

# Cylinder with Lock

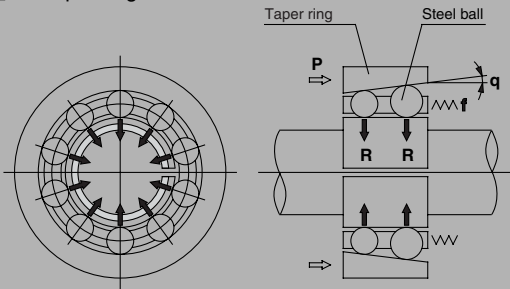
## Series CNA

ø40, ø50, ø63, ø80, ø100

**Suitable for intermediate stops, emergency stops and drop prevention**

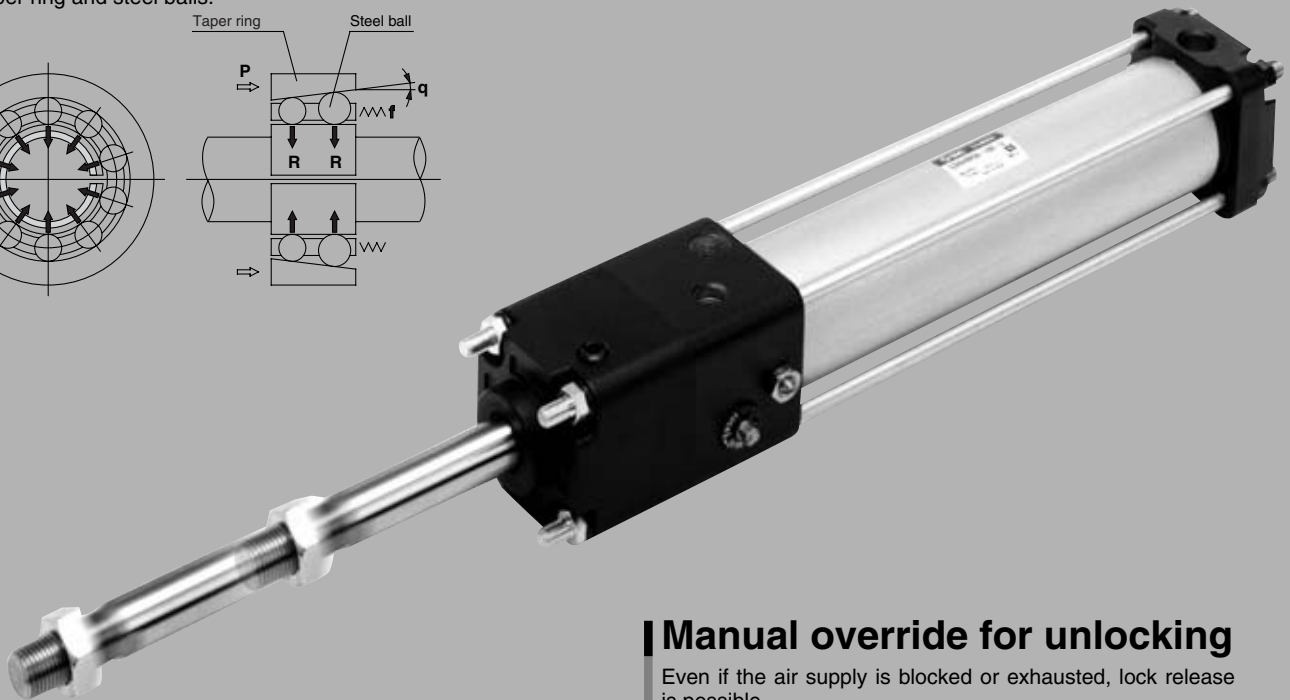
### Simple construction

A force magnifying mechanism is employed based on the wedge effect of the taper ring and steel balls.



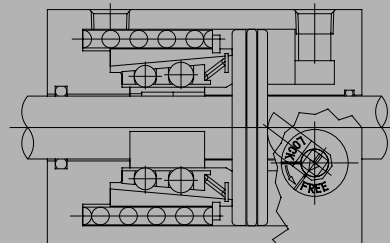
### Maximum piston speed: 1000 mm/s

It can be used at 50 to 1000 mm/s provided that it is within the allowable kinetic energy range.



### Manual override for unlocking

Even if the air supply is blocked or exhausted, lock release is possible. The fail safe mechanism locks again when the manual override is released.



### High locking efficiency

Greater locking efficiency as well as stable locking and unlocking operation has been achieved by arranging a large number of steel ball bearings in circular rows. (Unlocking pressure of 0.25 MPa ..... 0.05 MPa lower than conventional SMC products) In addition, both alignability and stable locking force with respect to piston rod eccentricity are obtained by allowing the taper ring to float.

### High reliability and stable holding force

Outstanding durability and stable holding force are maintained by the use of a brake shoe having superior wear resistance, which has also been substantially lengthened (double the conventional SMC product).

### Design minimizes the influences of unlocking air quality

A construction which is strong against moisture and drainage in the compressed air has been realized by separating the locking mechanism and the unlocking chamber.

### Series Variations

Series	Action	Type	Standard variations		Locking method	Bore size (mm)	Standard stroke (mm)
			Auto switch built-in magnet	With rod boot			
Cylinder with lock Series CNA	Double acting	Single rod Series CNA	●	●	Spring locking	40	25 to 500
		Double rod Series CNAW	●	●		50	25 to 600
			●	●		63	25 to 600
			●	●		80	25 to 700
					100	25 to 700	

### Can be locked in both directions

An equal holding force can be obtained on either reciprocating stroke of the cylinder.

### Compact lock unit saves space

The lock unit is extremely compact, without a large overhang.

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA**
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data



## Series CNA

# Specific Product Precautions 1

Be sure to read before handling.

### Design of Equipment and Machinery

#### Warning

1. Construct so that the human body will not come into direct contact with driven objects or the moving parts of locking cylinders.

Devise a safe structure by attaching protective covers that prevent direct contact with the human body, or in cases where there is a danger of contact, provide sensors or other devices to perform an emergency stop, etc., before contact occurs.

2. Use a balance circuit, taking cylinder lurching into consideration.

In cases such as an intermediate stop, where a lock is operated at a desired position within the stroke and air pressure is applied from only one side of the cylinder, the piston will lurch at high speed when the lock is released. In such situations, there is a danger of causing human injury by having hands or feet, etc. caught, and also a danger for causing damage to the equipment. In order to prevent this lurching, a balance circuit such as the recommended pneumatic circuits (page 9-7-3) should be used.

### Selection

#### Warning

1. When in the locked state, do not apply a load accompanied by an impact shock, strong vibration or turning force, etc.

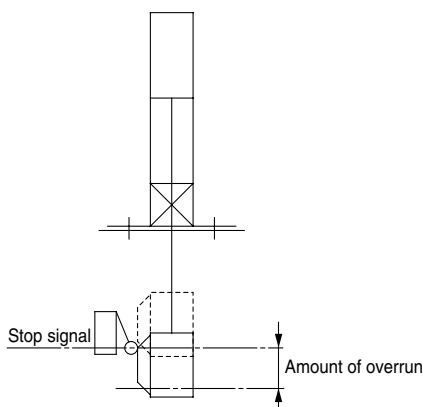
Use caution, because an external action such as an impacting load, strong vibration or turning force, may damage the locking mechanism or reduce its life.

2. Consider stopping accuracy and the amount of over-run when an intermediate stop is performed.

Due to the nature of a mechanical lock, there is a momentary lag with respect to the stop signal, and a time delay occurs before stopping. The cylinder stroke resulting from this delay is the overrun amount. The difference between the maximum and minimum overrun amounts is the stopping accuracy.

- Place a limit switch before the desired stopping position, at a distance equal to the overrun amount.
- The limit switch must have a detection length (dog length) of the overrun amount +  $\alpha$ .
- For SMC's auto switches, the operating range is between 8 and 14 mm. (It varies depending on a switch model.) When the overrun amount exceeds this range, self-holding of the contact should be performed at the switch load side.

\* For stopping accuracy, refer to page 9-7-9.



### Selection

#### Warning

3. In order to further improve stopping accuracy, the time from the stop signal to the operation of the lock should be shortened as much as possible.

To accomplish this, use a device such as a highly responsive electric control circuit or solenoid valve driven by direct current, and place the solenoid valve as close as possible to the cylinder.

4. Note that the stopping accuracy will be influenced by changes in piston speed.

When piston speed changes during the course of the cylinder stroke due to variations in the load or disturbances, etc., the dispersion of stopping positions will increase. Therefore, consideration should be given to establishing a standard speed for the piston just before it reaches the stopping position.

Moreover, the dispersion of stopping positions will increase during the cushioned portion of the stroke and during the accelerating portion of the stroke after the start of operation, due to the large changes in piston speed.

### Mounting

#### Warning

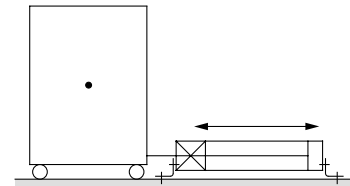
1. Be certain to connect the rod end to the load with the lock released.

- If connected in the locked state, a load greater than the turning force or holding force, etc. may operate on the piston rod and cause damage to the lock mechanism. Series CNA is equipped with an emergency unlocking mechanism, however, when connecting the rod end to the load this should be done with the lock released. This can be accomplished by simply connecting an air line to the unlocking port and supplying air pressure of 0.25 MPa or more.

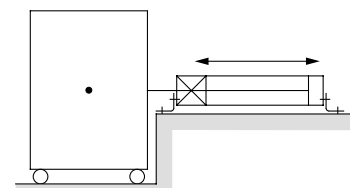
#### Caution

1. Do not apply offset loads to the piston rod.

Particular care should be taken to match the load's center of gravity with the center of the cylinder shaft. When there is a large discrepancy, the piston rod may be subjected to uneven wear or damage due to the inertial moment during locking stops.



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



O 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.



# Series CNA

# Specific Product Precautions 2

Be sure to read before handling.

## Mounting

### ⚠ Caution

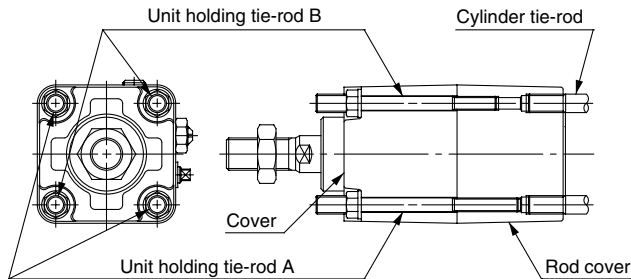
#### 2. Caution on using the basic style or replacing the support bracket.

The lock unit and cylinder rod cover are assembled as shown in the figure below. For this reason, it cannot be installed as in the case of common air cylinders, by using the basic type and screwing the cylinder tie-rods directly to machinery.

Furthermore, when replacing mounting brackets, the unit holding tie-rods may get loosen. Tighten them once again in such a case.

Use socket wrench for replacing the mounting bracket or tightening tie-rod for unit mounting.

Bore size (mm)	Mounting bracket nut			Unit holding tie-rod	
	Nut	Width across flats	Socket	Width across flats	Socket
40	JIS B 1181 Class 3 M8 x 1.25	13	JIS B 4636 2 point angle socket 13	10	JIS B 4636 2 point angle socket 10
				13	JIS B 4636 2 point angle socket 13
50	JIS B 1181 Class 3 M10 x 1.25	17	JIS B 4636 2 point angle socket 17	13	JIS B 4636 2 point angle socket 13
63	JIS B 1181 Class 3 M12 x 1.25	19	JIS B 4636 2 point angle socket 19	17	JIS B 4636 2 point angle socket 17



(ø2 depth 1 mm hole is on the side of tie-rod for attaching unit A.)

## Adjustment

### ⚠ Caution

1. Adjust air balance for cylinder. Balance the load by adjusting the air pressure in the cylinder rod side and head side after the lock is released when the load is mounted on cylinder. When you have this air balance, cylinder ejection at lock release can be avoided.

2. Adjust mounting position for detection area of auto switch etc. When intermediate stop is done, adjust the mounting position for detection stop is done, adjust the mounting position for detection area of auto switch etc., with consideration of overrun distance to required stop position.

## 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.

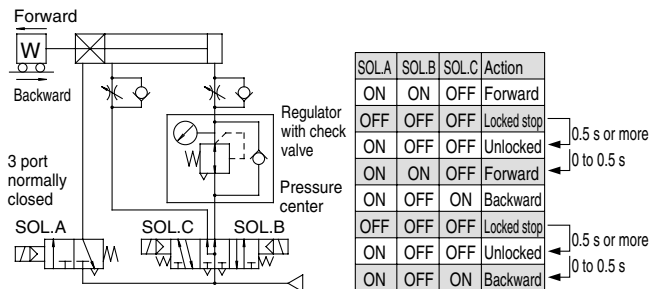
When the locked stop time is too short, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

#### 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.

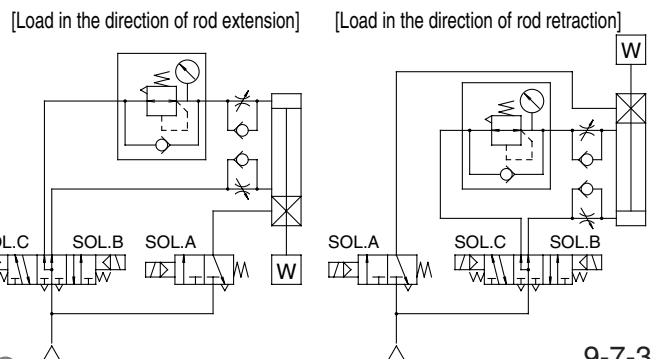
If the signal is delayed, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

#### 6. Basic circuit

##### 1) [Horizontal]



##### 2) [Vertical]



CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data



# Series CNA

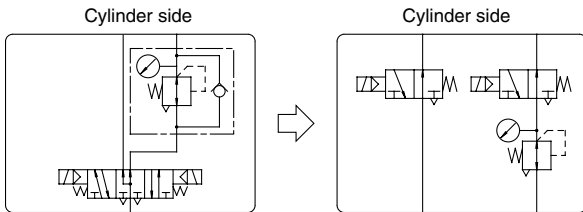
# Specific Product Precautions 3

Be sure to read before handling.

## Pneumatic Circuit

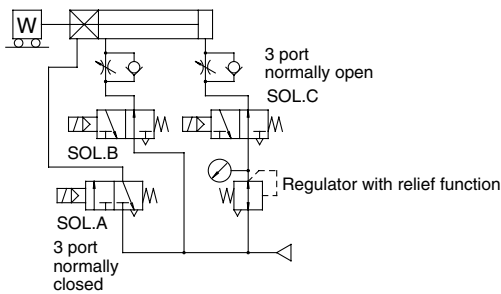
### ⚠ Caution

1. 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]

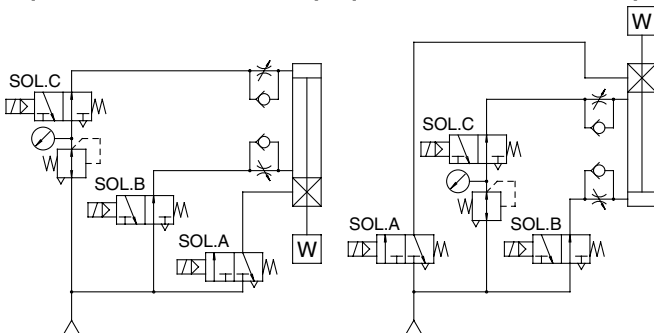
1) [Horizontal]



2) [Vertical]

[Load in the direction of rod extension]

[Load in the direction of rod retraction]



## Manually Unlocking

### ⚠ Caution

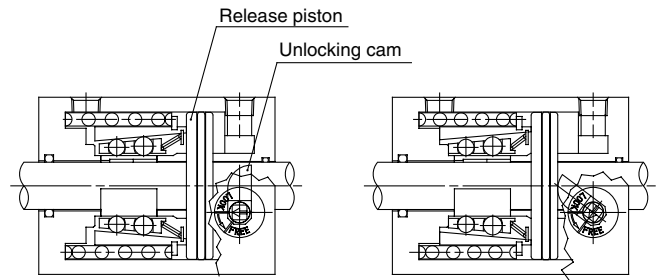
1. Lock release manual override on Series CNA is only for emergencies.

During an emergency when the air supply is cut off, it is used to alleviate a problem by forcibly pushing the release piston back to release the lock.

However, take note that the sliding resistance of the piston rod will be high compared to unlocking with air pressure.

2. When installing into equipment or machinery, etc., in cases where it will be necessary to hold an unlocked condition for an extended time, air pressure of 0.25 MPa or more should be applied to the unlocking port.

3. Do not turn the unlocking cam (the arrow (←) on the unlocking cam head) past the FREE position. If it is turned too far there is a danger of damaging the unlocking cam.



Locked state

Manually unlocked state

### [Principle]

If the unlocking cam is turned counter clockwise with a tool such as an adjustable angle wrench, the release piston is pushed back and the lock is released. Since the lever will return to its original position when released and become locked again, it should be held in this position for as long as unlocking is needed.



# Series CNA

# Specific Product Precautions 4

Be sure to read before handling.

## Maintenance

### Caution

1. Replacement of lock unit for Series CNA is possible. To order Series CNA lock units for maintenance, use the order numbers given in the table below.

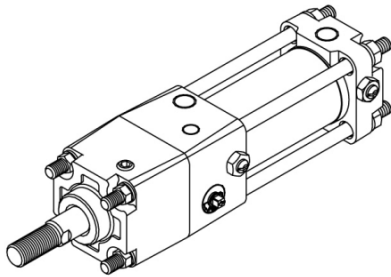
Bore size (mm)	Lock unit part no.
40	CNA 40D-UA
50	CNA 50D-UA
63	CNA 63D-UA
80	CNA 80D-UA
100	CNA100D-UA

\* But, suffix "L" to the end of part number for 1001 stroke or more on C□DNAF50 to 100.  
(Example: CNA100D-UAL)

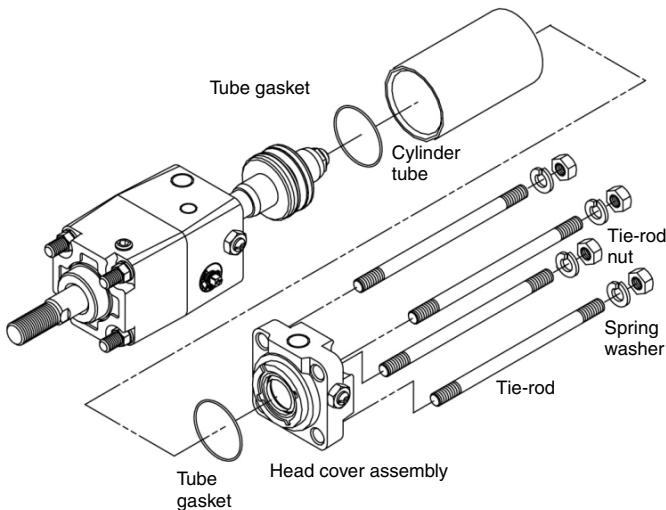
2. How to replace lock unit

- 1) Loosen the tie-rod nuts (4 pcs.) on the cylinder head cover side by using a socket wrench. For the applicable socket, refer to the table below.

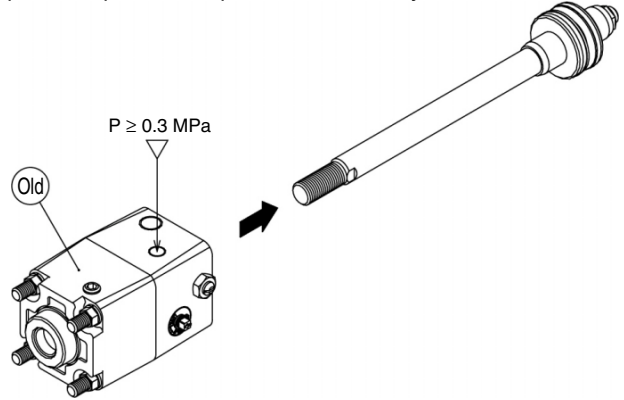
Bore size (mm)	Nut	Width across flats dimension	Socket
40, 50	JIS B 1181 Class 2 M8 x 1.25	13	JIS B 4636 + 2 point angle socket 13
63	JIS B 1181 Class 2 M10 x 1.25	17	JIS B 4636 + 2 point angle socket 17
80, 100	JIS B 1181 Class 2 M12 x 1.75	19	JIS B 4636 + 2 point angle socket 19



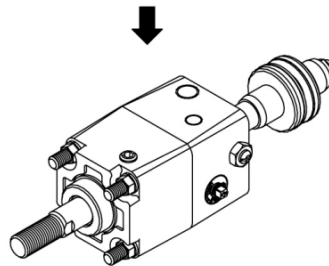
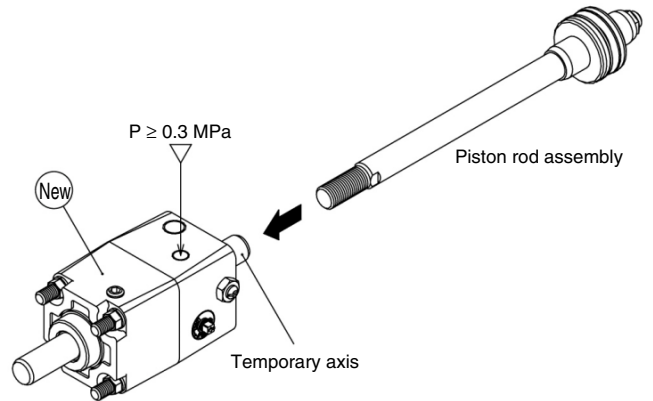
- 2) Remove the tie-rods, head cover and cylinder tube.



- 3) Apply 0.3 MPa or more of compressed air to the unlocking port, and pull out the piston rod assembly.



- 4) Similarly, apply 0.3 MPa or more of compressed air to the unlocking port of the new lock unit, and replace the new lock unit's temporary axis with the previous piston rod assembly.



- 5) Reassemble in reverse order from steps 2) and 1).

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

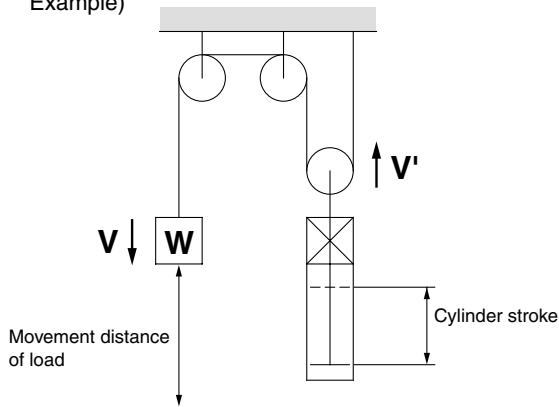
# Series CNA Model Selection

## Precautions on Model Selection

### ⚠ Caution

- In order that the originally selected maximum speed is not exceeded, be certain to use a speed controller to adjust the total movement distance of the load so that movement takes place in no less than the applicable movement time. The movement time is the time that is necessary for the load to travel the total movement distance from the start without any intermediate stops.
- In cases where the cylinder stroke and the movement distance of the load are different (double speed mechanism, etc.), use the movement distance of the load for selection purposes.

Example)



### Selection Example

- Load weight:  $m = 50 \text{ kg}$
- Movement distance:  $st = 500 \text{ mm}$
- Movement time:  $t = 2 \text{ s}$
- Load condition: Vertical downward = Load in direction of rod extension
- Operating pressure:  $P = 0.4 \text{ MPa}$

Step (1): From graph (1) find the maximum movement speed of the load.

∴ Maximum speed  $V \cong 350 \text{ mm/s}$

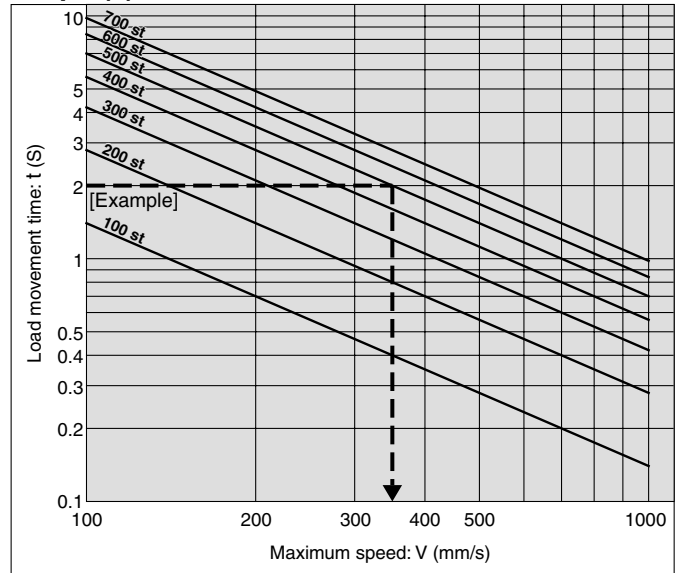
Step (2): Select graph (6) based upon the load conditions and operating pressure, and then from the intersection of the maximum speed  $V = 350 \text{ mm/s}$  found in Step (1), and the load weight  $m = 50 \text{ kg}$ .

∴  $\phi 63 \rightarrow$  Decided the tube I.D. CNA63 or more.

### Step (1) Find the maximum load speed V.

Find the maximum load speed:  $V$  (mm/s) from the load movement time:  $t$  (s) and the movement distance:  $st$  (mm).

### Graph (1)



### Step (2) Find the bore size.

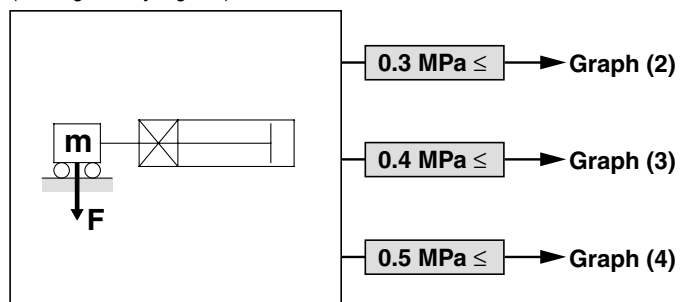
Select a graph based upon the load condition and operating pressure, and then find the point of intersection for the maximum speed found in Step (1) and the load weight. Select the bore size on the line above the point of intersection.

#### Load Condition

#### Operating Pressure

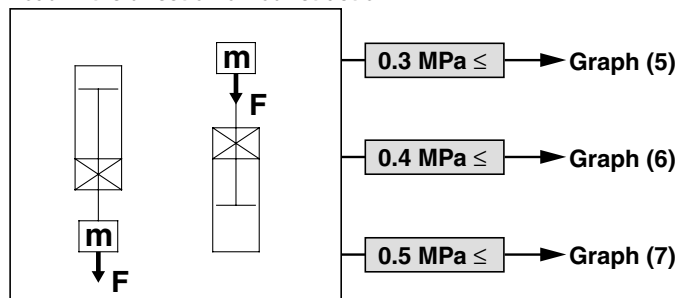
Load in the direction at the right angle to rod

(\* Being held by a guide)



Load in the direction of rod extension

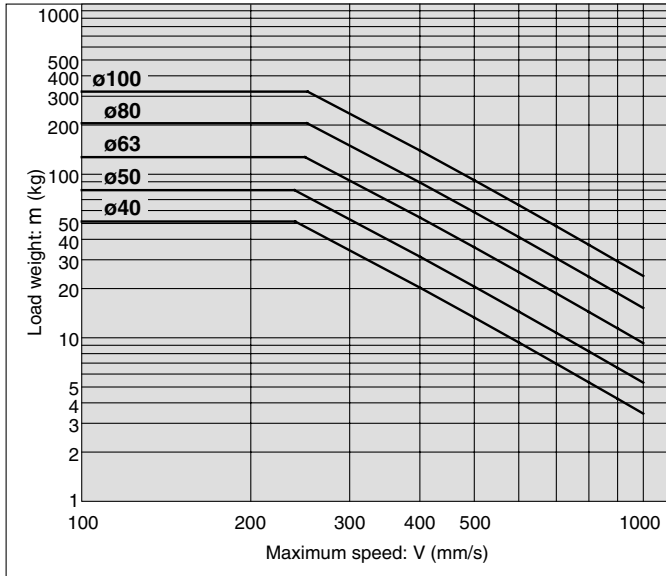
Load in the direction of rod retraction



## Selection Graph

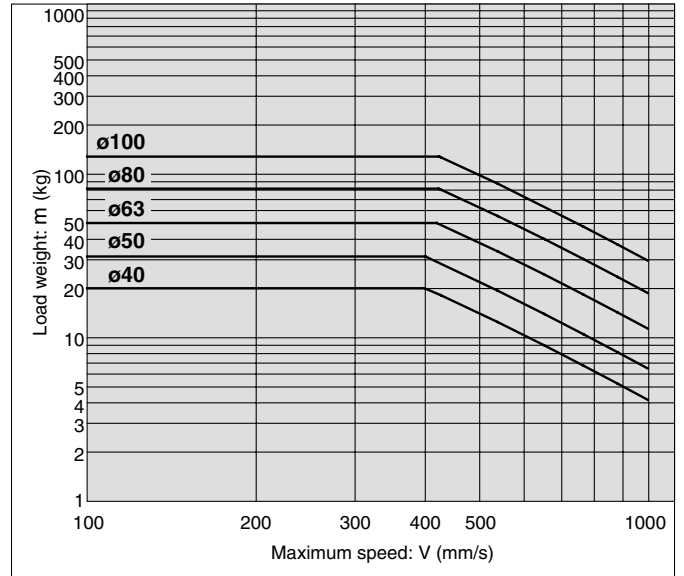
**Graph (2)**

$0.3 \text{ MPa} \leq P < 0.4 \text{ MPa}$



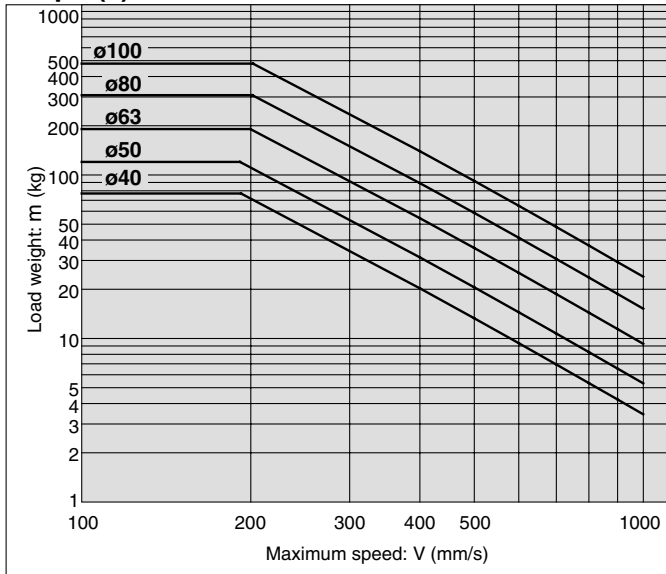
**Graph (5)**

$0.3 \text{ MPa} \leq P < 0.4 \text{ MPa}$



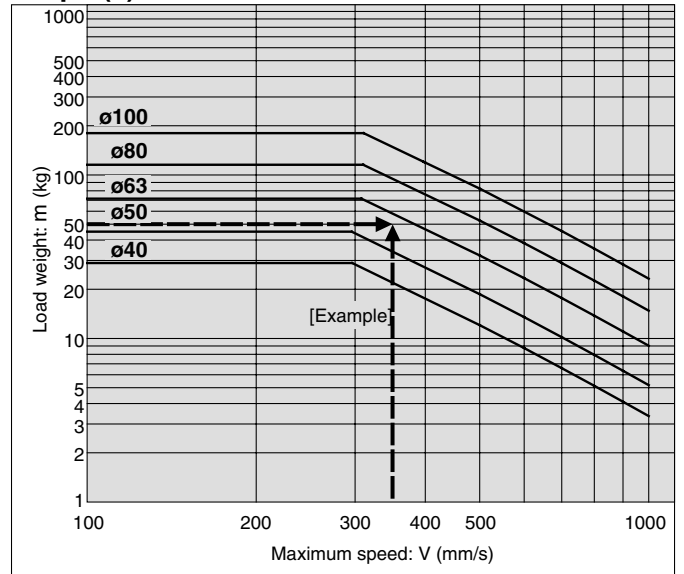
**Graph (3)**

$0.4 \text{ MPa} \leq P < 0.5 \text{ MPa}$



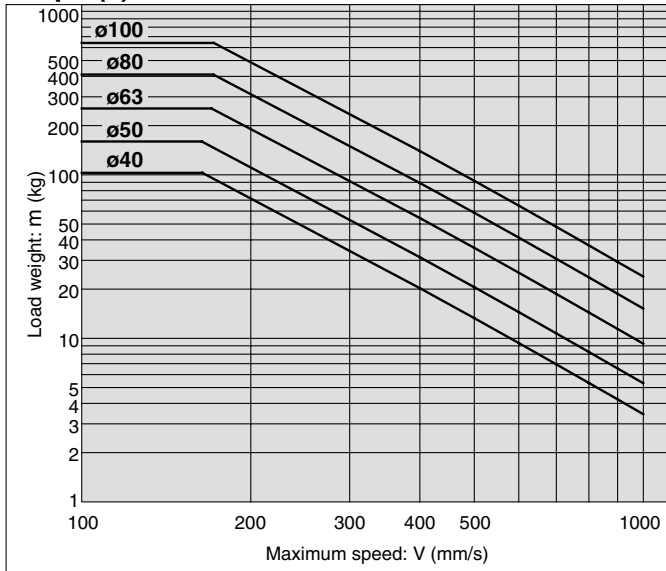
**Graph (6)**

$0.4 \text{ MPa} \leq P < 0.5 \text{ MPa}$



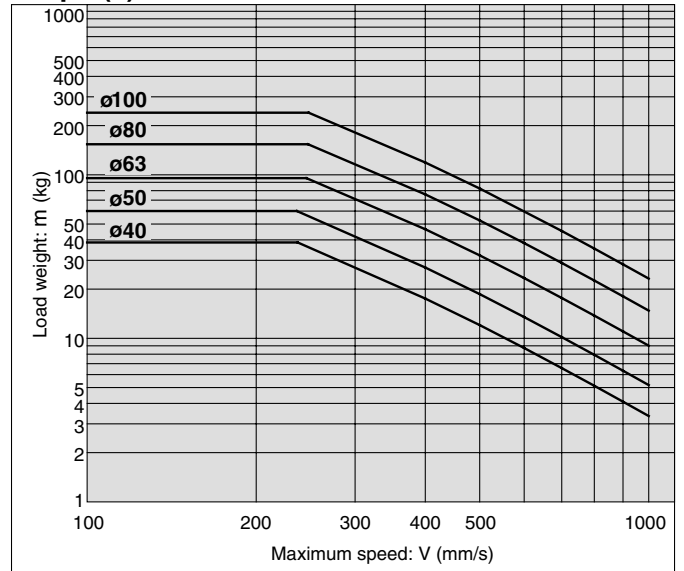
**Graph (4)**

$0.5 \text{ MPa} \leq P$



**Graph (7)**

$0.5 \text{ MPa} \leq P$



CL

CL1

MLGC

CNG

MNB

**CNA**

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data



# Cylinder with Lock

## Double Acting, Single Rod

# Series CNA

ø40, ø50, ø63, ø80, ø100

### How to Order

**Without auto switch**

**CNA** L N 50   100 JN D

**With auto switch**

**CDNA** L N 50   100 JN D

**Built-in magnet**

**Mounting style**

<b>B</b>	Basic style
<b>L</b>	Axial foot style
<b>F</b>	Rod side flange style
<b>G</b>	Head side flange style
<b>C</b>	Single clevis style
<b>D</b>	Double clevis style
<b>T</b>	Center trunnion style

**Type**

<b>N</b>	Non-lube
<b>F*</b>	Steel tube

\* Auto switches are not available with steel tube.

**Bore size**

<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm

**Thread type**

<b>Nil</b>	Rc
<b>N</b>	NPT

**Locking direction**

<b>D</b>	Both directions
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**Number of auto switches**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

**Auto switch**

<b>Nil</b>	Without auto switch
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\* For the applicable auto switch model, refer to the table below.

\* DZ7□/Z80/Y59□/Y69□/Y7□□ types are shipped together, (but not assembled). (But, only the mounting bracket for the above models is assembled when shipping.)

**With rod boot/cushion**

Rod boot	<b>J</b>	Nylon tarpaulin
	<b>K</b>	Heat resistant tarpaulin
Cushion	<b>Nil</b>	With cushion on both ends
	<b>N</b>	Without cushion
	<b>R</b>	With rod bumper
	<b>H</b>	With head cushion

**Built-in Magnet Cylinder Model**

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil". (Example) CDNALN40-100-D

**Cylinder stroke (mm)**

Refer to "Standard Stroke" on page 9-7-9.

### 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	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)							
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	Z76	—	●	●	—	—	IC circuit	—			
						100 V	—	Z73	—	●	●	●	—	—	Relay, PLC			
				2-wire	12 V	100 V, 200 V	—	B53	—	●	●	●	—	—	—	Relay, PLC		
						—	—	A33C	A33	—	—	—	—	—	—			
						100 V	—	A34C	A34	—	—	—	—	—	—			
						200 V	—	A44C	A44	—	—	—	—	—	—			
Diagnostic indication (2-color indication)	Grommet	—	—	A59W	B59W	●	●	—	—	—	—	Relay, PLC						
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	G59	●	●	○	○	IC circuit	Relay, PLC			
						3-wire (PNP)	—	Y7P	G5P	●	●	○	○	—				
				2-wire	100 V, 200 V	12 V	—	J51	—	●	●	○	—	—				
						5 V, 12 V	—	Y59B	K59	●	●	○	○	—				
				3-wire (NPN)	5 V, 12 V	—	—	G39C	G39	—	—	—	—	—		IC circuit		
						12 V	—	K39C	K39	—	—	—	—	—		—		
		3-wire (NPN)		24 V	5 V, 12 V	—	Y7NW	G59W	●	●	○	○	—	—		IC circuit		
					3-wire (PNP)	—	Y7PW	G5PW	●	●	○	○	—	—				
		Diagnostic indication (2-color indication)		Grommet	2-wire	12 V	—	—	Y7BW	K59W	●	●	○	○		—	—	
							5 V, 12 V	—	Y7BA	G5BA	—	●	○	○		—	—	
		Water resistant (2-color indication)		Grommet	4-wire (NPN)	5 V, 12 V	—	—	F59F	G59F	●	●	○	○		—	—	IC circuit
		With diagnostic output (2-color indication)					—	—	P5DW	—	—	●	●	○		○	—	—
Magnetic field resistant (2-color indication)	—	2-wire	—	—	—	—	—	—	—	—	—	—	—					

\* Lead wire length symbols: 0.5 m.....Nil (Example) A54  
 3 m.....L (Example) A54L  
 5 m.....Z (Example) A54Z

\* Solid state switches marked with "○" are produced upon receipt of order.  
 • Since there are other applicable auto switches than listed, refer to page 9-7-23 for details.  
 • For details about auto switches with pre-wire connector, refer to page 9-15-66.

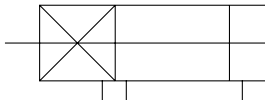


# Cylinder with Lock Double Acting, Single Rod **Series CNA**



### JIS Symbol

Double acting,  
Single rod



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

Symbol	Specification
-XA□	Change of rod end shape
-XC3	Special port location
-XC11	Dual stroke cylinder/Single rod type
-XC14	Change of trunnion bracket mounting position
-XC35	With coil scraper

## Specifications

Bore size (mm)	40, 50, 63, 80, 100
Fluid	Air
Type	Non-lube
Action	Double acting
Lock operation	Spring locking
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Max. operating pressure	0.08 MPa
Piston speed	50 to 1000 mm/s *
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)
Cushion	Air cushion
Stroke length tolerance	Up to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500: $^{+1.8}_0$
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

\* Load limits exist depending upon piston speed when locked, mounting direction and operating pressure.

## Lock Specifications

Locking action	Spring locking (Exhaust locking)
Unlocking pressure	0.25 MPa or more
Lock starting pressure	0.20 MPa or less
Max. operating pressure	1.0 MPa
Locking direction	Both directions

## Standard Stroke

For cases with auto switches, refer to the table of minimum strokes for auto switches mounting on page 9-7-21.

Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	800
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1200
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	ø80: 1400 ø100: 1500

\* Long stroke applies to the axial foot style and the rod side flange style.

## Stopping Accuracy

Lock type	Piston speed (mm/s)			
	100	300	500	1000
Spring locking	±0.3	±0.6	±1.0	±2.0

Condition/Lateral, Supply pressure P = 0.5 MPa

Load weight ..... Upper limit of allowed value

Solenoid valve for locking mounted on the unlocking port

Maximum value of stopping position dispersion from 100 measurements

## Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	40	50	63	80	100
Holding force (N)	882	1370	2160	3430	5390

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

# Series CNA

## Mounting Bracket Part No.

Bore size (mm)	40	50	63	80	100
Foot *	CA1-L04	CA1-L05	CA1-L06	CA1-L08	CA1-L10
Flange	CA1-F04	CA1-F05	CA1-F06	CA1-F08	CA1-F10
Single clevis	CA1-C04	CA1-C05	CA1-C06	CA1-C08	CA1-C10
Double clevis **	CA1-D04	CA1-D05	CA1-D06	CA1-D08	CA1-D10

\* When ordering foot bracket, order 2 pieces per cylinder.

\*\* Clevis pin, plain washer, and cotter pin are shipped together with double clevis style.

## Rod Boot Material

Symbol	Rod boot material	Max. ambient temperature
<b>J</b>	Nylon tarpaulin	70°C
<b>K</b>	Heat resistant tarpaulin	110°C *

\* Maximum ambient temperature for the rod boot itself.

## Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5NT D-F5BAL/F59F	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44 D-G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BAL D-G59F/G5NTL	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□C/A44C D-G39C/K39C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P5DWL	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080

\* Mounting bolt is attached to D-A3□C/A44C/G39C, and K39C.

To order, indicate as shown below, according to the cylinder size.

(Example) ø40.....D-A3□C-4, ø63.....D-A3□C-6, ø100.....D-A3□C-10  
ø50.....D-A3□C-5, ø80.....D-A3□C-8

To order the mounting brackets separately, use the part number shown above.

## Accessory

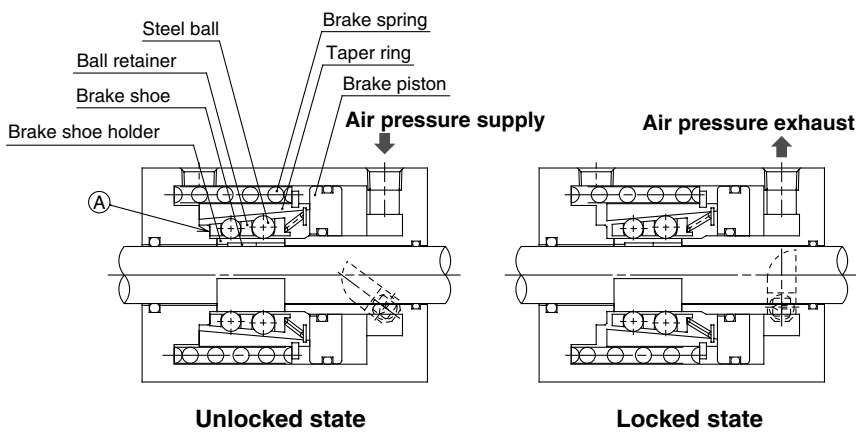
Mounting style		Basic style	Foot style	Rod side flange style	Head side flange style	Single clevis style	Double clevis style	Center trunnion style
Standard equipment	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●	●

## Weight/( ): Denotes the values for steel tube.

Bore size (mm)			40	50	63	80	100
Basic weight	Basic style		1.70 (1.75)	2.70 (2.76)	4.08 (4.12)	7.30 (7.46)	10.80 (11.01)
	Foot style		1.89 (1.94)	2.74 (2.78)	4.42 (4.46)	7.97 (8.13)	11.79 (12.00)
	Flange style		2.07 (2.12)	2.97 (3.01)	4.87 (4.91)	8.75 (8.91)	12.72 (12.93)
	Single clevis style		1.93 (1.98)	2.86 (2.90)	4.71 (4.75)	8.41 (8.57)	12.58 (12.79)
	Double clevis style		1.97 (2.02)	2.95 (2.99)	4.87 (4.91)	8.70 (8.86)	13.10 (13.31)
	Trunnion style		2.15 (2.25)	3.05 (3.15)	4.97 (5.17)	9.00 (9.29)	13.20 (13.59)
Additional weight per each 50mm of stroke	Aluminum tube	Mounting bracket	0.22	0.28	0.37	0.52	0.65
	Steel tube	Mounting bracket except trunnion	0.28	0.35	0.43	0.70	0.87
		Trunnion style	0.36	0.46	0.65	0.86	1.07
Accessory bracket	Single knuckle joint		0.23	0.26	0.26	0.60	0.83
	Double knuckle joint		0.32	0.38	0.38	0.73	1.08
	Knuckle pin		0.05	0.05	0.05	0.14	0.19

Calculation: (Example) CNALN40-100-D  
 • Base weight ..... 1.89 (Foot, ø40)  
 • Additional weight ..... 0.22/50 strokes  
 • Cylinder stroke ..... 100 strokes  
 $1.89 + 0.22 \times 100/50 = 2.33 \text{ kg}$

## Construction Principle



### Spring locking (Exhaust locking)

The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numerous steel balls which are arranged in two circles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

Unlocking is accomplished when air pressure is supplied to the unlocking port. The release piston and taper ring oppose the spring force, moving to the right side, and the ball retainer strikes the cover section A. The braking force is released as the steel balls are removed from the taper ring by the ball retainer.

CL

CL1

MLGC

CNG

MNB

**CNA**

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

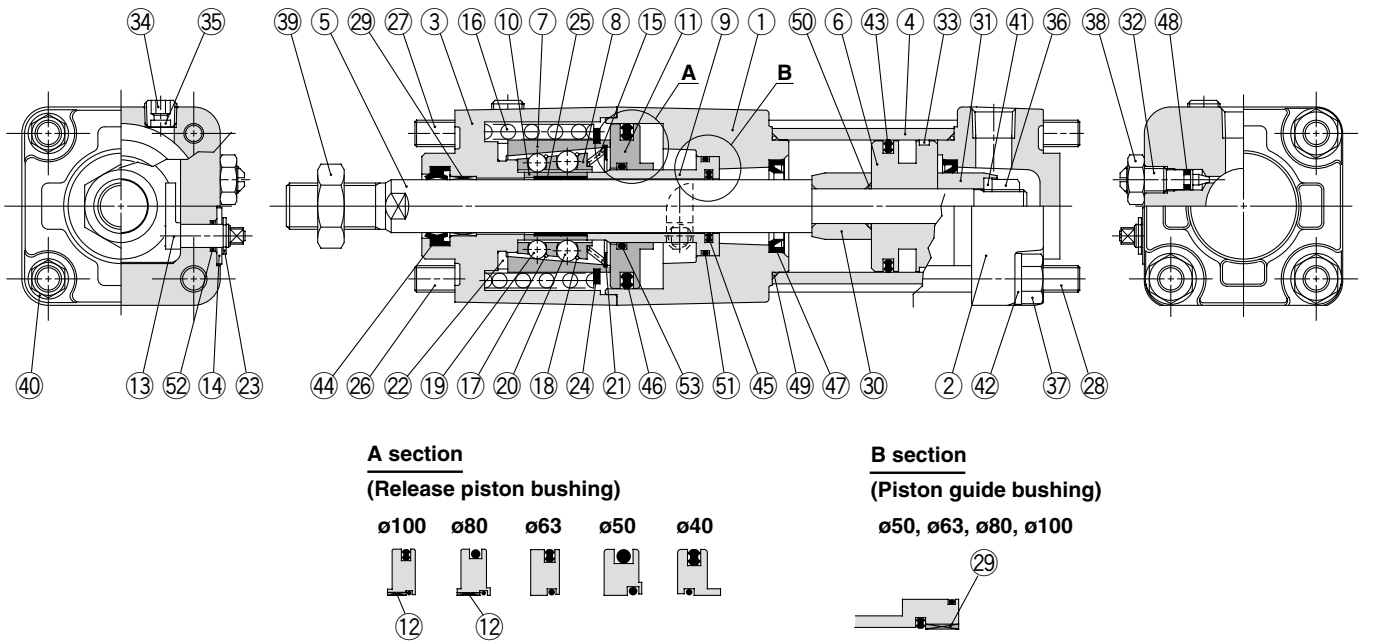
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Data

# Series CNA

## Construction



## Component Parts

No.	Description	Material	Note	
①	Rod cover	Aluminum alloy	Black painted after hard anodized	
②	Head cover	Aluminum alloy	Black painted	
③	Cover	Aluminum alloy	Black painted after hard anodized	
④	Cylinder tube	Aluminum alloy	Hard anodized	
⑤	Piston rod	Carbon steel	Hard chrome plated	
⑥	Piston	Aluminum alloy	Chromated	
⑦	Taper ring	Carbon steel	Heat treated	
⑧	Ball retainer	Special resin		
⑨	Piston guide	Carbon steel	Zinc chromated	
⑩	Brake shoe holder	Special steel	Heat treated	
⑪	Release piston	ø40	Aluminum alloy	Hard anodized
		ø50		
		ø63		
		ø80	Carbon steel	Zinc chromated
		ø100		
⑫	Release piston bushing	Steel + Special resin	Hard anodized	
⑬	Unlocking cam	Chromium molybdenum steel	Zinc chromated	
⑭	Washer	Carbon steel	Black zinc chromated	
⑮	Retainer pre-load spring	Steel wire	Zinc chromated	
⑯	Brake spring	Steel wire	Zinc chromated	
⑰	Clip A	Stainless steel		
⑱	Clip B	Stainless steel		
⑲	Steel ball A	Carbon steel		
⑳	Steel ball B	Carbon steel		
㉑	Tooth ring	Stainless steel		
㉒	Bumper	Polyurethane rubber		
㉓	Type C retaining ring for unlocking cam shaft	Carbon steel		
㉔	Type C retaining ring for taper ring	Carbon steel		
㉕	Brake shoe	Special friction material		
㉖	Unit holding tie-rod A	Carbon steel	Chromated	
㉗	Unit holding tie-rod B	Carbon steel	Chromated	
㉘	Tie-rod	Carbon steel	Chromated	
㉙	Bushing	Lead-bronze casted		
㉚	Cushion ring A	Rolled steel plate	Zinc chromated	

No.	Description	Material	Note
⑳	Cushion ring B	Rolled steel plate	Zinc chromated
㉑	Cushion valve	Rolled steel plate	Electroless nickel plated
㉒	Wear ring	Special resin	
㉓	Hexagon socket head plug	Chromium molybdenum steel	Black zinc chromated
㉔	Element	Bronze	
㉕	Piston nut	Rolled steel plate	Zinc chromated
㉖	Tie-rod nut	Carbon steel	Black zinc chromated
㉗	Lock nut	Carbon steel	Nickel plated
㉘	Rod end nut	Carbon steel	Nickel plated
㉙	Spring washer	Steel wire	Black zinc chromated
㉚	Spring washer	Steel wire	Black zinc chromated
㉛	Spring washer	Steel wire	Black zinc chromated
㉜	Piston seal	NBR	
㉝	Rod seal A	NBR	
㉞	Rod seal B	NBR	
㉟	Release piston seal	NBR	
㊱	Cushion seal	NBR	
㊲	Cushion valve seal	NBR	
㊳	Tube gasket	NBR	
㊴	Piston gasket	NBR	
㊵	Piston guide gasket	NBR	
㊶	Unlocking cam gasket	NBR	
㊷	O-ring	NBR	

## Replacement Parts: Seal Kit

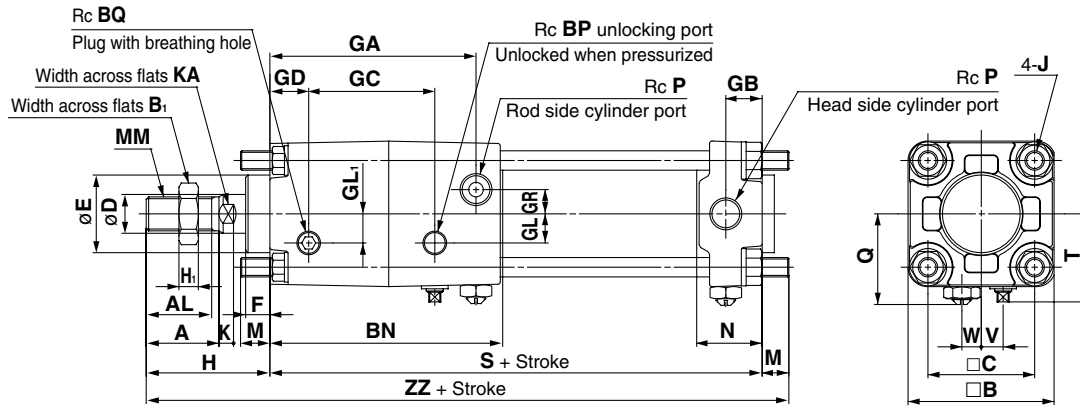
Bore size (mm)	Kit no.	Content
40	CA1N 40A-PS	Including no. ④③, ④④, ④⑧ and ④⑨.
50	CA1N 50A-PS	
63	CA1N 63A-PS	
80	CA1N 80A-PS	
100	CA1N100A-PS	

\* Since the lock section for Series CNA is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.

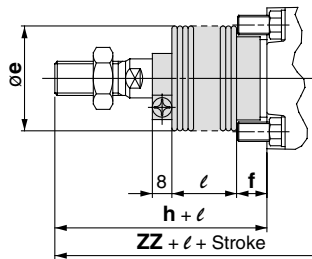
# Cylinder with Lock Double Acting, Single Rod Series CNA

## Dimensions

### Basic style (B): CNABN



With rod boot



Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA
40	Up to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14
50	Up to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18
63	Up to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18
80	Up to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22
100	Up to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26

Bore size (mm)	M	MM	N	P	Q	H	S	T	V	W	ZZ
40	11	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	215
50	11	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	237
63	14	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	254
80	17	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	306
100	17	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	335

With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	223
50	20 to 600	52	11.2	66	1/4 stroke	245
63	20 to 600	52	11.2	66	1/4 stroke	262
80	20 to 750	65	12.5	80	1/4 stroke	315
100	20 to 750	65	14	81	1/4 stroke	344

CL

CL1

MLGC

CNG

MNB

**CNA**

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

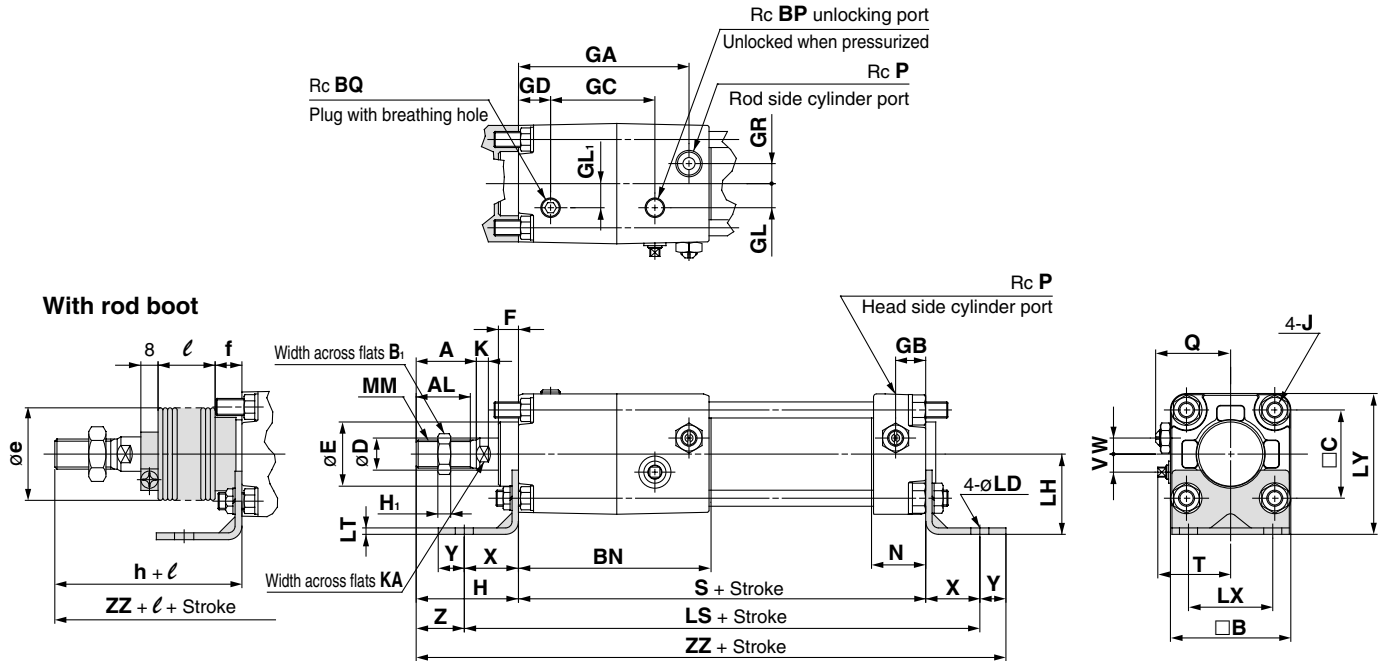
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Data

# Series CNA

## Dimensions

### Axial foot style (L): CNALN



### Long Stroke

Bore size (mm)	Stroke range (mm)	RT	RY
40	501 to 800	—	—
	601 to 1000	—	—
50	1001 to 1200	30	76
	601 to 1000	—	—
63	1001 to 1200	40	92
	751 to 1000	—	—
80	1001 to 1400	45	112
	751 to 1000	—	—
100	1001 to 1500	50	136
	—	—	—

Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA
40	Up to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14
50	Up to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18
63	Up to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18
80	Up to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22
100	Up to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26

Bore size (mm)	LD	LH	LS	LT	LX	LY	MM	N	P	Q	H	S	T	V	W	X	Y	Z	ZZ
40	9	40	207	3.2	42	70	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	27	13	24	244
50	9	45	222	3.2	50	80	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	27	13	31	266
63	11.5	50	250	3.2	59	93	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	34	16	24	290
80	13.5	65	306	4.5	76	116	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	44	16	27	349
100	13.5	75	332	6.0	92	133	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	43	17	29	378

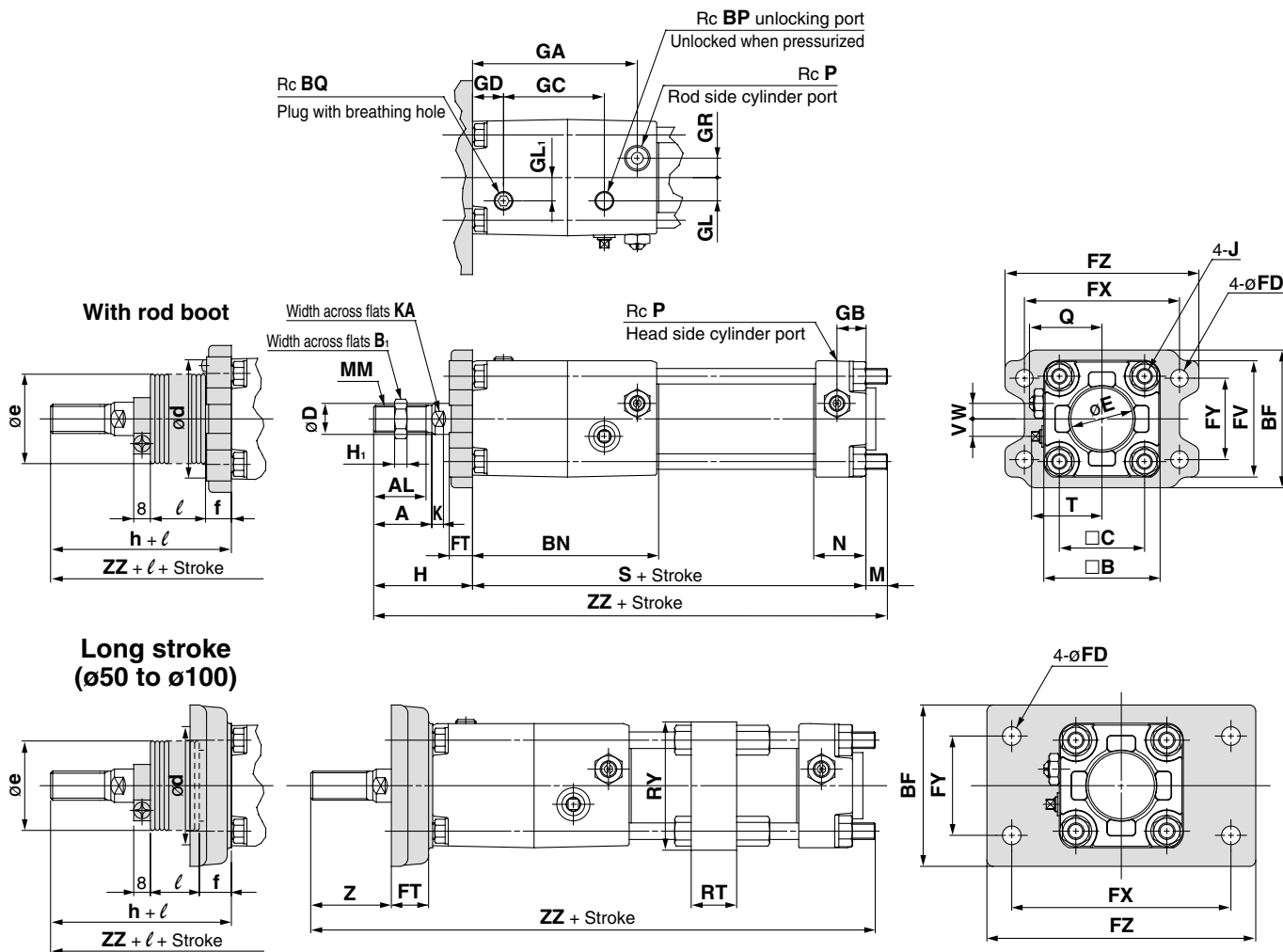
### With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	252
50	20 to 600	52	11.2	66	1/4 stroke	274
63	20 to 600	52	11.2	66	1/4 stroke	298
80	20 to 750	65	12.5	80	1/4 stroke	358
100	20 to 750	65	14	81	1/4 stroke	387

# Cylinder with Lock Double Acting, Single Rod Series CNA

## Dimensions

### Rod side flange style (F): CNAFN



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA**
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BF	BN	BP	BQ	C	D	E	FD	FT	FV	FX	FY	FZ	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J
40	Up to 800	30	27	60	22	71	96	1/8	1/8	44	16	32	9	12	60	80	42	100	85	15	52	16	12	12	10	8	M8 x 1.25
50	Up to 1000	35	32	70	27	81	108	1/4	1/8	52	20	40	9	12	70	90	50	110	95	17	56.5	20	13	15	12	11	M8 x 1.25
63	Up to 1000	35	32	86	27	101	115	1/4	1/4	64	20	40	11.5	15	86	105	59	130	102	17	67	20	18	12	15	11	M10 x 1.25
80	Up to 1000	40	37	102	32	119	139	1/4	1/4	78	25	52	13.5	18	102	130	76	160	123	21	83	20	23	18	17	13	M12 x 1.75
100	Up to 1000	40	37	116	41	133	160	1/4	1/4	92	30	52	13.5	18	116	150	92	180	144	21	98	22	25	20	19	16	M12 x 1.75

Bore size (mm)	K	KA	M	MM	N	P	Q	H	S	T	V	W	ZZ
40	6	14	11	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	215
50	7	18	11	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	237
63	7	18	14	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	254
80	11	22	17	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	306
100	11	26	17	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	335

#### With Rod Boot

Bore size (mm)	Stroke range (mm)	d	e	f	h	l	ZZ
40	20 to 800	52	43	15	59	1/4 stroke	223
50	20 to 1000	58	52	15	66	1/4 stroke	245
63	20 to 1000	58	52	17.5	66	1/4 stroke	262
80	20 to 1000	80	65	21.5	80	1/4 stroke	315
100	20 to 1000	80	65	21.5	81	1/4 stroke	344

#### Long Stroke

Bore size (mm)	Stroke range (mm)	BF	FD	FT	FX	FY	FZ	RT	RY	Z	ZZ
50	1001 to 1200	88	9	20	120	58	144	30	76	47	241
63	1001 to 1200	105	11.5	23	140	64	170	40	92	48	263
80	1001 to 1400	124	13.5	28	164	84	198	45	112	59	317
100	1001 to 1500	140	13.5	29	180	100	220	50	136	60	347

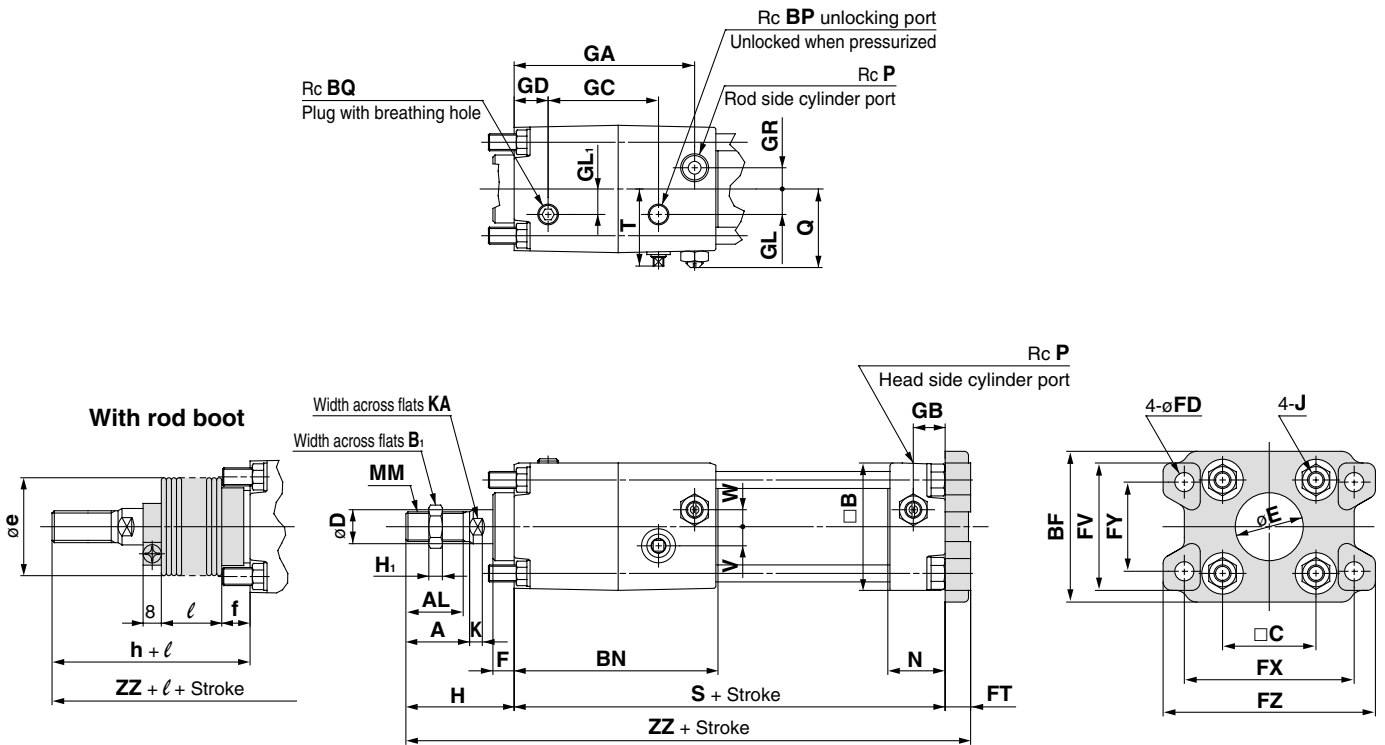
#### With Long Stroke Rod Boot

Bore size (mm)	Stroke range (mm)	d	e	f	h	l	ZZ
50	1001 to 1200	58	52	19	66	1/4 stroke	240
63	1001 to 1200	58	52	19	66	1/4 stroke	258
80	1001 to 1400	80	65	21	80	1/4 stroke	310
100	1001 to 1500	80	65	21	81	1/4 stroke	339

# Series CNA

## Dimensions

### Head side flange style (G): CNAGN



Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BF	BN	BP	BQ	C	D	E	F	FD	FT	FV	FX	FY	FZ	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>
40	Up to 500	30	27	60	22	71	96	1/8	1/8	44	16	32	10	9	12	60	80	42	100	85	15	52	16	12	12	10	8
50	Up to 600	35	32	70	27	81	108	1/4	1/8	52	20	40	10	9	12	70	90	50	110	95	17	56.5	20	13	15	12	11
63	Up to 600	35	32	86	27	101	115	1/4	1/4	64	20	40	10	11.5	15	86	105	59	130	102	17	67	20	18	12	15	11
80	Up to 750	40	37	102	32	119	139	1/4	1/4	78	25	52	14	13.5	18	102	130	76	160	123	21	83	20	23	18	17	13
100	Up to 750	40	37	116	41	133	160	1/4	1/4	92	30	52	14	13.5	18	116	150	92	180	144	21	98	22	25	20	19	16

Bore size (mm)	J	K	KA	M	MM	N	P	Q	H	S	T	V	W	ZZ
40	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	216
50	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	238
63	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	255
80	M12 x 1.75	11	22	17	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	307
100	M12 x 1.75	11	26	17	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	336

### With Rod Boot

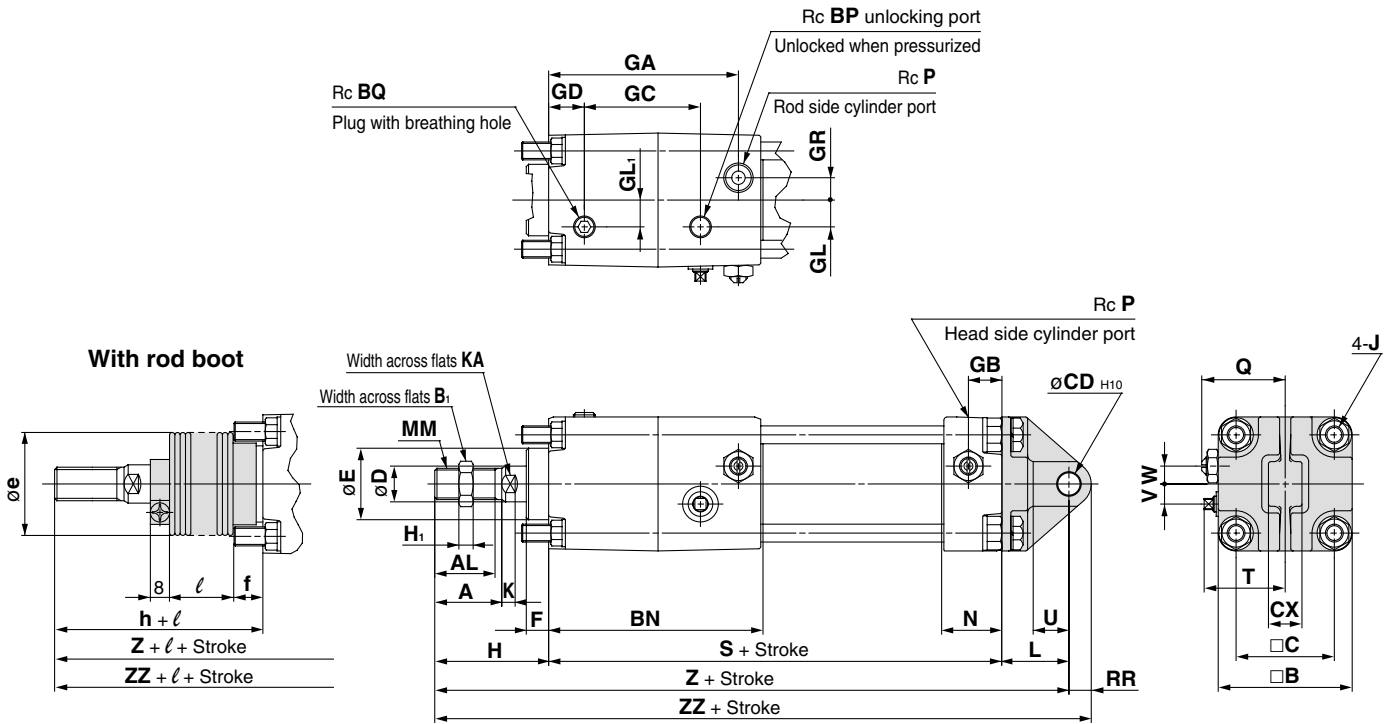
Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	224
50	20 to 600	52	11.2	66	1/4 stroke	246
63	20 to 600	52	11.2	66	1/4 stroke	263
80	20 to 750	65	12.5	80	1/4 stroke	316
100	20 to 750	65	14	81	1/4 stroke	345



# Cylinder with Lock Double Acting, Single Rod Series CNA

## Dimensions

### Single clevis style (C): CNACN



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA**
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	CD	CX	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>
40	Up to 500	30	27	60	22	96	1/8	1/8	44	10	15 <sup>-0.1</sup> <sub>-0.3</sub>	16	32	10	85	15	52	16	12	12	10	8
50	Up to 600	35	32	70	27	108	1/4	1/8	52	12	18 <sup>-0.1</sup> <sub>-0.3</sub>	20	40	10	95	17	56.5	20	13	15	12	11
63	Up to 600	35	32	86	27	115	1/4	1/4	64	16	25 <sup>-0.1</sup> <sub>-0.3</sub>	20	40	10	102	17	67	20	18	12	15	11
80	Up to 750	40	37	102	32	139	1/4	1/4	78	20	31.5 <sup>-0.1</sup> <sub>-0.3</sub>	25	52	14	123	21	83	20	23	18	17	13
100	Up to 750	40	37	116	41	160	1/4	1/4	92	25	35.5 <sup>-0.1</sup> <sub>-0.3</sub>	30	52	14	144	21	98	22	25	20	19	16

Bore size (mm)	J	K	KA	L	MM	N	P	Q	H	RR	S	T	U	V	W	Z	ZZ
40	M8 x 1.25	6	14	30	M14 x 1.5	27	1/4	37 to 39.5	51	10	153	37.5	16	9	8	234	244
50	M8 x 1.25	7	18	35	M18 x 1.5	30	3/8	42 to 44.5	58	12	168	44	19	11	0	261	273
63	M10 x 1.25	7	18	40	M18 x 1.5	31	3/8	50 to 51.5	58	16	182	52.5	23	12	0	280	296
80	M12 x 1.75	11	22	48	M22 x 1.5	37	1/2	59.5 to 62.5	71	20	218	59.5	28	15	0	337	357
100	M12 x 1.75	11	26	58	M26 x 1.5	40	1/2	66.5 to 69.5	72	25	246	69.5	36	15	0	376	401

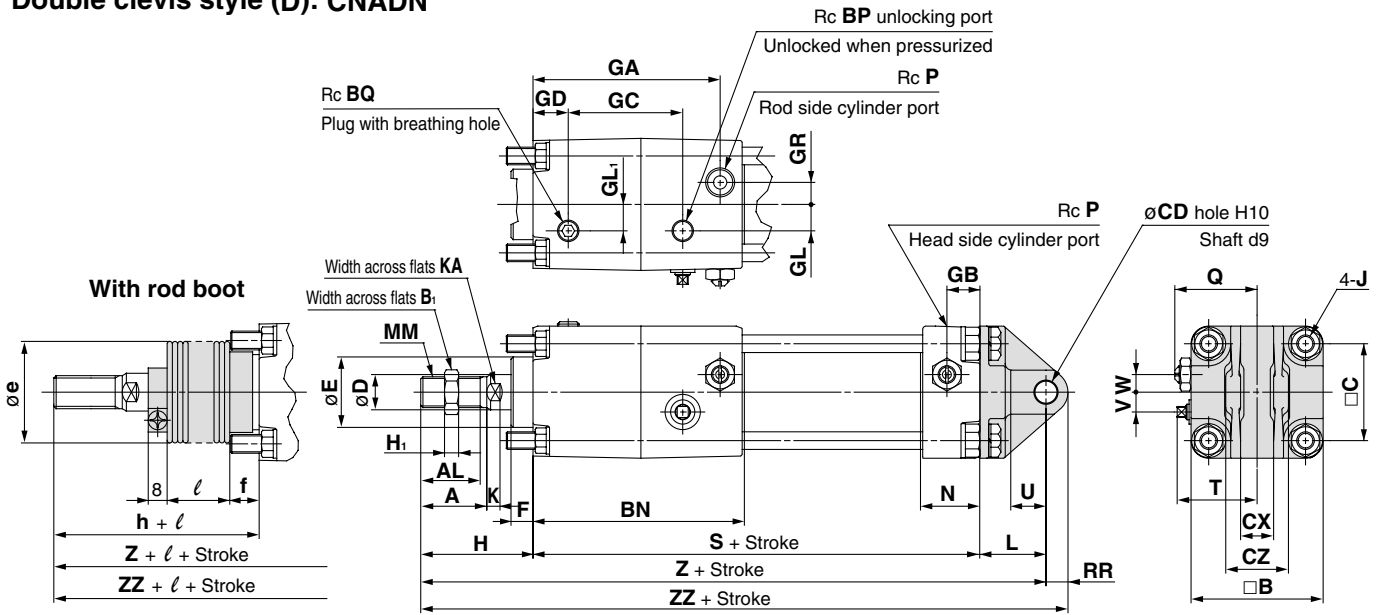
#### With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	Z	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	242	252
50	20 to 600	52	11.2	66	1/4 stroke	269	281
63	20 to 600	52	11.2	66	1/4 stroke	288	304
80	20 to 750	65	12.5	80	1/4 stroke	346	366
100	20 to 750	65	14	81	1/4 stroke	385	410

# Series CNA

## Dimensions

### Double clevis style (D): CNADN



Bore size (mm)	Stroke range (mm)	A	AL	B	B1	BN	BP	BQ	C	CD	CX	CZ	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H1	J	K	KA
40	Up to 500	30	27	60	22	96	1/8	1/8	44	10	15 <sup>+0.3</sup> <sub>-0.1</sub>	29.5	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14
50	Up to 600	35	32	70	27	108	1/4	1/8	52	12	18 <sup>+0.3</sup> <sub>-0.1</sub>	38	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18
63	Up to 600	35	32	86	27	115	1/4	1/4	64	16	25 <sup>+0.3</sup> <sub>-0.1</sub>	49	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18
80	Up to 750	40	37	102	32	139	1/4	1/4	78	20	31.5 <sup>+0.3</sup> <sub>-0.1</sub>	61	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22
100	Up to 750	40	37	116	41	160	1/4	1/4	92	25	35.5 <sup>+0.3</sup> <sub>-0.1</sub>	64	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26

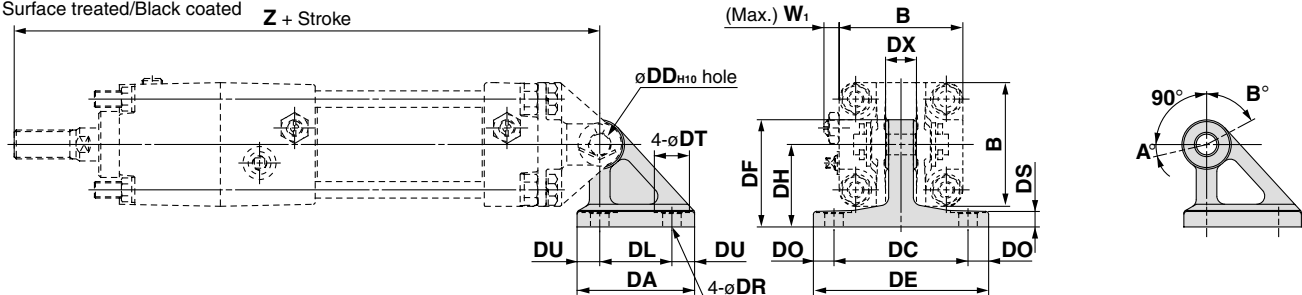
### With Rod Boot

Bore size (mm)	L	MM	N	P	Q	RR	S	T	U	V	W	H	Z	ZZ
40	30	M14 x 1.5	27	1/4	37 to 39.5	10	153	37.5	16	9	8	51	234	244
50	35	M18 x 1.5	30	3/8	42 to 44.5	12	168	44	19	11	0	58	261	273
63	40	M18 x 1.5	31	3/8	50 to 51.5	16	182	52.5	23	12	0	58	280	296
80	48	M22 x 1.5	37	1/2	59.5 to 62.5	20	218	59.5	28	15	0	71	337	357
100	58	M26 x 1.5	40	1/2	66.5 to 69.5	25	246	69.5	36	15	0	72	376	401

Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	Z	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	242	252
50	20 to 600	52	11.2	66	1/4 stroke	269	281
63	20 to 600	52	11.2	66	1/4 stroke	288	304
80	20 to 750	65	12.5	80	1/4 stroke	346	366
100	20 to 750	65	14	81	1/4 stroke	385	410

## Double Clevis Pivot Bracket

Material/Cast iron • Strength is the same as cylinder brackets.  
Surface treated/Black coated Z + Stroke



Part no.	Bore size (mm)	DA	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	DF	B	W <sub>1</sub>	Z	DD
CA1-B04	40	57	35	11	65	15	85	10	9	17	8	40	52	60	10	234	10 <sup>+0.058</sup> <sub>0</sub>
CA1-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	10	261	12 <sup>+0.070</sup> <sub>0</sub>
CA1-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	10	280	16 <sup>+0.070</sup> <sub>0</sub>
CA1-B08	80	93	60	16.5	100	31.5	130	15	13.5	24	12	65	90	102	12	337	20 <sup>+0.084</sup> <sub>0</sub>
CA1-B10	100	93	60	16.5	100	35.5	130	15	13.5	24	12	65	90	116	12	376	25 <sup>+0.084</sup> <sub>0</sub>

### Rotating Angle

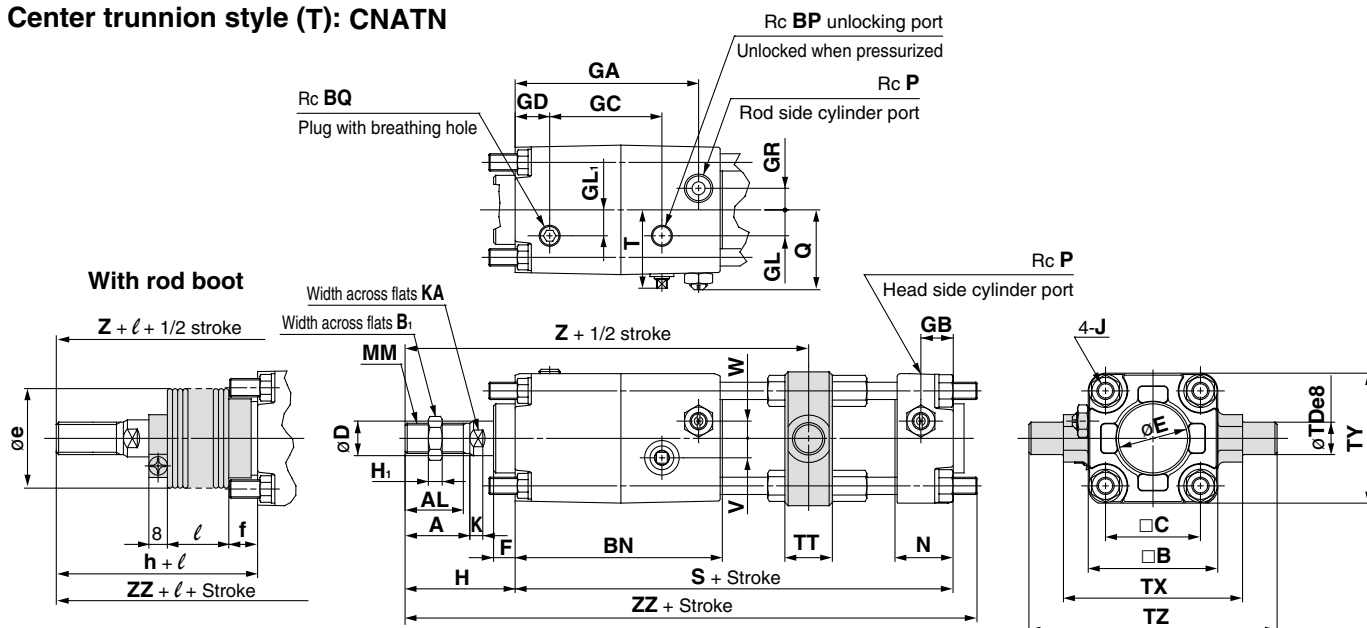
Bore size (mm)	A°	B°	A° + B° + 90°
40	12°	60°	162°
50			
63			
80			
100			

Note) There is no mention in cylinder part no. 2. Order it separately from cylinder. 3. Pin, retainer, etc. of female rear clevis, male rear clevis are shipped together.

# Cylinder with Lock Double Acting, Single Rod Series CNA

## Dimensions

### Center trunnion style (T): CNATN



Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA	MM	N
40	25 to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14	M14 x 1.5	27
50	25 to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18	M18 x 1.5	30
63	32 to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18	M18 x 1.5	31
80	41 to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22	M22 x 1.5	37
100	45 to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26	M26 x 1.5	40

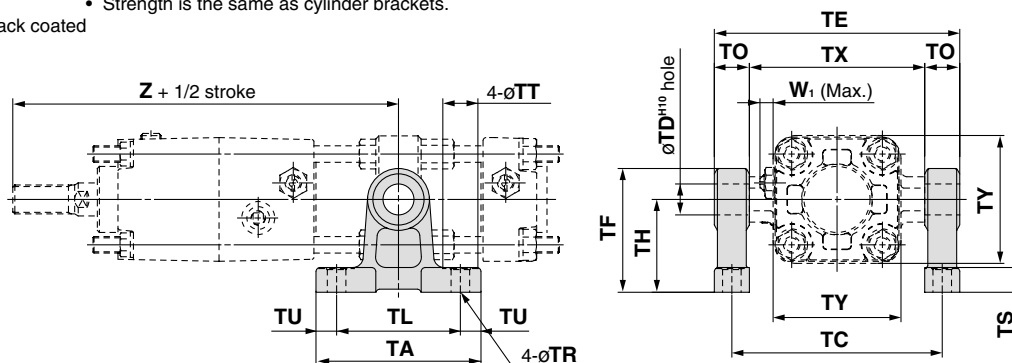
Bore size (mm)	P	Q	S	T	TDe8	TT	TX	TY	TZ	V	W	H	Z	ZZ
40	1/4	37 to 39.5	153	37.5	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	85	62	117	9	8	51	162	209
50	3/8	42 to 44.5	168	44	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	95	74	127	11	0	58	181	232
63	3/8	50 to 51.5	182	52.5	18 <sup>-0.032</sup> <sub>-0.059</sub>	28	110	90	148	12	0	58	191	246
80	1/2	59.5 to 62.5	218	59.5	25 <sup>-0.040</sup> <sub>-0.073</sub>	34	140	110	192	15	0	71	231	296
100	1/2	66.5 to 69.5	246	69.5	25 <sup>-0.040</sup> <sub>-0.073</sub>	40	162	130	214	15	0	72	255	326

### With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	Z	ZZ
40	25 to 500	43	11.2	59	1/4 stroke	170	217
50	25 to 600	52	11.2	66	1/4 stroke	189	240
63	32 to 600	52	11.2	66	1/4 stroke	199	254
80	41 to 750	65	12.5	80	1/4 stroke	240	305
100	45 to 750	65	14	81	1/4 stroke	264	335

## Trunnion Pivot Bracket

Material: Cast iron • Strength is the same as cylinder brackets.  
Surface treated: Black coated



Part no.	Bore size (mm)	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	TY	W <sub>1</sub>	Z	TD
CA1-S04	40	80	60	10	102	85	119	17	9	17	12	45	60	62	10	162	15 <sup>-0.070</sup> <sub>0</sub>
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	10	181	15 <sup>-0.070</sup> <sub>0</sub>
CA1-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	10	191	18 <sup>-0.070</sup> <sub>0</sub>
CA1-S08	80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	12	231	25 <sup>+0.084</sup> <sub>0</sub>
	100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	12	255	25 <sup>+0.084</sup> <sub>0</sub>

Note 1) There is no mention in cylinder part no.  
Note 2) Order it separately from cylinder.  
Note 3) Two trunnion pivot brackets are needed per one cylinder.

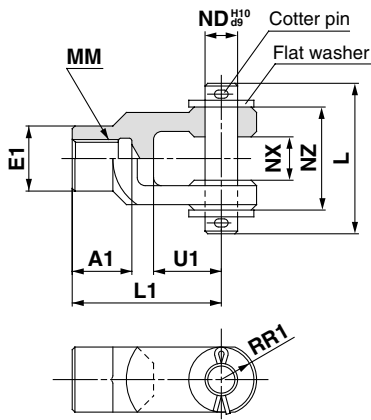
- CL
- CL1
- MLGC
- CNG
- MNB
- CNA**
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

# Series CNA

# Accessory Bracket Dimensions

## Y Type Double Knuckle Joint

\* Pin and snap ring are shipped together with double clevis and double knuckle joint.

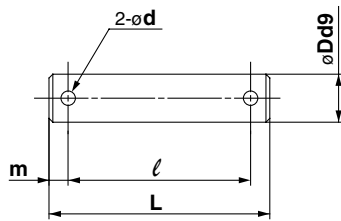


Material: Cast iron

Part no.	Applicable bore size (mm)	A1	E1	L1	MM	RR1	U1	ND	NX	NZ	L	Cotter pin size	Flat washer size
Y-04C	40	22	24	55	M14 x 1.5	13	25	12	16 <sup>+0.3</sup> / <sub>+0.1</sub>	38	55.5	ø3 x 18ℓ	Polished round 12
Y-05C	50, 63	27	28	60	M18 x 1.5	15	27	12	16 <sup>+0.3</sup> / <sub>+0.1</sub>	38	55.5	ø3 x 18ℓ	Polished round 12
Y-08C	80	37	36	71	M22 x 1.5	19	28	18	28 <sup>+0.3</sup> / <sub>+0.1</sub>	55	76.5	ø4 x 25ℓ	Polished round 18
Y-10C	100	37	40	83	M26 x 1.5	21	38	20	30 <sup>+0.3</sup> / <sub>+0.1</sub>	61	83	ø4 x 25ℓ	Polished round 20

\* Knuckle pin, cotter pin and flat washer are attached.

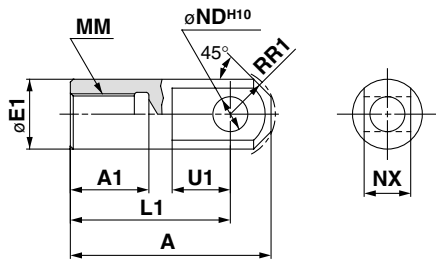
## Clevis Pin/Knuckle Pin



Material: Carbon steel

Part no.	Applicable bore size(mm)		Dd9	L	ℓ	m	d Drill through	Applicable cotter pin	Applicable flat washer
	Clevis	Knuckle							
CDP-2A	40	—	10 <sup>-0.040</sup> / <sub>-0.076</sub>	46	38	4	3	ø3 x 18ℓ	Polished round 10
CDP-3A	50	40, 50, 63	12 <sup>-0.050</sup> / <sub>-0.093</sub>	55.5	47.5	4	3	ø3 x 18ℓ	Polished round 12
CDP-4A	63	—	16 <sup>-0.050</sup> / <sub>-0.093</sub>	71	61	5	4	ø4 x 25ℓ	Polished round 16
CDP-5A	—	80	18 <sup>-0.050</sup> / <sub>-0.093</sub>	76.5	66.5	5	4	ø4 x 25ℓ	Polished round 18
CDP-6A	80	100	20 <sup>-0.065</sup> / <sub>-0.117</sub>	83	73	5	4	ø4 x 25ℓ	Polished round 20
CDP-7A	100	—	25 <sup>-0.065</sup> / <sub>-0.117</sub>	88	78	5	4	ø4 x 36ℓ	Polished round 24

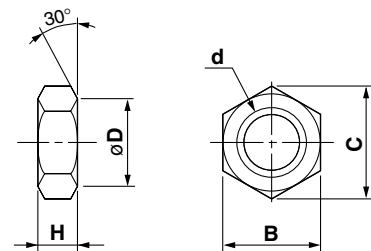
## I Type Single Knuckle Joint



Material: Sulfur free-cutting steel

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	R1	U1	ND	NX
I-04	40	69	22	24	55	M14 x 1.5	15.5	20	12 <sup>+0.070</sup> / <sub>0</sub>	16 <sup>-0.1</sup> / <sub>-0.3</sub>
I-05	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 <sup>+0.070</sup> / <sub>0</sub>	16 <sup>-0.1</sup> / <sub>-0.3</sub>
I-08	80	91	37	36	71	M22 x 1.5	22.5	26	18 <sup>+0.070</sup> / <sub>0</sub>	28 <sup>-0.1</sup> / <sub>-0.3</sub>
I-10	100	105	37	40	83	M26 x 1.5	24.5	28	20 <sup>+0.084</sup> / <sub>0</sub>	30 <sup>-0.1</sup> / <sub>-0.3</sub>

## Rod End Nut (Standard equipment)



Material: Rolled steel

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37.0	31
NT-10	100	M26 x 1.5	16	41	47.3	39

## Minimum Stroke for Auto Switch Mounting

n: Number of auto switch

Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-A5□/A6□/D-F5□/J5□ D-F5□W/J59W D-F5BAL, D-F59F	2 (Different sides, Same side), 1	15	90		100	110	120
	n (Same side)	$15 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-A59W	2 (Different sides, Same side)	20	90		100	110	120
	n (Same side)	$20 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
	1	15	90		100	110	120
D-F5□W/J59W D-F5BAL D-F59F D-F5NTL	2 (Different sides, Same side), 1	25	110		120	130	140
	n (Same side)	$25 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G5BAL D-G59F D-G5NTL	2	Different sides	15	90	100	110	
		Same side	75	90	100	110	
	n	Different sides	$15 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8, ...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4, ...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$100 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$110 + 50 (n-2)$ n = 2, 4, 6, 8, ...	
	1	10	90	100	110		
	1	10	90	100	110		
D-B59W	2	Different sides	20	90	100	110	
		Same side	75	90	100	110	
	n	Different sides	$20 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8, ...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...	
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4, ...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$100 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$110 + 50 (n-2)$ n = 2, 4, 6, 8, ...	
	1	15	90	100	110		
D-A3□ D-G39 D-K39	2	Different sides	35	75	80	90	
		Same side	100	100	100	100	
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4, ...	$75 + 30 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 30 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 30 (n-2)$ n = 2, 4, 6, 8, ...	
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4, ...	$100 + 100 (n-2), n = 2, 4, 6, 8, ...$			
	1	10	75	80	90		
D-A44	2	Different sides	35	75	80	90	
		Same side	55	75	80	90	
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4, ...	$75 + 30 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 30 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 30 (n-2)$ n = 2, 4, 6, 8, ...	
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4, ...	$75 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...	
	1	10	75	80	90		
D-A3□C D-G39C D-K39C	2	Different sides	20	75	80	90	
		Same side	100	100	100	100	
	n	Different sides	$20 + 35 (n-2)$ n = 2, 3, 4, ...	$75 + 35 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 35 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 35 (n-2)$ n = 2, 4, 6, 8, ...	
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4, 5...	$100 + 100 (n-2), n = 2, 4, 6, 8, ...$			
	1	10	75	80	90		
D-A44C	2	Different sides	20	75	80	90	
		Same side	55	75	80	90	
	n	Different sides	$20 + 35 (n-2)$ n = 2, 3, 4, ...	$75 + 35 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 35 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 35 (n-2)$ n = 2, 4, 6, 8, ...	
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4, ...	$75 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$80 + 50 (n-2)$ n = 2, 4, 6, 8, ...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...	
	1	10	75	80	90		
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different sides, Same side), 1	15	80	85	90	95	105
	n	$15 + 40 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$80 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$85 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$95 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$105 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-Y69□/Y7PV D-Y7□WV	2 (Different sides, Same side), 1	10	65		75	80	90
	n	$10 + 30 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$65 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$75 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$80 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-Y7BAL	2 (Different sides, Same side), 1	20	95		100	105	110
	n	$20 + 45 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$95 + 45 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$100 + 45 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$105 + 45 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 45 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-P5DWL	2 (Different sides, Same side), 1	15	120		130	140	
	n	$15 + 65 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$120 + 65 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130 + 65 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140 + 65 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		

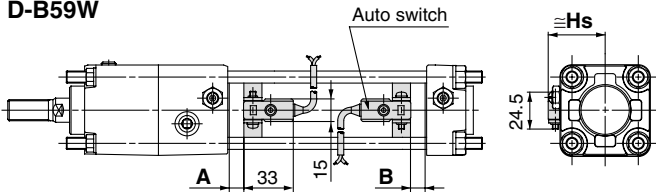
- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

# Series CNA

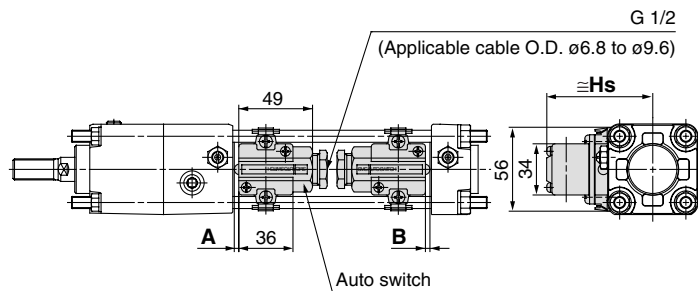
## Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

### <Band mounting style>

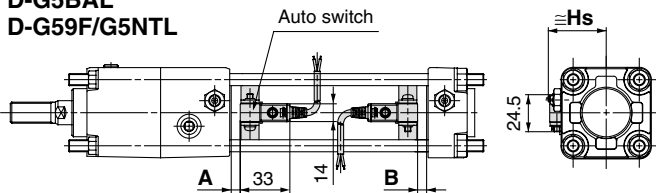
D-B5□/B64  
D-B59W



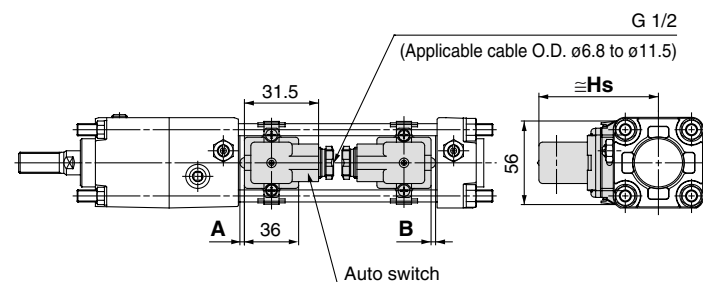
D-A3□  
D-G39/K39



D-G5□/K59  
D-G5□W/K59W  
D-G5BAL  
D-G59F/G5NTL

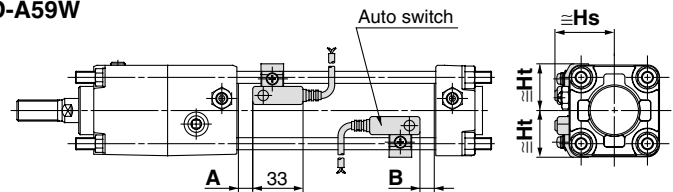


D-A44

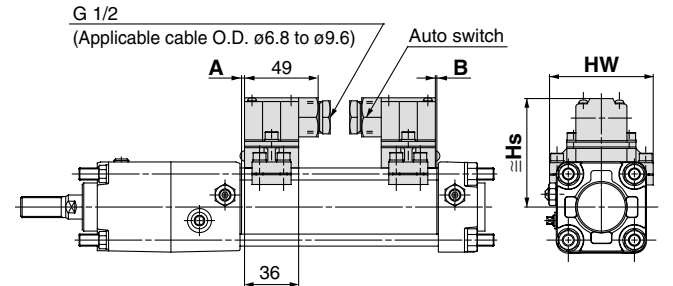


### <Tie-rod mounting style>

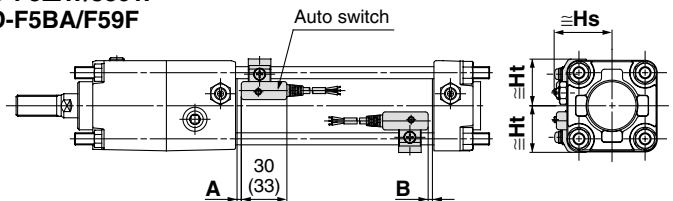
D-A5□/A6□  
D-A59W



D-A3□C  
D-G39C/K39C

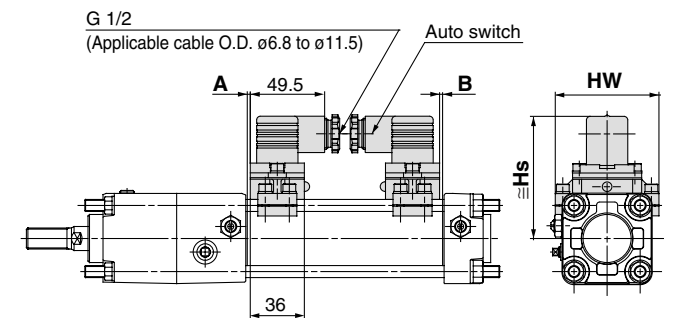


D-F5□/J5□  
D-F5NTL  
D-F5□W/J59W  
D-F5BA/F59F



\* ( ): Donates the value of D-F5LF.

D-A44C



### Proper Auto Switch Mounting Position

Auto switch model	D-A5□/A6□ D-A3□/A3□C D-A44/A44C D-G39/G39C D-K39/K39C		D-B5/B6		D-B59W		D-G59F D-F59F D-G5□W D-K59W D-G5BAL D-G5□ D-K59 D-G5NTL D-F5□ D-J5□		D-A59W		D-F5□W D-F5BAL		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	0	0	0.5	0	3.5	1.5	2	0	4	2	10.5	8.5	11.5	9.5
50	0	0	0.5	0	3.5	1.5	2	0	4	2	10.5	8.5	11.5	9.5
63	2.5	1.5	3	2	6	5	4.5	3.5	6.5	5.5	13	12	14	13
80	6	4	6.5	4.5	9.5	7.5	8	6	10	8	16.5	14.5	17.5	15.5
100	7.5	6.5	8	7	11	10	9.5	8.5	11.5	10.5	18	17	19	18

\* Long stroke is available only for foot style and rod side flange style mounting support.

9-7-22

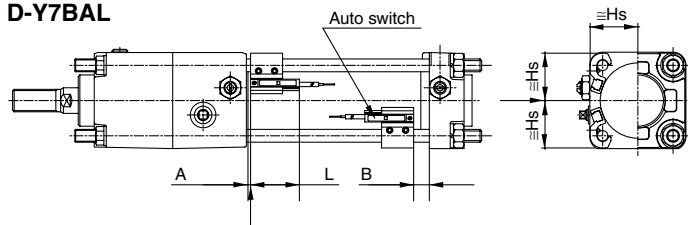
### Auto Switch Mounting Height

Auto switch model	D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-F5BAL D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C	
	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw	Hs	Hw	
40	38	72.5	80.5	40	31	38.5	31	73	69	81	69			
50	43.5	78	86	43.5	35	42.5	35	78.5	77	86.5	77			
63	50.5	85	93	49	42	48	42	85.5	91	93.5	91			
80	59	93.5	101.5	55.5	50	54	50	94	107	102	107			
100	69.5	104	112	63	57.5	62	57.5	104	121	112	121			

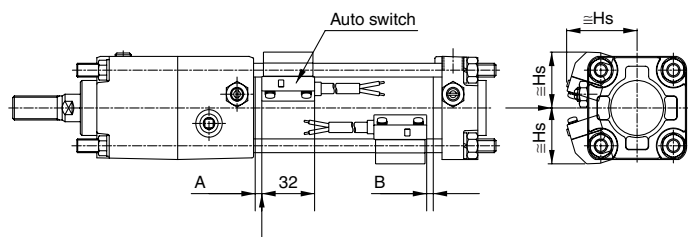
## Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

### <Tie-rod mounting style>

D-Z7□/Z80  
 D-Y59□/Y69□/Y7P/Y7PV  
 D-Y7□W, D-Y7□WV  
 D-Y7BAL



D-P5DWL



### Operating Range

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44	9	10	11	11	11
D-A3□C, D-A44C					
D-A5□/A6□ D-B5□/B64					
D-A59W	13	13	14	14	15
D-B59W	14	14	17	16	18
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-Y7BAL	3.5	3.5	5	5	5
D-F5□/J5□/F59F D-F5□W/J59W D-F5BAL/F5NTL	4	4	4.5	4.5	4.5
D-G5□/K59/G59F D-G5□W/K59W D-G5NTL/G5BAL	5	6	6.5	6.5	7
D-G39/K39	9	9	10	10	11
D-G39C, D-K39C D-P5DWL	4	4	4.5	4	4.5

\* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)  
 There may be the case it will vary substantially depending on an ambient environment.

### Proper Auto Switch Mounting Position

Auto switch model	D-P5DWL			
	D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL			
Bore size (mm)	A	B	A	B
40	3.5	1.5	3	1
50	3.5	1.5	3	1
63	6	5	5.5	4.5
80	9.5	7.5	9	7
100	11	10	10.5	9.5

### Auto Switch Mounting Height

Auto switch model	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-Y7BAL		D-P5DWL	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
Bore size (mm)								
40	30	30	30.5	30	34	30	43	33.5
50	34	34	35	34	38.5	34	47	38
63	41	41	42.5	41	46.5	41	53	44
80	49.5	48.5	51	48.5	55	48.5	60	52
100	58.5	56	59	56	63	56	67	59

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 9-15-1.

Type	Model	Electrical entry (Fetching direction)	Features
Read switch	D-A53/A56	Grommet (In-line)	—
	D-A64/A67		Without indicator light
	D-Z80		
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication type
	D-F5BAL		2-color indication type, Water resistant
	D-F5NTL		With timer
	D-G5NTL		
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV/Y7PWV/Y7BWV		2-color indication type

\* With pre-wire connector is available for solid state auto switches. For details, refer to page 9-15-66.

\* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 9-15-40.

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA**
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data



# Cylinder with Lock

## Double Acting, Double Rod

# Series CNAW

ø40, ø50, ø63, ø80, ø100

### How to Order

**Without auto switch**

**CNAW L N 50 100 JN D**

**With auto switch**

**CDNAW L N 50 100 JN D A53**

**Built-in magnet**

**Double rod type**

**Mounting style**

<b>B</b>	Basic style
<b>L</b>	Axial foot style
<b>F</b>	Rod side flange style
<b>T</b>	Center trunnion style

**Type**

<b>N</b>	Non-lube
<b>F*</b>	Steel tube

\* Auto switches are not available with steel tube.

**Bore size**

<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm

**Built-in Magnet Cylinder Model**

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil". (Example) CDNAWLN40-100-D

**Cylinder stroke (mm)**

Refer to "Standard Stroke" on page 9-7-25.

**Locking direction**

<b>D</b>	Both directions
----------	-----------------

**With rod boot/cushion**

One side* rod boot	<b>J</b>	Nylon tarpaulin
	<b>K</b>	Heat resistant tarpaulin
Both sides rod boot	<b>JJ</b>	Nylon tarpaulin
	<b>KK</b>	Heat resistant tarpaulin
Cushion	<b>Nil</b>	With cushion on both ends
	<b>N</b>	Without cushion
	<b>R</b>	With rod bumper
	<b>H</b>	With head cushion

**Number of auto switches**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

**Auto switch**

<b>Nil</b>	Without auto switch
------------	---------------------

\*For the applicable auto switch part model refer to the table below.  
 \* D-Z7□/Z80/Y59□/Y69□/Y70□ types are shipped together, (but not assembled). (But, only the mounting bracket for the above models is assembled when shipping.)

### 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	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)						
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	<b>Z76</b>	—	●	●	—	—	IC circuit	—		
				2-wire	24 V	12 V	100 V	—	<b>Z73</b>	—	●	●	●	—	—	—	Relay, PLC
							—	—	<b>B53</b>	—	●	●	●	—	PLC		
							100 V, 200 V	—	<b>A54</b>	<b>B54</b>	●	●	●	—	Relay, PLC		
							—	—	<b>A33C</b>	<b>A33</b>	—	—	—	—	PLC		
				100 V	—	<b>A34C</b>	<b>A34</b>	—	—	—	—	—	Relay, PLC				
200 V	—	<b>A44C</b>	<b>A44</b>	—	—	—	—										
Diagnostic indication (2-color indication)	—	—	—	—	—	<b>A59W</b>	<b>B59W</b>	●	●	—	—	—	—				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>Y59A</b>	<b>G59</b>	●	●	○	○	IC circuit	Relay, PLC		
				3-wire (PNP)				<b>Y7P</b>	<b>G5P</b>	●	●	○	○				
				2-wire	—	—	100 V, 200 V	<b>J51</b>	—	●	●	○	—				
				Terminal conduit	3-wire (NPN)	12 V	<b>Y59B</b>	<b>K59</b>	●	●	○	○	—				
							<b>G39C</b>	<b>G39</b>	—	—	—	—	IC circuit				
				Grommet	2-wire	12 V	<b>K39C</b>	<b>K39</b>	—	—	—	—	—	—		—	—
		3-wire (NPN)					5 V, 12 V	<b>Y7NW</b>	<b>G59W</b>	●	●	○	○	IC circuit			
								<b>Y7PW</b>	<b>G5PW</b>	●	●	○	○	IC circuit			
		3-wire (PNP)					5 V, 12 V	<b>Y7BW</b>	<b>K59W</b>	●	●	○	○	—			
								<b>Y7BA</b>	<b>G5BA</b>	—	—	○	○	—			
		Water resistant (2-color indication)					2-wire	12 V	<b>F59F</b>	<b>G59F</b>	●	●	○	○		IC circuit	
		With diagnostic output (2-color indication)		<b>P5DW</b>	—	—			●	●	○	○	—				
Magnetic field resistant (2-color indication)	4-wire (NPN)	5 V, 12 V	—	—	—	—	—	—	—								
—	2-wire	—	—	—	—	—	—	—	—								

\* Lead wire length symbols: 0.5 m.....Nil (Example) A54  
 3 m.....L (Example) A54L  
 5 m.....Z (Example) A54Z

\* Solid state switches marked with "○" are produced upon receipt of order.  
 • Since there are other applicable auto switches than listed, refer to page 9-7-26 for details.  
 • For details about auto switches with pre-wire connector, refer to page 9-15-66.



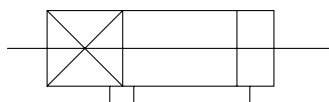


# Cylinder with Lock Double Acting, Double Rod **Series CNAW**



### JIS Symbol

Double acting,  
Double rod



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

Symbol	Specifications
-XC14	Change of trunnion pivot bracket mounting position

## Specifications

Bore size (mm)	40, 50, 63, 80, 100
Fluid	Air
Type	Non-lube
Action	Double acting
Lock operation	Spring locking
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.1 MPa
Piston speed	50 to 1000 mm/s *
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)
Cushion	Air cushion
Stroke length tolerance	Up to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500: $^{+1.8}_0$
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Center trunnion style

Note) Load limits exist depending upon piston speed when locked, mounting direction and operating pressure.

## Lock Specifications

Locking action	Spring locking (Exhaust locking)
Unlocking pressure	0.25 MPa or more
Lock starting pressure	0.20 MPa or less
Max. operating pressure	1.0 MPa
Locking direction	Both directions

**Standard Stroke** For cases with auto switches, refer to the table of minimum strokes for mounting of auto switches Table on page 9-7-21.

Bore size (mm)	Standard stroke (mm)
<b>40</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
<b>50, 63</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
<b>80, 100</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700

## Stopping Accuracy

Lock type	Piston speed (mm/s)			
	100	300	500	1000
Spring locking	±0.3	±0.6	±1.0	±2.0

Condition: Lateral, Supply pressure P = 0.5 MPa  
Load weight ..... Upper limit of allowed value  
Solenoid valve for locking mounted on the unlocking port  
Maximum value of stopping position dispersion from 100 measurements

## Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	40	50	63	80	100
Holding force (N)	882	1370	2160	3430	5390

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

# Series CNAW

## Mounting Bracket Part No.

Bore size (mm)	40	50	63	80	100
Foot *	CA1-L04	CA1-L05	CA1-L06	CA1-L08	CA1-L10
Flange	CA1-F04	CA1-F05	CA1-F06	CA1-F08	CA1-F10

\* When ordering foot bracket, order 2 pieces per cylinder.

## Rod Boot Material

Symbol	Rod boot material	Max. ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C *

\* Maximum ambient temperature for the rod boot itself.

## Accessory

Mounting		Basic style	Foot style	Flange style	Center trunnion style
Standard equipment	Rod end nut	●	●	●	●
	Clevis pin	—	—	—	—
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●
	With rod boot	●	●	●	●

\* Dimensions are same as double acting, single rod type of Series CNA. (Refer to page 9-7-10.)

## Weight( ): denotes the values for steel tube.

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	1.84 (1.89)	2.93 (2.99)	4.34 (4.38)	7.76 (7.92)	11.50 (11.71)
	Foot style	2.03 (2.08)	2.97 (3.01)	4.68 (4.72)	8.43 (8.59)	12.49 (12.70)
	Flange style	2.21 (2.26)	3.20 (3.24)	5.13 (5.17)	9.21 (9.37)	13.42 (13.63)
	Trunnion style	2.29 (2.39)	3.28 (3.38)	5.23 (5.43)	9.46 (9.75)	13.90 (14.29)
Additional weight per each 50 mm of stroke	Aluminum tube	Mounting bracket	0.30	0.40	0.50	0.71
	Steel tube	Mounting bracket except trunnion	0.35	0.47	0.55	0.89
		Trunnion style	0.44	0.58	0.77	1.06
Accessory bracket	Single knuckle joint		0.23	0.26	0.26	0.60
	Double knuckle joint		0.32	0.38	0.38	0.73
	Knuckle pin		0.05	0.05	0.05	0.14

Calculation: (Example) CNAWLN-40-100-D • Base weight ..... 2.03 (Foot, ø40)

• Additional weight ..... 0.03/50 strokes

• Cylinder stroke ..... 100 strokes

$2.03 + 0.30 \times 100/50 = 2.63 \text{ kg}$

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 9-15-1.

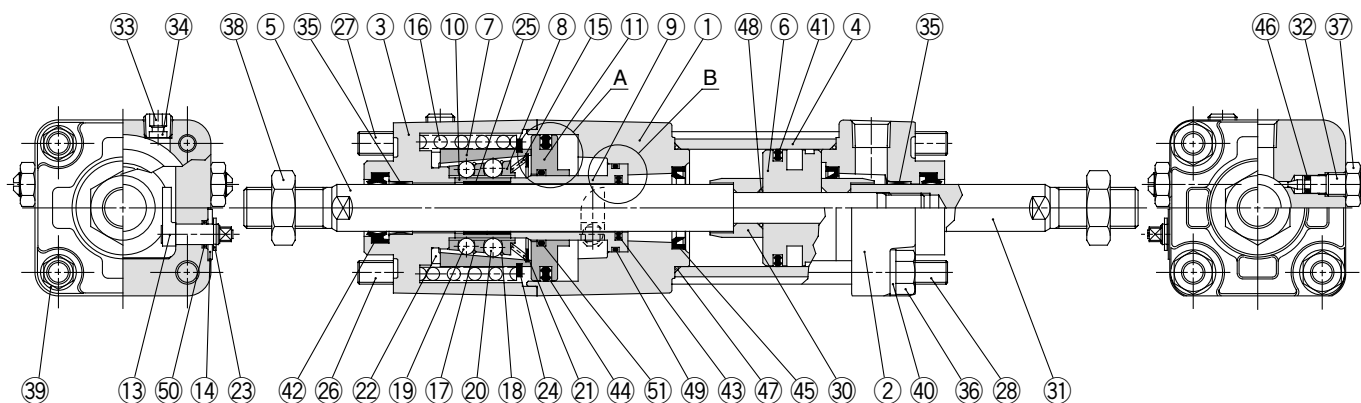
Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	—
	D-A64/A67		Without indicator light
	D-Z80		
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication type
	D-F5BAL		2-color indication type, Water resistant
	D-F5NTL		With timer
	D-G5NTL		
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV/Y7PWV/Y7BWV		2-color indication type

\* With pre-wire connector is available for solid state auto switches. For details, refer to page 9-15-66.

\* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 9-15-40.

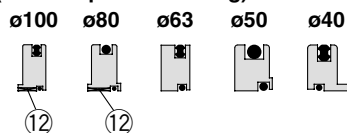
# Cylinder with Lock Double Acting, Double Rod Series CNAW

## Construction



### A section

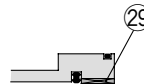
#### (Release piston bushing)



### B section

#### (Piston guide bushing)

ø50, ø63, ø80, ø100



## Component Parts

No.	Description	Material	Note	
①	Rod cover	Aluminum alloy	Black painted after hard anodized	
②	Rod cover	Aluminum alloy	Black painted	
③	Cover	Aluminum alloy	Black painted after hard anodized	
④	Cylinder tube	Aluminum alloy	Hard anodized	
⑤	Piston rod A	Carbon steel	Hard chrome plated	
⑥	Piston	Aluminum alloy	Chromated	
⑦	Taper ring	Carbon steel	Heat treated	
⑧	Ball retainer	Special resin		
⑨	Piston guide	Carbon steel	Zinc chromated	
⑩	Brake shoe holder	Special steel	Heat treated	
⑪	Release piston	ø40	Aluminum alloy	Hard anodized
		ø50		
		ø63		
		ø80	Carbon steel	Zinc chromated
		ø100		
⑫	Release piston bushing	Steel + Special resin	Hard anodized	
⑬	Unlocking cam	Chromium molybdenum steel	Zinc chromated	
⑭	Washer	Carbon steel	Black zinc chromated	
⑮	Retainer pre-load spring	Steel wire	Zinc chromated	
⑯	Brake spring	Steel wire	Zinc chromated	
⑰	Clip A	Stainless steel		
⑱	Clip B	Stainless steel		
⑲	Steel ball A	Carbon steel		
⑳	Steel ball B	Carbon steel		
㉑	Tooth ring	Stainless steel		
㉒	Bumper	Polyurethane rubber		
㉓	Type C retaining ring for unlocking cam shaft	Carbon steel		
㉔	Type C retaining ring for taper ring	Carbon steel		
㉕	Brake shoe	Special friction material		
㉖	Unit holding tie-rod A	Carbon steel	Chromated	
㉗	Unit holding tie-rod B	Carbon steel	Chromated	
㉘	Tie-rod	Carbon steel	Chromated	
㉙	Bushing	Lead-bronze casted		

No.	Description	Material	Note
⑳	Cushion ring	Rolled steel plate	Zinc chromated
㉑	Piston rod B	Carbon steel	Hard chrome plated
㉒	Cushion valve	Rolled steel plate	Electroless nickel plated
㉓	Hexagon socket head plug	Chromium molybdenum steel	Black zinc chromated
㉔	Element	Bronze	
㉕	Bushing	Lead-bronze casted	
㉖	Tie-rod nut	Carbon steel	Black zinc chromated
㉗	Lock nut	Carbon steel	Nickel plated
㉘	Rod end nut	Carbon steel	Nickel plated
㉙	Spring washer	Steel wire	Black zinc chromated
㉚	Spring washer	Steel wire	Black zinc chromated
㉛	Piston seal	NBR	
㉜	Rod seal A	NBR	
㉝	Rod seal B	NBR	
㉞	Release piston seal	NBR	
㉟	Cushion seal	NBR	
㊱	Cushion valve seal	NBR	
㊲	Tube gasket	NBR	
㊳	Piston gasket	NBR	
㊴	Piston guide gasket	NBR	
㊵	Unlocking cam gasket	NBR	
㊶	O-ring	NBR	

## Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Content
40	CA1WN 40A-PS	Including no. ④①, ④②, ④⑥ and ④⑦
50	CA1WN 50A-PS	
63	CA1WN 63A-PS	
80	CA1WN 80A-PS	
100	CA1WN100A-PS	

\* Since the lock section for Series CNA is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

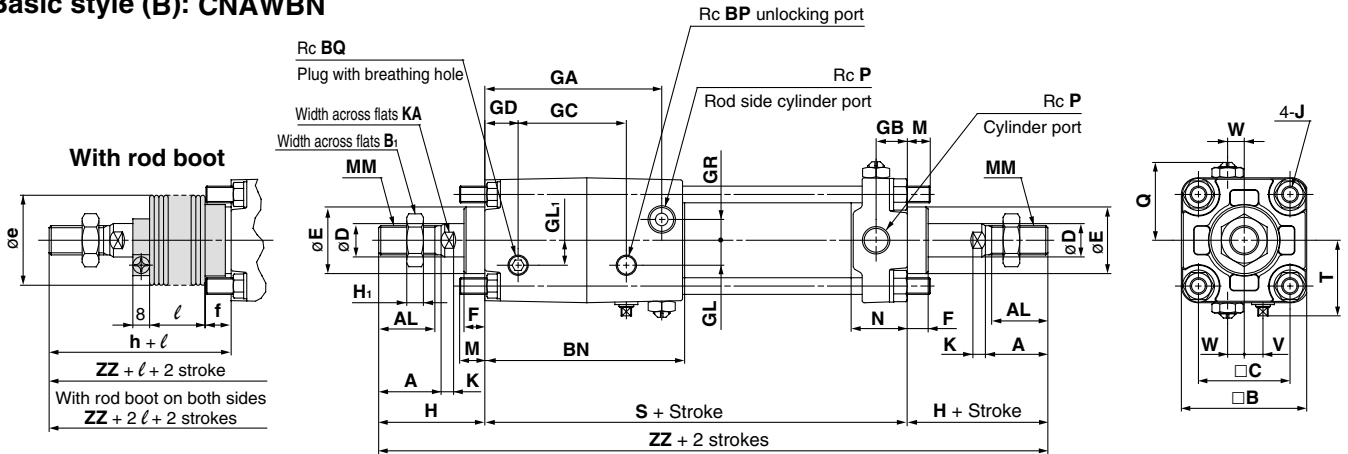
20-

Data

# Series CNAW

## Dimensions

### Basic style (B): CNAWBN



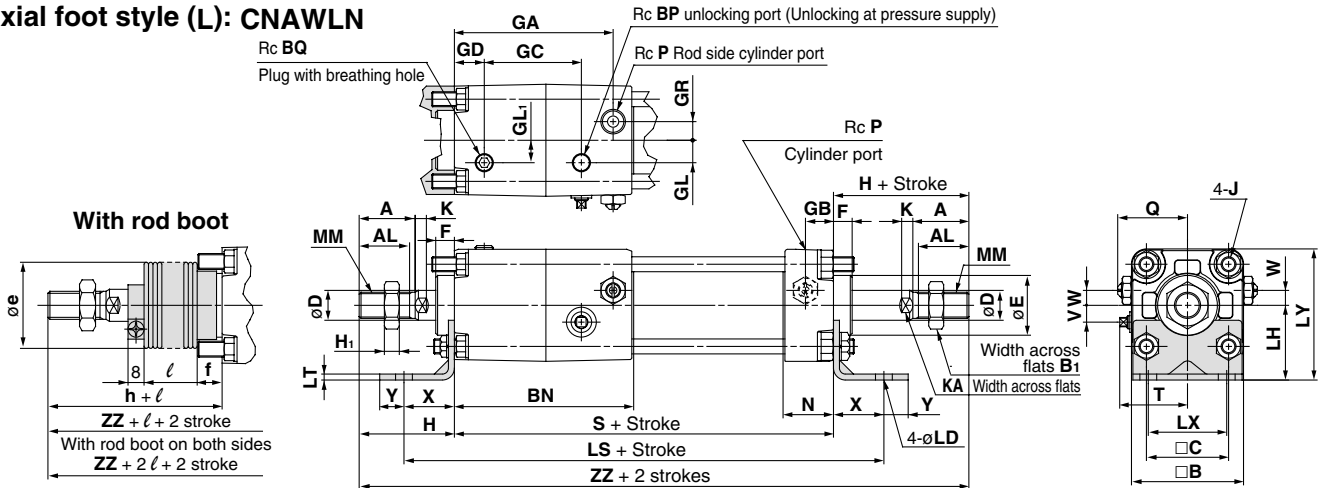
Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA
40	Up to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14
50	Up to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18
63	Up to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18
80	Up to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22
100	Up to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26

Bore size (mm)	M	MM	N	P	Q	H	S	T	V	W	ZZ
40	11	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	255
50	11	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	284
63	14	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	298
80	17	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	360
100	17	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	390

### With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ (One side)	ZZ (Both sides)
40	20 to 500	43	11.2	59	1/4 stroke	263	271
50	20 to 600	52	11.2	66	1/4 stroke	292	300
63	20 to 600	52	11.2	66	1/4 stroke	306	314
80	20 to 750	65	12.5	80	1/4 stroke	369	378
100	20 to 750	65	14	81	1/4 stroke	399	408

### Axial foot style (L): CNAWLN



Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA	LD	LH	LS	LT
40	Up to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14	9	40	207	3.2
50	Up to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18	9	45	222	3.2
63	Up to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18	11.5	50	250	3.2
80	Up to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22	13.5	65	306	4.5
100	Up to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26	13.5	75	332	6.0

### With Rod Boot

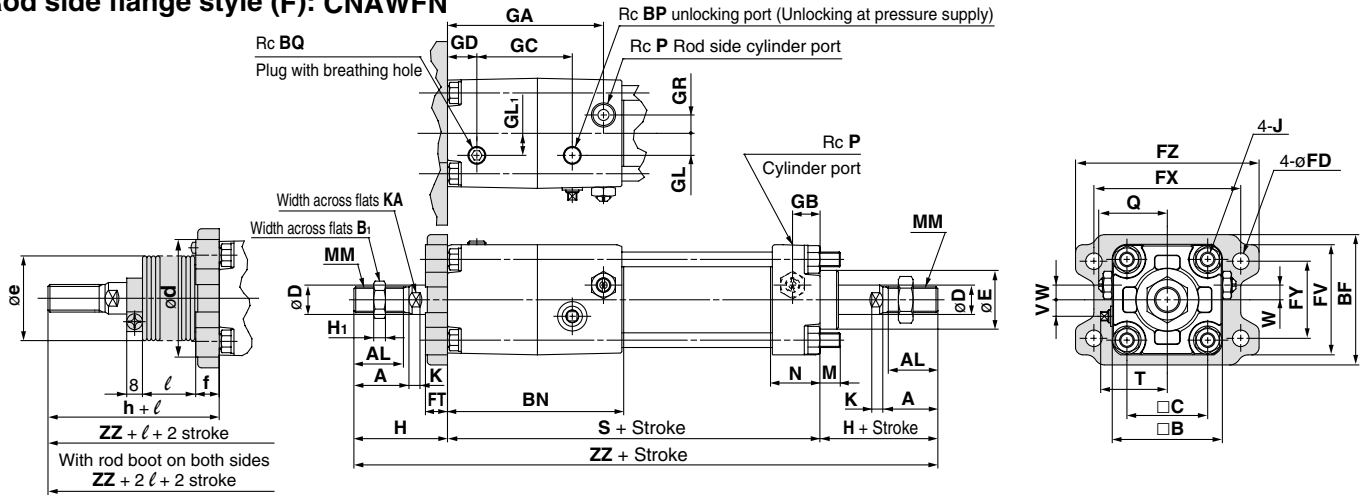
Bore size (mm)	LX	LY	MM	N	P	Q	H	S	T	V	W	X	Y	ZZ
40	42	70	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	27	13	255
50	50	80	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	27	13	284
63	59	93	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	34	16	298
80	76	116	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	44	16	360
100	92	133	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	43	17	390

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ (One side)	ZZ (Both sides)
40	20 to 500	43	11.2	59	1/4 stroke	263	271
50	20 to 600	52	11.2	66	1/4 stroke	292	300
63	20 to 600	52	11.2	66	1/4 stroke	306	314
80	20 to 750	65	12.5	80	1/4 stroke	369	378
100	20 to 750	65	14	81	1/4 stroke	399	408

# Cylinder with Lock Double Acting, Double Rod Series CNAW

## Dimensions

### Rod side flange style (F): CNAWFN



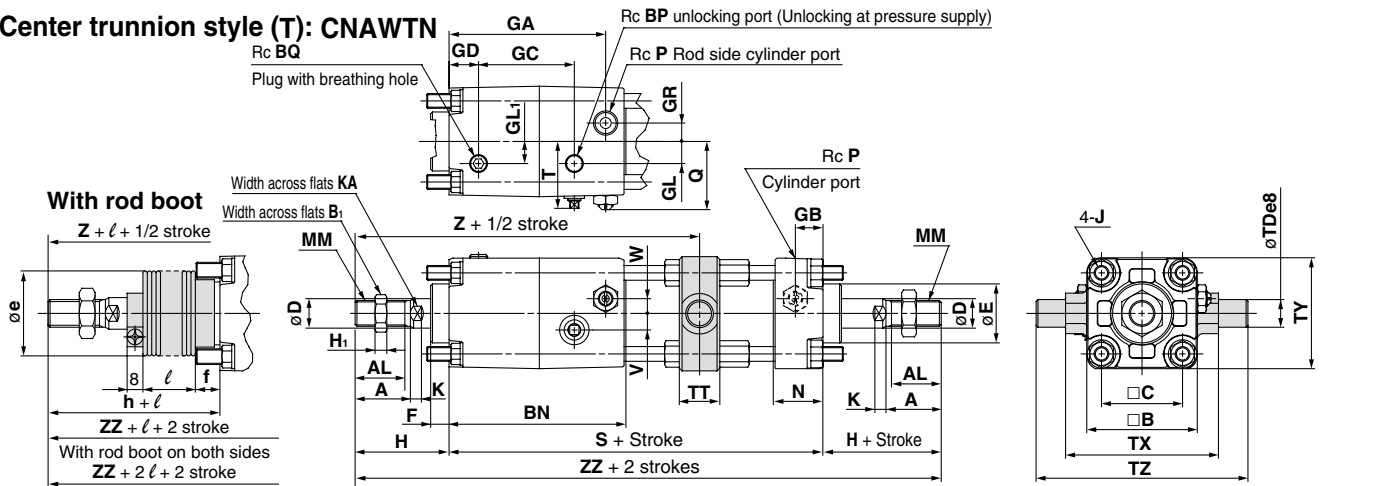
Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BF	BN	BP	BQ	C	D	E	FD	FT	FV	FX	FY	FZ	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J
40	Up to 500	30	27	60	22	71	96	1/8	1/8	44	16	32	9	12	60	80	42	100	85	15	52	16	12	12	10	8	M8 x 1.25
50	Up to 600	35	32	70	27	81	108	1/4	1/8	52	20	40	9	12	70	90	50	110	95	17	56.5	20	13	15	12	11	M8 x 1.25
63	Up to 600	35	32	86	27	101	115	1/4	1/4	64	20	40	11.5	15	86	105	59	130	102	17	67	20	18	12	15	11	M10 x 1.25
80	Up to 750	40	37	102	32	119	139	1/4	1/4	78	25	52	13.5	18	102	130	76	160	123	21	83	20	23	18	17	13	M12 x 1.75
100	Up to 750	40	37	116	41	133	160	1/4	1/4	92	30	52	13.5	18	116	150	92	180	144	21	98	22	25	20	19	16	M12 x 1.75

Bore size (mm)	K	KA	M	MM	N	P	Q	H	S	T	V	W	ZZ
40	6	14	11	M14 x 1.5	27	1/4	37 to 39.5	51	153	37.5	9	8	255
50	7	18	11	M18 x 1.5	30	3/8	42 to 44.5	58	168	44	11	0	284
63	7	18	14	M18 x 1.5	31	3/8	50 to 51.5	58	182	52.5	12	0	298
80	11	22	17	M22 x 1.5	37	1/2	59.5 to 62.5	71	218	59.5	15	0	360
100	11	26	17	M26 x 1.5	40	1/2	66.5 to 69.5	72	246	69.5	15	0	390

### With Rod Boot

Bore size (mm)	Stroke range (mm)	d	e	f	h	ℓ	ZZ (One side)	ZZ (Both sides)
40	20 to 500	52	43	15	59	1/4 stroke	263	271
50	20 to 600	58	52	15	66	1/4 stroke	292	300
63	20 to 600	58	52	17.5	66	1/4 stroke	306	314
80	20 to 750	80	65	21.5	80	1/4 stroke	369	378
100	20 to 750	80	65	21.5	81	1/4 stroke	399	408

### Center trunnion style (T): CNAWTN



Bore size (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA	MM	N	P
40	25 to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4
50	25 to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8
63	32 to 600	35	32	86	27	115	1/4	1/4	64	20	40	10	102	17	67	20	18	12	15	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8
80	41 to 750	40	37	102	32	139	1/4	1/4	78	25	52	14	123	21	83	20	23	18	17	13	M12 x 1.75	11	22	M22 x 1.5	37	1/2
100	45 to 750	40	37	116	41	160	1/4	1/4	92	30	52	14	144	21	98	22	25	20	19	16	M12 x 1.75	11	26	M26 x 1.5	40	1/2

### With Rod Boot

Bore size (mm)	Q	S	T	TDe8	TT	TX	TY	TZ	V	W	H	Z	ZZ
40	37 to 39.5	153	37.5	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	85	62	117	9	8	51	162	255
50	42 to 44.5	168	44	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	95	74	127	11	0	58	181	284
63	50 to 51.5	182	52.5	18 <sup>-0.032</sup> <sub>-0.059</sub>	28	110	90	148	12	0	58	191	298
80	59.5 to 62.5	218	59.5	25 <sup>-0.040</sup> <sub>-0.073</sub>	34	140	110	192	15	0	71	231	360
100	66.5 to 69.5	246	69.5	25 <sup>-0.040</sup> <sub>-0.073</sub>	40	162	130	214	15	0	72	255	390

Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	Z (One side)	ZZ (One side)	Z (Both sides)	ZZ (Both sides)
40	25 to 500	43	11.2	59	1/4 stroke	170	263	170	271
50	25 to 600	52	11.2	66	1/4 stroke	189	292	189	300
63	32 to 600	52	11.2	66	1/4 stroke	199	306	199	314
80	41 to 750	65	12.5	80	1/4 stroke	240	369	240	378
100	45 to 750	65	14	81	1/4 stroke	264	399	264	408

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

