1 • Switch holder (d)	●	—	—

### [Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

BBA4: For D-C7/C8/H7 types

\*5: Refer to page 1682 for details on the BBA4.

When the D-H7BA type auto switch is shipped independently, the BBA4 is attached.

**Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.**

Refer to pages 1575 to 1701 for the detailed specifications.

Type	Mounting	Model	Electrical entry	Features	Applicable bore size	
Sold state	Band mounting	D-H7A1/H7A2/H7B	Grommet (In-line)	—	ø6 to ø16	
		D-H7NW/H7PW/H7BW		Diagnostic indication (2-color indicator)		
	Rail mounting	D-F79/F7P/J79		Grommet (Perpendicular)	—	ø10, ø16
		D-F79W/F7PW/J79W			Diagnostic indication (2-color indicator)	
		D-F7NV/F7PV/F7BV	Grommet (Perpendicular)	—		
		D-F7NWV/F7BWV		Diagnostic indication (2-color indicator)		
Reed	Band mounting	D-C73/C76	Grommet (In-line)	—	ø6 to ø16	
		D-C80		Without indicator light		
	Rail mounting	D-A73H/A76H		Grommet (Perpendicular)	—	ø10, ø16
		D-A80H			Without indicator light	
		D-A73	Grommet (Perpendicular)	—		
		D-A80		Without indicator light		

\*: With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1648 and 1649.

\*: Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to page 1593.

**CJ1**

**CJP**

**CJ2**

**JCM**

**CM2**

**CM3**

**CG1**

**CG3**

**JMB**

**MB**

**MB1**

**CA2**

**CS1**

**CS2**

**D-□**

**-X□**

Technical  
Data

# CJ2 Series

# Made to Order: Individual Specifications

Contact SMC for detailed specifications, delivery and prices.



## 1 PTFE Grease

Symbol  
**-X446**

### Applicable Series

Description	Model	Action	Note
Standard type	CJ2	Double acting, Single rod	
		Single acting (Spring return/extend)	
	CJ2W	Double acting, Double rod	
Non-rotating rod type	CJ2K	Double acting, Single rod	
		Single acting (Spring return/extend)	
Built-in speed controller type	CJ2Z	Double acting, Single rod	
	CJ2ZW	Double acting, Double rod	
Direct mount type	CJ2R	Double acting, Single rod	
		Single acting (Spring return/extend)	
Direct mount, Non-rotating rod type	CJ2RK	Double acting, Single rod	
		Single acting (Spring return/extend)	

**Specifications: Same as standard type**

**Dimensions: Same as standard type**

※: When grease is necessary for maintenance, grease pack is available, please order it separately.  
**GR-F-005** (Grease: 5 g)

### How to Order

Standard model no. **- X446**  
PTFE grease ●

### Warning Precautions

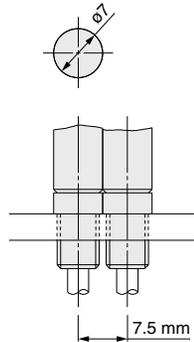
Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

**2 Short Pitch Mounting/Single Acting, Spring Return**

Symbol  
**-X773**

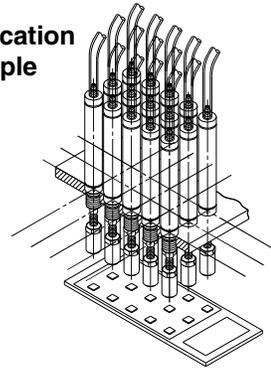
Mounting pitch is shortened when cylinders are used in parallel.

- Changes rod cover and head cover dimensions to  $\phi 7$ .
- Shortens the full length with a head cover integrated with a barb fitting.



\*: Directly mounted with cylinder mounting screws

Application example



Verification of push button actuation for mobile phones etc.

**Applicable Series**

Description	Model	Action	Note
Standard type	CJ2	Single acting (Spring return)	

**How to Order**

CJ2B6 - **Stroke** SU4Z - X773

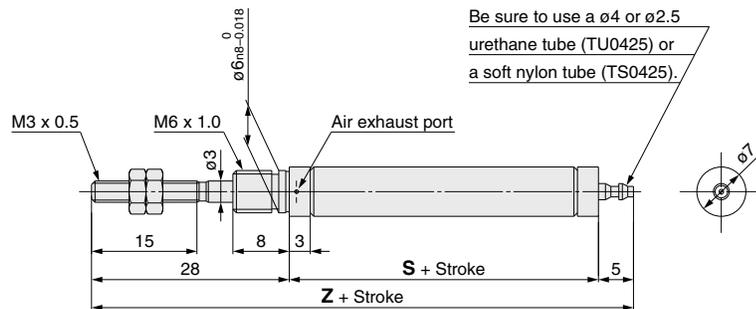
- Short pitch mounting/  
Single acting, spring return



**Specifications**

Bore size [mm]	6
Action	Single acting, Spring return
Operating pressure range	0.2 to 0.7 MPa
Port size	With $\phi 4$ barb fitting (For soft tube)
Connecting port location	Head cover/Axial direction
Stroke [mm]	5 to 60
Auto switch	None

**Dimensions**



	[mm]			
Stroke	5 to 15	16 to 30	31 to 45	46 to 60
<b>S</b>	30.5	39.5	43.5	57.5
<b>Z</b>	63.5	72.5	76.5	90.5

Note

1. When mounting a cylinder, make sure that the air exhaust port on the rod cover is not blocked.
2. When mounting a cylinder, apply thread locking adhesive on the threaded part and hold the external diameter of the rod cover with a needle-nose pliers or regular pliers.

CJ1

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**CJ2**

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Technical  
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## 3 Double Clevis (With One-touch Connecting Pin)

With pivot bracket (T-bracket) and one-touch connecting pin  
Not necessary to order a bracket for the applicable cylinder separately.

### Applicable Series

Applicable Cylinders (Double Clevis Type)

Series	Bore size [mm]	Type	Model	Action	Note
CJ2D	10, 16	Standard	CJ2D	Double acting, Single rod	Cannot be mounted on cylinders with air cushion, or rail mounting type auto switches.
			CJ2D	Single acting, Single rod (Spring return/extend)	
		Non-rotating rod type	CJ2KD	Double acting, Single rod	
			CJ2KD	Single acting, Single rod (Spring return/extend)	

### How to Order

Example) **CDJ2D10-60Z-N-M9BW-B-X2838**

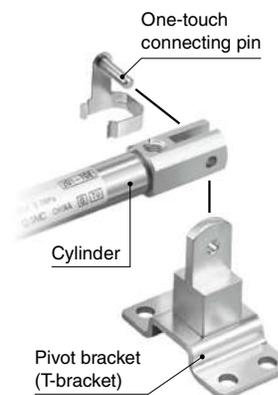
• **With one-touch connecting pin**

※: The pivot bracket (T-bracket) and one-touch connecting pin are shipped together. Refer to page 63-2 for assembly instructions.

• **Pivot bracket (T-bracket)**

Nil	None
N	Pivot bracket is shipped together with the product, but not assembled.

• **Double clevis type**

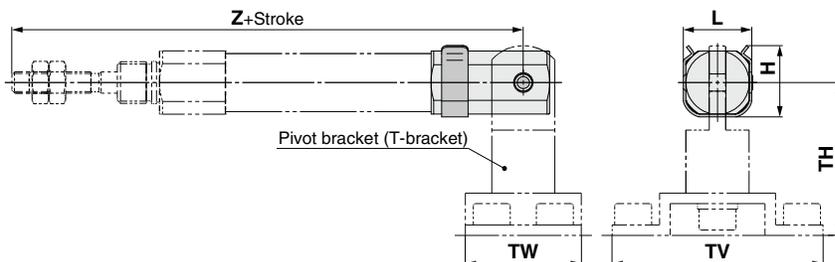


### Specifications: Same as standard type

### Dimensions

CJ2D  $\frac{10}{16}$  - Stroke Z - (N) - X2838

※: Refer to page 63-2 for assembly procedures and mounting methods.



[mm]						
Applicable bore size	H	L	TH	TV	TW	Z
10	13.4	13.2	29	40	22	82
16	18.2	19.5	35	48	28	85

※: The pivot bracket (T-bracket) is the same as the standard type. Refer to page 63-1 for details.



## Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

### Mounting

#### ⚠ Warning

1. Use within the specified cylinder speed and kinetic energy ranges.

Otherwise, cylinder and seal damage may occur.

2. Do not apply excessive lateral load to the piston rod.

Easy checking method

Minimum operating pressure after the cylinder is mounted to the equipment (MPa) = Minimum operating pressure of cylinder (MPa) + {Load weight (kg) x Friction coefficient of guide/Sectional area of cylinder (mm<sup>2</sup>)}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

3. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.

The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion.

#### ⚠ Caution

1. During installation, secure the cover on the tightening side and tighten by applying an appropriate tightening force to the retaining nut or to the cover on the tightening side.

If the cover on the opposite side of the tightening side is secured or tightened, the cover could rotate, leading to the deviation.

2. Tighten the retaining screws to an appropriate tightening torque within the range given below.

ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m

ø16: 10.8 to 11.8 N·m

3. To remove and install the retaining ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C retaining ring). In particular, use a pair of ultra-mini pliers for removing and installing the retaining ring on the ø10 cylinder.

4. In the case of auto switch rail mounting type, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

5. Please contact SMC when the stroke exceeds 100 mm for the axial foot mounting type.

#### <Precautions on the single acting cylinder>

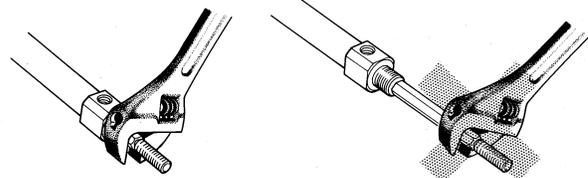
- 1) Do not operate it in such a way that a load would be applied during the retraction of the piston rod of the spring return type, or during the extension of the piston rod of the spring extend type. The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod will not be able to retract to the end of the stroke.
- 2) A breather hole is provided in the cover surface. Make sure not to block this hole during installation, as this could lead to a malfunction.

#### <Precautions on the non-rotating cylinder>

- 1) Tighten the retaining screws to an appropriate tightening torque within the range given below.  
ø10: 10.8 to 11.8 N·m, ø16: 20 to 21 N·m
- 2) Do not operate it in such a way that rotational torque would be applied to the piston rod. If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.

	ø10	ø16
Allowable rotational torque [N·m]	0.02	0.04

- 3) To screw a bracket onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.



CJ1

CJP

**CJ2**

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-

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Technical Data