

UCAC2

Clamp cylinder with drop prevention

ø50, ø63

Clamp Cylinder

Overview

The clamp cylinder with fall prevention is a fall prevention cylinder developed in consideration of equipment maintainability. The new swash plate mechanism locks the rod when air supply stops due to power outage, accident, etc., preventing the load from falling under its own weight. Moreover, due to the unidirectional lock, the rod can be moved in the opposite direction, allowing for emergency removal of workpieces, etc.

Features

Drop prevention is possible throughout the entire stroke

Drop prevention is possible at any position where the Piston Rod is stationary during the entire stroke, including the stroke end.

2 types of lock direction.

The lock direction can be selected from forward direction lock and reverse direction lock type. Unidirectional lock makes the opposite direction free.

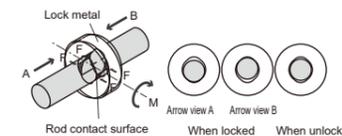
Even if a workpiece is caught, the rod moves in the free direction, so the workpiece can be removed.

Various detection switches can be installed.

Cylinder switches for various purposes such as non-contact type and strong magnetic field proof switches can be installed.

Drop prevention structure.

Installation of a new swash plate type lock mechanism has made fall prevention at free position possible. By applying rotational force M to the lock metal, axial force F is generated, holding the rod.



Selectable Switch Mounting Method

In addition to the conventional tie rod method, a band method that allows free rotation (circumferential direction) and movement adjustment of the switch has been added.

Variation Table

●: Standard, ○: Option

Variation	Model No. JIS Symbol	Bore Size (mm)	Standard Stroke (mm)					Min Stroke (mm)	Max Stroke (mm)	Options/Accessories								Page		
			50	75	100	125	150			Bellows (100 °C)	Limit switch mounting base with dog	Limit switch mounting base without dog	Toggle fitting	Double knuckle joint Cast Iron	Double knuckle joint Steel	Single knuckle joint Steel	Switch			
Double Acting type, single rod type	UCAC2 	ø50, ø63	●	●	●	●	●	50	150	○	○	○	○	○	○	○	○	○	○	772



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Clamp cylinder with drop prevention

UCAC2 Series

● Bore Size: ø50, ø63



UCAC2 Series

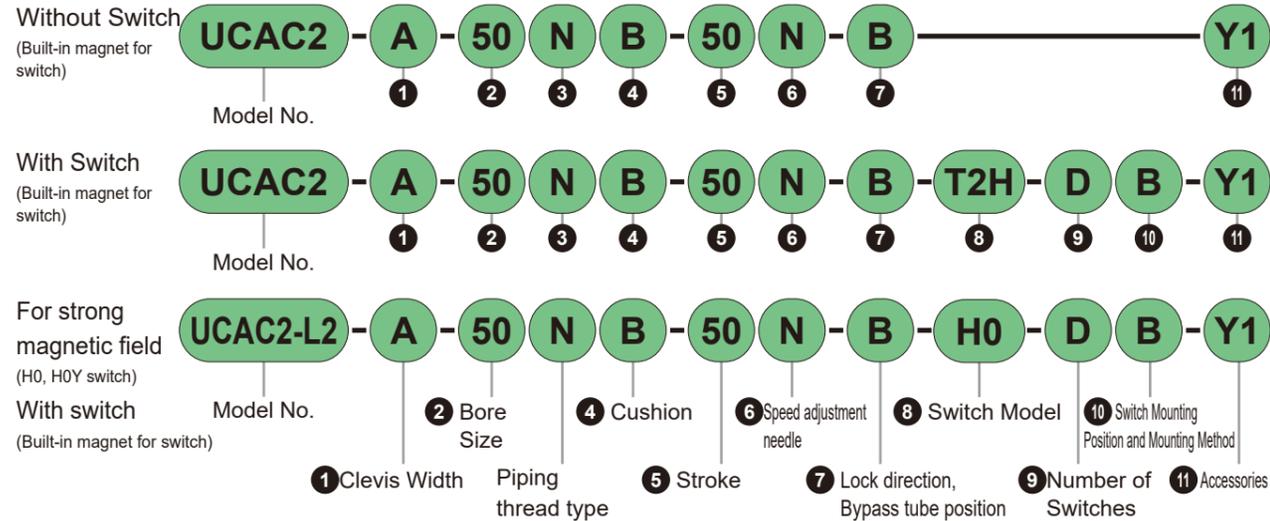
Model No. Notation

*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m HOH³
3 m HOH³₃
5 m HOH⁵₅

Model No. Notation



1 Clevis Width (mm)

Code	Content
A	16.5
B	19.5
AL	16.5 (Axial foot type)
BL	19.5 (Axial foot type)

Note: Clevis pin, split pin, and flat washer are attached to A, B, AL, BL. Clevis width and double yoke knuckle width are the same dimension.

2 Bore Size (mm)

Code	Content
50	ø50
63	ø63

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

4 Cushion

Code	Content
Blank	With head end cushion (Port thread: When blank)
H	With head end cushion (Port thread: When N, G)
B	With Cushion on Both Sides
N	Without Cushion

5 Stroke

Code	Content
50	50
75	75
100	100
125	125
150	150

6 Speed adjustment needle

Code	Content
Blank	Both sides included
R	Rod side included
H	Head side included
N	None

7 Lock direction/Bypass tube position

Code	Content
F	Forward direction lock (Bypass tube position F, Port position F1)
F1	Forward direction lock (Bypass tube position F1, Port position F2)
F2	Forward direction lock (Bypass tube position F2, Port position F1)
B	Reverse Direction Lock

8 Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire	
			AC	DC	AC voltage	DC voltage	Straight	L-shape
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□
		3-wire (NPN)	—	10 to 30	—	5 to 20 *2	T2H□	T2V□
		3-wire (PNP)	—	30 or less	—	100 or less	T3H□	T3V□
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□
		For 2-color AC Magnetic Field	—	—	—	—	T2YD□	—
Reed	1-Color	2-wire	—	24 ± 10%	—	5 to 20	T2YDU	—
		1-Color Off-Delay Type	—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□
	1-Color For Strong Magnetic Fields	2-wire	—	10 to 30	—	—	T2HR3	T2VR3
		2-color For strong magnetic field	—	24 ± 10%	—	5 to 20	H0Y□	—

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

9 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

11 Accessories

Code	Content
Blank	Accessories (knuckle) None
Y	Double knuckle joint Cast Iron (Pin, split pin, flat washer included)
Y1	Double knuckle joint Steel (Pin, split pin, flat washer included)
I	Single knuckle joint Steel
K	Bellows
D	Limit switch mounting base
D1	
Q	Clamp fitting

10 Switch Mounting Position and Mounting Method

Code	Content
Blank	
B	Tie rod mounting
C	
Z	Band mounting
* Selectable only when no switch model number is selected Tie rod mounting position	
Blank	Without tie rod
A	
B	
C	

*1: The switch cannot be mounted on the same surface as the bypass tube mounting position.

*2: "Z" is not available for 8 Switch model No. "H0□" "H0Y□".

*1: Q cannot be mounted on the standard type because the Piston Rod projection length is different from the standard type.

*2: When selecting "Q", 1 Clevis width will be "A".

*3: Bellows maximum Ambient Temperature is 100°C, instantaneous maximum temperature is 200°C.

*4: If 1 clevis width is "AL" or "BL", "K" cannot be selected.

*5: When selecting "K" and "D", select "Y", "Y1" and "I".

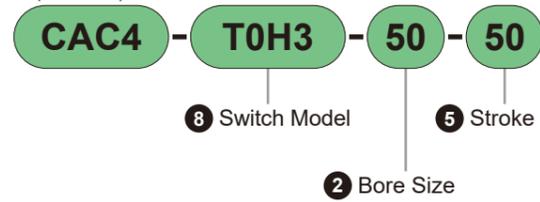
*6: When selecting "Q", please select "Y" or "Y1".

Switch Single Unit Model No. Notation *Pay attention to direction when installing tie rod. See P. 782, 783.

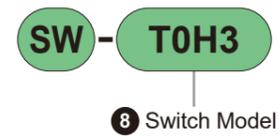
[Switch mounting: Tie rod method]

T-type Cylinder Switch

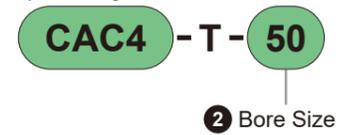
A) Switch body+Mounting bracket set
(=B+C+D)



B) Switch body only



C) Mounting bracket kit



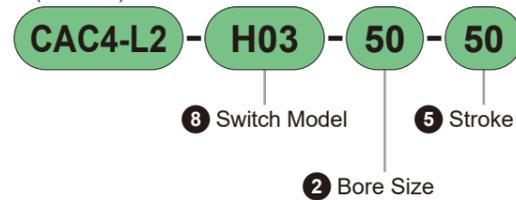
D) Mounting tie rod kit



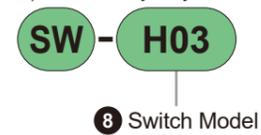
Strong magnetic field resistant cylinder switch

● H-type cylinder switch

A) Switch body+Mounting bracket set
(=B+C+D)



B) Switch body only



C) Mounting bracket kit

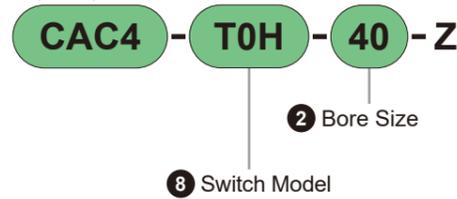


D) Mounting tie rod kit

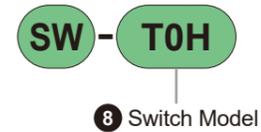


[Switch mounting: Band Type]

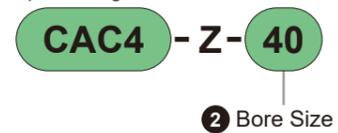
A) Switch body+Mounting bracket set+Band
(=B+C)



B) Switch body only



C) Mounting bracket set+Band



MEMO

Clamping

Clamping

CAC4

CAC4

UCAC2

UCAC2

CAC-N

CAC-N

UCAC-N

UCAC-N

RCS2

RCS2

RCC2

RCC2

PCC

PCC

Cylinder Switch

Cylinder Switch

Ending

Ending

UCAC2 Series

Specifications

Item	UCAC2	
Bore Size	mm	ø50 ø63
Actuation method	Double Acting Type	
Operating Fluid	Compressed Air	
Max Operating Pressure	MPa	1.0
Min Operating Pressure	MPa	0.25 (36 psi)
Proof Pressure	MPa	1.6
Ambient Temperature	°C	-10 to 60 (however, no freezing)
Port Size	Rc1/4	
Standard Stroke	mm	50, 75, 100, 125, 150
Stroke tolerance	+1.0 0	
Operating Piston Speed	mm/s	50 to 400 50 to 300
Cushion	With Air Cushion on Head Side	
Lubrication	Not allowed	
Mounting Style	Double Clevis	
Fall prevention mechanism	Forward direction lock or reverse direction lock	
Locking Force	N	1470
Allowable	With Cushion	6.54 11.63
Absorbed Energy J	Without cushion	0.137 0.206

Note: No cushion cannot absorb large energy generated by external load. It is recommended to use an external shock absorber together.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Min Stroke (mm)	Max Stroke (mm)
ø50	50, 75, 100, 125, 150	50	150
ø63	150		

Strokes other than Standard Strokes are custom products.

MEMO

Cylinder Weight

(Unit: kg)

Bore Size (mm)	Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Accessory Weight					Switch Weight	Mounting Bracket Weight		Mounting tie rod weight at stroke = 0 mm	Added weight per S = 10 mm of mounting tie rod	
			Axial foot	Double Knuckle	Single knuckle	Limit switch mounting base	Dog fitting		T Type	H type			
ø50	Forward lock: F	1.61	0.40	0.21	0.37	0.27	0.18	0.08	0.021	0.008	0.024	0.019	0.003
	Backward lock: B	1.56	0.39										
ø63	Forward lock: F	2.11	0.40	0.21	0.37	0.27	0.18	0.08	0.021	0.009	0.024	0.019	0.003
	Backward lock: B	2.06	0.39										

(Example) Product weight of UCAC2-A-50B-50R-B-T0H-D

- Product weight for 0 mm stroke (Backward Locking: B) 1.56 kg
- Additional weight for 50 mm stroke $0.39 \times \frac{50}{100} = 0.195$ kg
- Weight of tie rod at 0 mm stroke 0.019 kg
- Additional weight of tie rod on stroke 50mm $0.003 \times \frac{50}{10} = 0.015$ kg
- Weight of 2 T0H switches $0.018 \times 2 = 0.036$ kg
- Weight of 2 mounting brackets $0.021 \times 2 = 0.042$ kg
- Product weight $1.56 + 0.195 + 0.019 + 0.015 + 0.036 + 0.042 = 1.867$ kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.25 (36 psi)	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø50	Push	4.91×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	4.12×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	7.79×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	7.01×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3

Clamping

Clamping

CAC4

CAC4

UCAC2

UCAC2

CAC-N

CAC-N

UCAC-N

UCAC-N

RCS2

RCS2

RCC2

RCC2

PCC

PCC

Cylinder Switch

Cylinder Switch

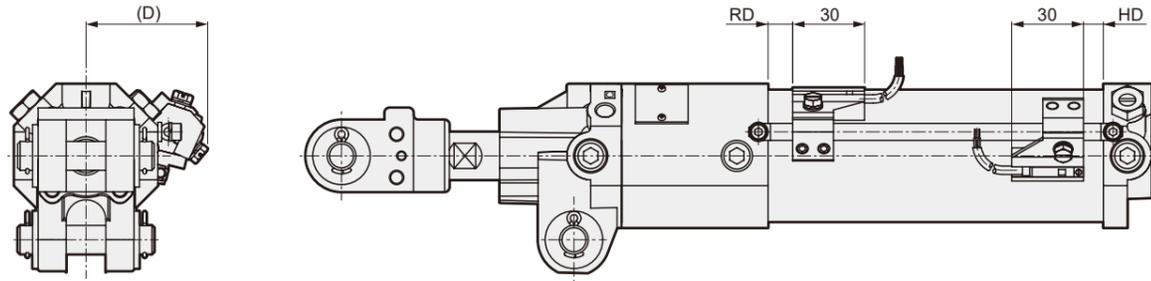
Ending

Ending

UCAC2 Series External Dimensions Diagram with Switch

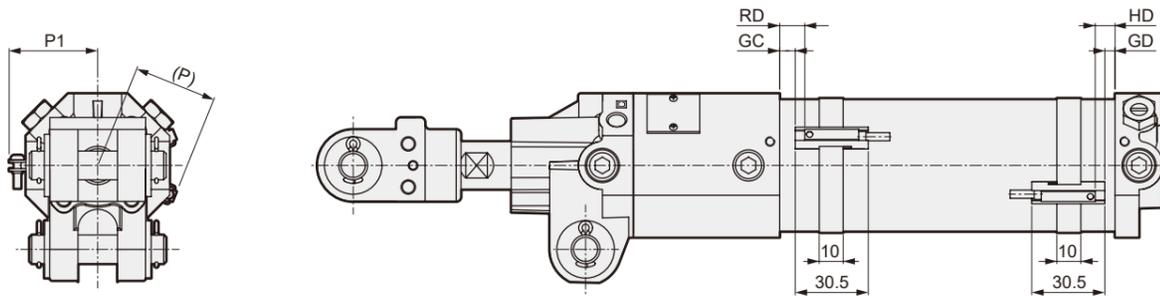
- T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2H/VR3, T2WH/V, T3WH/V, T2WLH/V

Tie rod mounting
 • UCAC2



Code	D	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W, T2WL	
Bore Size (mm)		RD	HD	RD	HD
ø50	50.5	10.5	8.5	13.5	11.5
ø63	56	10.5	8.5	13.5	11.5

Band mounting
 • UCAC2



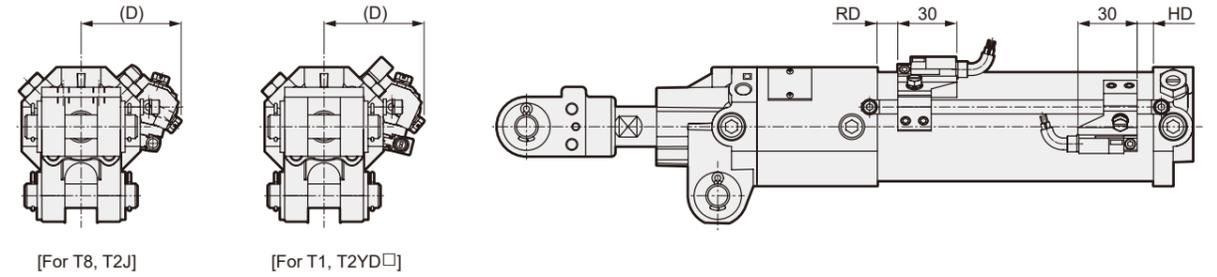
Code	P	P1	T0, T5, T2, T3, T3P, T2□R3				T2W, T3W, T2WL			
Bore Size (mm)			GC	GD	RD	HD	GC	GD	RD	HD
ø50	34.5	36	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5
ø63	41	42.5	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5

External Dimensions Diagram with Switch

UCAC2 Series External Dimensions Diagram with Switch

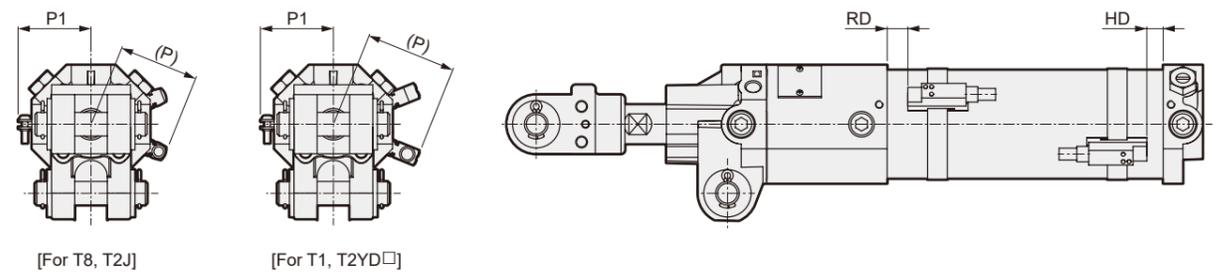
- T8H/V, T2JH/V, T1H/V, T2YD, T2YDT, T2YDU

Tie rod mounting
 • UCAC2



Code	D	T8		T2J		T1, T2YD, T2YDT, T2YDU	
Bore Size (mm)		RD	HD	RD	HD	RD	HD
ø50	50.5	5.5	3.5	10.5	8.5	10.5	8.5
ø63	56	5.5	3.5	10.5	8.5	10.5	8.5

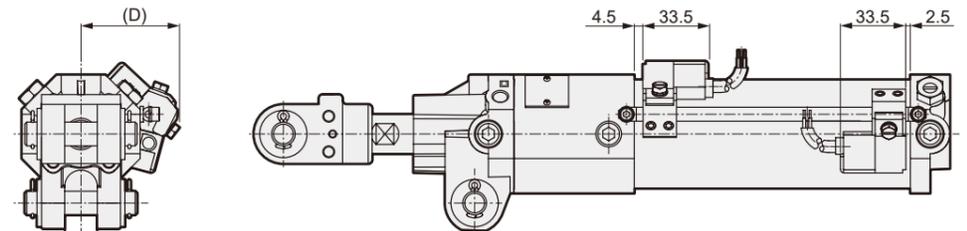
Band mounting
 • UCAC2



Code	T8				T2J				T1, T2YD, T2YDT, T2YDU			
Bore Size (mm)	P	P1	RD	HD	P	P1	RD	HD	P	P1	RD	HD
ø50	40	36	5.5	3.5	40	36	10.5	8.5	45.5	36	10.5	8.5
ø63	46.5	42.5	5.5	3.5	46.5	42.5	10.5	8.5	52	42.5	10.5	8.5

- H0, H0Y

Tie rod mounting
 • UCAC2



Code	H0, H0Y
Bore Size (mm)	D
ø50	50.5
ø63	56

Clamping

CAC4

UCAC2

CAC-N

UCAC-N

RCS2

RCC2

PCC

Cylinder Switch

Ending

Clamping

CAC4

UCAC2

CAC-N

UCAC-N

RCS2

RCC2

PCC

Cylinder Switch

Ending



To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Clamp cylinder with drop prevention UCAC2 Series

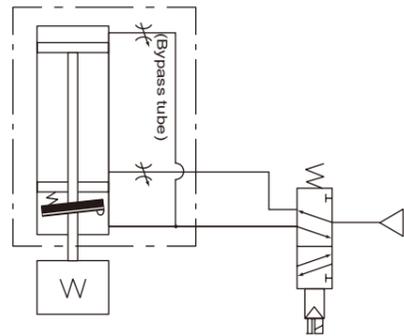
Design / Selection

CAUTION

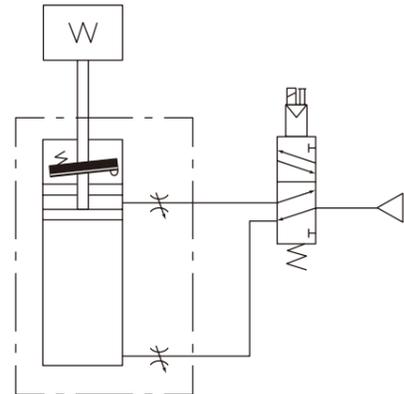
Basic Circuit Diagram

Since a throttle valve is built-in, installation of a speed controller for speed control is not particularly necessary, but because both meter-in and meter-out are throttled, adjusting one needle will change both forward and reverse speeds. Therefore, if you want to control the forward and reverse speeds separately, installation of a speed controller is necessary.

Forward Locking F type



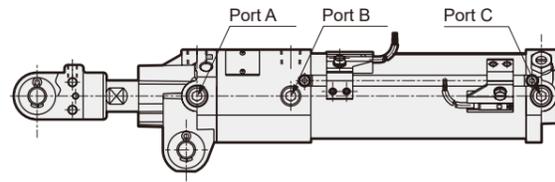
Backward Locking B type



When an emergency stop or urgent stop is performed, the forward direction lock type will continue to retract, and the reverse direction lock type will continue to advance and return to the home position. (If residual pressure is gone, it will stop at that position.)

The piping port position of UCAC2 can be changed in the same way as the CAC4 Series. Be sure not to use the incorrect pressure port when doing so.

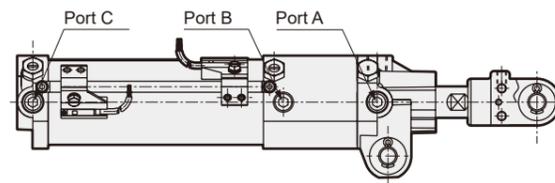
- When the port position is on the right side (lock direction F1 is on the right side as standard)



port	port A	Port B	port C
Lock Direction			
Forward Direction Lock F type *1	PUSH side port	PULL side port	Plug
Reverse Direction Lock Type B	Plug	PULL side port	PUSH side port

*1: The lock direction F2 type cannot have the port on the right side because of the bypass tube.

- When the port position is on the left side



port	Port A	Port B	Port C
Lock Direction			
Forward Direction Lock F type *1	PUSH side port	PULL side port	Plug
Reverse Direction Lock Type B	Plug	PULL side port	PUSH side port

*1: The lock direction F type cannot have the port on the left side because of the bypass tube.

The purpose of the cushion is to absorb the piston's kinetic energy with air compressibility, preventing the piston and cover from colliding at the stroke end.

Therefore, the cushion is not intended to operate the piston at low speed near the stroke end. The table below shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorbing device.

$$\text{Kinetic Energy (J)} = \frac{1}{2} \times \text{Weight (kg)} \times \{\text{Speed (m/s)}\}^2$$

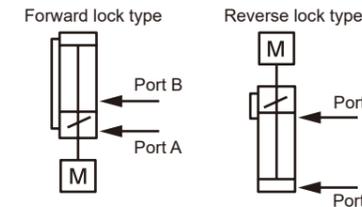
Cushion Characteristic Table

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)	
		With cushion	Without cushion
ø50	13.5	6.54	0.14
ø63	13.5	11.63	0.21

Do not use the product so as to apply torque to the rod when locked because the locking force may decrease, creating a dangerous condition.

Make sure to supply pressure to port B, and before unlocking, check that load is not applied to the lock mechanism.

If pressure is supplied to port A while both ports A and B are exhausted and the piston is locked, the lock may not be released, or the Piston rod may extend suddenly even if the lock is released, which is very dangerous.



If the cylinder is held with pressure applied on the locking mechanism, the lock could be released. Do not use 3-position closed center and 3-position P·A·B connection solenoid valves.

If a back pressure is applied while locked, the lock may be released. Use a discrete solenoid valve for brake release, or use an individual exhaust manifold.

Do not use with the by-pass tube disconnected as lock response could be delayed.

Note that due to the structure, a 1 mm deviation may occur when stopped with the lock.

Clamping

CAC4

UCAC2

CAC-N

UCAC-N

RCS2

RCC2

PCC

Cylinder Switch

Ending

Clamping

CAC4

UCAC2

CAC-N

UCAC-N

RCS2

RCC2

PCC

Cylinder Switch

Ending

During Use

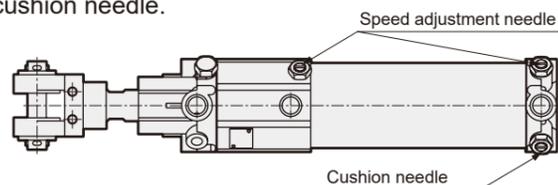
Warning

Do not disassemble the unit, as doing so may be dangerous.

During equipment maintenance, please take separate measures for safety so that the load does not fall due to its own weight.

CAUTION

Do not mistake the speed adjustment needle for the cushion needle.

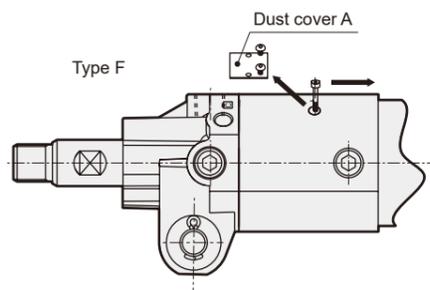
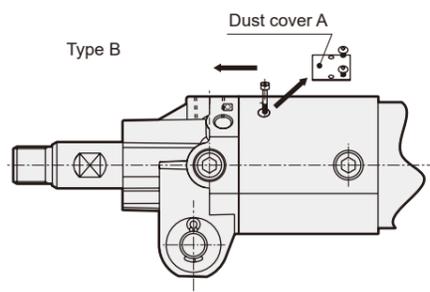


Flush the connected pipe sufficiently to prevent foreign materials or cutting chips from entering the cylinder when installing the product.

Be careful not to scratch or dent the Piston Rod sliding part. This can lead to damage to packings and cause air leakage.

How to unlock manually

1. Remove dust cover A.
2. Screw a Hexagon Socket Head Cap Screw (length 40 or more) into the screw hole M4 of the lock metal until the end.
3. Tilt the Hexagon Socket Head Cap Screw in the direction of the arrow to free the rod. (This frees the rod.)



1. Common (T type switch: Band mounting method)

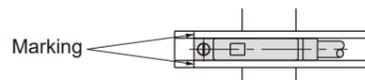
CAUTION

When Moving the Switch Position in the Stroke Direction

- The 1-color indicator switch can be finely adjusted by about ± 3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ± 3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.
- Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T□C, T2J, T2Y, T3Y, tighten with a torque of 0.5 to 0.7 N·m.
- The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. Note that the marking on the switch rail is set to the switch maximum sensitivity position, which is the switch mounting position of the external dimensions. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.

When Moving the Switch Position in the Circumferential Direction

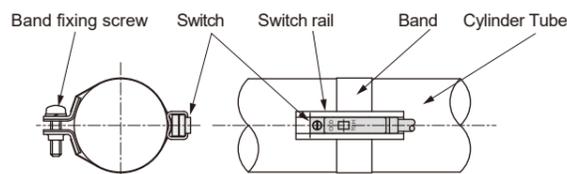
- Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position.



The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.

When Moving the Band Position

- Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (<https://www.ckd.co.jp/kiki/en/>) -> "Model No." -> [Instruction Manual].