Series CL
Specific Product Precautions 2

Be sure to read before handling.
The precautions on these pages are for the fine lock cylinders and the lock-up cylinders.
For general actuator precautions, refer to Actuator Precautions on pages 3 to 7.

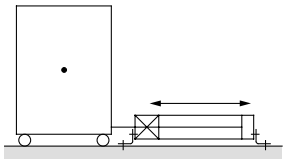
Mounting

⚠Warning

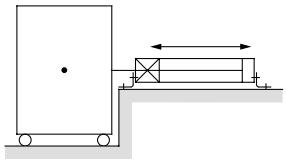
1. Be certain to connect the rod end to the load with the lock released.
- If this is performed with the lock engaged, a load that exceeds the allowable rotational force or holding force would be applied to the piston rod, which could damage the locking mechanism. The fine lock and Series CL1 with ø40 to ø100 cylinders have a built-in manual unlocking mechanism. Therefore, they can be maintained in the unlocked state without supplying air. For Series CL1 with ø125 to ø160 cylinders, simply connect piping to the lock-up port, and supply air pressure of 0.2 MPa or more to disengage the lock in order to attach a load.

⚠Caution

1. Do not apply offset loads on the piston rod.
- Pay particular attention to aligning the center of gravity of the load with the axial center of the cylinder. If there is a large amount of deviation, the piston rod could become unevenly worn or damaged due to the inertial moment that is created when the piston rod is stopped by the lock.



X Load center of gravity and cylinder shaft center are not matched.



○ Load center of gravity and cylinder shaft center are matched.

Note) Can be used if all of the generated moment is absorbed by an effective guide.

Adjustment

⚠Caution

1. Place it in the locked position. (Excluding the series CL1 ø125 to ø160.)
- The locks are manually disengaged at the time the cylinders are shipped from the factory. Therefore, make sure to change them to the locked state before using the cylinders. For procedures to effect the change, refer to page 599 for the fine lock series. Be aware that the lock will not operate properly if the change is not performed correctly.
- Adjust the cylinder's air balance. In the state in which a load is attached to the cylinder, disengage the lock and adjust the air pressure at the rod side and the head side of the cylinder to obtain a load balance. By maintaining a proper air balance, the piston rod can be prevented from lurching when the lock is disengaged.

2. Adjust the mounting position of detections such as those of the auto switches. To effect an intermediate stop, adjust the mounting position of the auto switch detection by taking the amount of overrun into consideration in relation to the desired stopping position.

Series CL
Specific Product Precautions 3

Be sure to read before handling.
The precautions on these pages are for the fine lock cylinders and the lock-up cylinders.
For general actuator precautions, refer to Actuator Precautions on pages 3 to 7.

Pneumatic Circuit

⚠ Warning

1. Be certain to use an pneumatic circuit which will apply balancing pressure to both sides of the piston when in a locked stop.
In order to prevent cylinder lurching after a lock stop, when restarting or when manually unlocking, a circuit should be used to which will apply balancing pressure to both sides of the piston, thereby canceling the force generated by the load in the direction of piston movement.

2. Use a solenoid valve for unlocking which has a large effective area, as a rule 50% or more of the effective area of the cylinder drive solenoid valve.
The larger the effective area is, the shorter the locking time will be (the overrun amount will be shorter), and stopping accuracy will be improved.

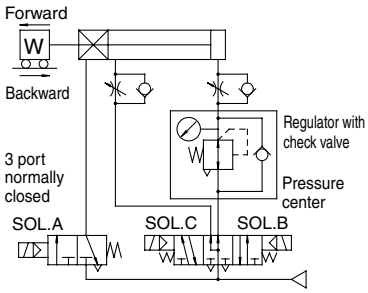
3. Place the solenoid valve for unlocking close to the cylinder, and no farther than the cylinder drive solenoid valve.
The shorter the distance from the cylinder (the shorter the piping), the shorter the overrun amount will be, and stopping accuracy will be improved.

4. Allow at least 0.5 seconds from a locked stop (intermediate stop of the cylinder) until release of the lock.
When the locked stop time is too short, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

5. When restarting, control the switching signal for the unlocking solenoid valve so that it acts before or at the same time as the cylinder drive solenoid valve.
If the signal is delayed, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

6. Basic circuit

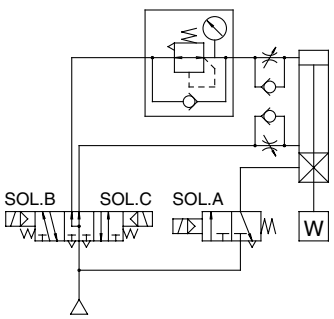
1) [Horizontal]



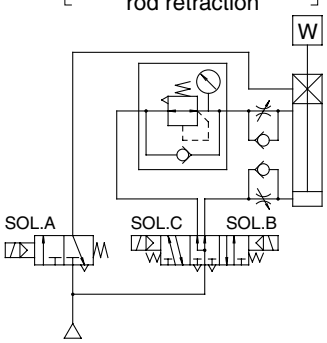
SOL.A	SOL.B	SOL.C	Action	
ON	ON	OFF	Forward	
OFF	OFF	OFF	Locked stop	0.5 s or more
ON	OFF	OFF	Unlocked	
ON	ON	OFF	Forward	0 to 0.5 s
ON	OFF	ON	Backward	
OFF	OFF	OFF	Locked stop	0.5 s or more
ON	OFF	OFF	Unlocked	
ON	OFF	ON	Backward	0 to 0.5 s

2) [Vertical]

[Load in the direction of rod extension]

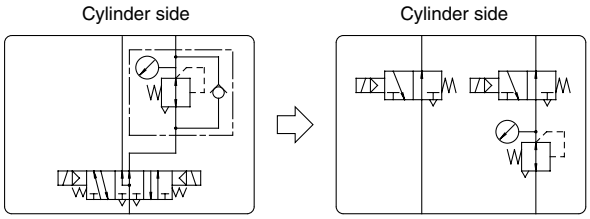


[Load in the direction of rod retraction]



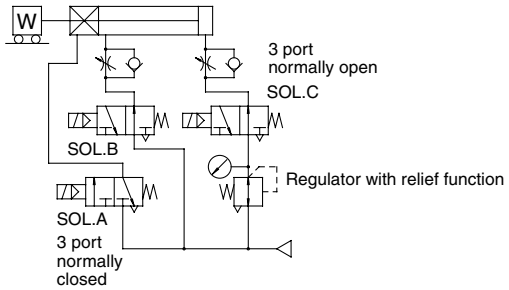
⚠ Caution

1. A 3 position pressure center solenoid valve and regulator with check valve can be replaced with two 3 port normally open valves and a regulator with relief function.



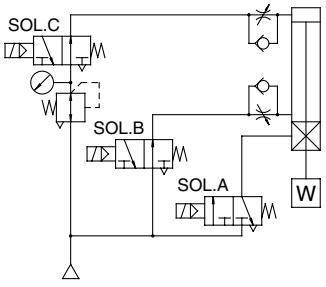
[Example]

1) [Horizontal]

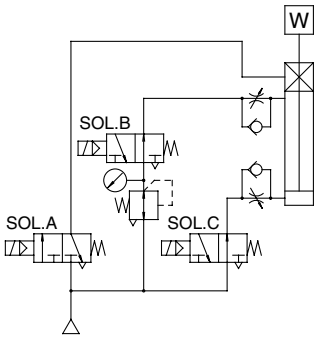


2) [Vertical]

[Load in the direction of rod extension]



[Load in the direction of rod retraction]



Series CL
Specific Product Precautions 4

Be sure to read before handling.
The precautions on these pages are for the fine lock cylinders and the lock-up cylinders.
For general actuator precautions, refer to Actuator Precautions on pages 3 to 7.

How to Manually Disengage the Lock and Change from the Unlocked to the Locked State

The lock is manually disengaged at the time the cylinder is shipped from the factory. Because the lock will not operate in this state, make sure to change it to the locked state before operation, after having adjusted the axial center for installation.

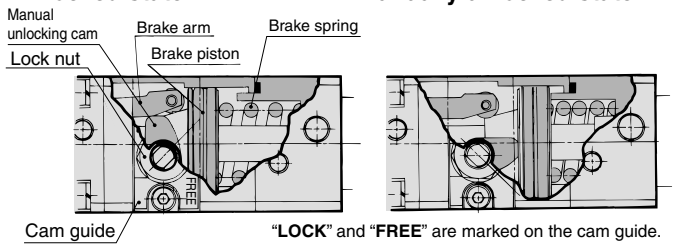
How to Change from Unlocked to Locked State

1. Series CLJ2, CLM2, CLG1

1) Loose locking nut.
2) Turn the wrench flats section of the manual unlocking cam to the LOCK position that is marked on the cam guide.
3) While keeping the wrench flats section in place, tighten the lock nut.

Note) The manual unlocking cam will rotate approximately 180°. Do not rotate the wrench flats section excessively.

Locked state **Manually unlocked state**



"**LOCK**" and "**FREE**" are marked on the cam guide.

Manually Unlocking

The lock of a fine lock series cylinder can be disengaged manually through the procedure described below. However, make sure to disengage the lock pneumatically before operating the cylinder.

Note) Manual disengagement of the lock could create a greater cylinder sliding resistance than pneumatic disengagement of the lock.

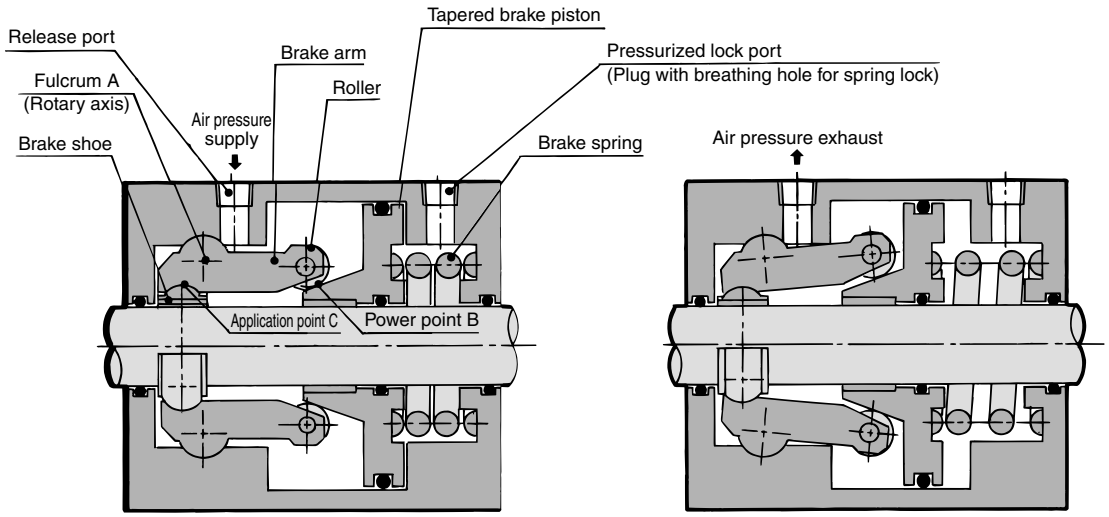
1. Series CLJ2, CLM2, CLG1

1) Loose locking nut.
2) Supply air pressure of 0.3 MPa or more to the lock release port.
3) Turn the wrench flats section of the manual unlocking cam until it stops at the FREE position that is marked on the cam guide.
4) While keeping the wrench flats section in place, tighten the lock nut.

Prior to Use

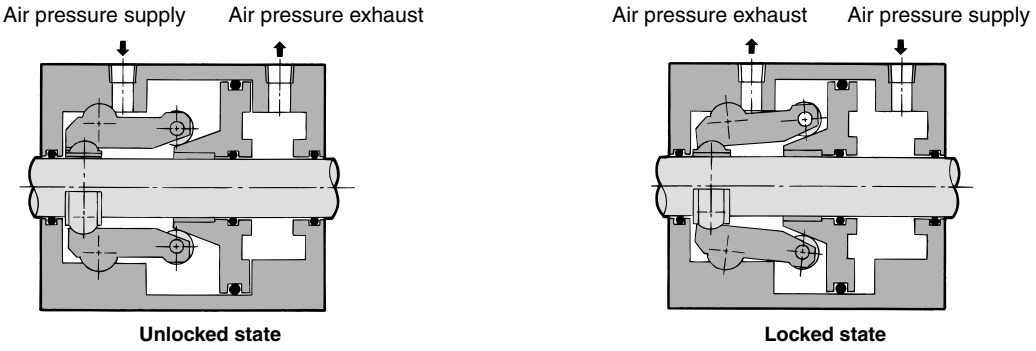
Construction Principle/Applicable Series: CLJ2, CLM2, CLG1, MLGC

Spring locking type



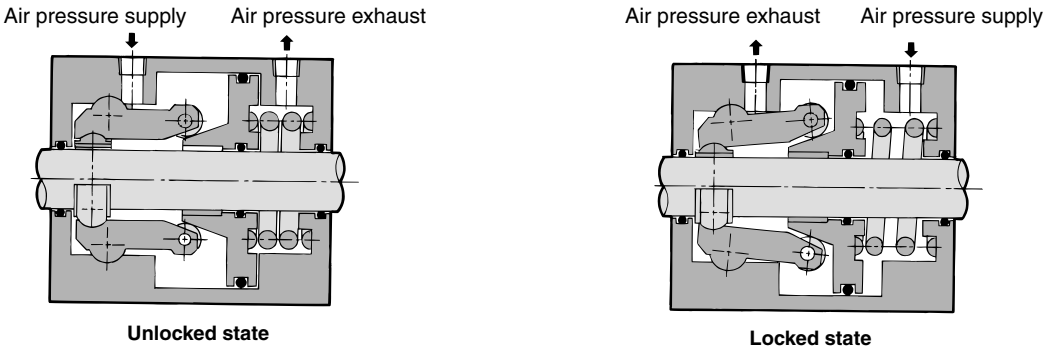
Spring locking (Exhaust locking)
The spring force that is applied to the tapered brake piston becomes amplified through the wedge effect. This force becomes further amplified to the power of AB/AC through the mechanical advantage of a lever and acts on the brake shoe, which in turn, applies a large force to tighten and lock the piston rod. To disengage the lock, air pressure is supplied through the unlocking port, thus disengaging the brake spring force.

Pneumatic locking type



Brake piston is operated by air pressure.

Spring and pneumatic locking type



Brake piston is operated by air pressure and spring force.

Fine Lock Cylinder
Double Acting, Single Rod
Series CLJ2
ø16

How to Order

CLJ2 **L** **16** – **60** **R** – **E** – ☐

With auto switch **CDLJ2** **L** **16** – **60** **R** – **E** – **M9BW** ☐ – ☐

With auto switch
(Built-in magnet)

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
D	Double clevis style

Bore size

16	16 mm

Standard stroke (mm)

ø16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

Port location on head cover

Nil	Perpendicular to axis
R	Axial direction

Lock operation

E	Spring locking (Exhaust locking)
P	Pneumatic locking (Pressure locking)
D	Spring and pneumatic locking

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Made to Order
Refer to page 602 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDLJ2B16-45-P

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 DC	Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9N**	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9P**	●	●	●	○	—	○		
				2-wire		12 V		**M9B**	●	●	●	○	—	○	—	
		Connector						**H7C**	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**M9NW**	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PW**	●	●	●	○	—	○		
				2-wire		12 V		**M9BW**	●	●	●	○	—	○	—	
	Water resistant (2-color indication)							**H7BA**	—	—	●	○	—	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**H7NF**	●	—	●	○	—	○	IC circuit	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96**	●	—	●	—	—	—	IC circuit	—
			Yes	2-wire	24 V	12 V		**A93**	●	—	●	—	—	—	—	Relay, PLC
			No				100 V or less	**A90**	●	—	●	—	—	—	IC circuit	
		Connector	Yes				—	**C73C**	●	—	●	●	●	—	—	
			No				24V or less	**C80C**	●	—	●	●	●	—	IC circuit	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Since there are other applicable auto switches than listed, refer to page 610 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
∗ D-A9□V□/M9□V□/M9□WV□/D-M9□A(V)L types cannot be mounted.

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ D-A9□/M9□/M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled at the time of shipment.)
∗ D-C7□□/C80□/H7□□ auto switches are assembled at the time of shipment.

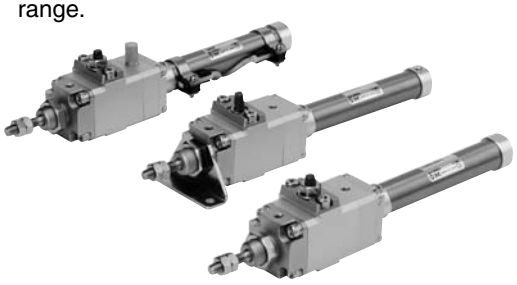
Provided with a compact lock mechanism, it is suitable for intermediate stop, emergency stop, and drop prevention.

Locking in both directions

The piston rod can be locked in either direction of its cylinder stroke.

Maximum piston speed: 500 mm/s

It can be used at 50 to 500 mm/s provided that it is within the allowable kinetic energy range.



Head Cover Port Location

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.

Axial Perpendicular

Made to Order Specifications
(For details, refer to page 1836.)

Symbol	Specifications
-XA□	Change of rod end shape

Refer to pages 608 to 610 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Switch mounting bracket: Part no.

Specifications

Bore size (mm)	16
Action	Double acting, Single rod
Lubricant	Not required (Non-lube)
Lock operation	Spring locking (Exhaust locking) Pneumatic locking (Pressure locking) Spring and pneumatic locking
Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.08 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)
Piston speed	50 to 500 mm/s *
Cushion	Rubber bumper
Stroke length tolerance	$^{+1.0}_{0}$
Mounting	Basic style, Axial foot style, Rod side flange style, Double clevis style

* Constraints associated with the allowable kinetic energy are imposed on the speeds at which the piston can be locked.
The maximum speed of 750 mm/s can be accommodated if the piston is to be locked in the stationary state for the purpose of drop prevention.

Fine Lock Specifications

Lock operation	Spring locking (Exhaust locking)	Spring and pneumatic locking	Pneumatic locking (Pressure locking)
Fluid	Air		
Maximum operating pressure	0.5 MPa		
Unlocking pressure	0.3 MPa or more		0.1 MPa or more
Lock starting pressure	0.25 MPa or less		0.05 MPa or more
Locking direction	Both directions		

Standard Stroke/

Refer to the minimum auto switch mounting stroke (page 609) for those with an auto switch. (mm)

Bore size (mm)	Standard stroke
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

* Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

Mounting Bracket and Accessory/For details, refer to page 607.

Mounting		Basic style	Axial foot style	Rod side flange style	Double clevis style
Standard equipment	Mounting nut	●	●	●	—
	Rod end nut	●	●	●	●
	Clevis pin	—	—	—	●
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint (With pin) *	●	●	●	●
	T-bracket	—	—	—	●

* Pins and retaining rings are packaged together with double clevis and double knuckle joint.

Mounting Bracket Part No.

Mounting bracket	Part no.
Foot	CLJ-L016B
Flange	CLJ-F016B
T-bracket *	CJ-T016B

* T-bracket is used with double clevis (D).

Mass

(g)

Bore size (mm)		16
Standard mass *		320
Additional mass per each 15 mm of stroke		6.5
Mounting bracket mass	Axial foot style	27
	Rod side flange style	21
	Double clevis style (With pin) **	10

* Mounting nut and rod end nut are included in the basic mass.
** Mounting nut is not included in double clevis style.

Calculation: (Example) **CLJ2L16-60**
- Basic mass·····320 (ø16)
- Additional mass·····6.5/15 stroke
- Cylinder stroke·····60 stroke

320 + 6.5/15 x 60 + 27 = 373 g

Stopping Accuracy (Not including tolerance of control system.) (mm)

Lock type	Piston speed (mm/s)			
	50	100	300	500
Spring locking (Exhaust locking)	±0.4	±0.5	±1.0	±2.0
Pneumatic locking (Pressure locking) Spring and pneumatic locking	±0.2	±0.3	±0.5	±1.5

Condition: Load: 2 kg
Solenoid valve: Lock port mounting

⚠Caution

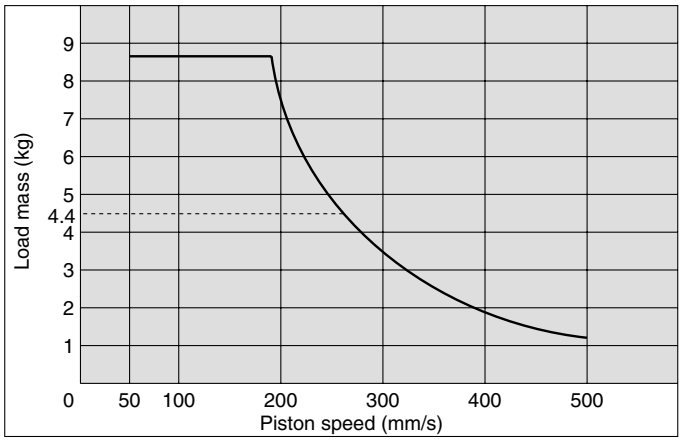
Recommended Pneumatic Circuit/Caution on Handling

For detailed specifications of the fine lock cylinder, Series CLJ2 mentioned above, refer to pages 596 to 599.

⚠ Caution/Allowable Kinetic Energy when Locking

Bore size (mm)	16
Allowable kinetic energy (J)	0.17

1. In terms of specific load conditions, this allowable kinetic energy is equivalent to a load of 3.7 kg in mass, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, there is no need to calculate.
2. Apply the following formula to obtain the kinetic energy of the load.
   Ek: Kinetic energy of load (J)
   $Ek = \frac{1}{2} m v^2$ m: Load mass (kg)
   v: Piston speed (m/s)
3. The piston speed will exceed the average speed immediately before locking. To determine the piston speed for the purpose of obtaining the kinetic energy of load, use 1.2 times the average speed as a guide.
4. The relationship between the speed and the load is indicated in the graph below. The area below the line is the allowable kinetic energy range.
5. During locking, the lock mechanism must sustain the thrust of the cylinder, in addition to absorbing the energy of the load. Therefore, there is an upper limit to the size of the load that can be sustained. Thus, a horizontally mounted cylinder must be operated below the solid line, and a vertically mounted cylinder must be operated below the dotted line.

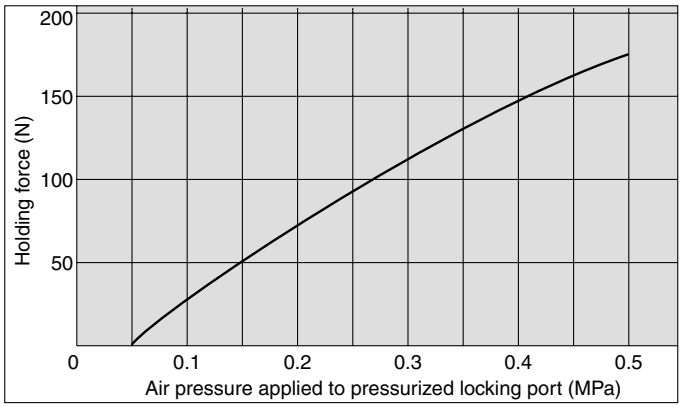


Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	16
Holding force (N)	122

Note) Holding force at piston rod extended side decreases approximately 15%.

Holding Force of Pneumatic Locking (Maximum static load)



* When selecting cylinders, refer to the Precautions and allowable kinetic energy when locking on page 596, and then select a cylinder.

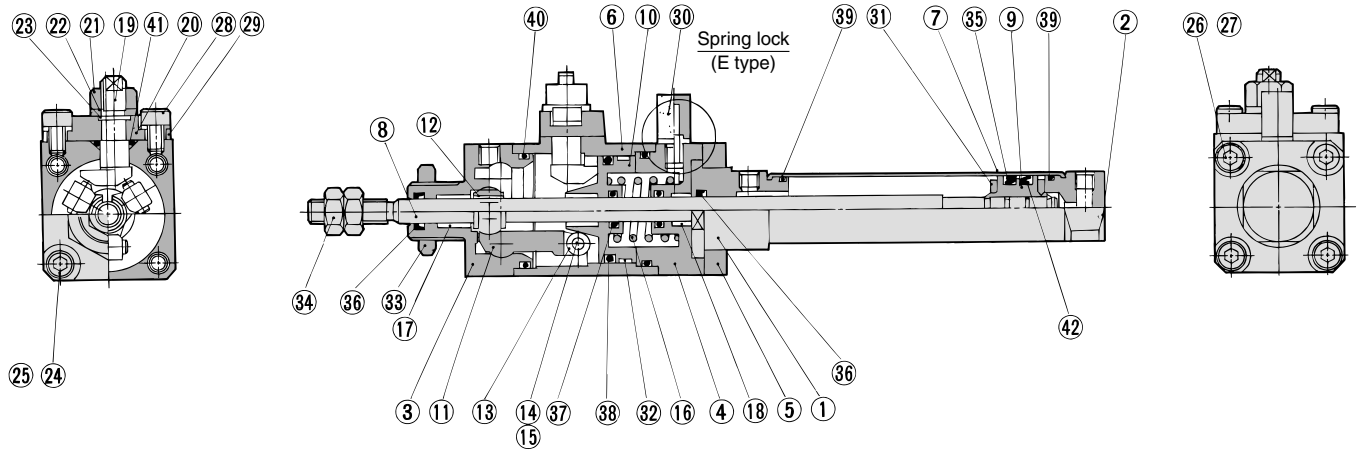
⚠Caution

Caution when Locking

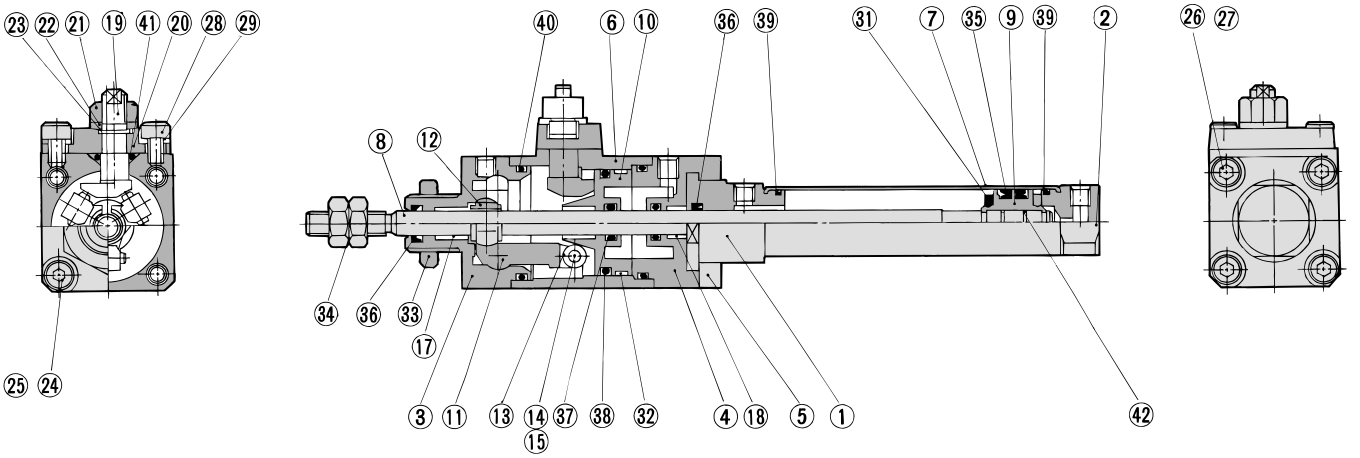
Holding force is the force which can hold a static load, given no vibration or impact, in a locked state. Therefore, do not use cylinders around the maximum holding force. Note the following points.
- If the piston rod slips because the lock's holding force has been exceeded, the brake shoe could be damaged, resulting in a reduced holding force or shortened life.
- To use the lock for drop prevention purposes, the load to be attached to the cylinder must be within 35% of the cylinder's holding force.
- Do not use the cylinder in the locked state to sustain a load that involves impact.

Construction (Not able to disassemble)

Spring locking (Exhaust locking)
Spring and pneumatic locking



Pneumatic locking (Pressure locking)



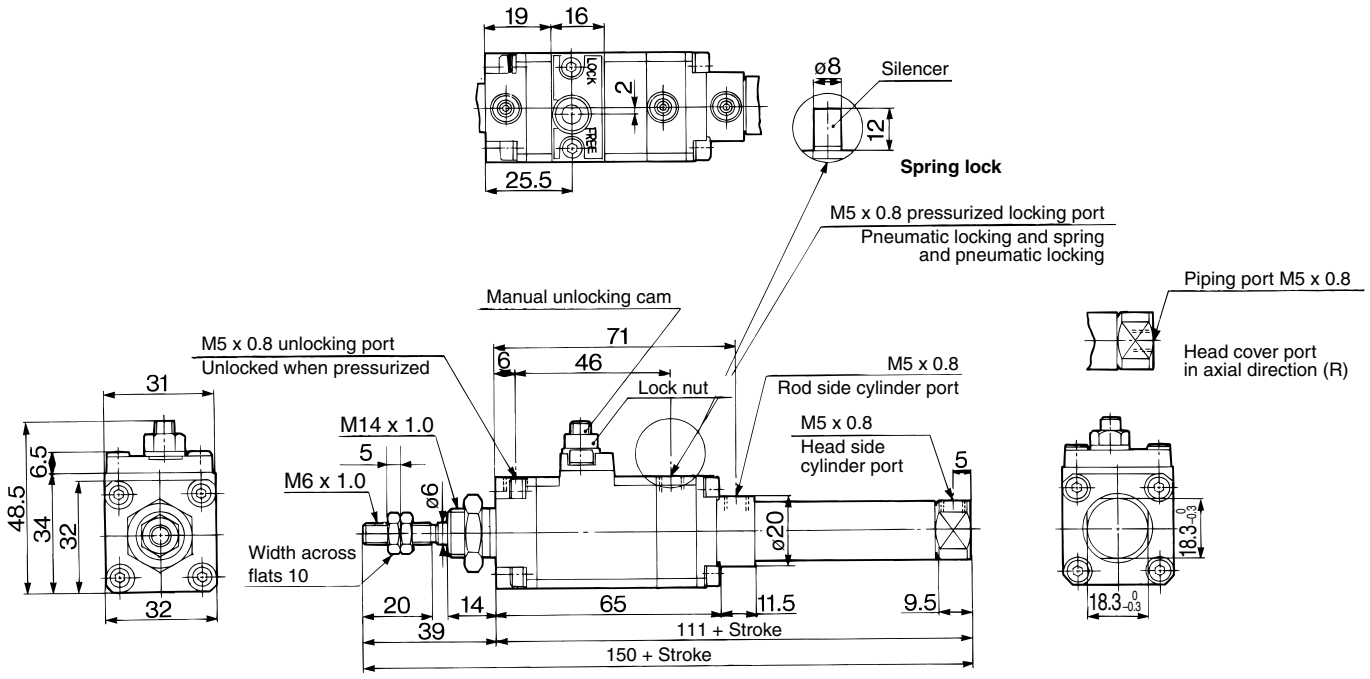
Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Clear anodized
2	**Head cover**	Aluminum alloy	Clear anodized
3	**Cover A**	Carbon steel	Nitrided, nickel chrome plated
4	**Cover B**	Aluminum alloy	Hard anodized
5	**Cover C**	Aluminum alloy	Hard anodized
6	**Intermediate cover**	Aluminum alloy	Hard anodized
7	**Cylinder tube**	Stainless steel	
8	**Piston rod**	Stainless steel	Hard chrome plated
9	**Piston**	Brass	
10	**Brake piston**	Carbon steel	Nitrided
11	**Brake arm**	Carbon steel	Nitrided
12	**Brake shoe**	Special friction material	
13	**Roller**	Carbon steel	Nitrided
14	**Pin**	Carbon steel	Heat treated
15	**Retaining ring**	Carbon tool steel	Nickel plated
16	**Brake spring**	Steel wire	Zinc chromated
17	**Bushing A**	Oil-impregnated sintered alloy	
18	**Bushing B**	Oil-impregnated sintered alloy	
19	**Manual lock release cam**	Chromium molybdenum steel	Nitrided
20	**Cam guide**	Carbon steel	Nitrided, platinum silver painted
21	**Lock nut**	Rolled steel	Nickel plated

No.	Description	Material	Note
22	**Plain washer**	Rolled steel	Nickel plated
23	**Retaining ring**	Carbon tool steel	Nickel plated
24	**Hexagon socket head cap screw**	Chromium molybdenum steel	Nickel plated
25	**Spring washer**	Steel wire	Nickel plated
26	**Hexagon socket head cap screw**	Chromium molybdenum steel	Nickel plated
27	**Spring washer**	Steel wire	Nickel plated
28	**Hexagon socket head cap screw**	Chromium molybdenum steel	Nickel plated
29	**Spring washer**	Steel wire	Nickel plated
30	**Silencer**	Bronze	Type E only
31	**Bumper**	Urethane	
32	**Wear ring**	Resin	
33	**Mounting nut**	Brass	Nickel plated
34	**Rod end nut**	Rolled steel	Nickel plated
35	**Piston seal**	NBR	
36	**Rod seal A**	NBR	
37	**Rod seal B**	NBR	
38	**Brake piston seal**	NBR	
39	**Cylinder tube gasket**	NBR	
40	**Intermediate cover gasket**	NBR	
41	**Cam gasket**	NBR	
42	**Piston gasket**	NBR	

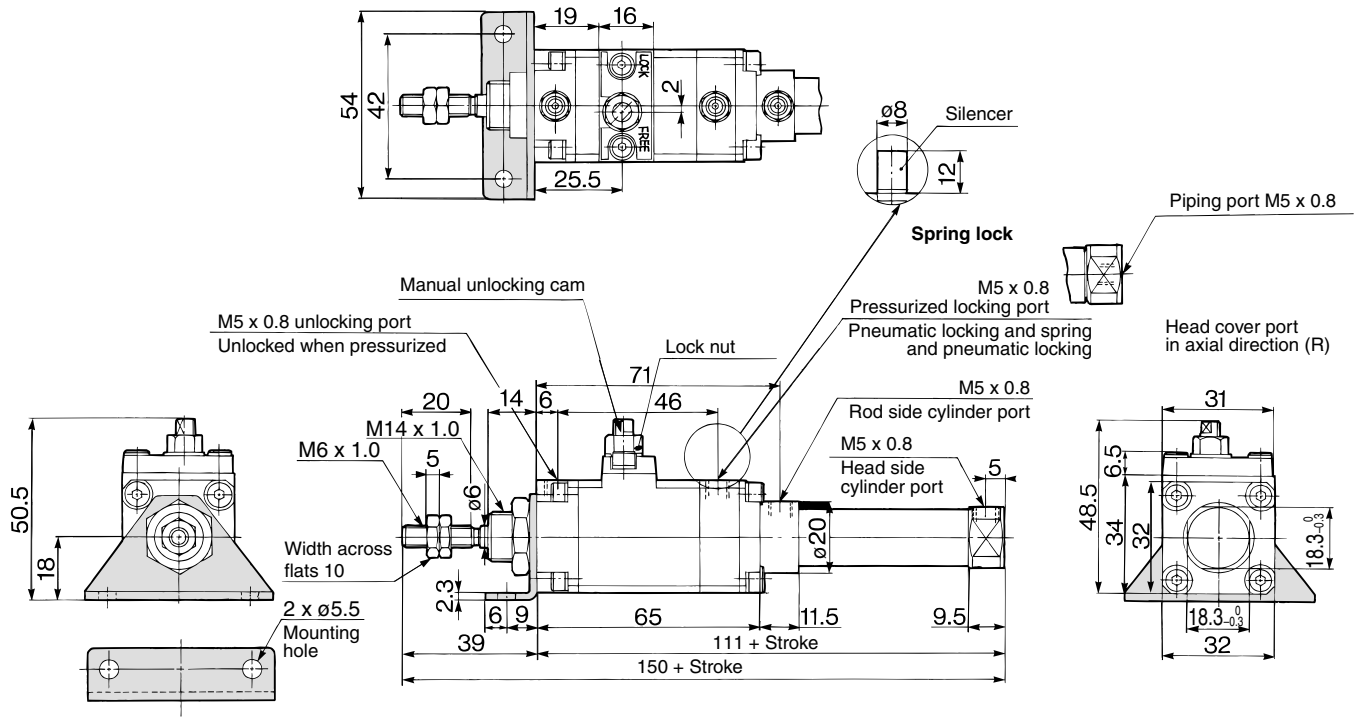
Basic Style (B)

CLJ2B16-□□-$\frac{E}{D}$ / P



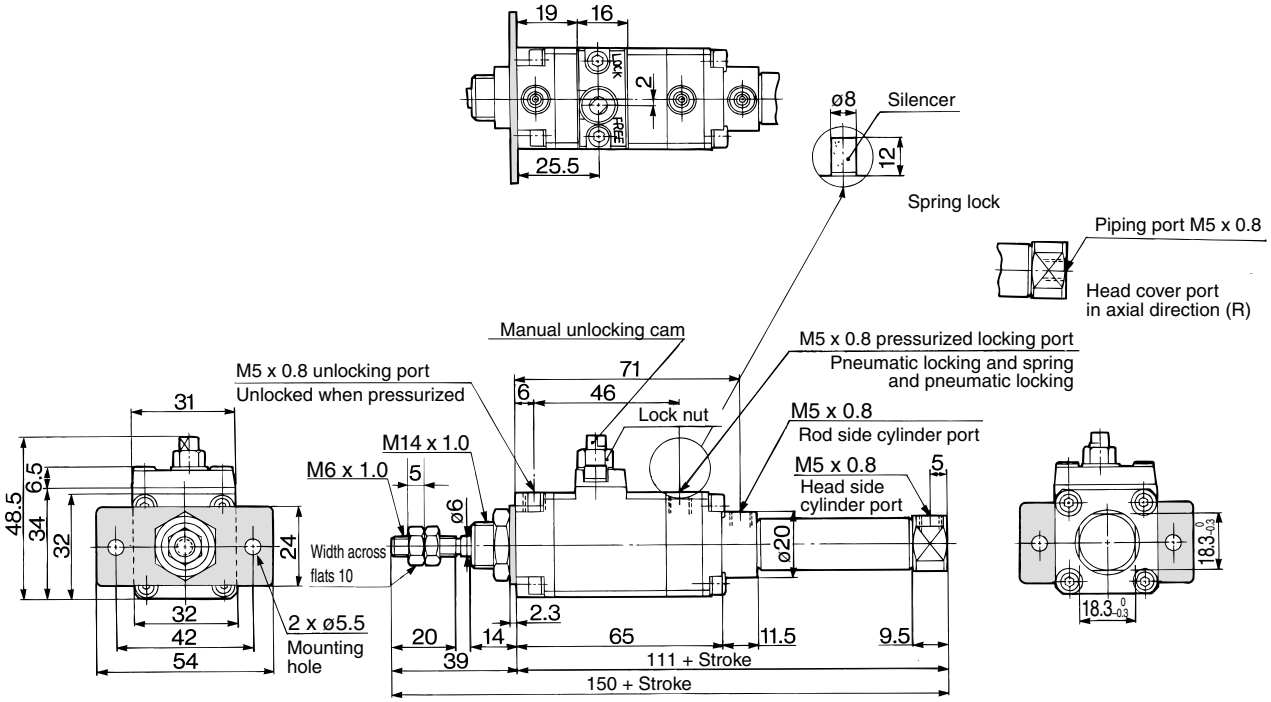
Axial Foot Style (L)

CLJ2L16-□□-$\frac{E}{D}$ / P



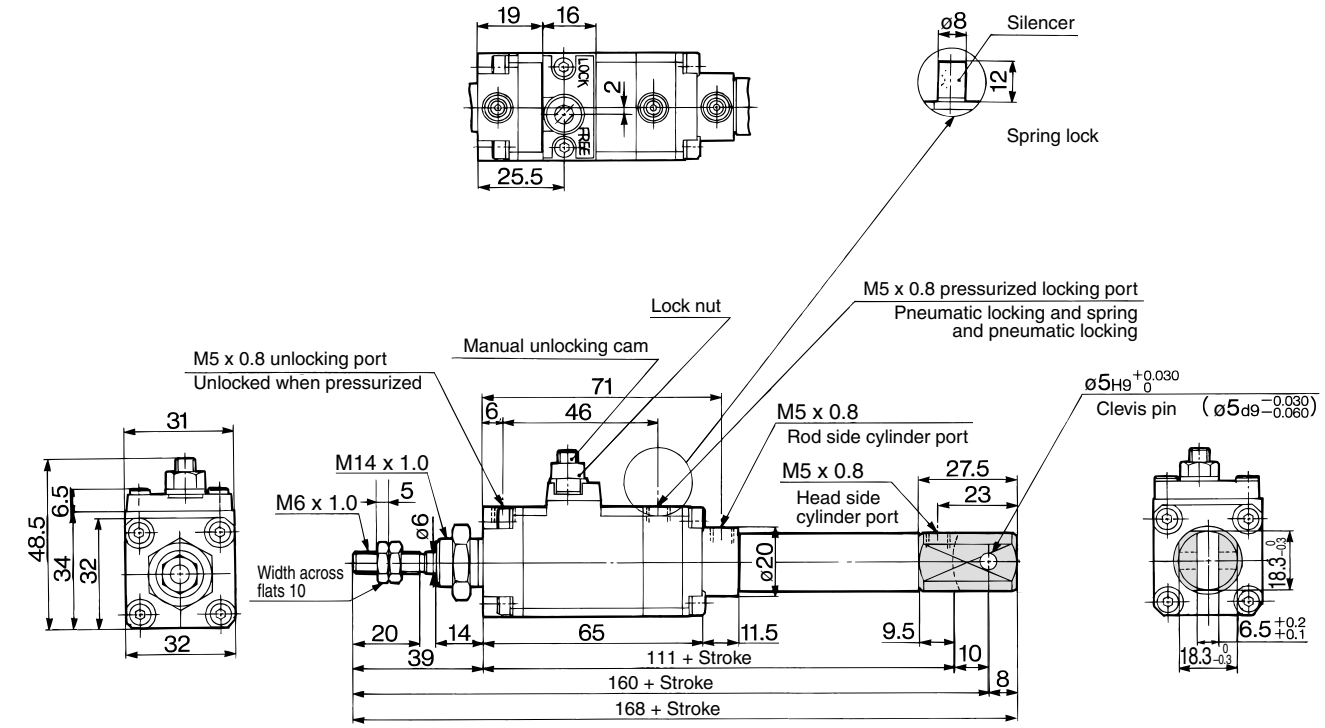
Rod Side Flange Style (F)

CLJ2F16-□□-$\frac{E}{P}$



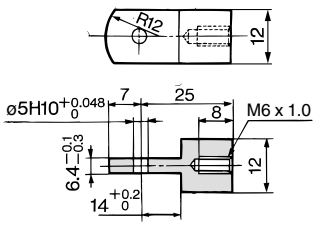
Double Clevis Style (D) * Clevis pin and retaining ring are shipped together.

CLJ2D16-□□-$\frac{E}{P}$



Accessory Bracket Dimensions

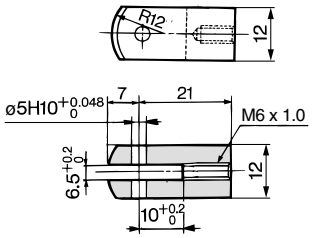
Single Knuckle Joint: I-LJ016B



Material: Rolled steel

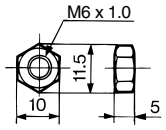
Double Knuckle Joint: Y-LJ016B

∗ Knuckle pin and retaining ring are shipped together.



Material: Rolled steel

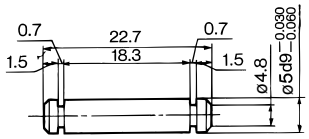
Rod End Nut: NT-015A



Material: Rolled steel

Clevis Pin: CD-Z015

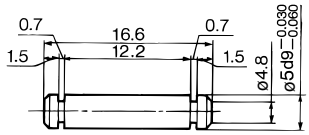
∗ Retaining rings are shipped together.



Material: Stainless steel

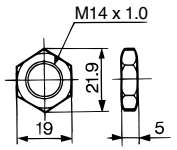
Knuckle Pin: IY-J015A

∗ Retaining rings are shipped together.



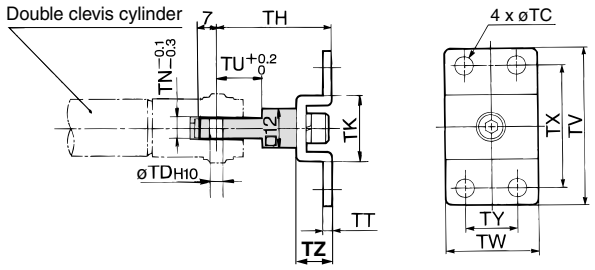
Material: Stainless steel

Mounting Nut: SNLJ-016B



Material: Brass

T-bracket: CJ-T016B



Material: Rolled steel

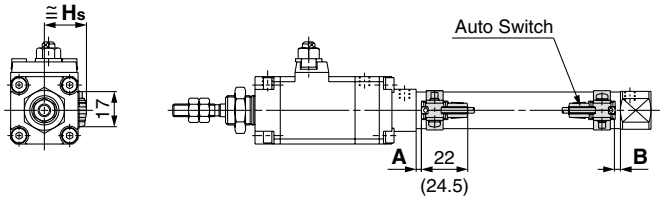
Part no.	Bore size (mm)	TC	TDH10	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T016B	**16**	5.5	5 +0.048 0	35	20	6.4	2.3	14	48	28	38	16	10

∗ T-bracket includes a T-bracket base, single knuckle joint, hexagon socket head cap screw and spring washer.

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

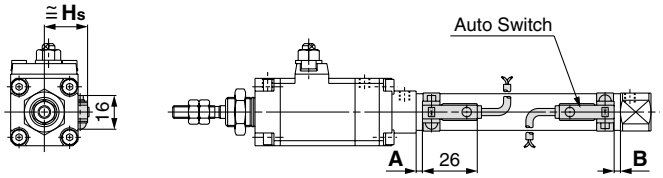
Reed auto switch
<Band Mounting>

D-A9□

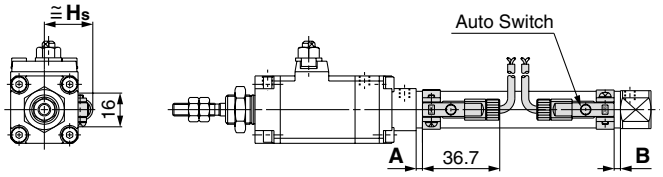


( ): For D-A93

D-C7□/C80

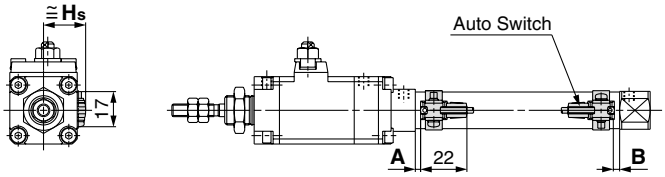


D-C73C□/C80C

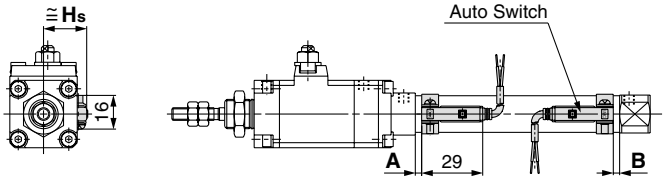


Solid state auto switch
<Band Mounting>

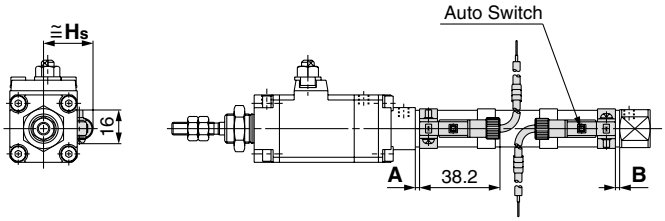
D-M9□
D-M9□W



D-H7□
D-H7□W
D-H7BAL
D-H7NF



D-H7C



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

Auto Switch Proper Mounting Position

(mm)

Autto switch model / Bore size (mm)	D-A9□		D-M9□ D-M9□W		D-C7□ D-C80 D-C73C D-C80C	
	A	B	A	B	A	B
16	2.5	2.5	6.5	6.5	3	3

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

Auto Switch Mounting Height

(mm)

Autto switch model / Bore size (mm)	D-A9□ D-M9□ D-M9□W	D-C7□/C80 D-H7□/H7□W D-H7NF D-H7BAL	D-C73C D-C80C	D-H7C
	Hs	Hs	Hs	Hs
16	20	20.5	23	23.5

Minimum Auto Switch Mounting Stroke

(mm)

Auto switch mounting	Auto switch model	No. of auto switches mounted				
		1	2		n (n: No. of auto switches)	
			Different surfaces	Same surface	Different surfaces	Same surface
Band mounting	**D-A9□** **D-M9□** **D-M9□W**	10	15 (1)	45 (1)	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···)	45 + 15(n - 2)
	D-C7□ **D-C80**	10	15	50	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6···)	50 + 20 (n - 2)
	D-H7□ **D-H7□W** **D-H7BAL** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···)	60 + 22.5 (n - 2)
	D-C73C **D-C80C** **D-H7C**	10	15	65 (2)	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	50 + 27.5 (n - 2)

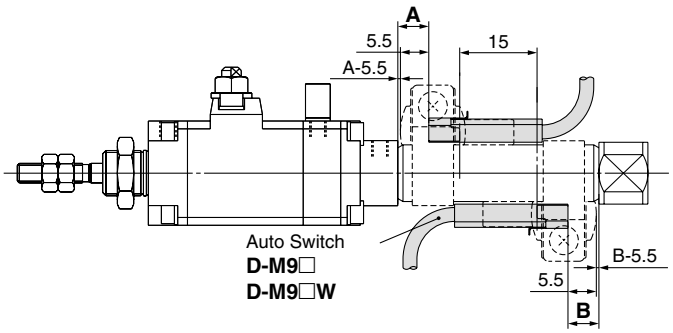
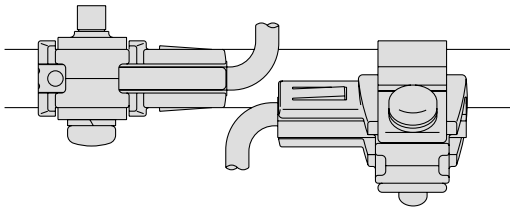
Note 1) The following table is applicable for cylinders with two D-A93/M9□/M9□W auto switches.
Note 2) For Series CDLJ2, 65 strokes cannot be manufactured, as a reference.

Operating Range

(mm)

Auto switch model	Bore size (mm)
	16
D-A9□	7
D-M9□ **D-M9□W**	3
D-C7□/C80 **D-C73C/C80C**	7
D-H7□/H7□W/H7BAL/H7NF	4
D-H7C	9

∗ Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 The proper auto switch mounting position is 5.5 mm inward from the switch holder edge.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-A93	—	Less than 50 strokes
D-M9□ **D-M9□W**	Less than 20 strokes	Less than 55 strokes

Auto Switch Mounting Bracket: Part No.

Auto switch model	Bore size (mm)
	ø16
D-A9□ **D-M9□** **D-M9□W**	(1) ① BJ2-016 ② BJ3-1
D-C7□/C80 **D-C73C/C80C** **D-H7□** **D-H7□W** **D-H7BAL** **D-H7NF**	BJ2-016

Note 1) Two kinds of auto switch mounting brackets are used as a set.

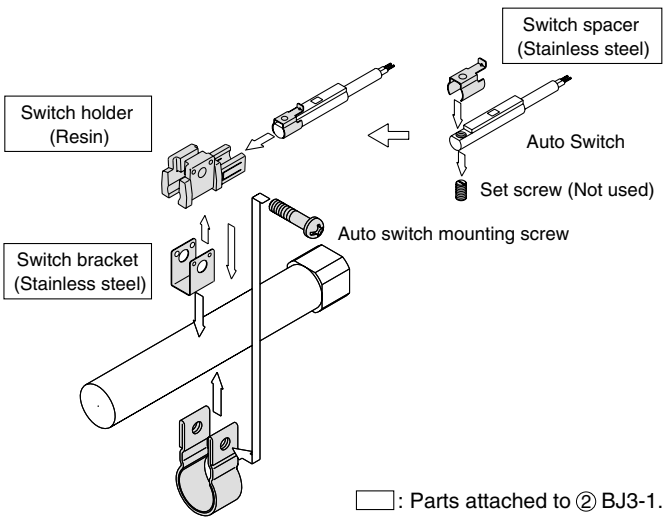
[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA4: For D-C7/C8/H7 types

Note 2) Refer to page 1814 for the details of BBA4.

D-H7BAL auto switch is set on the cylinder with the stainless steel screws above when shipped. When an auto switch is shipped independently, BBA4 is attached.



1. Auto Switch Mounting Bracket

Besides the models listed in How to Order, the following auto switches are applicable.
Refer to pages 1719 to 1827 for the detailed specifications.

Auto switch type	Part no.	Electrical entry (Fetching direction)	Features
Reed	D-C73, C76	Grommet (In-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B		—
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)

∗ For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1784 and 1785 for details.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1746 for details.