

# Cylinder with Lock Series CNA

ø40, ø50, ø63, ø80, ø100

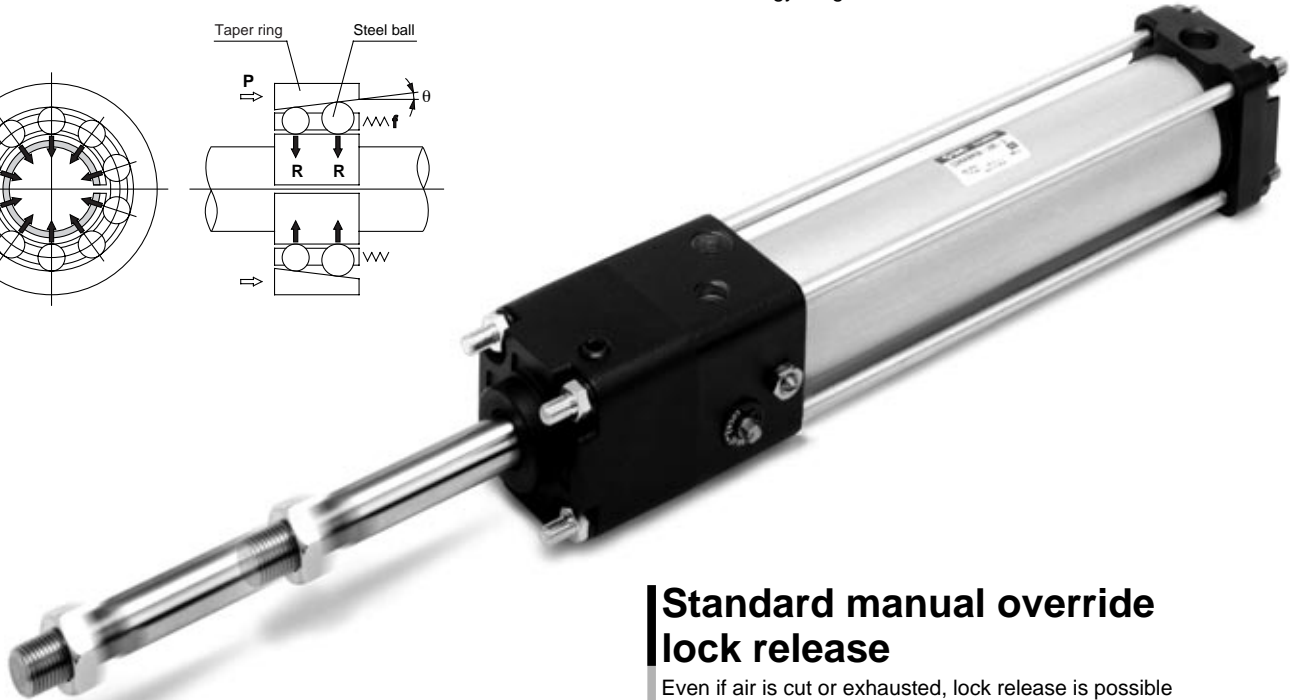
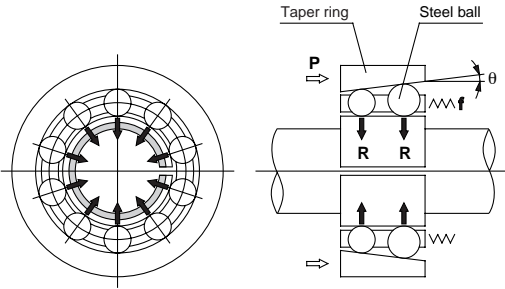
**Suitable for intermediate stops, emergency stops and drop prevention**

## Simple construction

Increased power from wedge effect due to taper ring and steel balls.

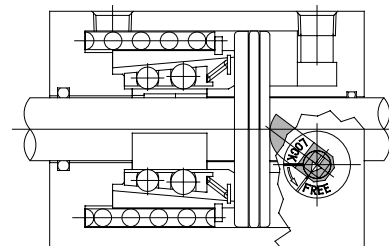
## Max. piston speed: 1000mm/s

Can be used from 50 to 100 mm/s within the allowable kinetic energy range.



## Standard manual override lock release

Even if air is cut or exhausted, lock release is possible using a wrench. When override is released, lock is engaged again as a fail safe.



## High locking effect

High locking effect and stable locking and release are enabled by two rows of precision steel balls (Pressure for lock release is 0.25 MPa, a reduction of 0.05 MPa from conventional SMC product). In addition, both alignability and stable locking force with respect to piston rod eccentricity are obtained by allowing the tapering to float.

## High reliability and stable holding force

Improved brake shoe material and increased length (twice that of other SMC products) results in a stable holding force and high reliability.

## Construction is not effected by air quality

Locking mechanism is isolated from lock release air, so lock function is not diminished by excessive dirt or drainage in compressed air.

### Variations

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

## Possible to lock at both ends

Same holding force in extending and retracting directions.

## Compact lock unit saves space.

Lock unit is compact without any projections.

CL

MLGC

CNA

CB

CV/MVG

CXW

CXS

CXT

MX

MXU

MXS

MXQ

MXF

MXW

MPX

MG

MGP

MGQ

MGG

MGC

MGF

CY1

MY1

# Series CNA/Precautions ①



Be sure to read before handling.

Refer to p.0-39 to 0-46 for Safety Instructions and actuator cautions and auto switch precautions.

## Design of Equipment

### ⚠ Warning

- ① **Equipment should be designed considering safety of operator from lock cylinder and other moving parts.**

Use a protective cover to avoid risk of injury to operator or install a sensor for emergency stops before contact occurs.

- ② **Use balanced air circuit to avoid sudden cylinder extension.**

When the piston rod is locked in the intermediate stroke position and air is supplied to one side of the cylinder, the rod moves at high speed when lock is released. In this case, operator injury and equipment damage can occur. Use a balanced circuit such as the recommended pneumatic circuit shown on p.3.3-3 and 3.3-4 to avoid this sudden movement.

## Selection

### ⚠ Warning

- ① **Do not apply load with impacts and/or strong vibrations and rotation forces when locked.**

If applied, locking parts will be damaged or operating life will be reduced.

- ② **Consider stopping accuracy and over-run distance when intermediate stop is used.**

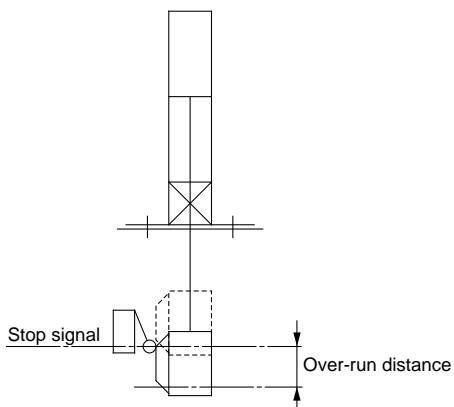
Piston rod stops a few seconds after stop signal due to actuation of mechanical lock. This delay results in cylinder stroke over-run. The difference between minimum and maximum over-run distance is stopping accuracy.

● **Consider over-run distance when setting limit switch position. Limit switch detection distance  $a$  is also a factor in setting switch position.**

● **Limit switch needs over-run distance + detection length for  $\alpha$  (dog length).**

● **Operating range of SMC auto switches is from 8 to 14mm (depending on switch). If over-run distance exceeds this operating range, contact holding circuit should be installed in control circuit.**

\*Refer to p.3.3-9 for stop accuracy.



## Selection

### ⚠ Warning

- ③ **Stopping accuracy can be improved by reducing the time from the lock signal to the actual stop.**

To improve stopping accuracy, use an electric control circuit and direct current driven solenoid valve with good response and place the solenoid valve as close as possible to the cylinder.

- ④ **Change of piston speed influences stopping accuracy.**

If piston speed changes by a load change or disturbances, etc. during cylinder stroke, range of stop position will be large.

Maintain stable piston speed just before stop position.

Speed change during cushion process and operation start is large, so the stop position range will be large.

## Mounting

### ⚠ Warning

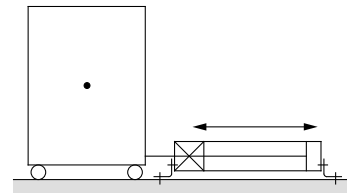
- ① **Connection between rod end and load should be done in lock released condition.**

● If this connection is done in the lock condition, loads which exceed rotation and holding forces act on the piston rod. This damages the lock mechanism. CNA series is equipped with lock releasing mechanism for emergency, however, connect the rod end and load in the condition of lock release after piping supply air pressure of 0.25MPa or more to lock release port for temporary lock release.

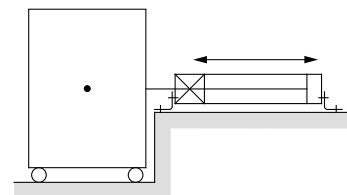
### ⚠ Caution

- ① **Do not apply eccentric loads on the piston rod.**

Pay attention to the center of gravity for the load and cylinder. When the gap is big, the piston rod may have eccentric friction and be damaged by the inertia moment when the lock actuates.



X Gap between center of gravity of load and center of cylinder



○ No gap between center of gravity of load and center of cylinder

Note) It is possible to use in the case when effective guide mechanism absorbs all created moments.

# Series CNA/Precautions ②



Be sure to read before handling.

Refer to p.0-39 to 0-46 for Safety Instructions and actuator cautions and auto switch precautions.

## Mounting

### ⚠ Caution

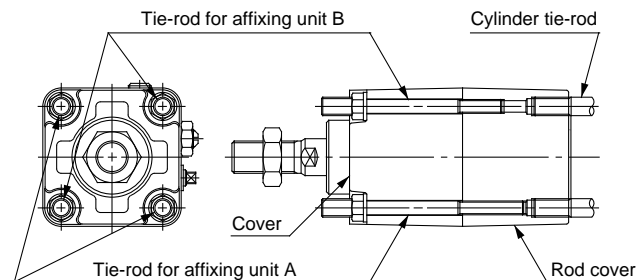
#### ② Caution for use of basic style or replacing of support bracket.

Lock parts and cylinder rod cover are mounted as shown in figure below. Due to this construction, the cylinder cannot be set directly on the machine by attaching to the tie-rod, such as mounting of a basic general air cylinder.

When mounting bracket is replaced, tie-rod for mounting should be tightened as it may be loosened.

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

Bore (mm)	Mounting bracket nut			Tie-rod for affixing	
	Nut	Width across flats	Socket	Width across flats	Socket
40	M8 X 1.25in	13	JIS B4636 2 angle socket 13	10	JIS B4636 2 angle socket 10
50	JIS B1181 class 3			13	JIS B4636 2 angle socket 13
63	M10 X 1.25in	17	JIS B4636 2 angle socket 17	13	JIS B4636 2 angle socket 13
	JIS B1181 class 3			13	JIS B4636 2 angle socket 13
80, 100	M12 X 1.25in	19	JIS B4636 2 angle socket 19	17	JIS B4636 2 angle socket 17
	JIS B1181 class 3			17	JIS B4636 2 angle socket 17



ø2 depth 1mm 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 over-run distance to required stop position.

## Pneumatic Circuit

### ⚠ Warning

#### ① Use a pneumatic circuit which applies balanced pressure to both sides of piston at lock stop.

Use a circuit which applies balanced pressure to both sides of piston to cancel developed pressure of piston operating direction by load, and to avoid ejection at manual lock release or re-starting after lock stop.

#### ② For solenoid valve for lock release, use a solenoid valve which has large effective area based on an effective area which is 50% or more than effective area of solenoid valve for cylinder actuation.

In case that effective area is large, stopping accuracy is increased by reducing over-run.

#### ③ Minimize the distance from the lock release solenoid valve to the cylinder.

When the distance from cylinder is shortened, over-run decreases and stopping accuracy increases.

#### ④ The time period between the intermediate stop and the lock release should be 0.5 seconds or longer.

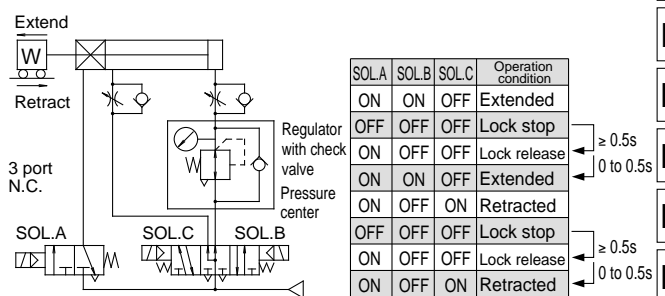
If the duration of lock stop is not sufficient, piston rod may shoot out over the flow control's speed control capacity.

#### ⑤ Switch signal for solenoid valve for lock release at re-start should be controlled to proceed or act at same time as the solenoid valve for cylinder actuation.

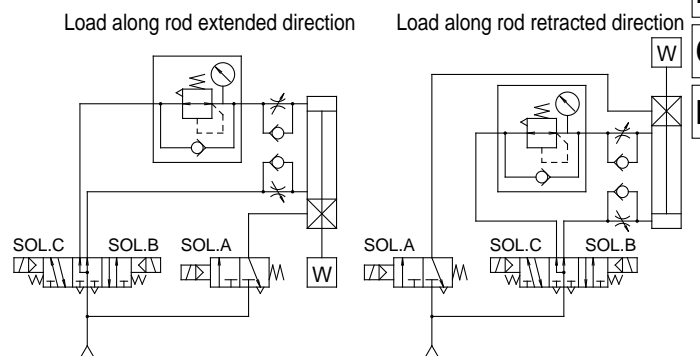
When the signal is delayed, piston rod may eject with speed which exceeds control speed of speed controller.

#### ⑥ Basic circuit

##### 1. [Lateral]



##### 2. [Vertical]



CL  
MLGC  
CNA  
CB  
CV/MVG  
CXW  
CXS  
CXT  
MX  
MXU  
MXS  
MXQ  
MXF  
MXW  
MXP  
MG  
MGP  
MGQ  
MGG  
MGC  
MGF  
CY1  
MY1

# Series CNA/Precautions ③



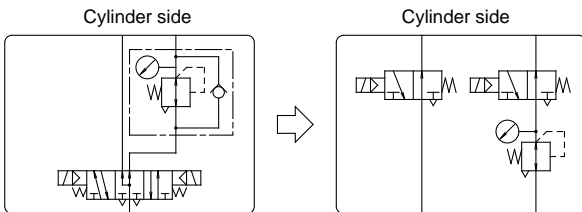
Be sure to read before handling.

Refer to p.0-39 to 0-46 for Safety Instructions and actuator cautions and auto switch precautions.

## Pneumatic Circuit

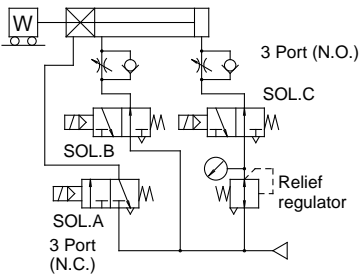
### ⚠ Caution

- It is possible to use a 3 position pressure center solenoid valve and regulator with check valve instead of two 3 port normally open valves and relieving style regulator.



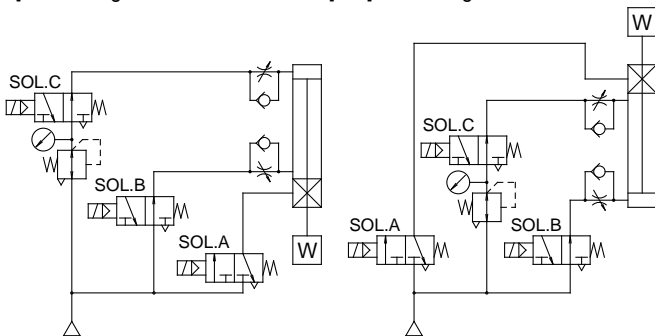
[Example]

1. [Lateral]



2. [Vertical]

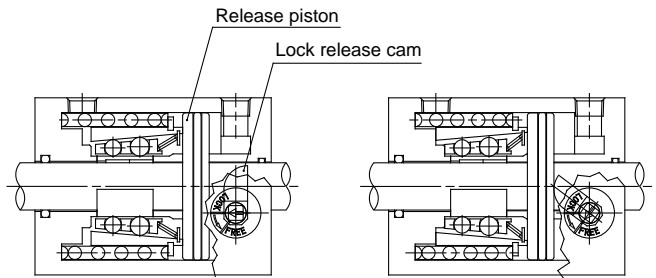
[Load along rod extended direction]    [Load along rod retracted direction]



## Manual Lock Release

### ⚠ Caution

- Lock release manual override on CNA series is only for emergencies.**  
When air supply pressure drops in an emergency, lock release manual override is used to forcibly push back the release piston and release the lock for emergency.  
Torque required to operate override is high as it is intended only for emergency use.
- When lock release condition is required for a long period during equipment mounting, supply air pressure of 0.25Mpa or more to the lock release port.**
- Do not rotate lock release cam (←on top of release cam) past "FREE". If the release cam rotates beyond this point, it may be damaged.**



Lock

Manual lock release

[Principles]

When lock release cam is rotated counter-clockwise with a wrench, lock is released after release piston is pushed back. When cam is released, lever returns to original position and lock is engaged. If lock release must be maintained, leave the cam in this position.



# Series CNA/Precautions ④

Be sure to read before handling.  
Refer to p.0-39 to 0-46 for Safety Instructions and actuator cautions and auto switch precautions.

## Maintenance

### ⚠ Caution

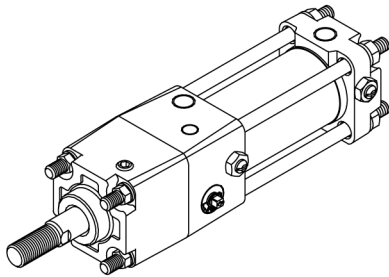
- ① Replacement of lock unit for CNA series is possible.  
To order CNA lock units for maintenance use the part numbers mentioned below.

Bore size (mm)	Part No. of lock unit
40	CNA 40D-UA
50	CNA 50D-UA
63	CNA 63D-UA
80	CNA 80D-UA
100	CNA100D-UA

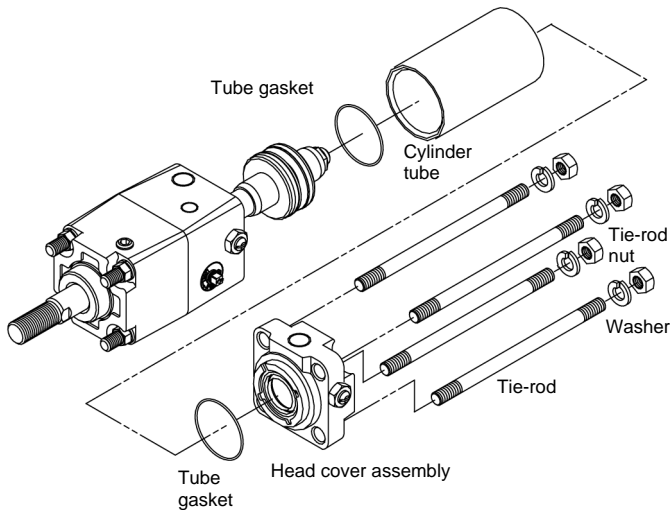
- ② How to replace lock unit

- 1) Loosen the tie-rod nut (4 pcs.) on head cover of cylinder by using socket wrench.  
Refer to table below for applicable sockets.

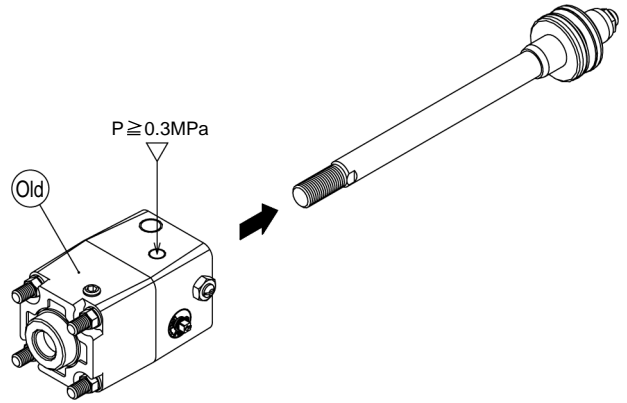
Bore size (mm)	Nut	Width across flats	Socket
40, 50	M8 X 1.25 in JIS B1181 class 2	13	JISB4636 + 2 angle socket 13
63	M10 X 1.25 in JIS B1181 class 2	17	JISB4636 + 2 angle socket 17
80, 100	M12 X 1.75 in JIS B1181 class 2	19	JISB4636 + 2 angle socket 19



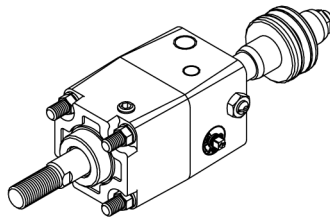
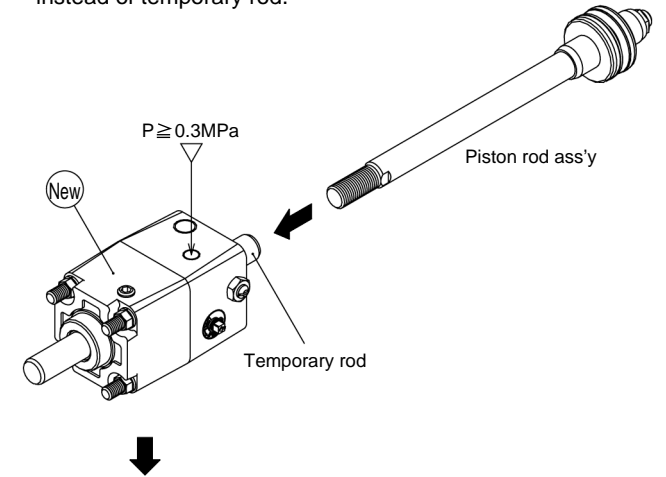
- 2) Remove tie-rod, head cover and cylinder tube.



- 3) Supply compressed air of 0.3MPa or more to lock release port, pull out piston rod assembly.



- 4) Supply compressed air of 0.3MPa or more to lock release port of new lock unit in the same way, replace piston rod assembly instead of temporary rod.



- 5) Reassemble in reverse procedures.

CL

MLGC

**CNA**

CB

CV/MVG

CXW

CXS

CXT

MX

MXU

MXS

MXQ

MXF

MXW

MPX

MG

MGP

MGQ

MGG

MGC

MGF

CY1

MY1

# Series CNA

## How to Select

### Cautions on Selection

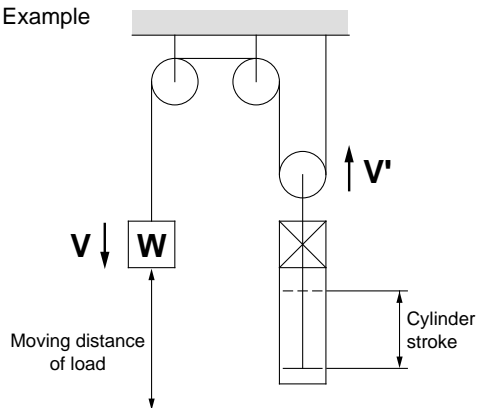
#### ⚠ Caution

- Adjust the load speed so that the load will travel the entire distance under the max. speed used in the model sizing and that the entire "travel time" will be greater than the calculated time.

"Travel time": Time period that the load moves the entire distance without intermediate stops.

- When cylinder stroke is different from moving distance of the load (Double speed mechanism), use moving distance of the load for selection.

Example



### Example of Selection

- Load weight :  $m=50\text{kg}$
- Moving distance :  $st=500\text{mm}$
- Moving time :  $t=2\text{s}$
- Load condition : Vertical, Down direction = Rod extended direction
- Operating pressure:  $P=0.4\text{MPa}$

Procedure 1: Calculate the maximum speed of load movement from graph 1

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

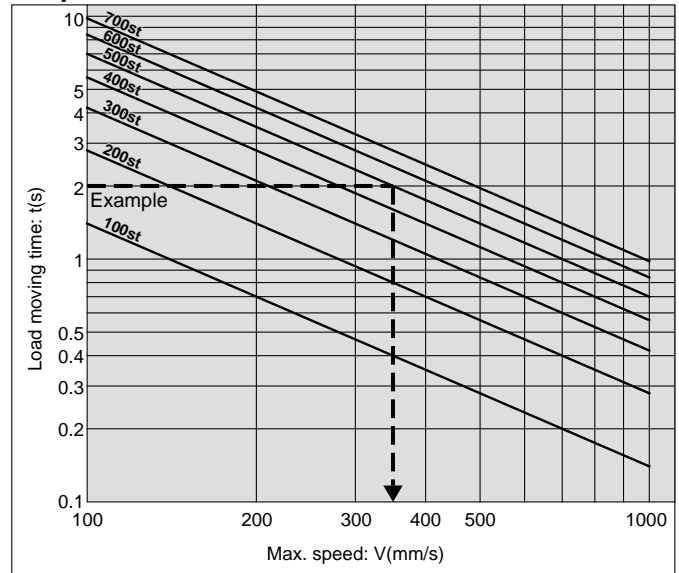
Procedure 2: Select graph 6 based on load conditions and operating pressures. According to the intersection based on answer in Procedure 1 and load weight  $m=50\text{kg}$

∴  $\phi 64 \rightarrow$  Decided the tube I.D. CNA63 or more

### Procedure 1 Calculate Max. Speed of Load Movement V

Calculate max. speed of load movement  $V(\text{mm/s})$  according to load moving time  $t(\text{s})$  and moving distance  $st(\text{mm})$ .

#### Graph 1



### Procedure 2 Select The Graph According to Load Conditions and Operating Pressure.

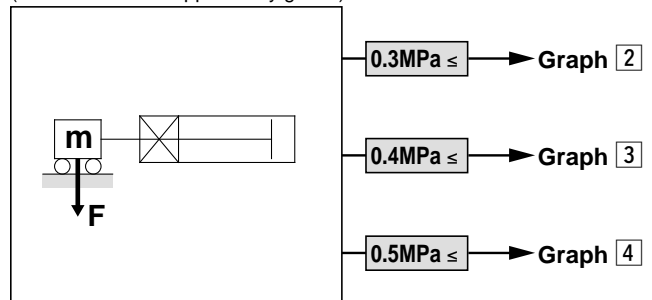
Calculate the intersection for load weight and max. speed that was calculated in procedure 1. Choose the tubing I.D. which is located on upper side of this intersection.

#### Load conditions

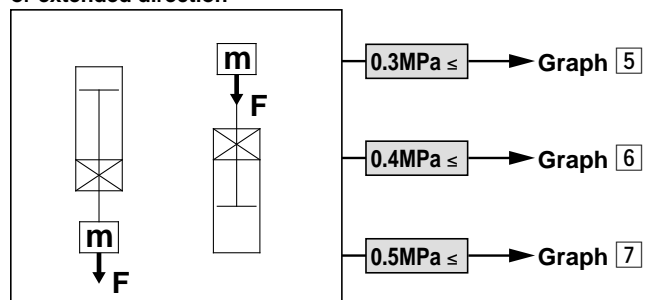
#### Operating pressure

#### Load along perpendicular direction to the rod

(\*This should be supported by guide.)

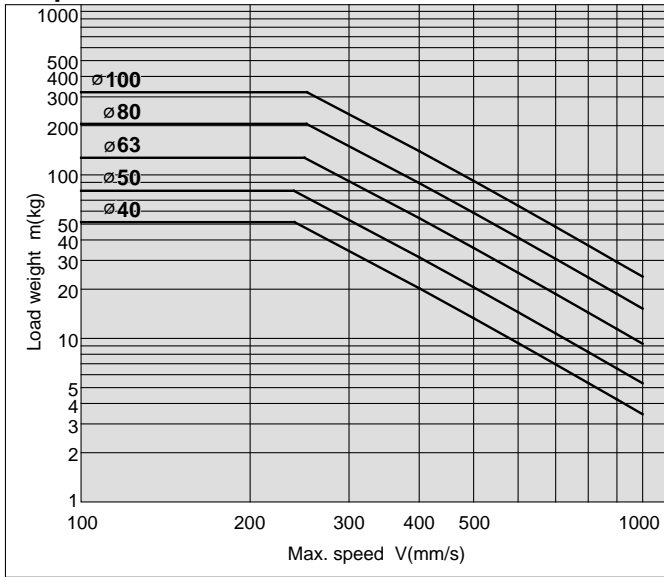


#### Load along rod retracted or extended direction

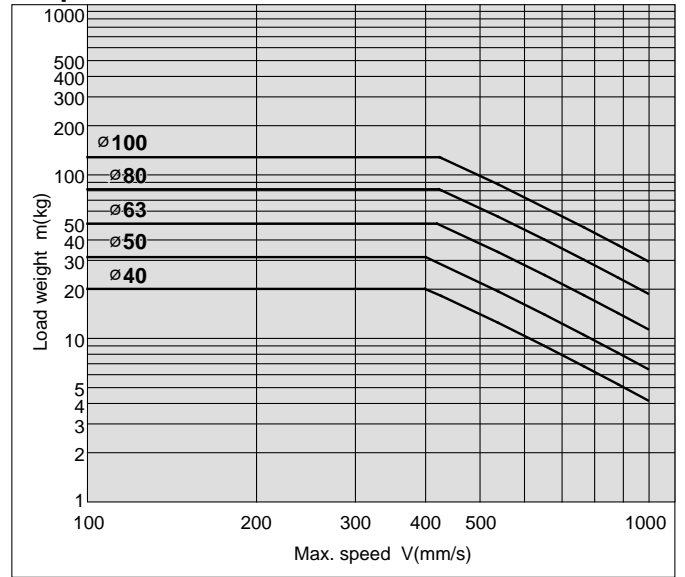


## Selection Graphs

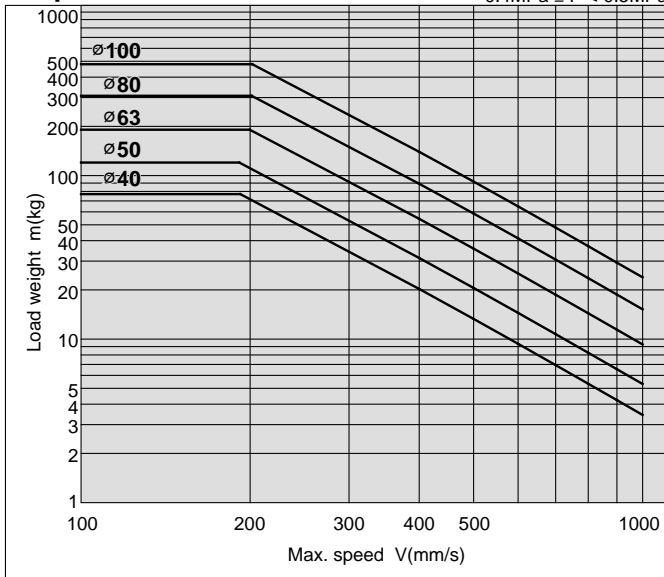
**Graph 2**  $0.3\text{MPa} \leq P < 0.4\text{MPa}$



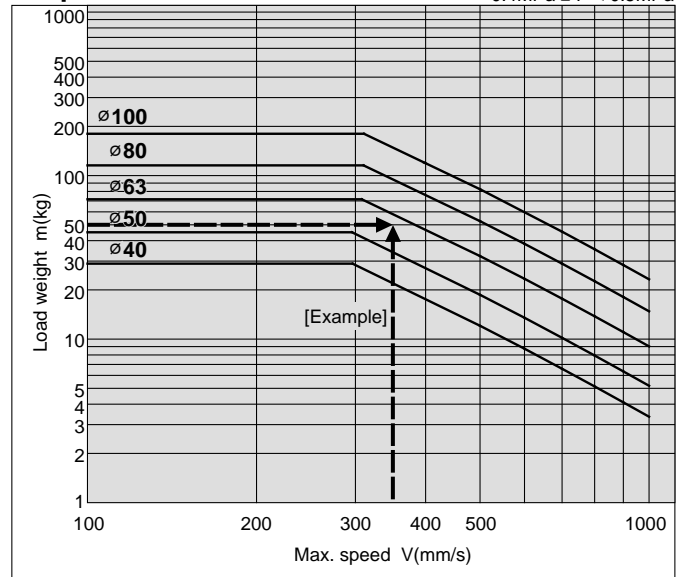
**Graph 5**  $0.3\text{MPa} \leq P < 0.4\text{MPa}$



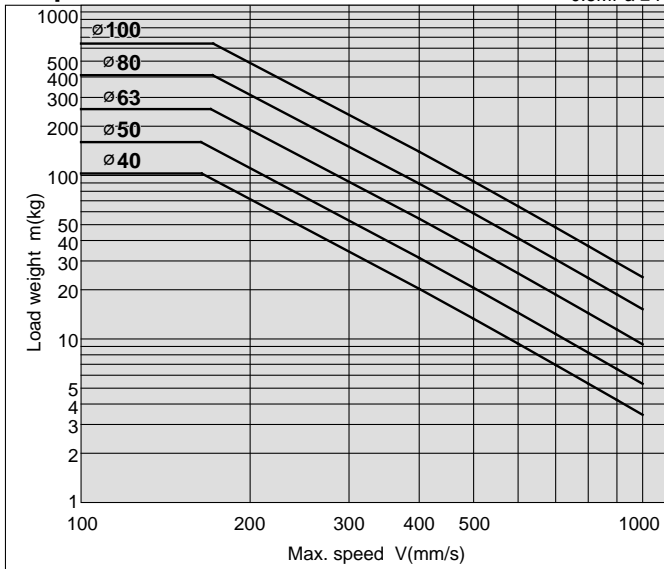
**Graph 3**  $0.4\text{MPa} \leq P < 0.5\text{MPa}$



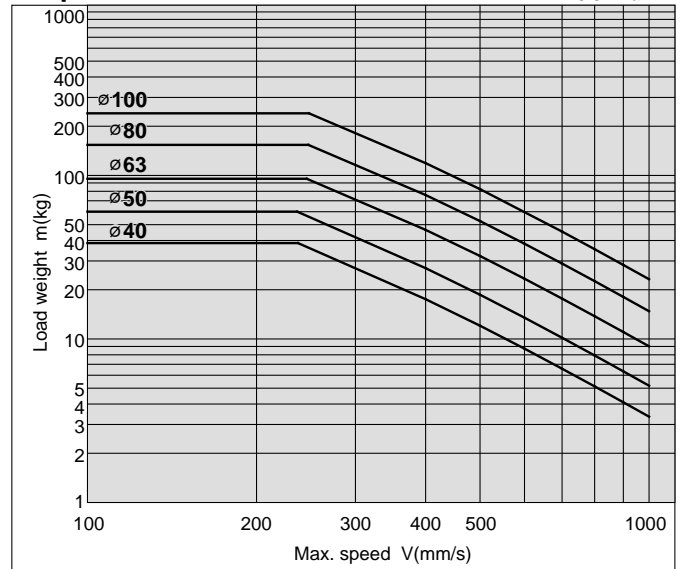
**Graph 6**  $0.4\text{MPa} \leq P < 0.5\text{MPa}$



**Graph 4**  $0.5\text{MPa} \leq P$



**Graph 7**  $0.5\text{MPa} \leq P$



CL

MLGC

**CNA**

CB

CV/MVG

CXW

CXS

CXT

MX

MXU

MXS

MXQ

MXF

MXW

MXP

MG

MGP

MGQ

MGG

MGC

MGF

CY1

MY1

# Cylinder with Lock/Double Acting Single Rod

# Series CNA

ø45, ø50, ø63, ø80, ø100



## How to Order

**Standard** CNA **L** **N** **50** **100** **JN** **D**

**With auto switch** CDNA **L** **N** **50** **100** **JN** **D** **A53**

**Mounting**

<b>B</b>	Basic
<b>L</b>	Foot
<b>F</b>	Front flange
<b>G</b>	Rear flange
<b>C</b>	Single clevis
<b>D</b>	Double clevis
<b>T</b>	Center trunnion

**Style**

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

\* Auto switch not applicable for steel tube model.

**Bore size**

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

**Cylinder stroke (mm)**

Refer to p.3.3-9 for standard stroke.

**Number of auto switches**

—	2
<b>S</b>	1
<b>n</b>	n

**Auto switch**

—	None
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\* Refer to table below for selection of applicable auto switch.

**Lock direction**

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

**Option**

Rod boot	<b>J</b>	Nylon tarpaulin
	<b>K</b>	Heat resistant tarpaulin
Cushion	—	Both ends with cushion on both sides
	<b>N</b>	Without cushion
	<b>R</b>	With cushion on rod side
	<b>H</b>	Rear end with cushion on head side

\* When specifying symbol more than one, combine symbols in alphabetical order.

### Applicable Auto Switches/Refer to p.5.3-2 for further information on auto switch.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch symbol		Lead wire (m)*			Applicable load	
					DC	AC	Tie rod mounting	Band mounting	0.5 (—)	3 (L)	5 (Z)		
Reed switch	—	Grommet	Yes	3 wire (NPN) (Equiv. to NPN)	24V	5V	—	<b>A56</b>	—	●	●	—	IC
						12V	—	<b>A53</b>	<b>B53</b>	●	●	●	PLC
		Terminal conduit	No	2 wire	12V	100V, 200V	<b>A54</b>	<b>B54</b>	●	●	●	Relay, PLC	
					5V, 12V	—	<b>A67</b>	—	●	●	—	IC	
	Diagnostic (2 color)	Grommet	Yes	2 wire	24V	200V or less	—	<b>A64</b>	<b>B64</b>	●	●	—	Relay, PLC
						—	—	<b>A33C</b>	<b>A33</b>	—	—	—	PLC
		DIN connector	No	2 wire	100V, 200V	—	<b>A34C</b>	<b>A34</b>	—	—	—	Relay, PLC	
					—	—	<b>A44C</b>	<b>A44</b>	—	—	—	PLC	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	<b>F59</b>	<b>G59</b>	●	●	○	IC
				3 wire (PNP)			—	<b>F5P</b>	<b>G5P</b>	●	●	○	IC
				2 wire			—	<b>J51</b>	—	●	●	○	—
		Terminal conduit	No	2 wire	12V	—	<b>J59</b>	<b>K59</b>	●	●	○	—	
					5V, 12V	—	<b>G39C</b>	<b>G39</b>	—	—	—	IC	
					12V	—	<b>K39C</b>	<b>K39</b>	—	—	—	—	
	Diagnostic (2 color)	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	<b>F59W</b>	<b>G59W**</b>	●	●	○	Relay, PLC
				3 wire (PNP)			—	<b>F5PW</b>	<b>G5PW**</b>	●	●	○	IC
				2 wire			—	<b>J59W</b>	<b>K59W**</b>	●	●	○	—
		Grommet	No	2 wire	12V	—	<b>F5BA</b>	<b>G5BA**</b>	—	—	—	—	
					5V, 12V	—	<b>F5NT</b>	<b>G5NT</b>	—	—	—	IC	
					—	—	<b>F59F</b>	<b>G59F**</b>	●	●	○	—	
Water resistant (2 color)	Grommet	No	4 wire (NPN)	24V	—	—	<b>F5LF</b>	—	●	●	○	—	
						—	—	—	—	—	—	—	—

\* Lead wire length 0.5m..... (Example) A53  
3m..... L (Example) A53L  
5m..... Z (Example) A53Z

\* "○": Solid state switch is manufactured upon receipt of order.  
\*\* D-G5□W, K59W, G5BA, G59F are not available for bore size ø40, ø50.

### Part No. of Cylinder with Built-in Magnet

If ordering cylinder with built-in magnet without auto switch, symbol for auto switch is Nil.  
(Example) CDNALN40-100-D

### Mounting Bracket Part No.

Refer to p.3.3-10 for part number of mounting bracket except basic style.



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



## Cylinder Specifications

<b>Bore size (mm)</b>	ø40, ø50, ø63, ø80, ø100	
<b>Fluid</b>	Air	
<b>Style</b>	Non-lube	
<b>Action</b>	Double acting	
<b>Lock operation</b>	Spring lock	
<b>Proof pressure</b>	1.5MPa	
<b>Max. operating pressure</b>	1.0MPa	
<b>Min. operating pressure</b>	0.08MPa	
<b>Operating piston speed</b>	50 to 1000mm/s*	
<b>Ambient and fluid temperature</b>	Without auto switch: -10°C to 70°C (No freezing) With auto switch : -10°C to 60°C	
<b>Cushion</b>	Air cushion	
<b>Allowable stroke tolerance</b>	to 250: $\begin{matrix} +1.0 \\ 0 \end{matrix}$ , 251 to 1000: $\begin{matrix} +1.4 \\ 0 \end{matrix}$ , 1001 to 1500: $\begin{matrix} +1.8 \\ 0 \end{matrix}$	
<b>Mounting</b>	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion	

\*Load is limited by piston speed, mounting direction and operating pressure at locking.

## Lock Specifications

<b>Style of locking</b>	Spring lock (Exhaust lock)
<b>Lock release pressure</b>	0.25MPa or more
<b>Lock starting pressure</b>	0.20MPa or less
<b>Max. operating pressure</b>	1.0MPa
<b>Lock direction</b>	Both directions

**Standard Strokes/** Refer to "Allowable min. stroke of auto switch mounting" on p.3.3-20 for auto switches.

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

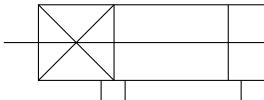
Style of locking	Operating piston speed (mm/s)			
	100	300	500	1000
Spring lock	± 0.3	± 0.6	± 1.0	± 2.0

Condition/Lateral, Supply pressure P = 0.5MPa  
 Load weight.....Top limit of allowable value  
 Solenoid valve for locking mounted on locking release port  
 Maximum value of stop position in measured 100 times

## Holding Force of Spring Lock (Max. Static Load)

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

**JIS symbol**  
Double acting single rod



CL  
MLGC  
**CNA**  
CB  
CV/MVG  
CXW  
CXS  
CXT  
MX  
MXU  
MXS  
MXQ  
MXF  
MXW  
MXP  
MG  
MGP  
MGQ  
MGG  
MGC  
MGF  
CY1  
MY1

# 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 brackets per cylinder.

\*\*Clevis pin, plain washer and split pin are packed with double clevis.

## Rod Boot Materials

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

\*Max. ambient temperature is for rod boot unit.

## Accessories

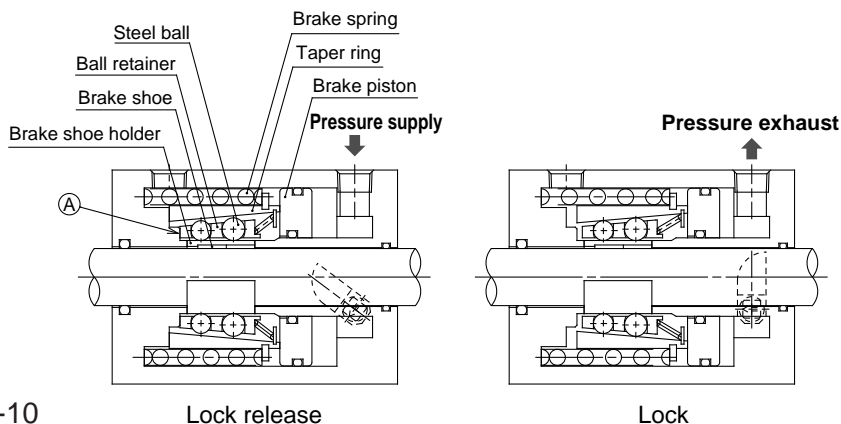
Mounting		Basic	Foot	Front flange	Rear flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Pin for clevis	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

## Weight/ ( ): Value for steel tube

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

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

## Construction/Operation Principles

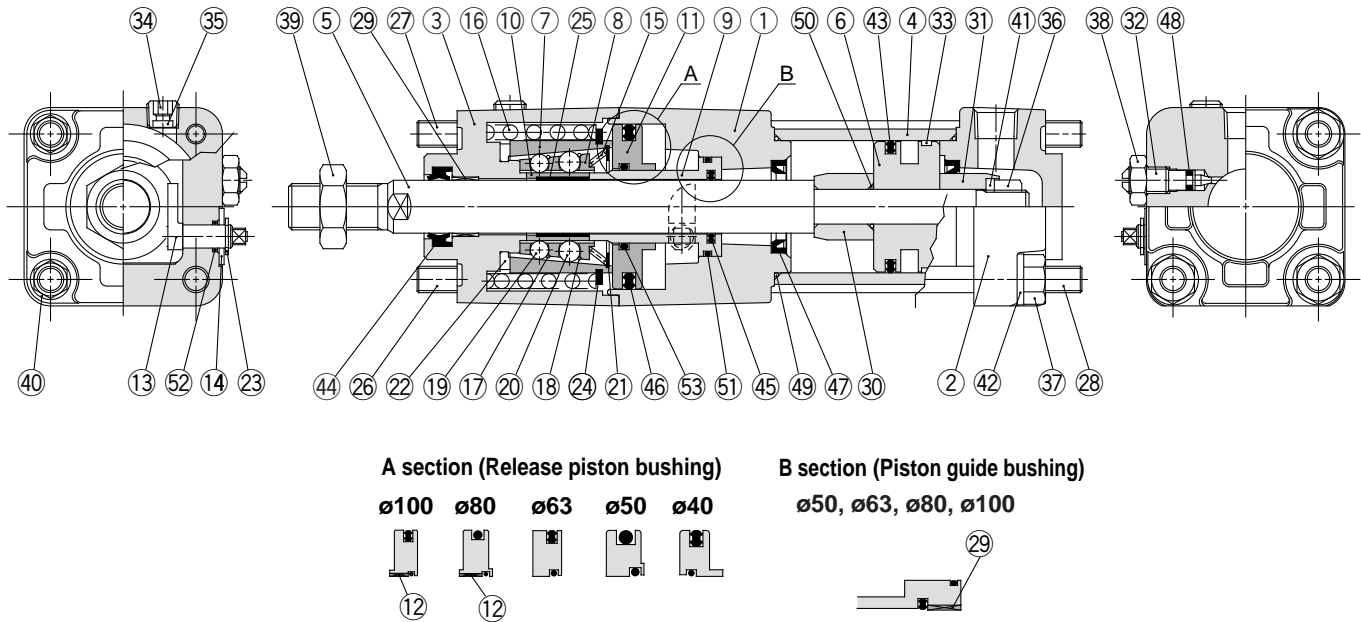


### Spring lock (Exhaust lock):

Spring force acting on the brake piston moves brake piston and taper ring to the right. Inner surface of taper ring wedges the two parallel sets of steel balls against the brake shoe holder and brake shoe. This force tightens the shoe against the rod and locks it. To release the rod, air pressure is supplied the release port. This exerts sufficient force on the brake piston to overcome the spring force and move the taper ring to the left. Brake force is released as taper ring separates from steel balls.

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

## Construction



- CL
- MLGC
- CNA**
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

### Component Parts

No.	Description	Material	Note
①	<b>Rod cover</b>	Aluminum alloy	Black coated after hard anodized
②	<b>Head cover</b>	Aluminum alloy	Black coated
③	<b>Cover</b>	Aluminum alloy	Black coated after hard anodized
④	<b>Cylinder tube</b>	Aluminum alloy	Hard anodized
⑤	<b>Piston rod</b>	Carbon steel	Hard chrome plated
⑥	<b>Piston</b>	Aluminum alloy	Chromated
⑦	<b>Taper ring</b>	Carbon steel	Heat treatment
⑧	<b>Ball retainer</b>	Special resin	
⑨	<b>Piston guide</b>	Carbon steel	Zinc chromated
⑩	<b>Brake shoe holder</b>	Special resin	Heat treatment
⑪	<b>Brake release piston</b>	ø40	Aluminum alloy Hard anodized
		ø50	
		ø63	
		ø80	Carbon steel Zinc chromated
		ø100	
⑫	<b>Brake release piston bushing</b>	Steel + Special resin	Hard anodized
⑬	<b>Cam for lock release</b>	Chrome molybdenum steel	Zinc chromated
⑭	<b>Washer</b>	Carbon steel	Black zinc chromated
⑮	<b>Spring for retainer pre-load</b>	Steel wire	Zinc chromated
⑯	<b>Brake spring</b>	Steel wire	Zinc chromated
⑰	<b>Clip A</b>	Stainless steel	
⑱	<b>Clip B</b>	Stainless steel	
⑲	<b>Steel ball A</b>	Carbon steel	
⑲	<b>Steel ball B</b>	Carbon steel	
⑲	<b>Tooth ring</b>	Stainless steel	
⑲	<b>Damper</b>	Polyurethane rubber	
⑲	<b>C shape snap ring for release cam axis</b>	Carbon steel	
⑲	<b>C shape snap ring for taper ring</b>	Carbon steel	
⑲	<b>Brake shoe</b>	Special friction material	
⑲	<b>Tie rod A for unit attachment</b>	Carbon steel	Electrogalvanized chromated
⑲	<b>Tie rod B for unit attachment</b>	Carbon steel	Electrogalvanized chromated
⑲	<b>Tie rod</b>	Carbon steel	Electrogalvanized chromated
⑲	<b>Bushing</b>	Lead bronze casting	
⑲	<b>Cushion ring A</b>	Rolled steel	Zinc chromated

### Component Parts

No.	Description	Material	Note
⑳	<b>Cushion ring B</b>	Rolled steel	Zinc chromated
㉑	<b>Cushion valve</b>	Rolled steel	Nickel plated
㉒	<b>Wear ring</b>	Special resin	
㉓	<b>Plug with Hex. hole</b>	Chrome molybdenum steel	Black zinc chromated
㉔	<b>Element</b>	Bronze	
㉕	<b>Piston nut</b>	Rolled steel	Zinc chromated
㉖	<b>Tie rod nut</b>	Carbon steel	Black zinc chromated
㉗	<b>Lock nut</b>	Carbon steel	Nickel plated
㉘	<b>Rod end nut</b>	Carbon steel	Nickel plated
㉙	<b>Spring washer</b>	Steel wire	Black zinc chromated
㉚	<b>Spring washer</b>	Steel wire	Black zinc chromated
㉛	<b>Spring washer</b>	Steel wire	Black zinc chromated
㉜	<b>Piston seal</b>	NBR	
㉝	<b>Rod seal A</b>	NBR	
㉞	<b>Rod seal B</b>	NBR	
㉟	<b>Release piston seal</b>	NBR	
㊱	<b>Cushion seal</b>	NBR	
㊲	<b>Cushion valve seal</b>	NBR	
㊳	<b>Tube gasket</b>	NBR	
㊴	<b>Piston gasket</b>	NBR	
㊵	<b>Gasket for piston guide</b>	NBR	
㊶	<b>Gasket for release cam</b>	NBR	
㊷	<b>O ring</b>	NBR	

### Replacement Parts: Seal Kits

Bore size (mm)	Parts No.	Notes
40	CA1N 40A-PS	Including No. ④③, ④④, ④⑤ and ④⑨.
50	CA1N 50A-PS	
63	CA1N 63A-PS	
80	CA1N 80A-PS	
100	CA1N100A-PS	

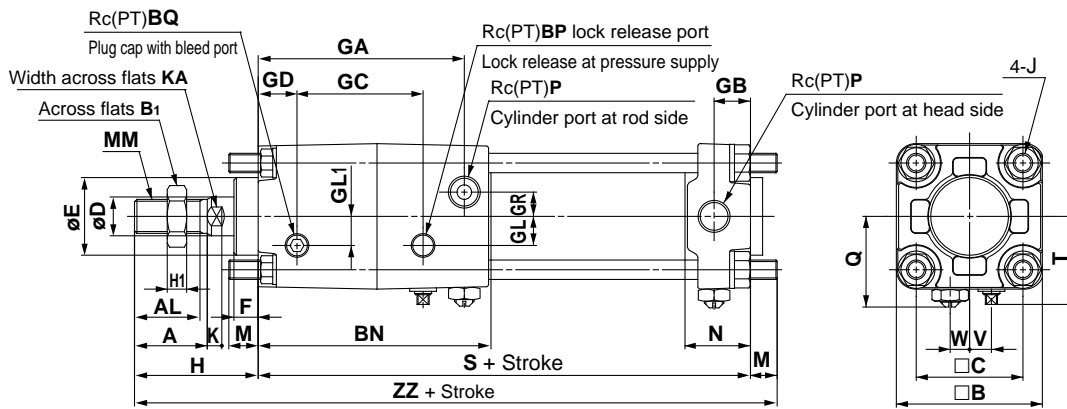
\*As a general rule, the lock section of the CNA series is replaced as a unit, and therefore, the replacement seal kits are for the cylinder section only. These can be ordered using the order number for each bore size.

# Series CNA

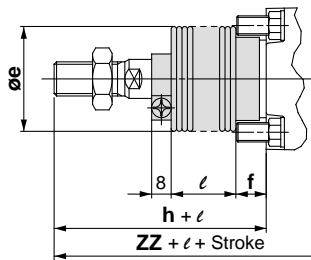
## Dimensions



### Basic (B)/CNABN



#### With rod boot



Bore (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	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	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	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	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	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 (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 (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



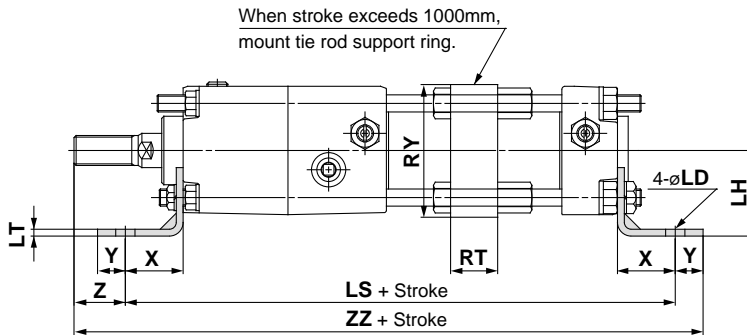
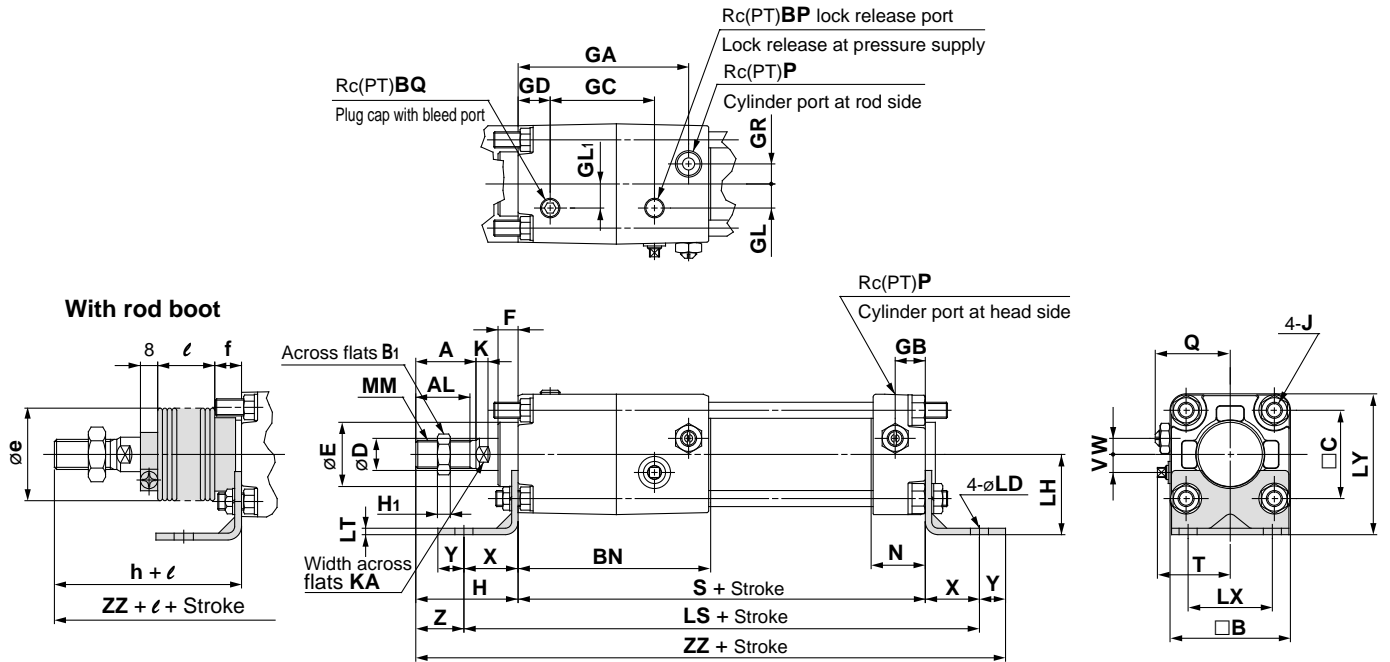
With auto switch

CNABN [Bore size] ..... SCNA [Bore size], #1 (#1+#11)

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



## Axial foot (L)/CNALN



### Long stroke (mm)

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

Bore (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	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	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	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	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	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 (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 (mm)

Bore (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



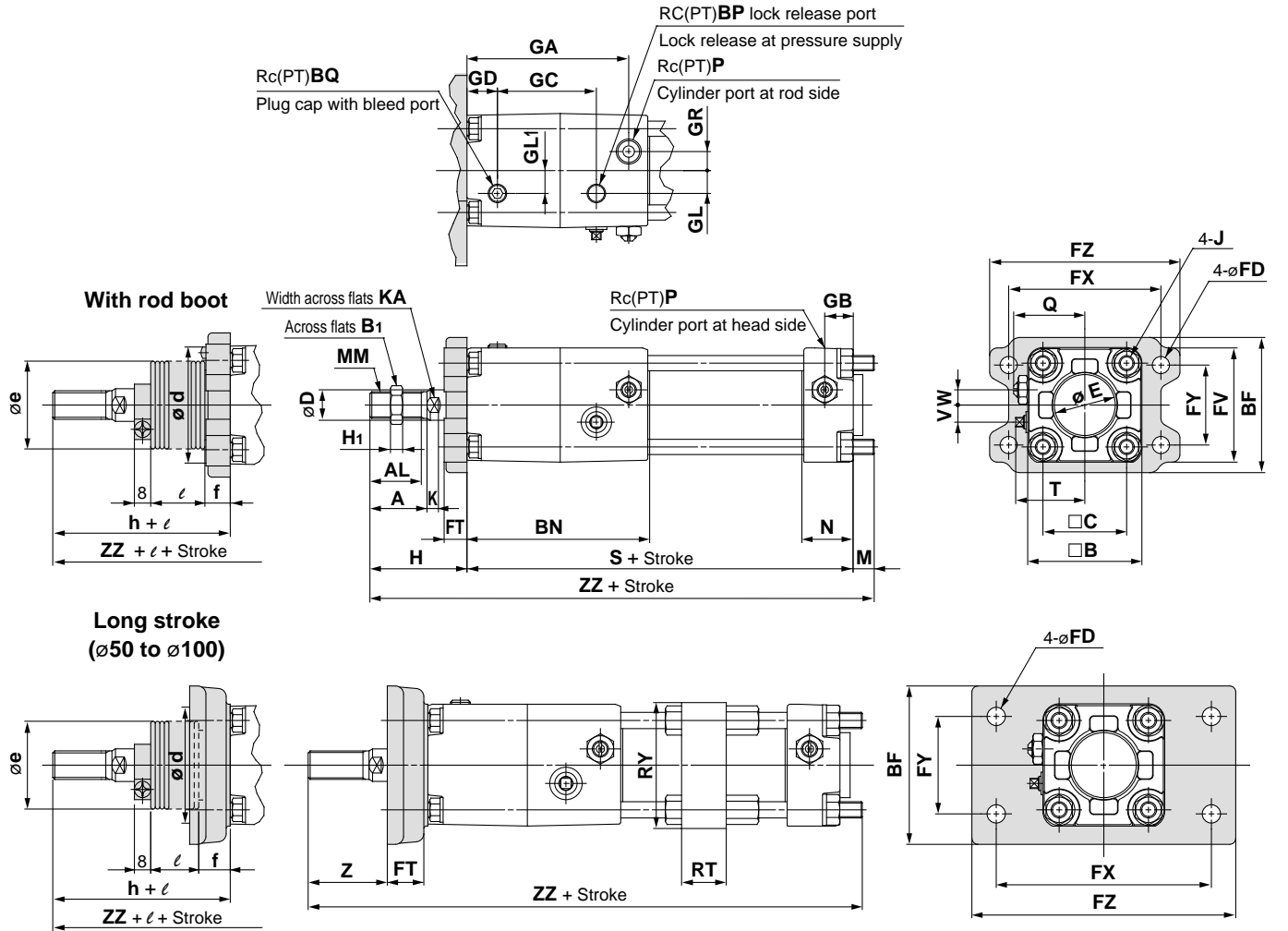
With auto switch  
 CNALN [Bore size]..... SCNA [Bore size], #2 (#1+#2+#11)

- CL
- MLGC
- CNA**
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MPX
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

# Series CNA



## Front flange (F)/CNAFN



Bore (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	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	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	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	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	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 (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

Bore (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

Bore (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

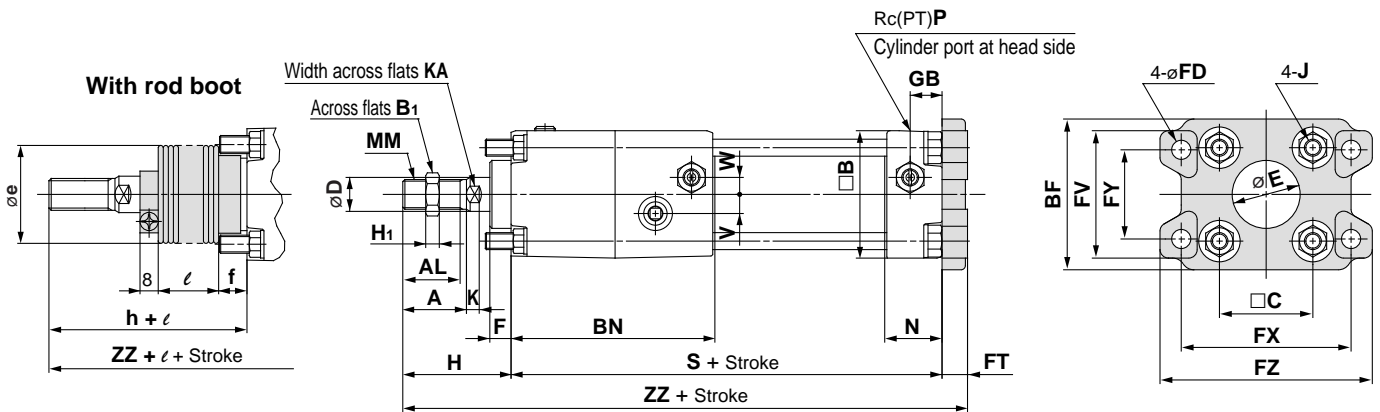
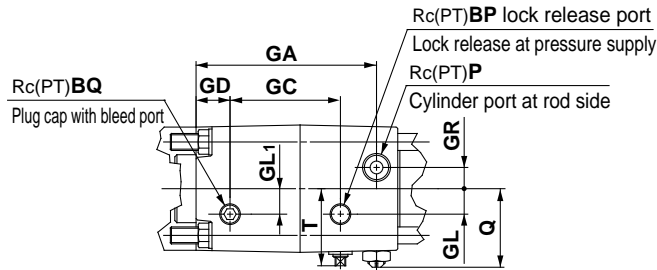
Bore (mm)	Stroke range (mm)	d	e	f	h	ℓ	ZZ
50	1001 to 1200	58	52	19	66	1/4 Stroke	240
63	1001 to 1200	58	52	19	66	1/4 Stroke	258
80	1001 to 1400	80	65	21	80	1/4 Stroke	310
100	1001 to 1500	80	65	21	81	1/4 Stroke	339

With auto switch  
 CNAFN [Bore size] ..... SCNA [Bore size], #3 (#1+#3+#11)

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



## Rear flange (G)/CNAGN



Bore (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	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	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	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	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	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 (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

Bore (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



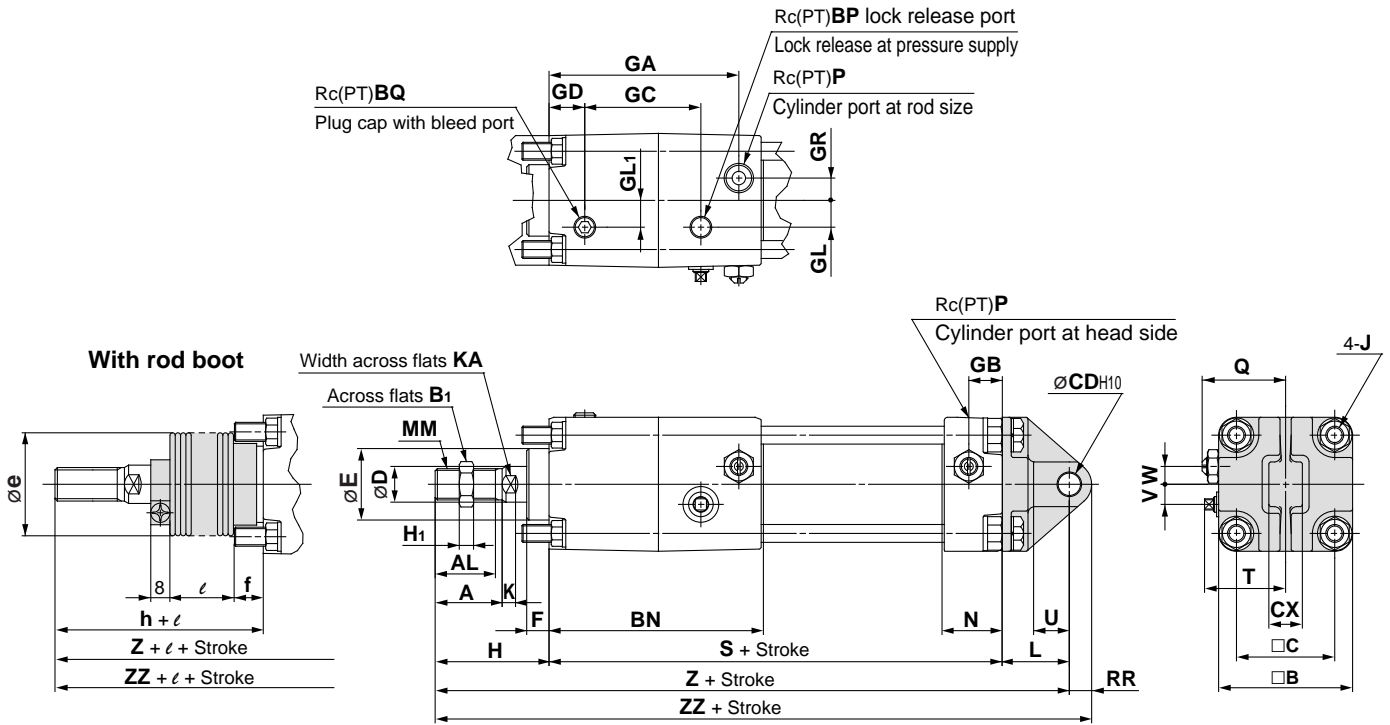
With auto switch  
 CNAGN [Bore size] ..... SCNA [Bore size] , #4 (#1+#4+#11)

- CL
- MLGC
- CNA**
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MPX
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

# Series CNA



## Single clevis (C)/CNACN



Bore (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	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	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	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	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	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 (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

Bore (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

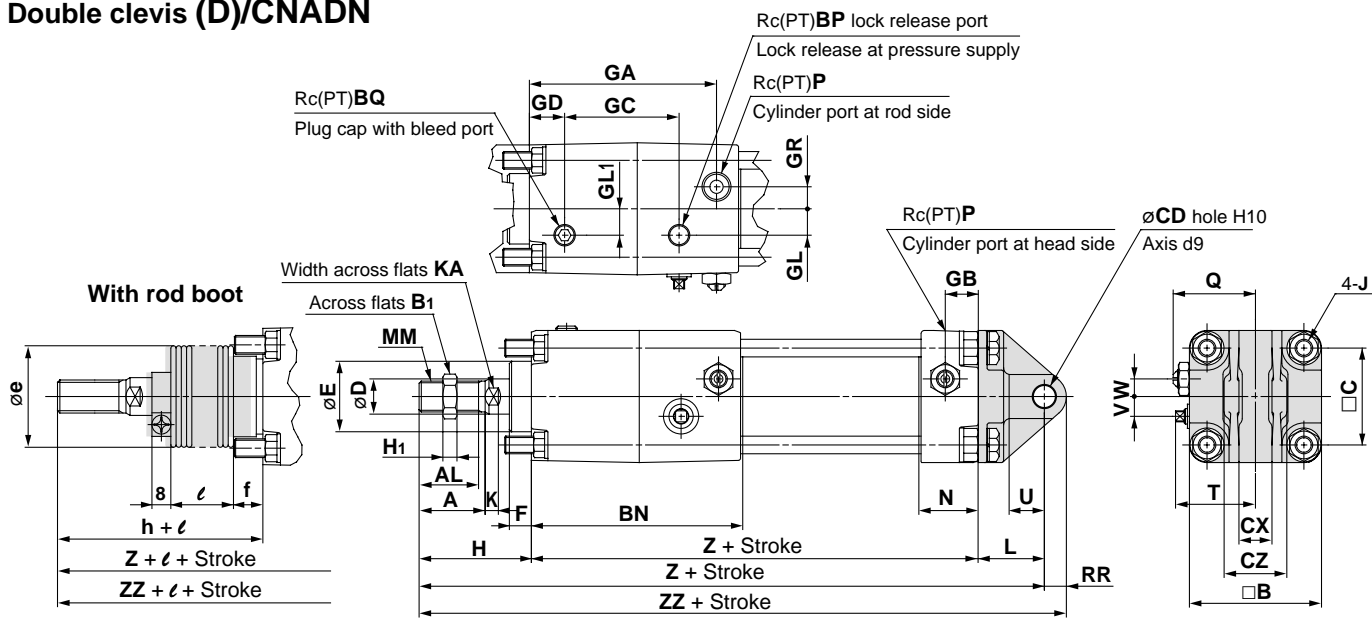
With auto switch  
 CNACN [Bore size]..... SCNA [Bore size], #5 (#1+#5+#11)



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



## Double clevis (D)/CNADN



Bore (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	CD	CX	CZ	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA
40	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	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	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	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	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

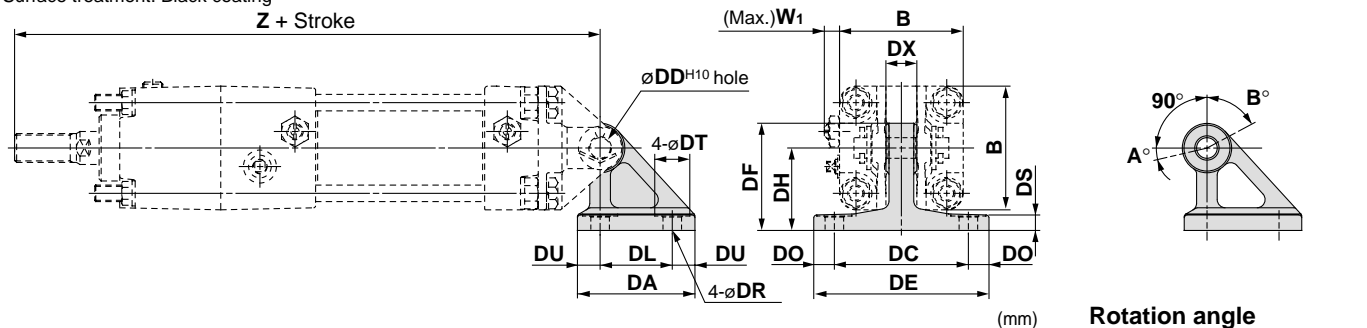
Bore (mm)	L	MM	N	P	Q	RR	S	T	U	V	W	H	Z	ZZ
40	30	M14 X 1.5	27	1/4	37 to 39.5	10	153	37.5	16	9	8	51	234	244
50	35	M18 X 1.5	30	3/8	42 to 44.5	12	168	44	19	11	0	58	261	273
63	40	M18 X 1.5	31	3/8	50 to 51.5	16	182	52.5	23	12	0	58	280	296
80	48	M22 X 1.5	37	1/2	59.5 to 62.5	20	218	59.5	28	15	0	71	337	357
100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

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

With auto switch  
 CNADN [Bore size] ..... SCNA [Bore size], #6 (#1+#6+#11)

## Double Clevis Pivot Bracket

Material: Cast iron ●The strength is same as cylinder support bracket.  
 Surface treatment: Black coating



Part No.	Bore (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>

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

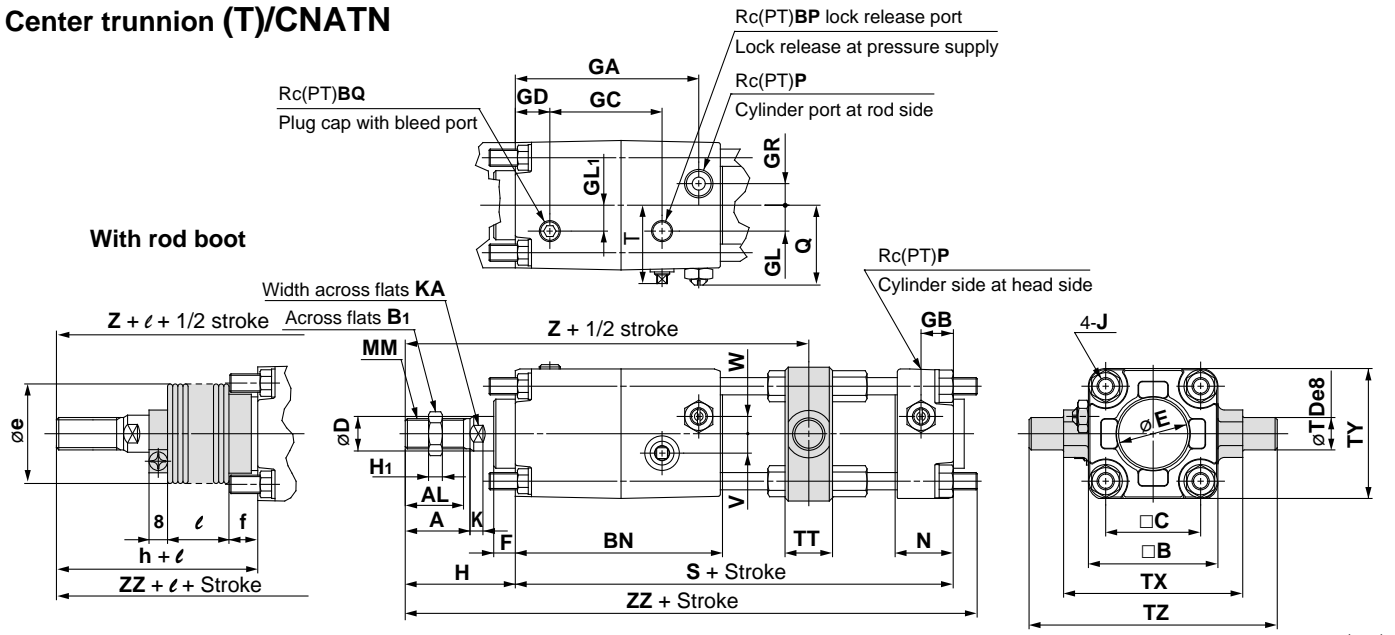
Note) 1. There is no mention in cylinder part no. 2. Order it separately from cylinder. 3 Pin, retainer, etc. of female rear clevis, male rear clevis are shipped with cylinder.

Accessory ..... SCNA [Bore size], #9

# Series CNA



## Center trunnion (T)/CNATN



Bore (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

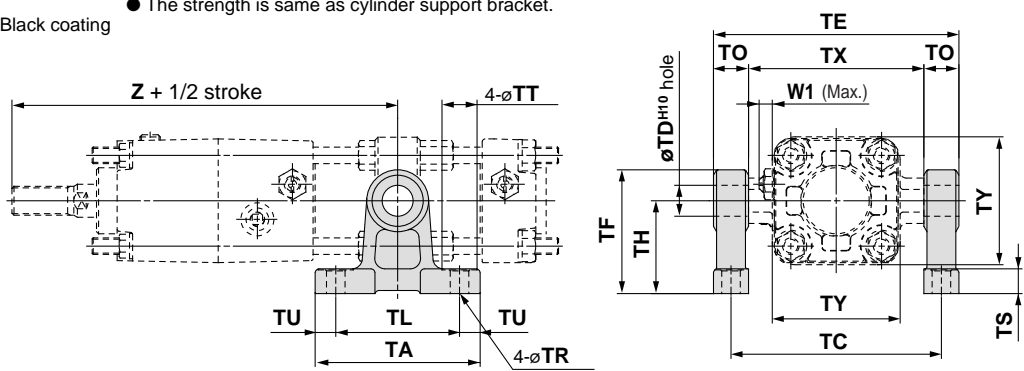
Bore (mm)	P	Q	S	T	TDe8	TT	TX	TY	TZ	V	W	H	Z	ZZ
40	1/4	37 to 39.5	153	37.5	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	85	62	117	9	8	51	162	209
50	3/8	42 to 44.5	168	44	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	95	74	127	11	0	58	181	232
63	3/8	50 to 51.5	182	52.5	18 <sup>-0.032</sup> <sub>-0.059</sub>	28	110	90	148	12	0	58	191	248
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

Bore (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	256
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

With auto switch  
 CNATN [Bore size] ..... SCNA [Bore size], #7 (1#+#7+#11)

## Trunnion Pivot Bracket

Material: Cast iron ● The strength is same as cylinder support bracket.  
 Surface treatment: Black coating



Part No.	Bore (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>
	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>
CA1-S08	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.  
 2. Order it separately from cylinder.  
 3. Two trunnion support brackets are needed per one cylinder.

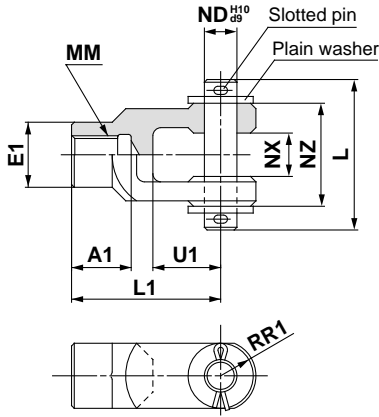
# Series CNA

# Accessory Dimensions



## Y Type Double Knuckle Joint

\* Pin, retainer, etc. for double clevis and double knuckle joint are shipped with cylinder.



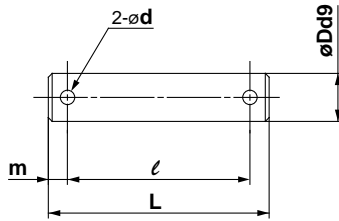
Material: Cast iron

(mm)

Part No.	Bore size (mm)	A1	E1	L1	MM	RR1	U1	ND	NX	NZ	L	Slotted pin size	Plain 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	"MIGAKIMARU" Polish 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	"MIGAKIMARU" Polish 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	"MIGAKIMARU" Polish 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	"MIGAKIMARU" Polish 20

\* Knuckle pin, slotted pin and washer are included.

## Pin for Clevis/Pin for Knuckle Joint

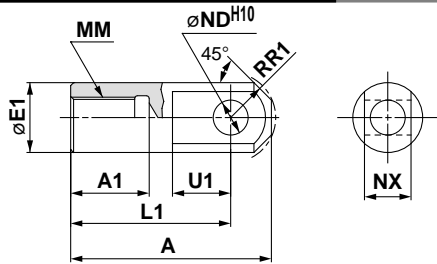


Material: Carbon steel

(mm)

Part No.	Bore size		Dd9	L	ℓ	m	d through drill	Used slotted pin	Used plain washer
	Clevis	Nuckle							
CDP-2A	40	—	10 <sup>-0.040</sup> <sub>-0.076</sub>	46	38	4	3	ø3 X 18ℓ	"MIGAKIMARU" Polish 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	"MIGAKIMARU" Polish 12
CDP-4A	63	—	16 <sup>-0.050</sup> <sub>-0.093</sub>	71	61	5	4	ø4 X 25ℓ	"MIGAKIMARU" Polish 16
CDP-5A	—	80	18 <sup>-0.050</sup> <sub>-0.093</sub>	76.5	66.5	5	4	ø4 X 25ℓ	"MIGAKIMARU" Polish 18
CDP-6A	80	100	20 <sup>-0.065</sup> <sub>-0.117</sub>	83	73	5	4	ø4 X 25ℓ	"MIGAKIMARU" Polish 20
CDP-7A	100	—	25 <sup>-0.065</sup> <sub>-0.117</sub>	88	78	5	4	ø4 X 36ℓ	"MIGAKIMARU" Polish 24

## I Type Single Knuckle Joint

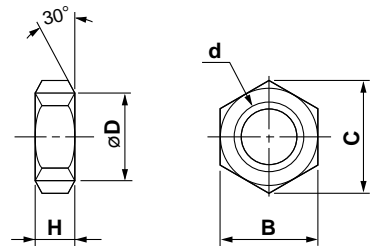


Material: Sulfur free-cutting steel

(mm)

Part No.	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 option)



Material: Rolled steel material

(mm)

Part No.	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



Accessory ..... SCNA [Bore size], #9

- CL
- MLGC
- CNA
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MPX
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

# Series CNA Auto Switch Specifications

Refer to p.5.3-2 for details on auto switch.



## Applicable Auto Switch

Style	Auto switch model No.	Electrical entry/Function	
Reed switch	D-B5/B6	Band mounting	Grommet
	D-B59W		Grommet (2 color indication)
	D-A3□		Terminal conduit
	D-A44		DIN terminal
	D-A5/A6	Tie rod mounting	Grommet
	D-A59W		Grommet (2 color indication)
	D-A3□C		Terminal conduit
	D-A44C		DIN terminal
Solid state switch	D-G5□/K59	Band mounting	Grommet
	D-G5NT		Grommet (With timer)
	D-G5□W/K59W		Grommet (2 color indication)
	D-G5BAL		Grommet (2 color, Water resistant)
	D-G59F	Tie rod mounting	Grommet (2 color, With diagnostic output)
	D-G39/K39		Terminal conduit
	D-F5□/J5□		Grommet
	D-F5NTL		Grommet (With timer)
	D-F5□W/J59W	Tie rod mounting	Grommet (2 color indication)
	D-F5BAL		Grommet (2 color, Water resistant)
	D-F5□F		Grommet (2 color, With diagnostic output)
	D-G39C/K39C		Terminal conduit

\* It is not possible to mount D-G5□W, K59W, G5BA, G59F for bore size ø40, ø50.

**Caution** Minimum stroke to be able to mount depends on mounting support style of cylinder and switch style. Especially note it for center trunnion style. (Refer to below table for minimum stroke to be able to mount the cylinder.)

## Minimum Strokes for Auto Switch Mounting

n: Number of auto switches

Part No.	No. of auto switches	Mounting bracket except for center trunnion	Center trunnion style			
			ø40,ø50	ø63	ø80	ø100
D-A5 D-A6 D-F5□ D-J5□	With 2 (Different and same)	15	90	100	110	120
	With 1					
D-A59W	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, ...
	With 2 (Different side and same side)	20	90	100	110	120
	n (Same)	$20+55 \frac{(n-2)}{2}$ 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, ...
D-F5□W D-J59W D-F5BA D-F5□F D-F5NTL	With 2 (Different and same)	25	110	120	130	140
	With 1					
D-B5 D-B6 D-G5□ D-K59 D-K59W D-G5□W D-G5BAL D-G59F D-G5NTL	With 2	Different	15	90	100	110
	Same	75	90	100	110	
D-B59W	With n	Different mounting	$15+50 \frac{(n-2)}{2}$ 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	$75+50 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$90+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$100+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$110+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
	With 1	Different	20	90	100	110
		Same	75	90	100	110

## Auto Switch Mounting Bracket Part No.

Model No. of auto switch	Bore size (mm)				
	40	50	63	80	100
D-A5/A6 D-A59W D-F5□/J5□ D-F5□W/J59W D-F5NT D-F5BAL/F5□F	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/B6 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

\* Mounting bracket for D-A3□C, A44C, G39C, K39C are attached. When ordering, specify the part no. according to 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  
When new mounting bracket is needed, order it as above part no.

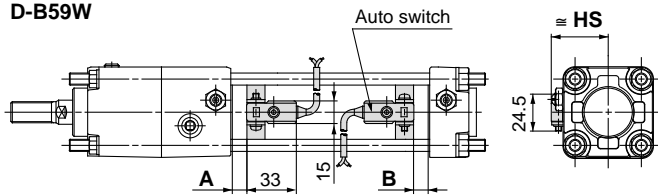
n: Number of auto switches

Part No.	No. of auto switches	Mounting bracket except for center trunnion	Center trunnion style			
			ø40,ø50	ø63	ø80	ø100
D-A3 D-G39 D-K39	With 2	Different	35	75	80	90
		Same side	100	100	100	100
	With n	Different mounting	$35+30 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
		Same side	$100+100 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$100+100 \frac{(n-2)}{2}$ , n=2, 4, 6, 8, ...		
D-A44	With 2	Different mounting	35	75	80	90
		Same side	55	75	80	90
	With n	Different mounting	$35+30 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+30 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
		Same	$55+50 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
D-A3□C D-G39C D-K39C	With 2	Different	20	75	80	90
		Same side	100	100	100	100
	With n	Different mounting	$20+35 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
		Same	$100+100 \frac{(n-2)}{2}$ n=2, 3, 4, 5, ...	$100+100 \frac{(n-2)}{2}$ , n=2, 4, 6, 8, ...		
D-A44C	With 2	Different	20	75	80	90
		Same	55	75	80	90
	With n	Different mounting	$20+35 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+35 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
		Same side	$55+50 \frac{(n-2)}{2}$ n=2, 3, 4, ...	$75+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$80+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...	$90+50 \frac{(n-2)}{2}$ n=2, 4, 6, 8, ...
With 1	Different	10	75	80	90	

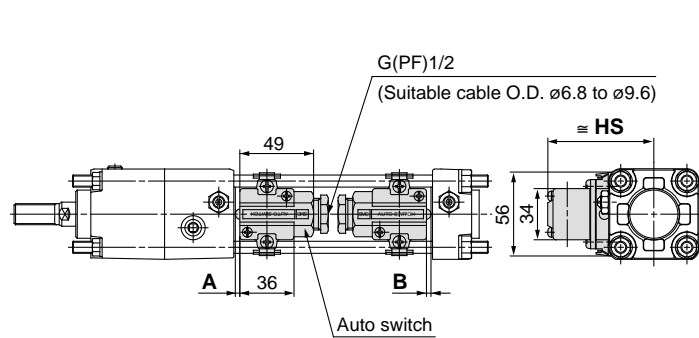
## Auto Switch/Proper Mounting Position and Height for Stroke End Detection

### <Band mounting>

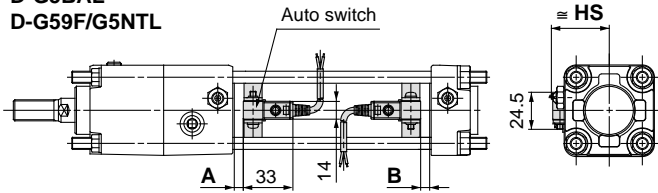
D-B5/B6  
D-B59W



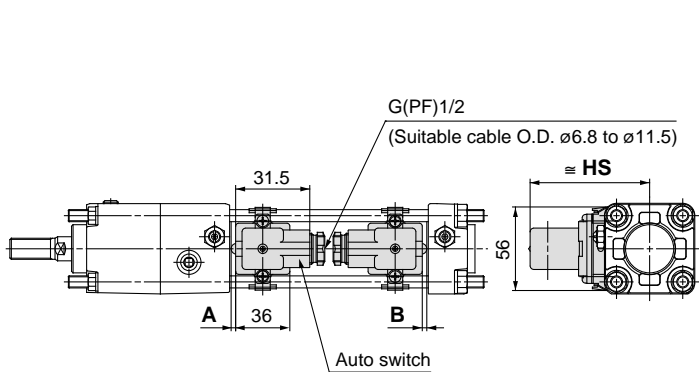
D-A3  
D-G39/K39



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

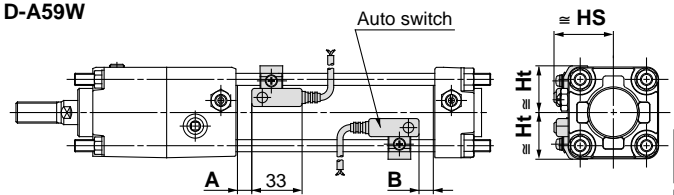


D-A44

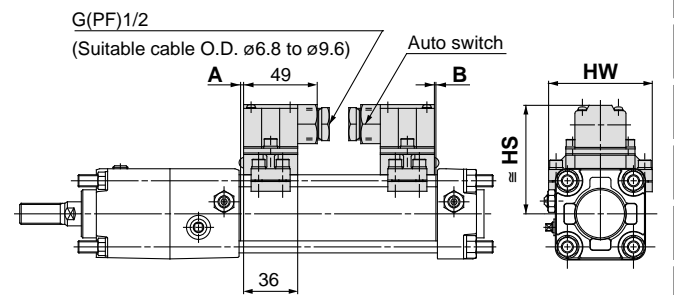


### <Tie rod mounting>

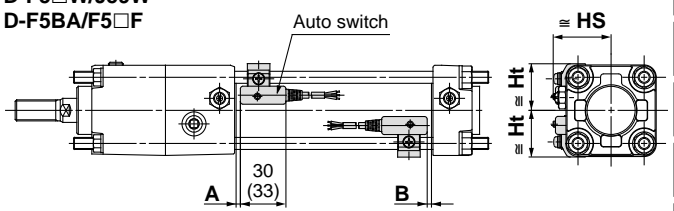
D-A5/A6  
D-A59W



D-A3□C  
D-G39C/K39C

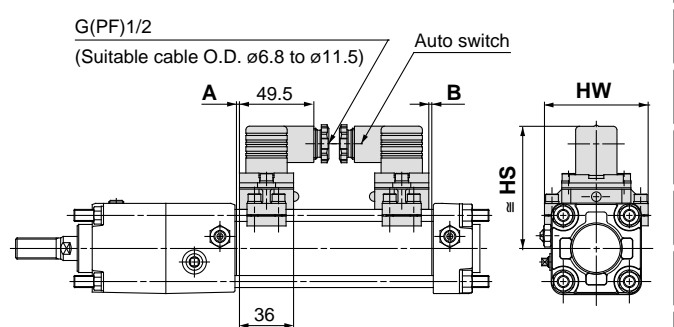


D-F5□/J5□  
D-F5NTL  
D-F5□W/J59W  
D-F5BA/F5□F



\*( ) : D-F5LF

D-A44C



### Auto Switch Mounting Position (mm)

Auto switch model	D-A5/A6		D-B5/B6		D-B59W		D-G5□/K59		D-A59W		D-F5□W/J59W		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 flange style mounting support.

### Auto Switch Mounting Height (mm)

Auto switch model	D-B5/B6		D-A3	D-A5		D-F5□		D-A3□C		D-A44C	
	Hs	Ht		Hs	Ht	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

- CL
- MLGC
- CNA**
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

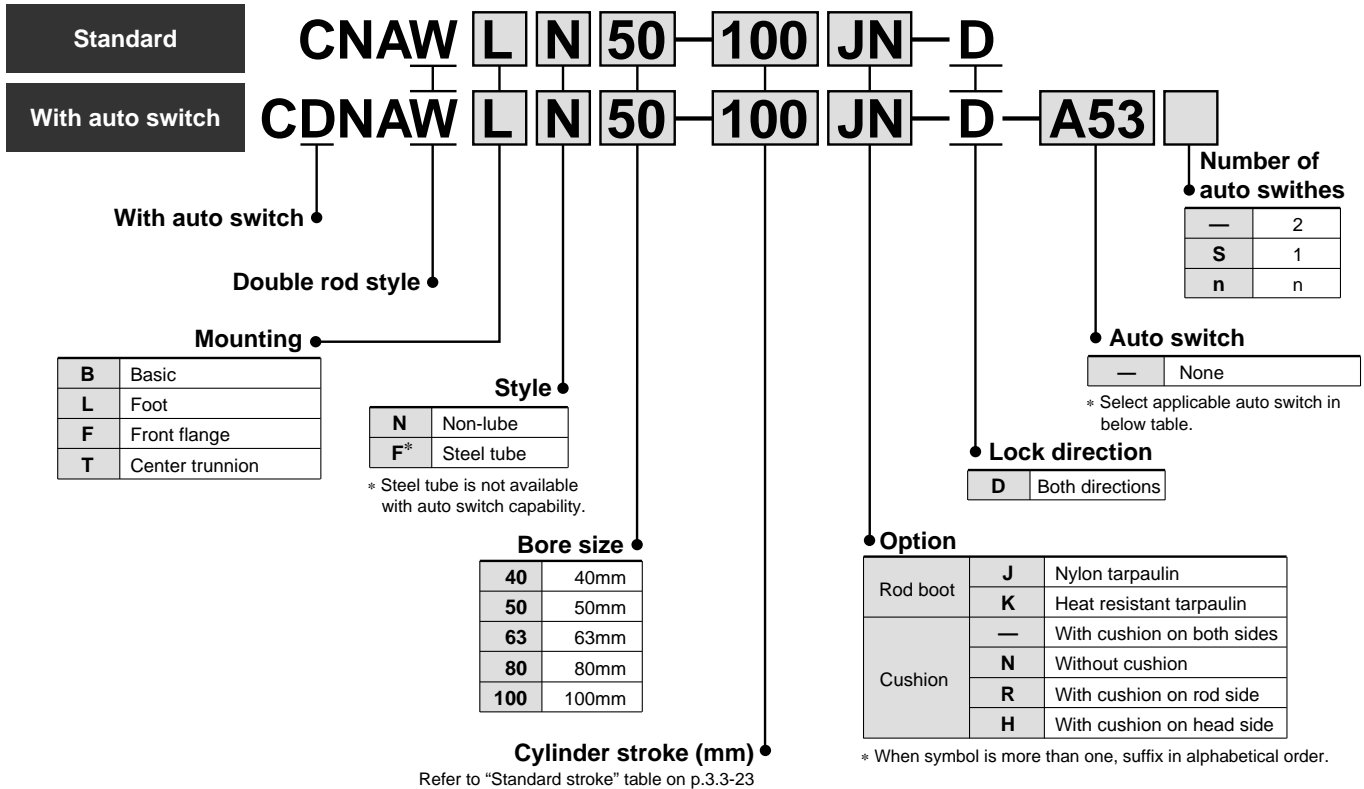
# Cylinder with Lock/Double Acting Double Rod

# Series CNAW

ø45, ø50, ø63, ø80, ø100



## How to Order



### Applicable Auto Switch/Refer to p.5.3-2 for further information on auto switch.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)*			Applicable load					
					DC	AC	Tie rod mounting	Band mounting	0.5 (-)	3 (L)	5 (Z)						
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	24V	5V	—	A56	—	●	●	—	IC				
						12V	—	A53	B53	●	●	●	—	PLC			
						12V	100V, 200V	A54	B54	●	●	●	—	Relay, PLC			
						5V, 12V	—	A67	—	●	●	—	—	IC			
		Terminal conduit	Yes	DIN connector	No	2 wire	24V	≤ 200V	—	A64	B64	●	●	—	Relay, PLC		
								—	—	A33C	A33	—	—	—	—	PLC	
								12V	—	A34C	A34	—	—	—	—	—	
								100V, 200V	—	A44C	A44	—	—	—	—	Relay, PLC	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	F59	G59	●	●	○	IC				
								3 wire (PNP)	F5P	G5P	●	●	○	—			
								2 wire	—	J51	—	●	●	○	—		
								—	—	100V, 200V	—	●	●	○	—		
								12V	—	J59	K59	●	●	○	—		
								5V, 12V	—	G39C	G39	—	—	—	IC		
		Terminal conduit	Yes	DIN connector	No	2 wire	24V	12V	—	K39C	K39	—	—	—	—		
										5V, 12V	—	F59W	G59W**	●	●	○	IC
										5V, 12V	—	F5PW	G5PW**	●	●	○	—
										12V	—	J59W	K59W**	●	●	○	—
										12V	—	F5BA	G5BA**	—	—	—	—
										5V, 12V	—	F5NT	G5NT	—	●	○	IC
Grommet	Yes	DIN connector	No	4 wire (NPN)	24V	—	—	F59F	G59F**	●	●	○	—				
								—	—	F5LF	—	●	●	○	—		
								—	—	—	—	—	—	—	—		
								—	—	—	—	—	—	—	—		

\* Lead wire length symbol 0.5m..... (Example) A53  
 3m.....L (Example) A53L  
 5m.....Z (Example) A53Z

\* Solid state switch marked O is manufactured upon receipt of order.  
 \*\* D-G5□W, K59W, G5BA, G59F are not available for bore size ø40, ø50.

### Part No. of Cylinder with Built-in Magnet

If ordering cylinder with built-in magnet without auto switch, symbol for auto switch is Nil.  
 (Example) CDNAWLN40-100-D

### Mounting Bracket Part No.

Refer to p.3.3-24 for part number of mounting bracket except for basic style.

# Cylinder with Lock/Double Acting Double Rod *Series CNA*



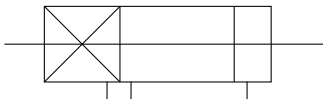
## Cylinder Specification

<b>Bore size (mm)</b>	ø40, ø50, ø63, ø80, ø100
<b>Fluid</b>	Air
<b>Style</b>	Non-lube
<b>Action</b>	Double acting
<b>Lock operation</b>	Spring lock
<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Min. operating pressure</b>	0.08MPa
<b>Operating piston speed</b>	50 to 1000mm/s*
<b>Ambient and fluid temperature</b>	Without auto switch: -10°C to 70°C With auto switch : -10°C to 60°C (No freezing)
<b>Cushion</b>	Air cushion
<b>Allowable stroke tolerance</b>	to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500: $^{+1.8}_0$
<b>Mounting bracket</b>	Basic, Axial foot, Front flange, Center trunnion

\* Load is limited by piston speed, mounting direction, operating pressure at locking.

### JIS symbol

Double acting  
Double rod



## Lock Specifications

<b>Lock style</b>	Spring lock (Exhaust lock)
<b>Lock release pressure</b>	0.25MPa or more
<b>Lock starting pressure</b>	0.20MPa or less
<b>Max. operating pressure</b>	1.0MPa
<b>Lock direction</b>	Both directions

## Standard Strokes/

Refer to "Allowable min. stroke of auto switch mounting" on p.3.3-20 for auto switches.

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

Unit: mm

Locking style	Operating piston speed (mm/s)			
	100	300	500	1000
Spring lock	±0.3	±0.6	±1.0	±2.0

Condition/Lateral, Supply pressure P=0.5MPa

Load weight---Top limit of allowable value

Solenoid valve for locking mounted on locking release port

Maximum value of stop position in measured 100 times

## Holding Force of Spring Lock (Max. static load)

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

CL

MLGC

**CNA**

CB

CV/MVG

CXW

CXS

CXT

MX

MXU

MXS

MXQ

MXF

MXW

MPX

MG

MGP

MGQ

MGG

MGC

MGF

CY1

MY1

# 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 brackets per cylinder.

## Rod Boot Materials

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

\* Max. ambient temperature of rod boot unit.

## Accessories

Mounting		Basic	Foot	Flange	Trunnion
Standard	Rod end nut	●	●	●	●
	Pin for clevis	—	—	—	—
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint	●	●	●	●
	Rod boot	●	●	●	●

\* Refer to p.3.3-19 for optional bracket dimensions of CNA double acting: single rod style.

## Weight/ ( ): Value for steel tube

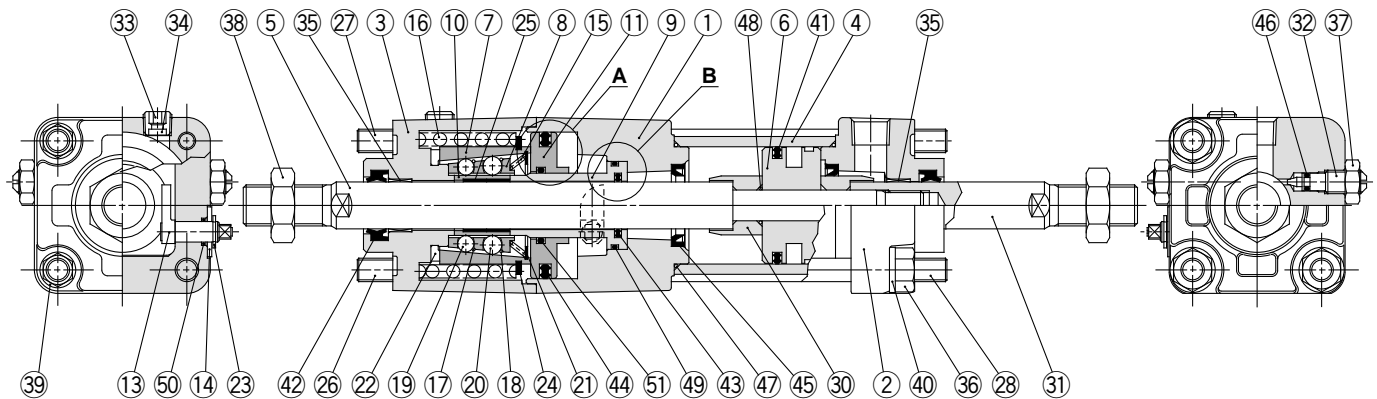
Bore size (mm)		40	50	63	80	100
Basic weight	Basic	1.84 (1.89)	2.93 (2.99)	4.34 (4.38)	7.76 (7.92)	11.50 (11.71)
	Foot	2.03 (2.08)	2.97 (3.01)	4.68 (4.72)	8.43 (8.59)	12.49 (12.70)
	Flange	2.21 (2.26)	3.20 (3.24)	5.13 (5.17)	9.21 (9.37)	13.42 (13.63)
	Trunnion	2.29 (2.39)	3.28 (3.38)	5.23 (5.43)	9.46 (9.75)	13.90 (14.29)
Additional weight for each 50 stroke	Aluminum tube	Every 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	0.44	0.58	0.77	1.06
Accessories	Single knuckle joint		0.23	0.26	0.26	0.60
	Double knuckle joint		0.32	0.38	0.38	0.73
	Pin for knuckle joint		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 stroke  
 Cylinder stroke.....100 stroke  
 $2.03 + 0.03 \times 100 / 50 = 2.63$  kg

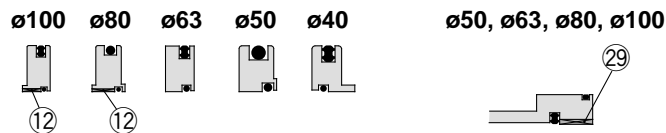


# Cylinder with Lock/Double Acting Double Rod *Series CNA*

## Construction



**A section (Release piston bushing)    B section (Piston guide bushing)**



### Component Parts

No.	Description	Material	Note	
①	Rod cover	Aluminum alloy	Black coated after hard anodized	
②	Rod cover	Aluminum alloy	Black coated	
③	Cover	Aluminum alloy	Black coated after hard anodized	
④	Cylinder tube	Aluminum alloy	Hard anodized	
⑤	Piston rod A	Carbon steel	Hard chrome plated	
⑥	Piston	Aluminum alloy	Chromate	
⑦	Taper ring	Carbon steel	Heat treatment	
⑧	Ball retainer	Special resin		
⑨	Piston guide	Carbon steel	Zinc chromated	
⑩	Brake shoe holder	Special steel	Heat treatment	
⑪	Brake release piston	ø40	Aluminum alloy	Hard anodized
		ø50		
		ø63		
		ø80	Carbon steel	Zinc chromated
		ø100		
⑫	Brake release piston bushing	Steel + Special resin	Hard anodized	
⑬	Cam for lock release	Chrome molybdenum steel	Zinc chromated	
⑭	Washer	Carbon steel	Black zinc chromated	
⑮	Spring for retainer initial pressure	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	Damper	Polyurethane rubber		
㉓	Snap ring for release cam axis	Carbon steel		
㉔	Snap ring for taper ring	Carbon steel		
㉕	Brake shoe	Special friction material		
㉖	Tie rod A for unit attachment	Carbon steel	Electrogalvanized chromated	
㉗	Tie rod B for unit attachment	Carbon steel	Electrogalvanized chromated	
㉘	Tie rod	Carbon steel	Electrogalvanized chromated	
㉙	Bushing	Lead bronze casting		

### Component Parts

No.	Description	Material	Note
⑳	Cushion ring A	Rolled steel	Zinc chromated
㉑	Piston rod B	Rolled steel	Zinc chromated
㉒	Cushion valve	Rolled steel	Nickel plated
㉓	Plug with hex. Hole	Chrome molybdenum steel	Black zinc chromated
㉔	Element	Bronze	
㉕	Bushing	Lead bronze casting	
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	Gasket for piston guide	NBR	
㊵	Gasket for release cam	NBR	
㊶	O ring	NBR	

### Replacement Parts: Seal Kits

Bore size (mm)	Parts No.	Note
40	CA1N 40A-PS	Including No. ④①, ④②, ④⑥ and ④⑦.
50	CA1N 50A-PS	
63	CA1N 63A-PS	
80	CA1N 80A-PS	
100	CA1N100A-PS	

\* As a general rule, the lock section of the CNA series is replaced as a unit, and therefore, the replacement seal kits are for the cylinder section only. These can be ordered using the order number for each bore size.

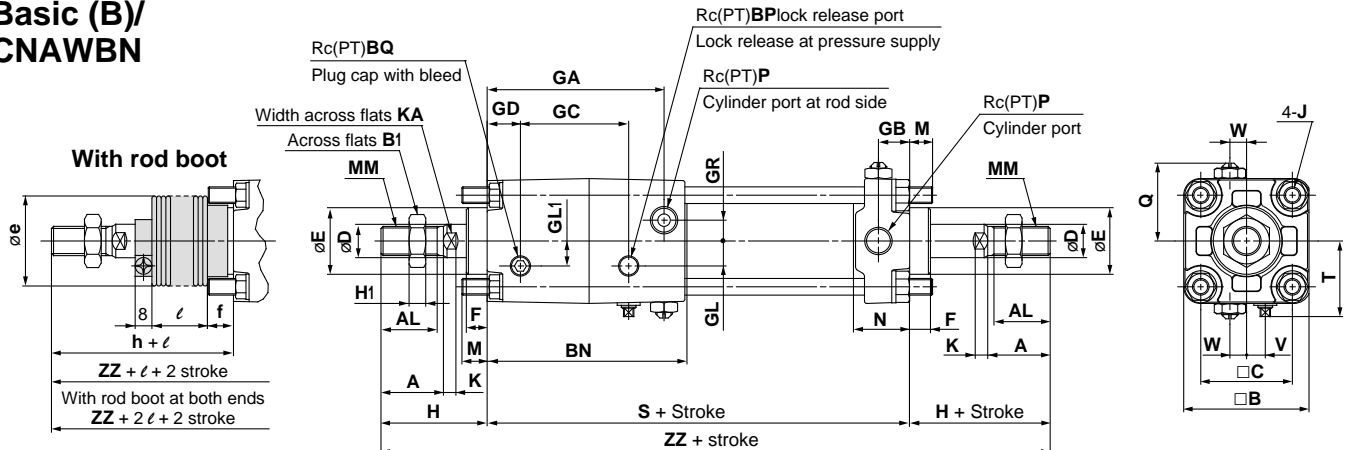
- CL
- MLGC
- CNA**
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

# Series CNAW

## Dimensions



### Basic (B)/ CNAWBN

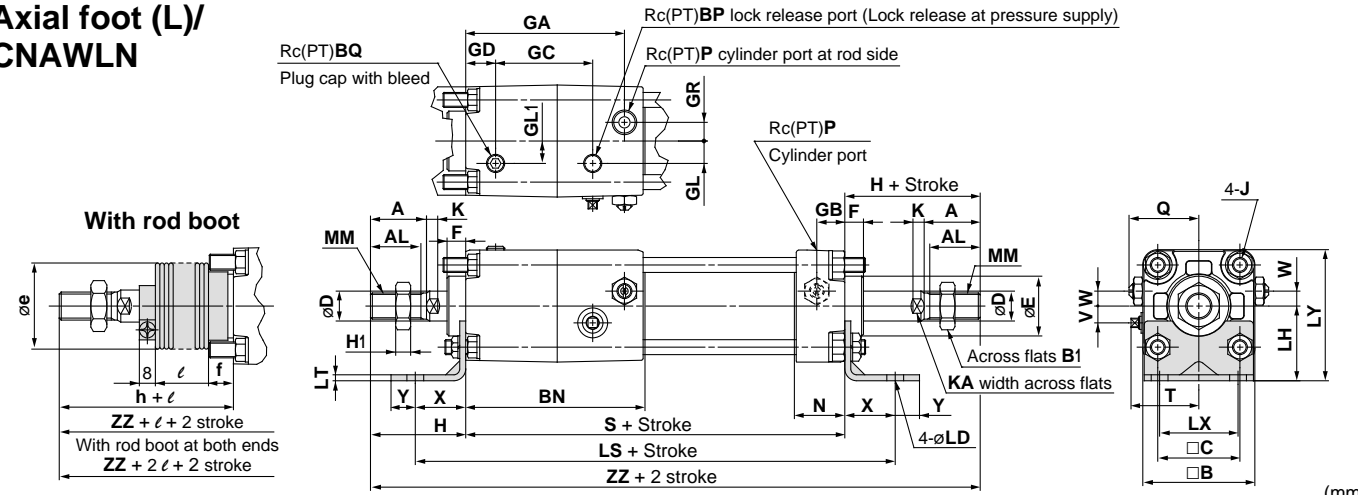


Bore (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	F	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	K	KA
40	to 500	30	27	60	22	96	1/8	1/8	44	16	32	10	85	15	52	16	12	12	10	8	M8 X 1.25	6	14
50	to 600	35	32	70	27	108	1/4	1/8	52	20	40	10	95	17	56.5	20	13	15	12	11	M8 X 1.25	7	18
63	to 600	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	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	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 (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

Bore (mm)	Stroke range (mm)	e	f	h	l	ZZ (One)	ZZ (Both)
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 (L)/ CNAWLN



Bore (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	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	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	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	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	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

Bore (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

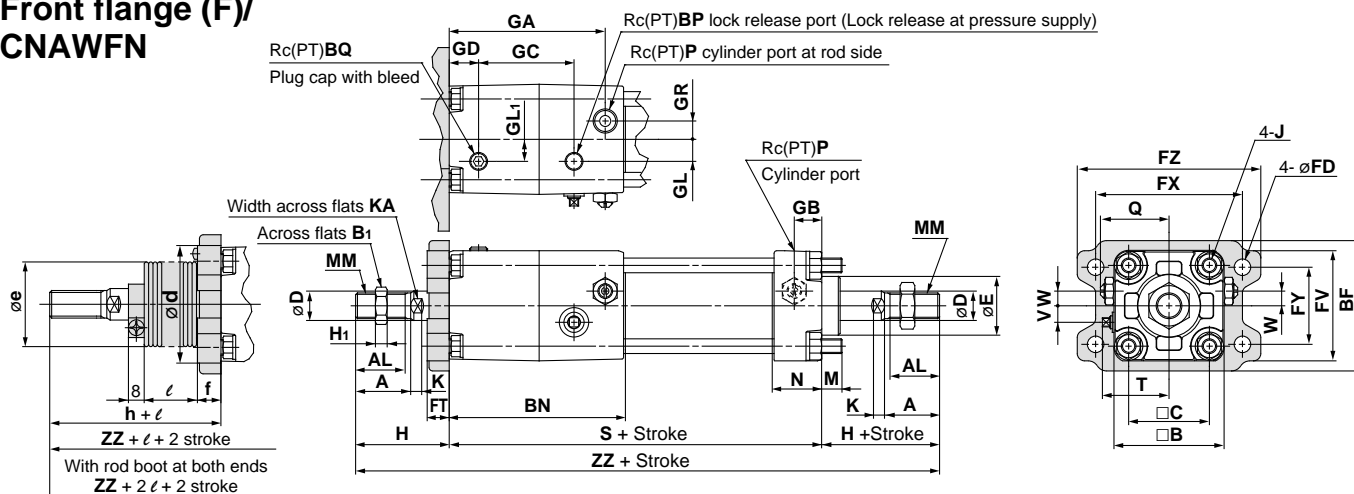
Bore (mm)	Stroke range (mm)	e	f	h	l	ZZ (One)	ZZ (Both)
40	20 to 500	43	11.2	59	1/4 Stroke	263	271
50	20 to 600	52	11.2	66	1/4 Stroke	292	300
63	20 to 600	52	11.2	66	1/4 Stroke	306	314
80	20 to 750	65	12.5	80	1/4 Stroke	369	378
100	20 to 750	65	14	81	1/4 Stroke	399	408

CNAWBN [Bore size] ..... SCNA [Bore size], #8 (#8+#11)  
 CNAWLN [Bore size] ..... Add foot bracket (#2) to -SCNA [Bore size], #8 (#8+#11)

# Cylinder with Lock/Double Acting Double Rod *Series CNA*



## Front flange (F)/ CNAWFN

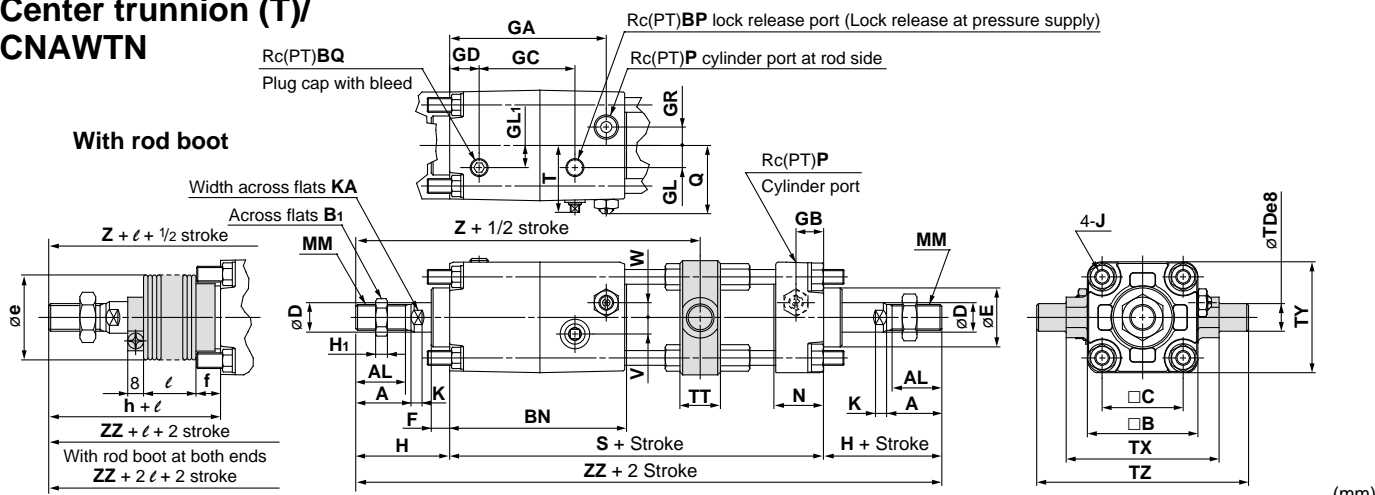


Bore (mm)	Stroke range (mm)	A	AL	B	B <sub>1</sub>	BN	BP	BQ	C	D	E	FD	FT	FV	FX	FY	FZ	GA	GB	GC	GD	GL	GL <sub>1</sub>	GR	H <sub>1</sub>	J	
40	to 500	30	27	60	22	71	96	1/8	1/8	44	16	32	9	12	60	80	42	100	85	15	52	16	12	12	10	8	M8 X 1.25
50	to 600	35	32	70	27	81	108	1/4	1/8	52	20	40	9	12	70	90	50	110	95	17	56.5	20	13	15	12	11	M8 X 1.25
63	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	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	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 (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

Bore (mm)	Stroke range (mm)	d	e	f	h	l	ZZ (One)	ZZ (Both)
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 (T)/ CNAWTN



Bore (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

Bore (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 (mm)	Stroke range (mm)	e	f	h	l	Z	ZZ (One)	Z (Both)	ZZ (Both)
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

**CAD** CNAWFN [Bore size] ..... Add flange bracket (#3) to -SCNA [Bore size], #8 (#8+#11)  
**CAD** CNAWTN [Bore size] ..... Add trunnion bracket (#7) to -SCNA [Bore size], #8 (#8+#11)

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