



Helping lighten welding jigs and other tools

Light weight clamp cylinder CAC-N32/40 Series

Light weight position locking clamp cylinder UCAC-N32/40 Series

New product

Light weight clamp cylinder CAC-N Series /Light weight position locking clamp cylinder UCAC-N Series



CKD Corporation

CC-959A

New Compact Lightweight Clamp Cylinder Helps Lighten Welding Jigs and Tools

Clamp cylinder

CAC-N Series

Bore size $\varnothing 32$, $\varnothing 40$

- The highly reliable lightweight CMK2 Series is incorporated for the cylinder.
- Reed switches, proximity switches, bicolor indicators, and strong magnetic fields, can be mounted.

CAC-N40-150 Weight: **950 g**
56% compared to conventional models



Clamp cylinder with position locking

UCAC-N Series

Bore size $\varnothing 32$, $\varnothing 40$

- Free position locking on CAC-N Series
- Lock at a random position if the cylinder is stationary
- Free movement in the lock's reverse direction

RoHS

RoHS-Compatible

All substances adversely affecting the environment, including lead and hexavalent chrome, have been eliminated.



Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured. It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance of specifications.

This product must be used within its stated specifications. It must not be modified or machined.

This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.

(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

- ① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
- ② Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B8370 (pneumatic system rules)

JFPS2008 (principles for pneumatic cylinder selection and use)


Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.


4 Do not handle, pipe, or remove devices before confirming safety.


- ① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
- ② Note that there may be hot or charged sections even after operation is stopped.
- ③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
- ④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

 **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

 **WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

 **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.

In any case, important information that must be observed is explained.

Disclaimer

1. CKD cannot be held liable for any business interruption, loss of profit, personal injury, delay cost, or any other ancillary or indirect loss, cost, or damage resulting from the use of or faults in the use of CKD products.
2. CKD cannot be held responsible for the following damage.
 - (1) Damage resulting from disaster or failure of CKD parts due to fire from reasons not attributable to CKD, or by intentional or negligence of a third party or customer.
 - (2) When a CKD product is assembled into customer equipment, damage that could have been avoided if customer equipment were provided with functions and structure, etc., generally accepted in the industry.
 - (3) Damage resulting from use exceeding the scope of specifications provided in CKD catalogs or instruction manuals, etc., or from actions not following precautions for installation, adjustment, or maintenance, etc.,
 - (4) Damage resulting from product modifications not approved by CKD, or from faults due to combination with other software or other connected devices.



Pneumatic components

Safety precautions

Always read this section before starting use.

Refer to "Pneumatic Cylinders (No. CB-029SA)" for the general cylinder or cylinder switch.

Light in weight position locking clamp cylinder UCAC-N32/N40

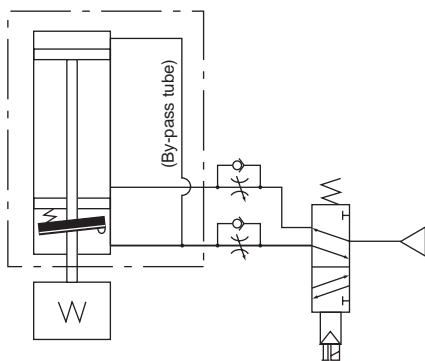
Design & Selection

CAUTION

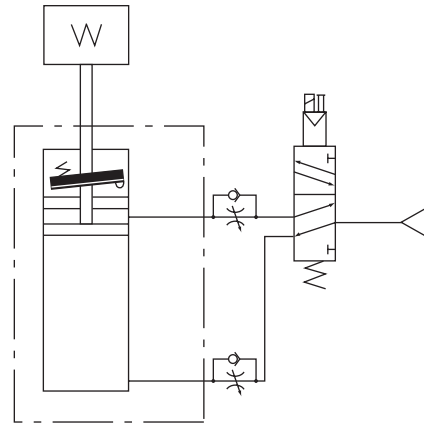
Basic circuit diagram

A speed controller must be used when controlling speed.

Forward lock F type



Backward lock B type



Installation & Adjustment

WARNING

- Do not disassemble the unit, since this may cause a hazardous situation.

CAUTION

- Before connection, flush piping size sufficiently to prevent foreign matter and cutting chips, etc., from entering the cylinder.

- Check that load is applied axially to the piston rod.

- Handle carefully to prevent scratching or denting the piston rod sliding section.

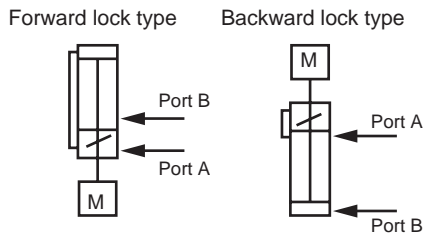
Rough handling could damage packing seal and result in air leaks.

During Use & Maintenance

⚠ WARNING

- For safety purposes, prevent the load from dropping under its own weight during maintenance.
- Do not apply torque to the rod when locked as the holding force could stop and be dangerous. Use a mechanism that does not rotate the rod.
- Supply pressure to port B, and release brakes after the load is removed from the locking mechanism.

If pressure is supplied to port A when both ports A and B are exhausted and the piston is locked, the lock may not be leased or the piston rod may pop out even if the lock is released. This can be extremely hazardous.

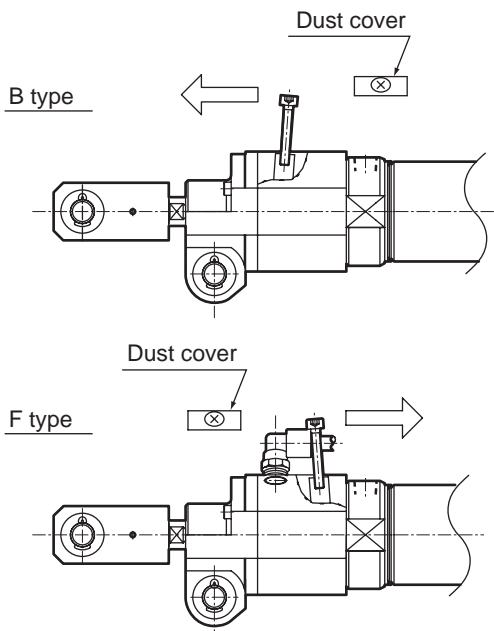


- The lock may be released if the cylinder is held while pressure is applied on the lock mechanism.

Do not use 3-position closed center or 3-position P/A/B port connection solenoid valve.

- 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 type manifold.
- Do not use with the by-pass tube disconnected as lock response could be delayed.
- Note that due to the structure 1mm deviation may occur in stopping with the lock.
- How to unlock manually

1. Remove dust cover A.
2. Screw the M4 hexagon socket head cap screw (length 40 or more) into the lock metal screw.
3. The rod is freed when the hexagon socket head cap screw is tilted in the direction of the arrow.

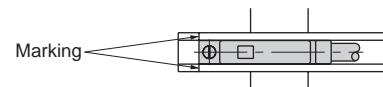


1. Common (T type with switch)

⚠ CAUTION

■ Moving the switch in the stroke direction

- The monochrome indicator switch can be finely adjusted ± 3 mm from the default installation position. If the adjustment range exceeds ± 3 mm, or when adjusting the 2-color indicator switch, move the band position.
- Loosen the switch fixing screw, move the switch along the rail, and tighten at the required position. When using the T2, T3, T0, or T5 switch, use a minus screwdriver with a 5 to 6 mm grip, 2.4 mm or smaller tip width and 0.3 mm or thinner (clock screwdriver, precision screwdriver, etc.), and tighten with a tightening torque of 0.1 to 0.2 N·m. When using T1, T*C, T2J, T2Y, T3Y, T2YF, T3YF, T2YM, T3YM, or T8, tighten with a tightening torque of 0.5 to 0.7 N·m.
- The switch bracket rail has a marking 4 mm from the rail end. Use this as a guide for the mounting position when replacing the switch. Switch rail markings are set to the switch maximum sensitivity default. This default changes when the switch type is changed or when the switch bracket is moved. Adjust the position accordingly.

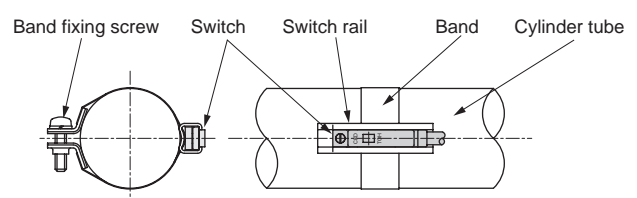


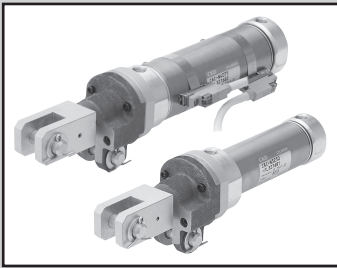
■ Shifting the switch position circumferentially

- Loosen the band fixing screw, shift the switch rail in the circumference direction, and tighten at the specified position. Tightening torque is 0.6 to 0.8 N·m.

■ Shifting the band position

- Loosen the band fixing screw, shift the switch rail and band along the cylinder tube, then tighten at the specified position. Tightening torque is 0.6 to 0.8 N·m.





Light in weight clamp cylinder, double acting single rod type

CAC-N32/N40 Series

● Bore size: $\Phi 32$, $\Phi 40$

JIS symbol 

RoHS

Specifications

Descriptions		CAC-N32	CAC-N40
Bore size	mm	$\Phi 32$	$\Phi 40$
Operation type		Double acting	
Max. working pressure	MPa	1.0	
Min. working pressure	MPa	0.15	
Withstanding pressure	MPa	1.6	
Ambient temperature	°C	5 to 60	
Port size		Rc1/8	
Working piston speed	mm/s	50 to 500	
Cushion		Rubber cushion	
Lubrication		Not required (when lubricating, use turbine oil ISO VS32.)	
Mounting style		Clevis	

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke length with switch (mm)
$\Phi 32$	50, 75, 100, 125, 150	150	5	10
$\Phi 40$				

Cylinder weight (with rod eye/clevis)

(Unit: kg)

Bore size (mm)	Product weight per stroke length = 0mm	Additional weight per stroke length = 100mm
$\Phi 32$	0.62	0.15
$\Phi 40$	0.70	0.17

Switch specifications

● 1 color/2 color indicator/strong magnetic field proof

*The T0/T5 switch can be used with 220 VAC.
Working conditions is consult with CKD.

Descriptions	Proximity 2 wire			Proximity 3 wire			Reed 2 wire						
	T1H/T1V	T2H/T2V/ T2JH/ T2JV	T2YH/ T2YV	T3H/ T3V	T3PH/ T3PV (Custom order)	T3YH/ T3YV	T0H/T0V	T5H/T5V		T8H/T8V			
Applications	Programmable controller relay and small solenoid valve	Programmable controller		Programmable controller and relay			Programmable controller and relay	Programmable controller, relay, IC circuit (without indicator light), serial connection		Programmable controller and relay			
Output method	-			NPN output	PNP output	NPN output	-						
Power voltage	-			10 to 28 VDC			-						
Load voltage	85 to 265 VAC	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 100mA	5 to 20mA (Note 1)		100mA or less		50mA or less	5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 50mA	7 to 20mA	7 to 10mA
Light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Without indicator light		LED (ON lighting)			
Leakage current	1mA or less with 100 VAC 2mA or less with 200 VAC	1mA or less		10μA or less			0mA						

Note 1: Maximum load current above: 20mA is the value at 25°C. When ambient temperature around a switch is higher than 25°C, the value is lower than 20mA. (5 to 10mA when 60°C)

● Strong magnetic field proof

Descriptions	Proximity 2 wire	
	T2YD	
Applications	Programmable controller dedicated	
Light	Red/green LED ON lighting	
Load voltage	24 VDC ±10%	
Load current	5 to 20mA DC	
Internal voltage drop	6V or less	
Leakage voltage	1.0mA or less	
Output delay hour (Note 1) (ON and OFF delay)	30 to 60mS	
Lead wire (Note 2, 3)	Oil resistant vinyl cable Φ6, 0.5mm ² x 2-conductor (standard 1m)	
Insulation resistance	100MΩ and over with 500 VDC megger	
Withstand voltage	No failure impressed at 1000 VAC for one minute	
Maximum shock resistance	980m/s ²	
Ambient temperature	-10 to + 60°C	
Protective structure	JIS C0920 (water tight type), IEC standards IP67, oil resistance	

Note 1: This shows the time from magnetic sensor detects piston magnet until outputs a signal.

Note 2: For lead wire length, 3m and 5m are available as options.

Note 3: For lead wire material, flame resistance type is available as option.

CAC-N32/N40 Series

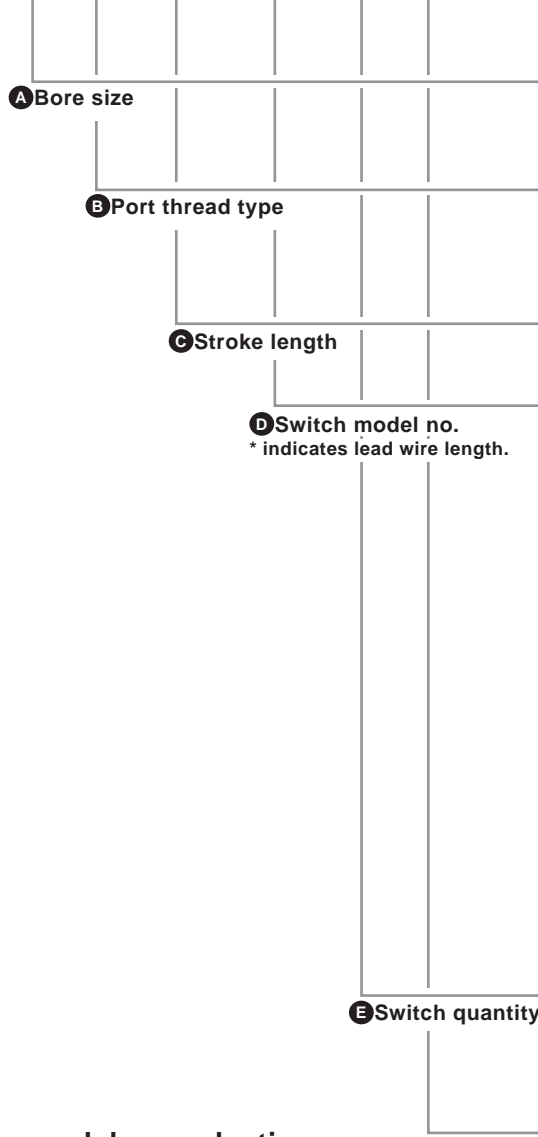
How to order

● Without switch

CAC - N40 - 50 - Y

● With switch

CAC - N40 - 50 - T0H - R - Y



Symbol	Descriptions			
A Bore size (mm)				
N32	Φ32			
N40	Φ40			
B Port thread type				
Blank	Rc thread			
N	NPT thread (custom order)			
G	G thread (custom order)			
C Stroke length (mm)				
50, 75, 100, 125, 150				
D Switch model no.				
Lead wire Axial	Lead wire Radial	Contact	Indication	Lead wire
T0H*	T0V*	Reed	1 color indicator type	2-wire
T5H*	T5V*		Without indicator light	
T8H*	T8V*		1 color indicator type	
T1H*	T1V*	Proximity	1 color indicator type	2-wire
T2H*	T2V*			3-wire
T3H*	T3V*		1 color indicator type (custom order)	3-wire
T3PH*	T3PV*			3-wire
T2YH*	T2YV*		2 color indicator type	2-wire
T3YH*	T3YV*			3-wire
T2YD*	-		Strong magnetic field proof switch	2-wire
T2YDT*	-			
T2JH*	T2JV*	Off-delay type	2-wire	
*Lead wire length (m)				
Blank	1 (standard)			
3	3 (option)			
5	5 (option)			
E Switch quantity				
R	1 on rod end			
H	1 on head end			
D	Two			
F Accessory				
Y	Rod clevis			

Note on model no. selection

Note 1: A pin, a split pin or plain washer is included with Y.

F Accessory
Note 1

<Example of model number>

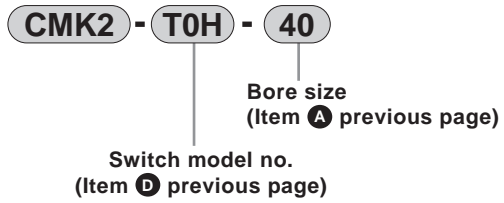
CAC-N40-50-T0H-R-Y

Model: Clamp cylinder

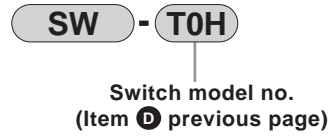
- A Bore size** : Φ40mm
- B Port thread type** : Rc thread
- C Stroke length** : 50mm
- D Switch model no.** : Reed switch T0H and lead wire length 1m
- E Switch quantity** : 1 on rod end
- F Accessory** : Rod clevis

How to order switch

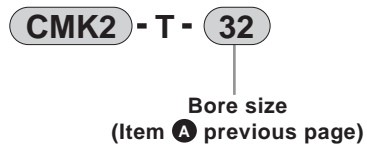
A) Switch body + mounting bracket



B) Only switch body

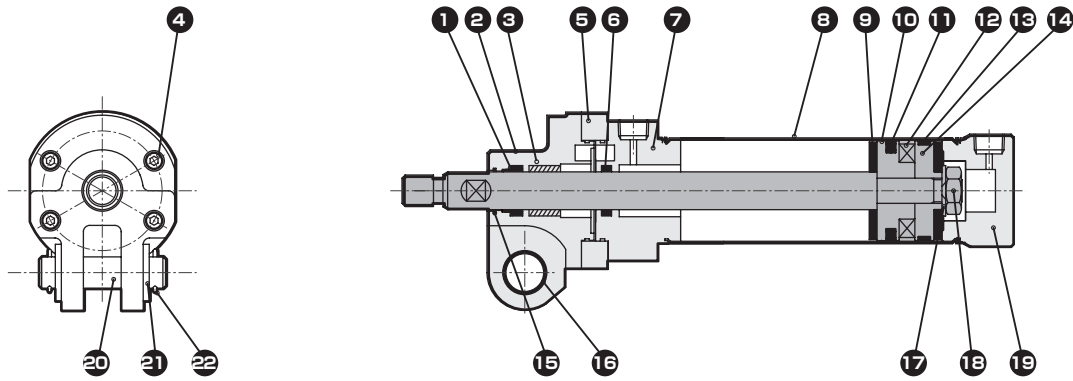


C) Mounting bracket



CAC-N32/N40 Series

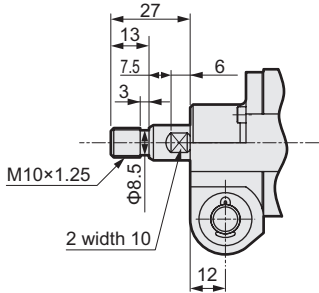
Internal structure and parts list



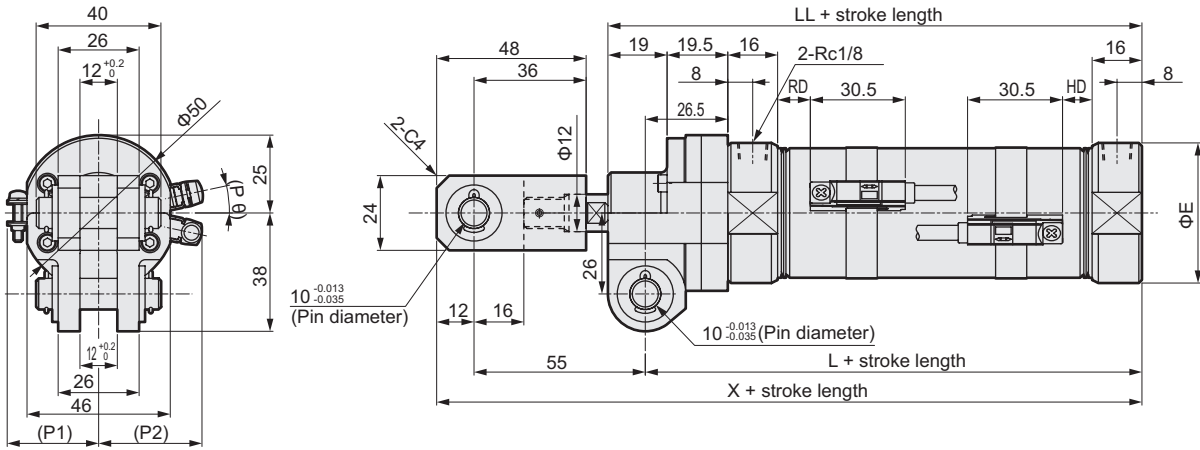
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Scraper	Nitrile rubber		12	Magnet	Plastic	
2	Front clevis	Aluminum alloy die-casting	Alumite	13	Wear ring	Polyacetal resin	
3	Bush	Copper		14	Piston B	Aluminum alloy	
4	Hexagon socket head cap bolt	Alloy steel		15	Metal scraper	Copper	
5	Adaptor	Aluminum alloy	Alumite	16	Bush for clevis	Dry bearing	
6	Rod packing seal	Nitrile rubber		17	Plain washer	Steel	Zinc chromate
7	Rod cover	Aluminum alloy		18	Hexagon nut	Steel	Zinc chromate
8	Tube	Stainless steel		19	Head cover	Aluminum alloy	
9	Cushion rubber	Urethane rubber		20	Pin	Steel	Zinc chromate
10	Piston A	Aluminum alloy		21	Plain washer	Steel	Zinc chromate
11	Piston packing seal	Nitrile rubber		22	Split pin	Steel	Zinc chromate

Dimensions

Without rod eye/clevis



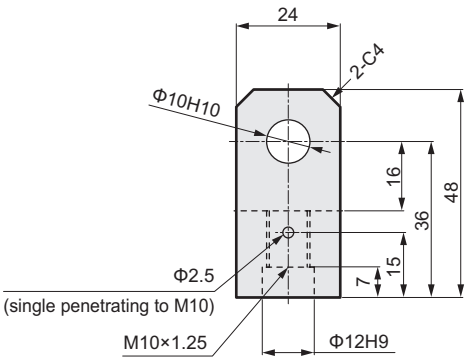
With rod clevis (Y)



Symbol Bore size	E	L	LL	X	P1	P2	P θ	RD	HD
Φ32	36	95.5	107.5	162.5	25	29	15°	8.5	7.5
Φ40	45	99.5	111.5	166.5	29	33	12°	10.5	9.5

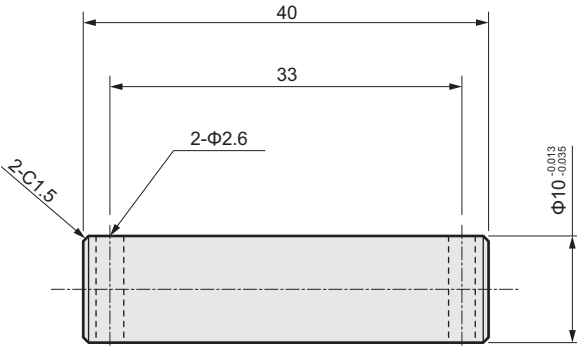
Accessory dimensions

● Rod clevis (Y) material: Steel

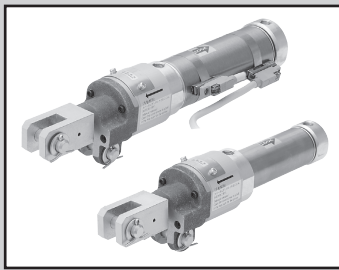


Weight: 0.15kg

● Clevis pin material: Steel



Weight: 0.02kg

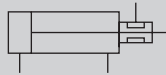


Light weight position locking clamp cylinder

UCAC-N32/N40 Series

● Bore size: $\Phi 32$, $\Phi 40$

JIS symbol



Specifications

Descriptions		UCAC-N32	UCAC-N40
Bore size	mm	$\Phi 32$	$\Phi 40$
Operation type		Double acting	
Max. working pressure	MPa	1.0	
Min. working pressure	MPa	0.25	
Withstanding pressure	MPa	1.6	
Ambient temperature	$^{\circ}\text{C}$	5 to 60	
Port size		Rc1/8	
Working piston speed	mm/s	50 to 500	
Cushion		Rubber cushion	
Lubrication		Not required (when lubricating, use turbine oil ISO VS32.)	
Mounting style		Clevis	
Position locking mechanism		Forward lock or backward lock	
Holding force	N	631	

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke length with switch (mm)
$\Phi 32$	50, 75, 100, 125, 150	150	5	10
$\Phi 40$				

Switch specifications

● 1 color/2 color indicator

*The T0/T5 switch can be used with 220 VAC.
Working conditions is consult with CKD.

Descriptions	Proximity 2 wire			Proximity 3 wire			Reed 2 wire						
	T1H/T1V	T2H/T2V	T2YH/ T2YV	T3H/ T3V	T3PH/ T3PV (Custom order)	T3YH/ T3YV	T0H/T0V	T5H/T5V		T8H/T8V			
Applications	Programmable controller relay and small solenoid valve	Programmable controller		Programmable controller and relay			Programmable controller and relay	Programmable controller, relay, IC circuit (without indicator light), serial connection		Programmable controller and relay			
Output method	-			NPN output	PNP output	NPN output	-						
Power voltage	-			10 to 28 VDC			-						
Load voltage	85 to 265 VAC	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 100mA	5 to 20mA (Note 1)		100mA or less		50mA or less	5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 50mA	7 to 20mA	7 to 10mA
Light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Green LED (ON lighting)	Red/green LED Diode (ON lighting)	LED (ON lighting)	Without indicator light		LED (ON lighting)			
Leakage current	1mA or less with 100 VAC 2mA or less with 200 VAC	1mA or less		10 μ A or less			0mA						

Note 1: Maximum load current above: 20mA is the value at 25 $^{\circ}\text{C}$. When ambient temperature around a switch is higher than 25 $^{\circ}\text{C}$, the valve is lower than 20mA.
(5 to 10mA when 60 $^{\circ}\text{C}$)

UCAC-N32/N40 Series

Specifications

Cylinder weight (with rod eye/clevis)

(Unit: kg)

Bore size (mm)		Product weight per stroke length = 0mm	Additional weight per stroke length = 100mm
Φ32	Forward lock: F	0.88	0.15
	Backward lock: B	0.82	
Φ40	Forward lock: F	0.95	0.17
	Backward lock: B	0.89	

UCAC-N30/N40 Series

How to order

● Without switch

UCAC - N32 - 50 - B ————— Y

● With switch

UCAC - N32 - 50 - B - T0H - D - Y

Ⓐ Bore size

Ⓑ Stroke length

Ⓒ Lock direction

Ⓓ Switch model no.
* indicates lead wire length.

Ⓔ Switch quantity

Ⓕ Accessory
Note 1

Note on model no. selection

Note 1: A pin, a split pin or plain washer is included with Y.

Symbol	Descriptions				
Ⓐ Bore size (mm)					
N32	Φ32				
N40	Φ40				
Ⓑ Stroke length (mm)					
50	50				
75	75				
100	100				
125	125				
150	150				
Ⓒ Lock direction and by-pass tube position					
F	Forward lock				
B	Backward lock				
Ⓓ Switch model no.					
Lead wire Axial	Lead wire Radial	Contact	Indication	Lead wire	
T0H*	T0V*	Reed	1 color indicator type	2-wire	
T5H*	T5V*		Without indicator light		
T8H*	T8V*		1 color indicator type		
T1H*	T1V*	Proximity	1 color indicator type	2-wire	
T2H*	T2V*			3-wire	
T3H*	T3V*		1 color indicator type (custom order)	3-wire	
T3PH*	T3PV*			2 color indicator type	2-wire
T2YH*	T2YV*				3-wire
T3YH*	T3YV*		Strong magnetic field proof switch		2-wire
T2YD*	-				
T2YDT*	-				
*Lead wire length (m)					
Blank	1 (standard)				
3	3 (option)				
5	5 (option)				
Ⓔ Switch quantity					
R	1 on rod end				
H	1 on head end				
D	Two				
Ⓕ Accessory					
Y	Rod clevis (pin, split pin or plain washer attached)				

<Example of model number>

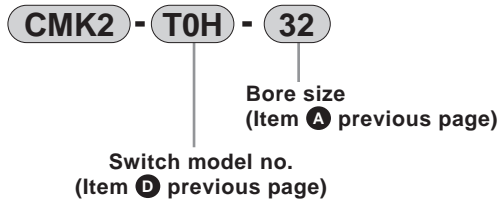
UCAC-N32-50-B-T0H-D-Y

Model: Position locking clamp cylinder, double acting

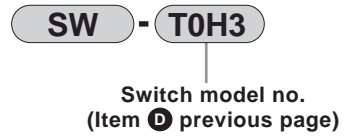
- Ⓐ Bore size : Φ32mm
- Ⓑ Stroke length : 50mm
- Ⓒ Lock direction : Backward lock
- Ⓓ Switch model no. : Reed switch T0H, lead wire length 1m
- Ⓔ Switch quantity : Two
- Ⓕ Accessory : Rod clevis

How to order switch

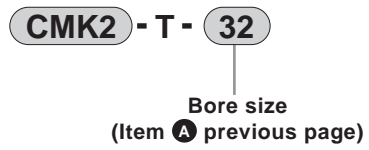
A) Switch body + mounting bracket



B) Only switch body



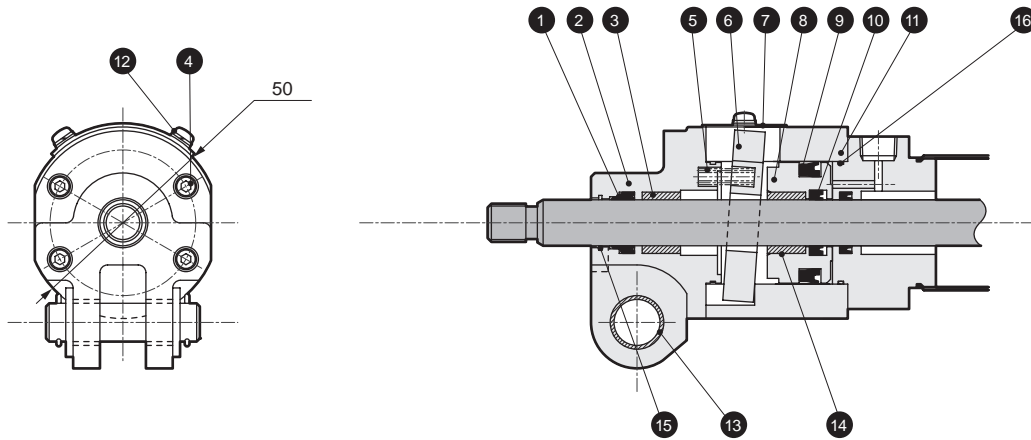
C) Mounting bracket



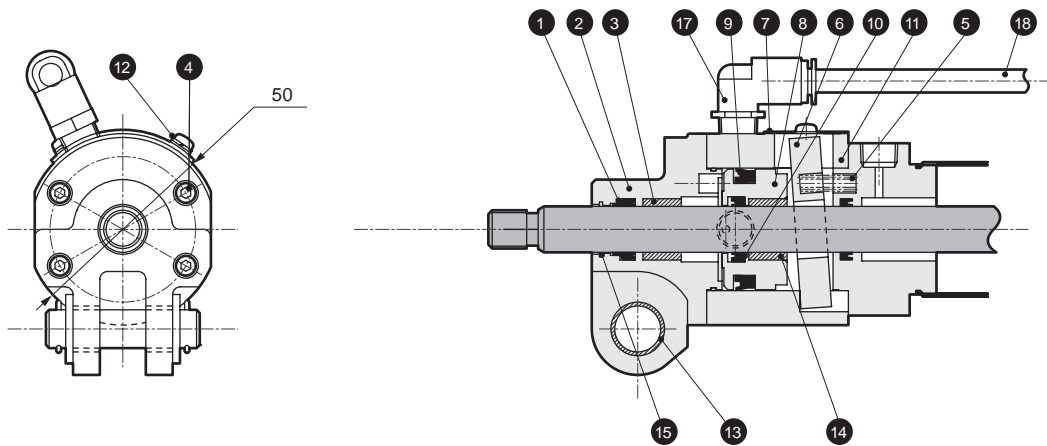
UCAC-N32/N40 Series

Internal structure and parts list

● With backward lock (UCAC-N32/N40-B)



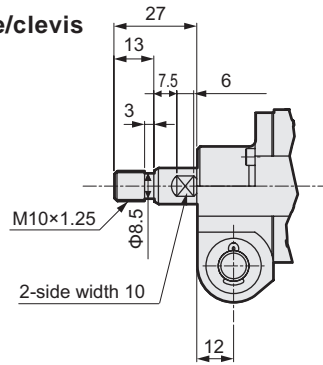
● With forward lock (UCAC-N32/N40-F)



No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Scraper	Nitrile rubber		10	Lock rod packing seal	Nitrile rubber	
2	Rod cover	Aluminum alloy die-casting	Alumite	11	Intermediate guard	Aluminum alloy	Alumite
3	Metal	Copper		12	Pan head sems screw with cross-head socket	Carbon steel	Trivalent chromate
4	Hexagon socket head cap bolt	Alloy steel		13	Bush for clevis	Dry bearing	
5	Spring	Steel	Blackening	14	Metal	Copper	
6	Lock plate	Cast iron		15	Metal scraper	Copper alloy	
7	Dust cover	Stainless steel		16	Gasket	Nitrile rubber	
8	Release piston	Aluminum alloy	Alumite	17	By-pass tube		
9	Lock piston packing seal	Nitrile rubber		18	Push-in joint		

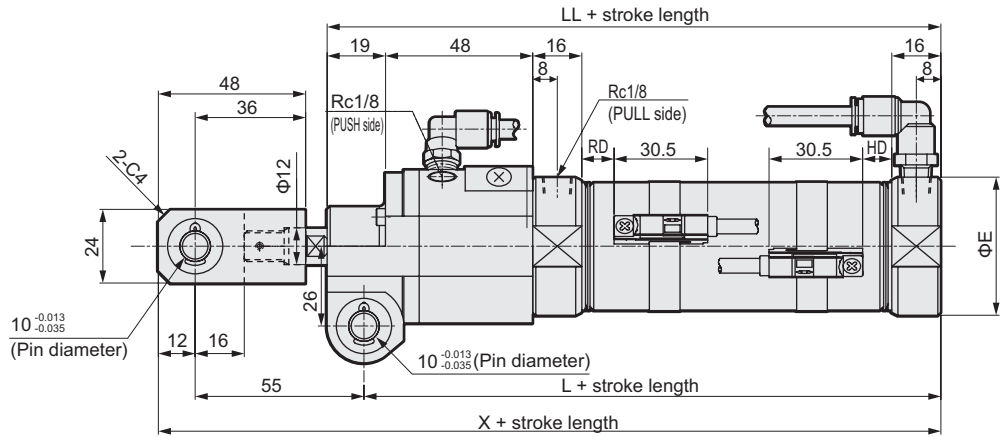
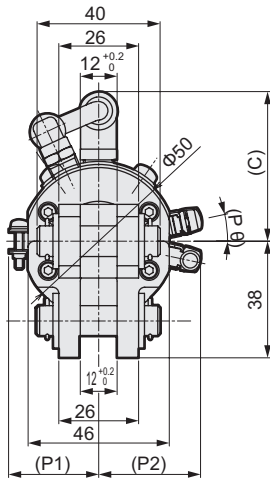
Dimensions

● Without rod eye/clevis

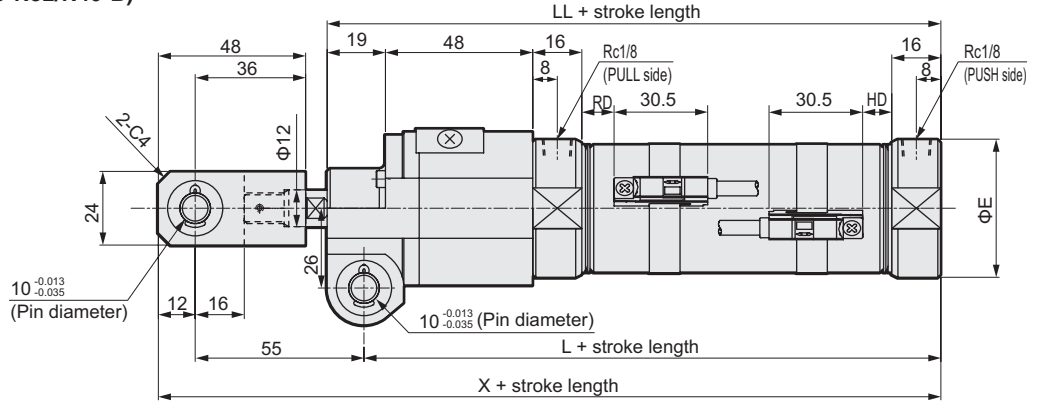
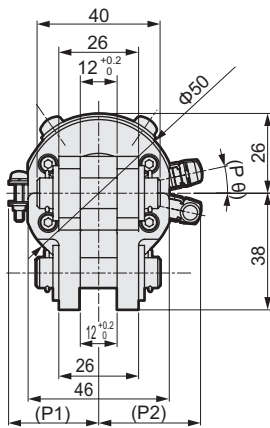


● With rod clevis (Y)

• With forward lock (UCAC-N32/N40-F)



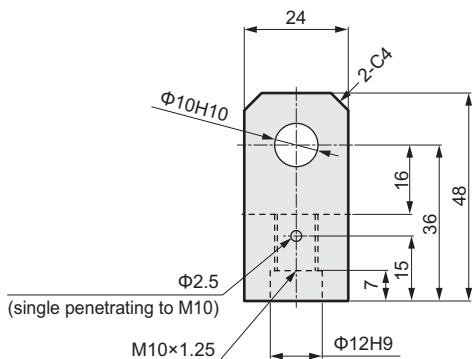
• With backward lock (UCAC-N32/N40-B)



Symbol	C	E	L	LL	X	P1	P2	Pθ	RD	HD
Φ32	44	36	124	136	191	25	29	15°	8.5	7.5
Φ40	49	45	128	140	195	29	33	12°	10.5	9.5

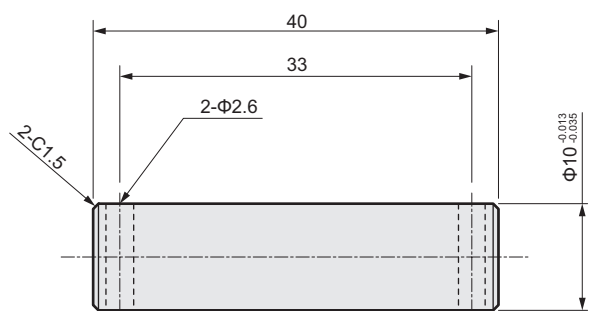
Accessory dimensions

● Rod clevis (Y) material: Steel



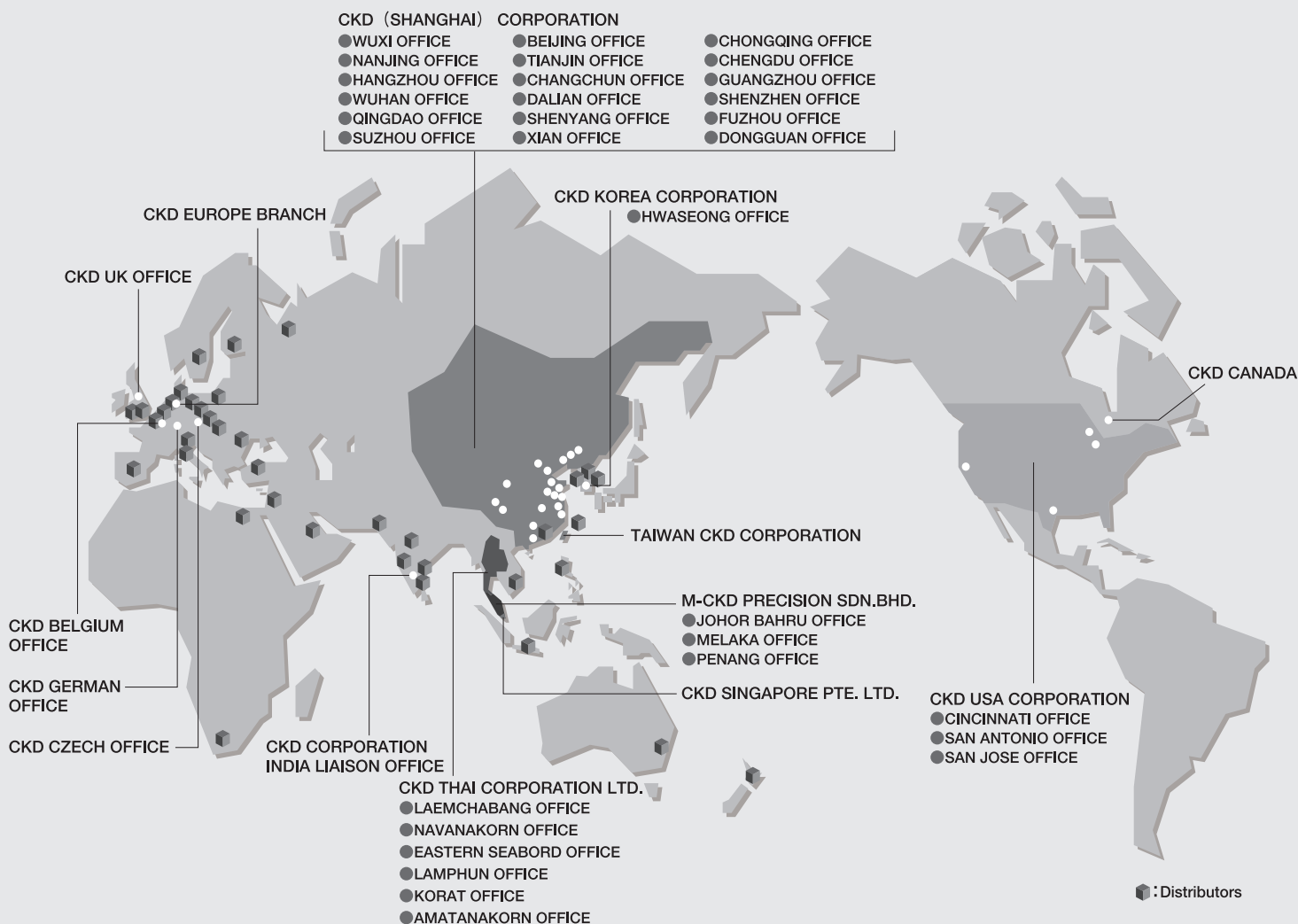
Weight: 0.15kg

● Clevis pin material: Steel



Weight: 0.02kg

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