

Fine Lock Cylinder

Double Acting, Single Rod

Series CLJ2

ø16

How to Order

Without auto switch CLJ2 **L** 16 — **60** **R** — **E**

With auto switch CDLJ2 **L** 16 — **60** **R** — **E** — **H7BW**

Number of auto switches

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

Auto switch

Nil	Without auto switch (Built-in magnet)
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* For the applicable auto switch model, refer to the table below.

Lock operation

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

Port location on head cover

Nil	Perpendicular to axis
R	Axial direction

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
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Standard stroke (mm)

ø16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200
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Applicable Auto Switch/Refer to page 9-15-1 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-wire connector	Applicable load		
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	●	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	C73	●	●	●	—	—	—	Relay, PLC
		Connector		—	—	—	C73C	●	●	●	●	—	—	—	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7A2	●	●	○	—	○		
		2-wire		H7B				●	●	○	—	○			
	Connector	2-wire		H7C	●	●	●	—	—						
		3-wire (NPN)		H7NW	●	●	○	—	○						
		3-wire (PNP)		H7PW	●	●	○	—	○						
	Grommet	Diagnostic indication (2-color indication)		2-wire	H7BW	●	●	○	—	○					
				Water resistant (2-color indication)	H7BA	—	●	○	—	○					
					4-wire (NPN)	H7NF	●	●	○	—	○				
With diagnostic output (2-color indication)	—	—	—	—	—	—	—	—	—	—	—	—			

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 1 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

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

• Since there are other applicable auto switches than listed, refer to page 9-2-16 for details.
 • For details about auto switches with pre-wire connector, refer to page 9-15-66.

Fine Lock Cylinder Double Acting, Single Rod **Series CLJ2**

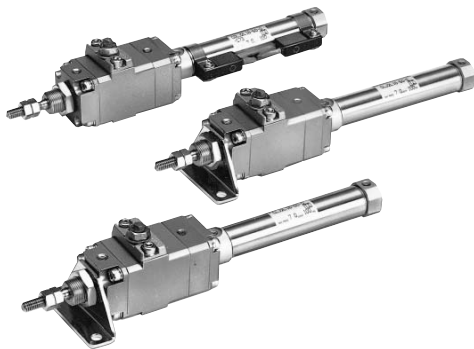
Provided with a compact lock mechanism, it is suitable for intermediate stop, emergency stop, and drop prevention.

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.



Made to Order Specifications
(For details, refer to page 9-16-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Specifications

Bore size (mm)	16
Action	Double acting, Single rod
Type	Non-lube/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
Thread tolerance	JIS Class 2
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

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

Mounting Bracket and Accessory/For details, refer to page 9-2-16.

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 (With pin)	●	●	●	●
	T-bracket	—	—	—	●

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).

Auto Switch Mounting Bracket Part No.

Auto switch mounting bracket no.	Note
BJ2-016	For D-C7/C8/H7



* Mounting screws set made of stainless steel. The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (A switch mounting band is not included, so please order it separately.)
BBA4: For D-C7/C8/H7
"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped. When only a switch is shipped independently, "BBA4" screws are attached.

CL

CL1

MLGC

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Data

Series CLJ2

Minimum Stroke for Auto Switch Mounting

Auto switch mounting style	Auto switch model	No. of auto switches mounted	Minimum cylinder stroke (mm)
Band mounting style	D-C7□ D-C80	2 (Same side)	50
		2 (Different sides)	15
		1	10
	D-H7□ D-H7□W D-H7NF D-H7BAL	2 (Same side)	60
		2 (Different sides)	15
		1	10
	D-C73C D-C80C D-H7C	2 (Same side)	65
		2 (Different sides)	15
		1	10

Weight (g)

Bore size (mm)		16
Standard weight *		320
Additional weight per each 15 mm of stroke		6.5
Mounting bracket weight	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 weight.

** Mounting nut is not included in double clevis style.

Calculation: (Example) CLJ2L16-60

- Basic weight.....320 (ø16)
 - Additional weight.....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

Port Location on Head Cover

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



Axial



Perpendicular

Caution

Recommended Pneumatic Circuit/Caution on Handling

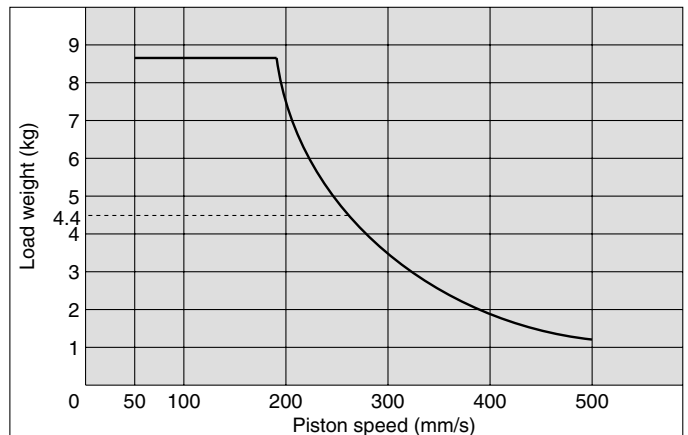
For detailed specifications of the fine lock cylinder, Series CLJ2 mentioned above, refer to pages 9-2-4 to 9-2-7.

Caution/Allowable Kinetic Energy when Locking

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

- In terms of specific load conditions, this allowable kinetic energy is equivalent to a load of 3.7 kg in weight, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, there is no need to calculate.
- Apply the following formula to obtain the kinetic energy of the load.

$$E_k = \frac{1}{2} m v^2$$
 Ek: Kinetic energy of load (J)
 m: Load weight (kg)
 v: Piston speed (m/s)
- 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.
- 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.
- 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.

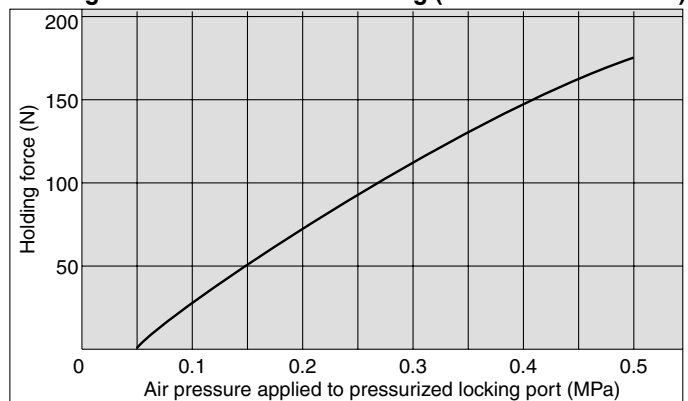


Holding Force of Spring Locking (Maximum static load)

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)



Caution

Caution when Locking

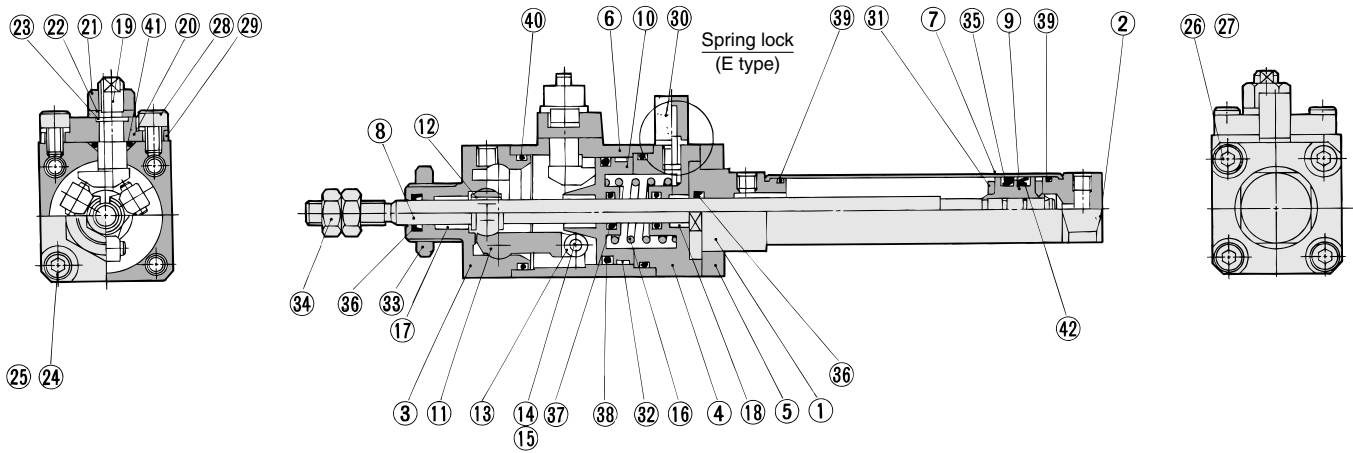
The holding force is the lock's ability to hold a static load that does not involve vibrations or impacts, when it is locked without a load. Therefore, when normally using the cylinder near the upper limit of the holding force, be aware of the points described below.

- 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.

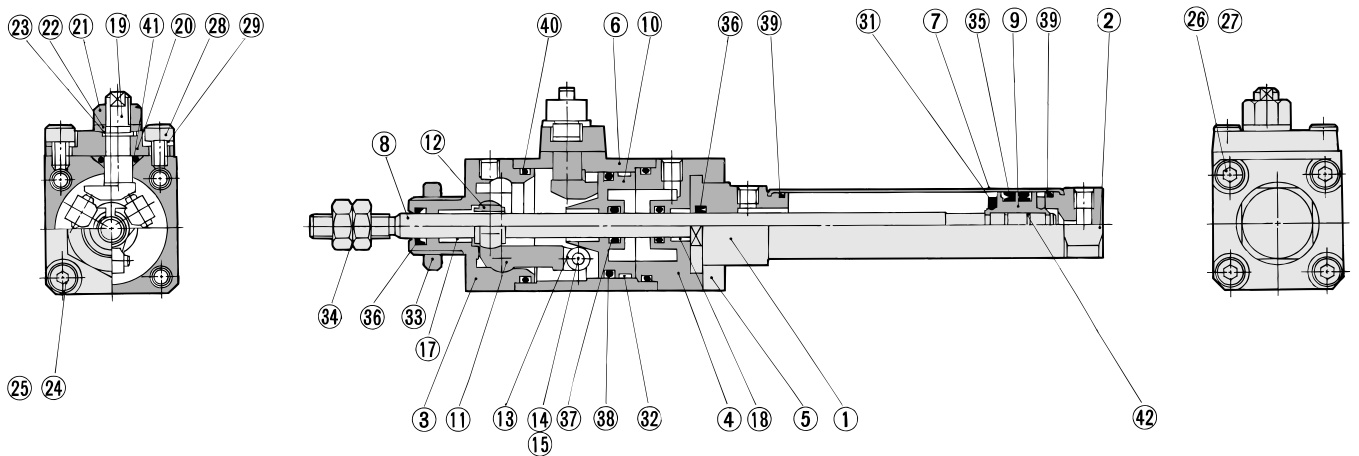
Fine Lock Cylinder Double Acting, Single Rod Series **CLJ2**

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	Snap 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	Snap 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	

CL

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MLGC

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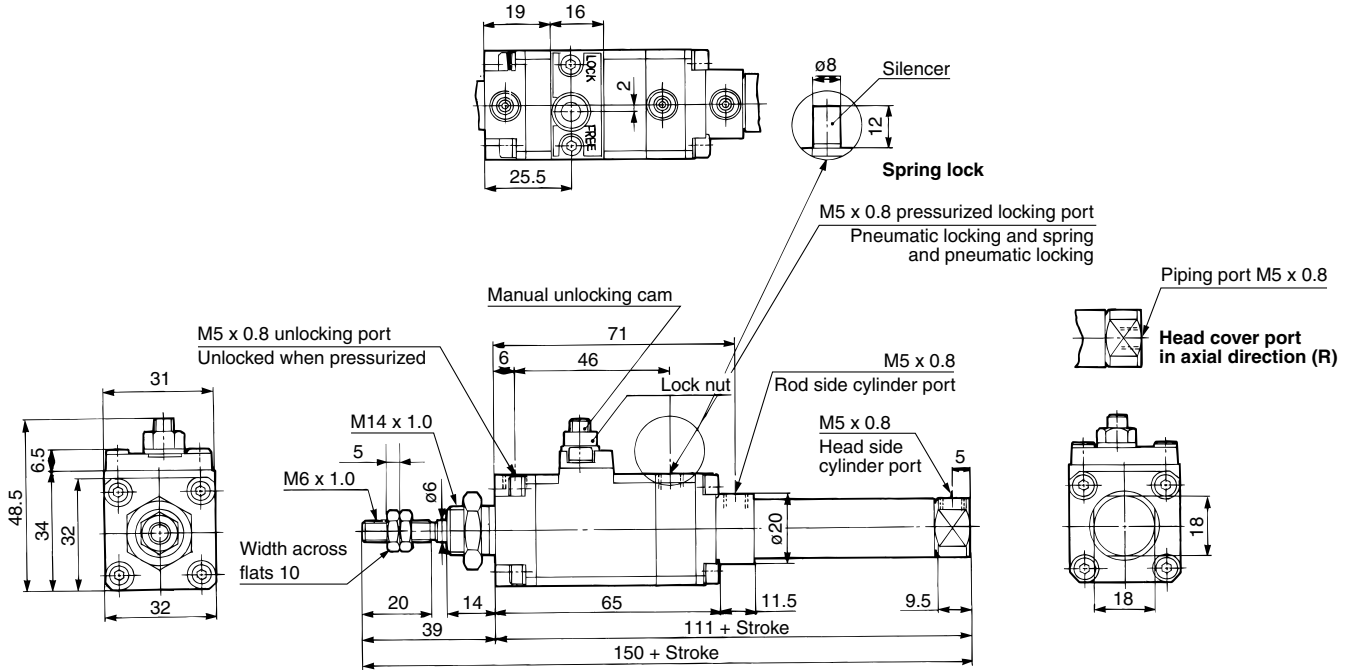
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Data

Series CLJ2

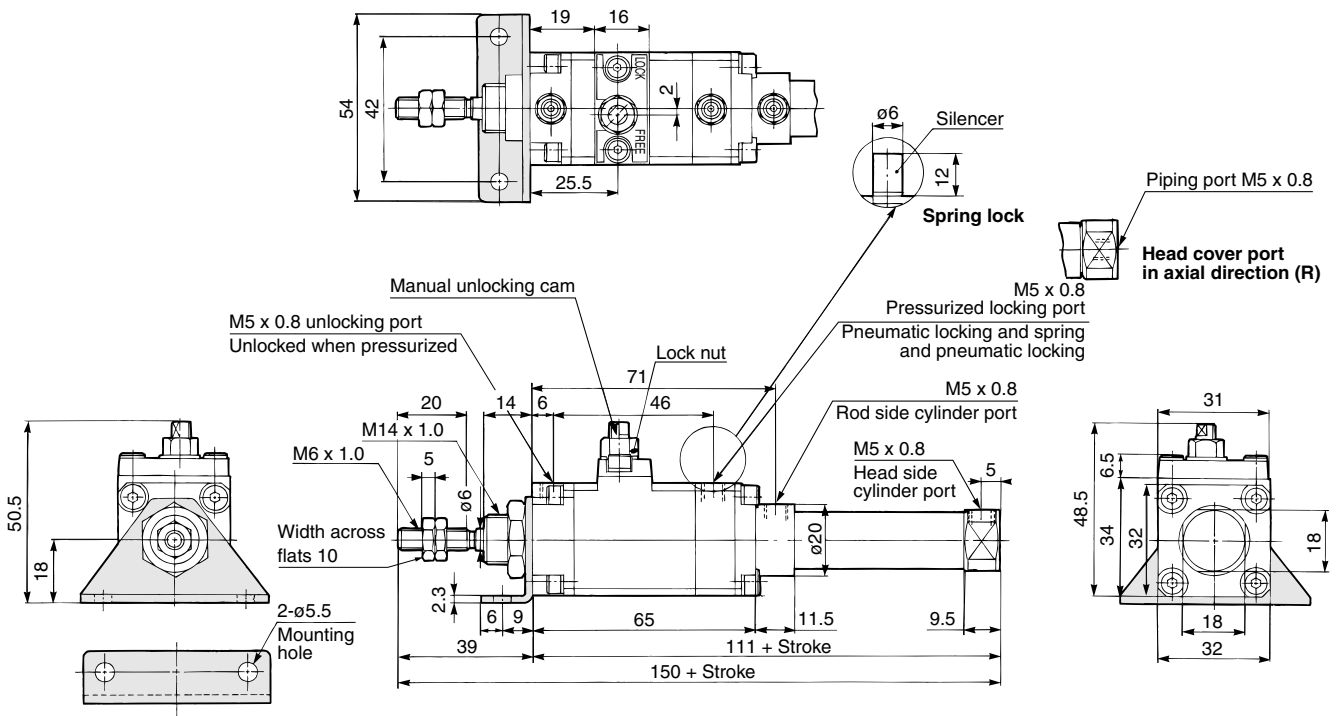
Basic Style (B)

CLJ2B16-□□- $\frac{F}{P}$



Axial Foot Style (L)

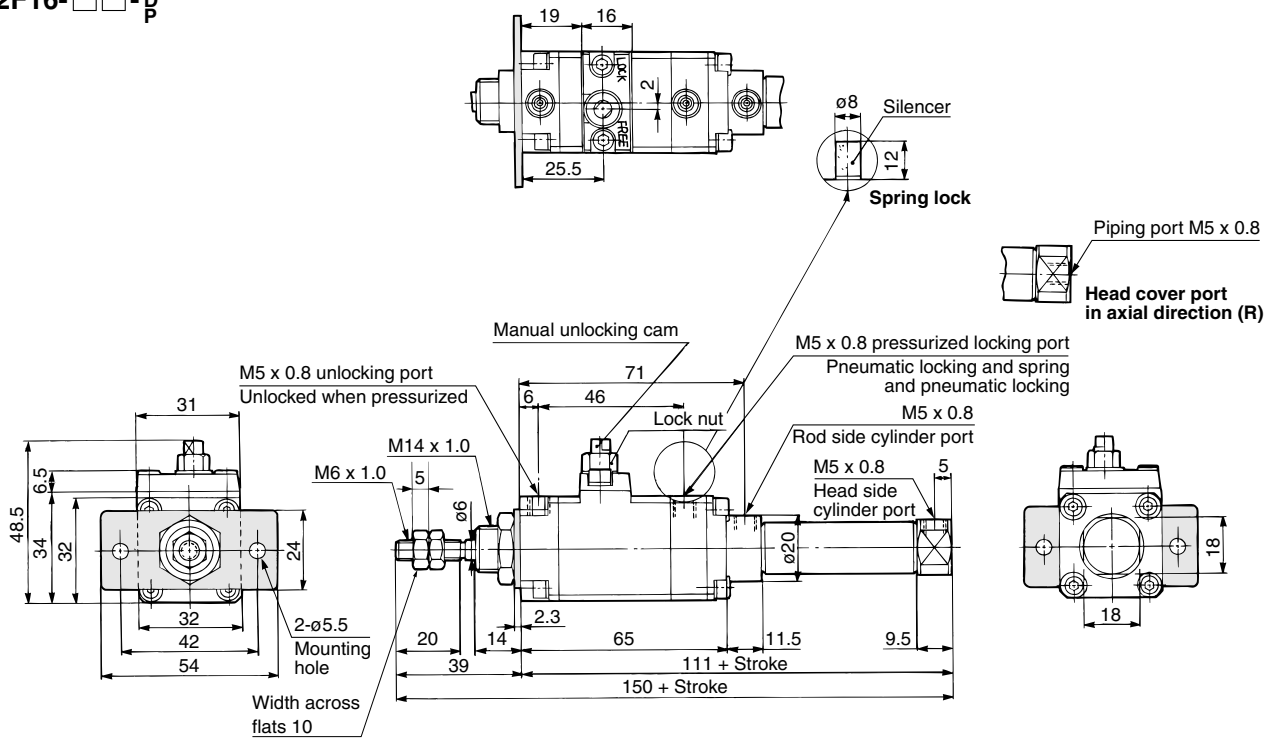
CLJ2L16-□□- $\frac{F}{P}$



Fine Lock Cylinder Double Acting, Single Rod Series CLJ2

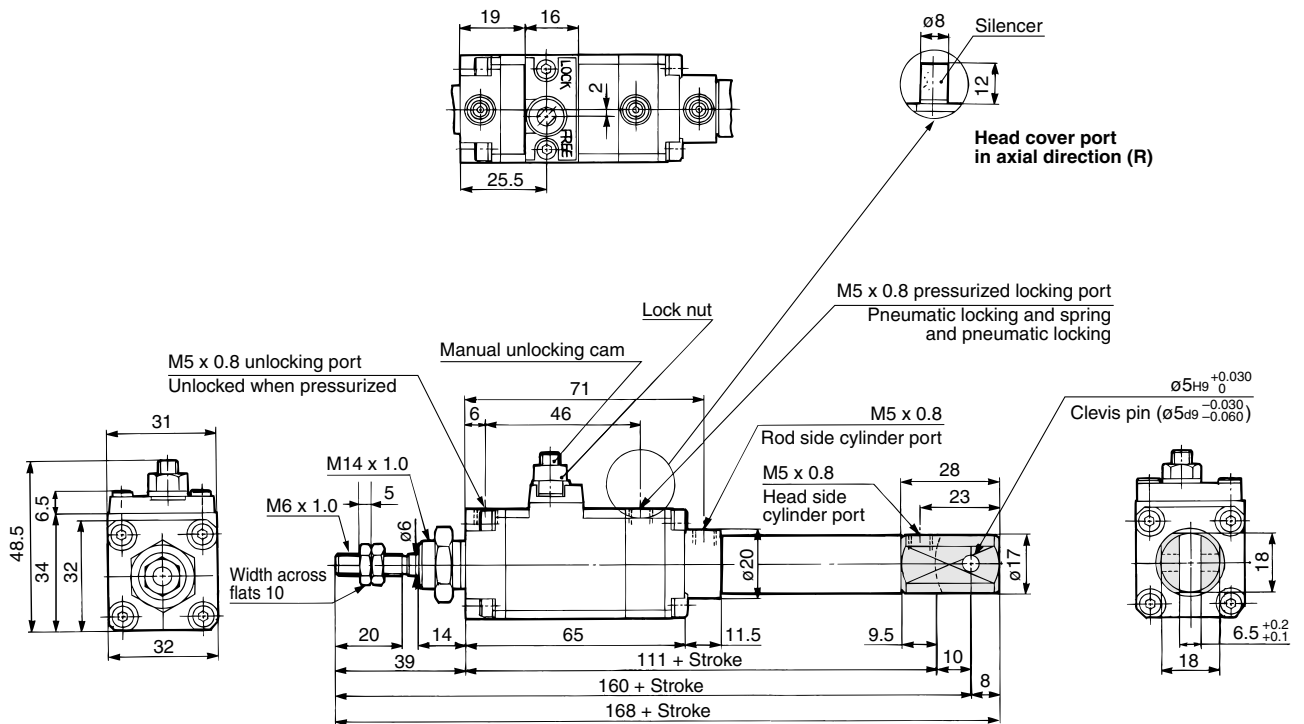
Rod Side Flange Style (F)

CLJ2F16-□□- $\frac{F}{D}$



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

CLJ2D16-□□- $\frac{D}{M}$



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RLQ

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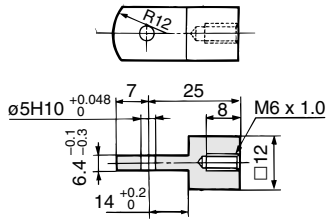
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Accessory Bracket Dimensions

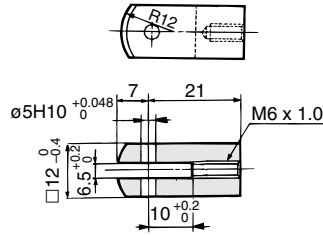
Single Knuckle Joint: I-LJ016B



Material: Rolled steel

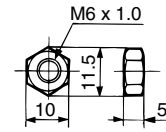
Double Knuckle Joint: Y-LJ016B

* Knuckle pin and snap ring are shipped together.



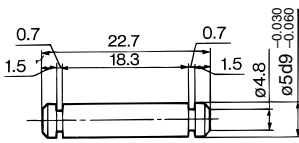
Material: Rolled steel

Rod End Nut: NT-015A



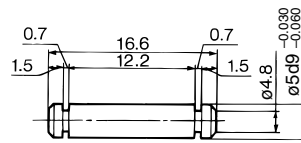
Material: Rolled steel

Clevis Pin: CD-Z015



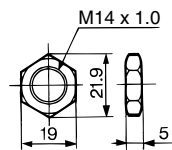
Material: Stainless steel

Knuckle Pin: IY-J015A



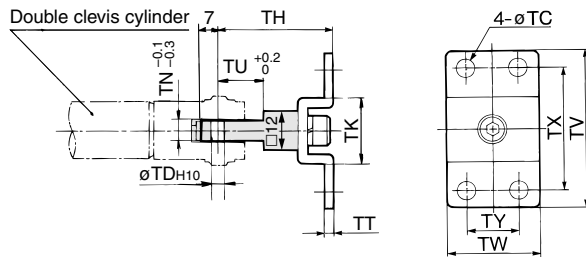
Material: Stainless steel

Mounting Nut: SNLJ-016B



Material: Brass

T-bracket: CJ-T016B



Material: Rolled steel

Part no.	Bore size (mm)	TC	TD _{H10}	TH	TK	TN	TT	TU	TV	TW	TX	TY
CJ-T016B	16	5.5	5 ^{+0.048} ₀	35	20	6.4	2.3	14	48	28	38	16

Regarding the installation position and the mounting height of the auto switch, refer to page of Series CDJ2 air cylinder (Double acting, Single rod), since the dimensions are the same.

Note) Applicable auto switches for Fine lock cylinder Series CLJ2 are the band mounting style only.
Use care that auto switch for rail mounting style is not available.