

# Air Cylinder

## CA2 Series

ø40, ø50, ø63, ø80, ø100

RoHS

Reduced weight by changing the shape of the rod cover and head cover.

Weight reduced by up to

(ø50-50 stroke)  
**15% lighter**

**1.31 kg**

**1.54 kg**  
Current model



CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

### Easy air cushion control

Number of cushion valve adjustment rotations increased from 1 rotation to **3 rotations**.

Fine adjustment becomes easy, **ensuring smooth operation at the stroke end.**



Cushion valve

Hexagon wrench

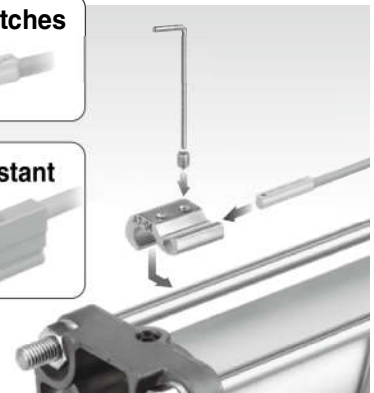
Various switches such as compact auto switches and magnetic field resistant auto switches can be mounted.

#### Compact auto switches

- D-M9
- D-A9

#### Magnetic field resistant auto switches

- D-P3DWA
- D-P4DW



D-

-X

Technical  
Data

## Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately

Note) Mounting bracket is shipped together with the product, but not assembled.

Example) CDA2 **D** 40-100Z- **N** **W** -M9BW

• Mounting

### Pivot bracket

<b>Nil</b>	None
<b>N</b>	Pivot bracket is shipped together with the product, but not assembled.

\* Applicable to only mounting D (Double clevis) and T (Center trunnion).

**N:** Kit of pivot bracket and double clevis



Kit of pivot bracket and trunnion



### Rod end bracket

<b>Nil</b>	None
<b>V</b>	Single knuckle joint
<b>W</b>	Double knuckle joint

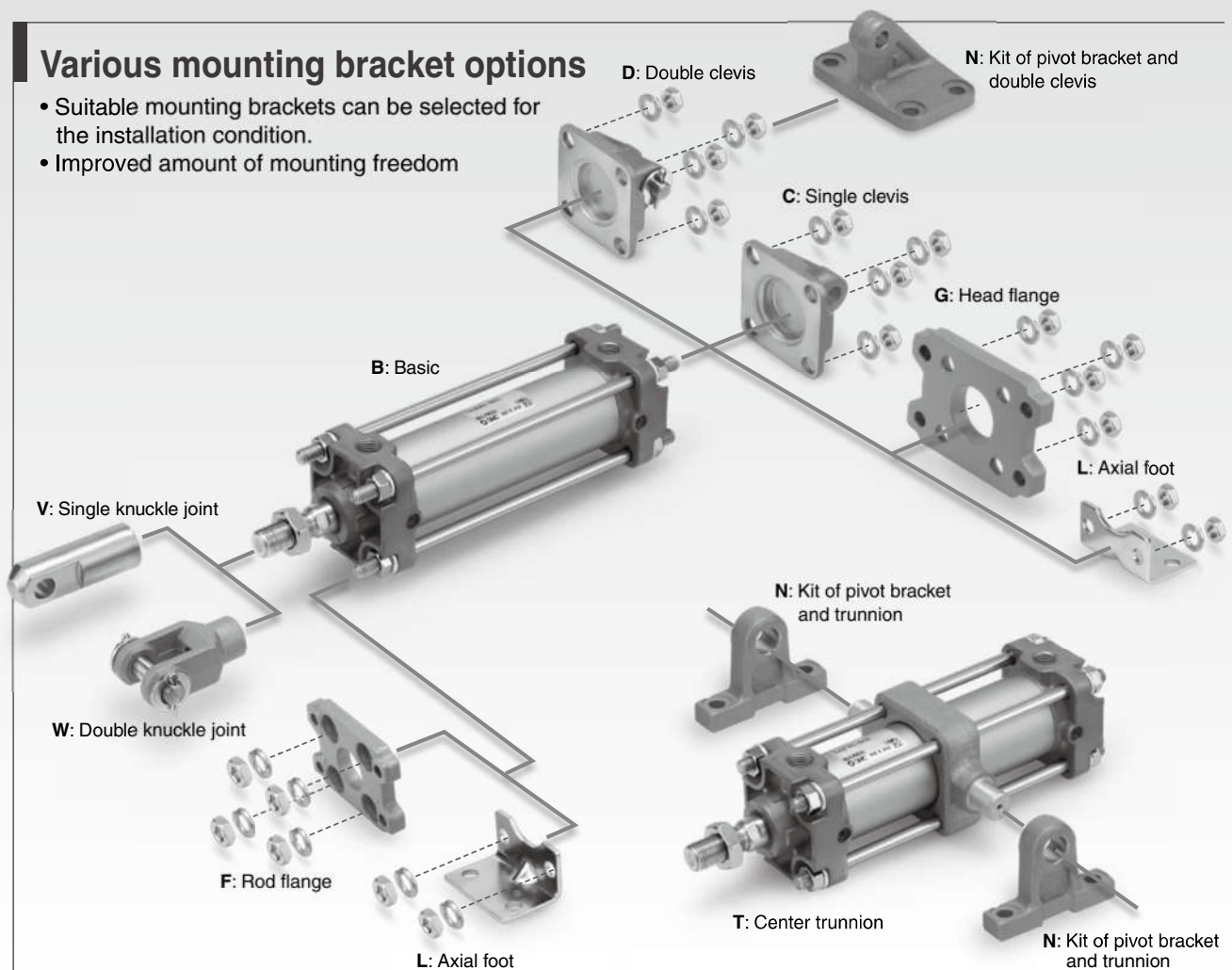
### With rod end bracket

**V:** Single knuckle joint **W:** Double knuckle joint



## Various mounting bracket options

- Suitable mounting brackets can be selected for the installation condition.
- Improved amount of mounting freedom



Reduced weight by changing the shape of the rod cover and head cover.

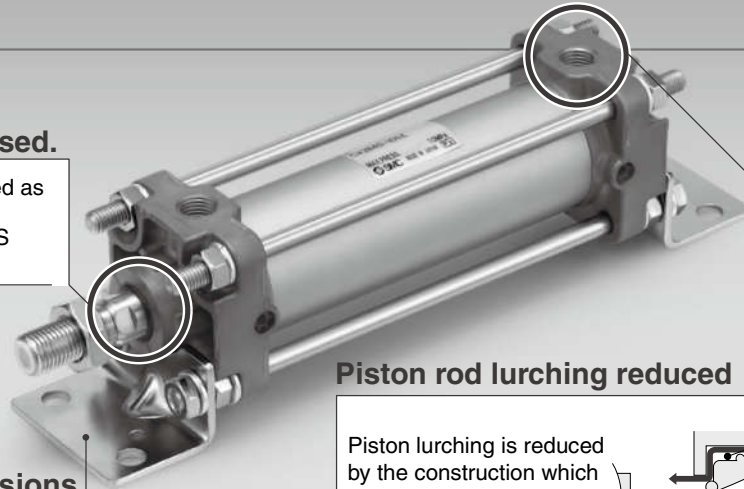
Bore size (mm)	CA2	Reduction rate	Current model (kg)
40	0.93	12%	1.06
50	1.31	15%	1.54
63	1.84	14%	2.15
80	3.17	11%	3.56
100	4.29	10%	4.76

\* Compared to 50 stroke for each size

No substances hazardous to the environment are used.

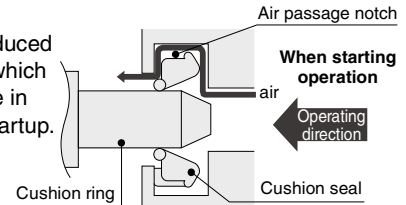
Lead free bushing is used as sliding material. Compliant with EU RoHS directive.

Mounting dimensions are the same as the current product.



### Piston rod lurching reduced

Piston lurching is reduced by the construction which minimizes resistance in the air passage at startup.



### Stroke Variations

Bore size (mm)	Standard stroke																
	25	50	75	100	125	150	175	200	250	300	350	400	450	500	600	700	Up to 1800
40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
80	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

### Series Variations

Series	Type	Bore size (mm)					Variations		Page
		40	50	63	80	100	With rod boot	Water resistant	
<b>Standard</b> <b>CA2-Z</b> 	Single rod	●	●	●	●	●	●	●	Page 470
	Double rod	●	●	●	●	●	●	●	Page 486
<b>Non-rotating rod</b> <b>CA2K</b> 	Single rod	●	●	●	●	●	●	●	Page 494
	Double rod	●	●	●	●	●	●	●	Page 498
<b>With end lock</b> <b>CBA2</b> 	Single rod	●	●	●	●	●	●	●	Page 502
<b>Air-hydro</b> <b>CA2□H</b> 	Single rod	●	●	●	●	●	●	●	Page 508
	Double rod	●	●	●	●	●	●	●	Page 512
<b>Smooth Cylinder</b> <b>CA2Y-Z</b> 	Single rod	●	●	●	●	●	●	●	Best Pneumatics No. 2-3
<b>Low friction</b> <b>CA2□Q</b> 	Use the new series "Smooth Cylinder CA2Y Series" to realize both-direction low friction and low-speed operation. (Refer to the Best Pneumatics No. 2-3.)								

\* For details about the clean series, refer to the "Pneumatic Clean Series" (CAT.E02-23).

- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2**
- CS1
- CS2

- D-□
- X□

Technical Data

# Combinations of Standard Products and Made to Order Specifications

## CA2 Series

- : Standard
- ◎ : Made to Order
- : Special product (Please contact SMC for details.)
- : Not available

Series	CA2 (Standard type)		CA2K <sup>Note 4)</sup> (Non-rotating rod type)	
	Double acting			
Action/ Type	Single rod	Double rod	Single rod	Double rod
Page	Page 470	Page 486	Page 494	Page 498

Symbol	Specifications	Applicable bore size	—			
<b>Standard</b>	Standard	ø40 to ø100	●	●	●	●
<b>CDA2-□Z</b>	Built-in magnet		●	●	●	●
<b>Long st</b>	Long stroke		●	●	○	○
<b>CA2□-□JZ</b>	With rod boot (Nylon tarpaulin)		●	●	●	●
<b>CA2□-□KZ</b>	With rod boot (Heat resistant tarpaulin)		●	●	●	●
<b>10-, 11-</b>	Clean series <sup>Note 4)</sup>	ø40 to ø63	●	○	—	—
<b>25A-</b>	Copper (Cu) and Zinc (Zn)-free <sup>Note 1)</sup>	ø40 to ø100	●	○	—	—
<b>20-</b>	Copper <sup>Note 2)</sup> and Fluorine-free		●	●	●	●
<b>CA2□R</b>	Water resistant (NBR seal)	ø40 to ø100	●	○	—	—
<b>CA2□V</b>	Water resistant (FKM seal)		●	○	—	—
<b>CA2□M</b>	Cylinder with stable lubrication function (Lube-retainer)		●	○	—	—
<b>XA□</b>	Change of rod end shape	ø40 to ø100	◎	◎	◎	○
<b>XB5</b>	Oversized rod cylinder <sup>Note 4)</sup>		◎	○	—	—
<b>XB6</b>	Heat resistant cylinder (-10 to 150°C)		◎	◎	—	—
<b>XC3</b>	Special port location <sup>Note 4)</sup>		◎	◎	○	○
<b>XC4</b>	With heavy duty scraper		◎	◎	—	—
<b>XC5</b>	Heat resistant cylinder (-10 to 110°C)		◎	◎	—	—
<b>XC6</b>	Made of stainless steel <sup>Note 4)</sup>		—	—	—	—
<b>XC7</b>	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel		◎	◎	◎	◎
<b>XC8</b>	Adjustable stroke cylinder/Adjustable extension type		◎	—	◎	○
<b>XC9</b>	Adjustable stroke cylinder/Adjustable retraction type		◎	—	◎	—
<b>XC10</b>	Dual stroke cylinder/Double rod type		◎	—	◎	—
<b>XC11</b>	Dual stroke cylinder/Single rod type		◎	○	◎	—
<b>XC12</b>	Tandem cylinder		◎	○	○	—
<b>XC14</b>	Change of trunnion bracket mounting position		◎	◎	◎	◎
<b>XC15</b>	Change of tie-rod length		◎	◎	◎	◎
<b>XC22</b>	Fluororubber seal		◎	◎	—	—
<b>XC27</b>	Double clevis and double knuckle joint pins made of stainless steel		◎	—	◎	—
<b>XC28</b>	Compact flange made of SS400		◎	◎	◎	◎
<b>XC29</b>	Double knuckle joint with spring pin		◎	○	○	○
<b>XC30</b>	Rod trunnion		◎	○	○	○
<b>XC35</b>	With coil scraper		◎	◎	—	—
<b>XC65</b>	Made of stainless steel (Combination of XC7 and XC68)		◎	◎	—	—
<b>XC68</b>	Made of stainless steel (with hard chrome plated piston rod)		◎	◎	—	—
<b>XC85</b>	Grease for food processing equipment		◎	◎	○	○
<b>XC88</b>	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)		◎	○	—	—
<b>XC89</b>	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)		◎	○	—	—
<b>XC91</b>	Spatter resistant coil scraper, Grease for welding (Piston rod: S45C)		◎	○	—	—
<b>X1184</b>	Cylinder with heat resistant reed auto switch (-10 to 120°C)		◎	○	—	—

Note 1) For details, refer to the **Web Catalog**.  
 Note 2) Copper-free for the externally exposed part. For details, refer to the **Web Catalog**.  
 Note 3) For details about the smooth cylinder, refer to the Best Pneumatics No. 2-3.  
 Note 4) The cover shape is the same as the current product.

Use the new series "Smooth Cylinder CA2Y Series" to realize both-direction low friction and low-speed operation. (Refer to the Best Pneumatics No. 2-3.)

CBA2 <sup>Note 4)</sup> (With end lock)	CA2□H <sup>Note 4)</sup> (Air-hydro type)	CA2Y <sup>Note 3)</sup> (Smooth Cylinder)	CA2□Q <sup>Note 4)</sup> (Low friction type)		
Double acting					
Single rod	Single rod	Double rod	Single rod	Single rod	
Page 502	Page 508	Page 512	Best Pneumatics No. 2-3	Page 516	Symbol
●	●	●	●	●	Standard
●	●	●	●	●	CDA2-□Z
●	●	●	○	○	Long st
●	●	●	○	○	CA2□-□JZ
●	●	●	○	○	CA2□-□KZ
● <sup>Note 5)</sup>	—	—	—	—	10-, 11-
—	—	—	◎	—	25A-
●	○	○	—	—	20-
● <sup>Note 5)</sup>	○	○	—	—	CA2□R
● <sup>Note 5)</sup>	○	○	—	—	CA2□V
—	—	—	—	—	CA2□M
◎	◎	○	◎	◎	XA□
○	○	○	—	—	XB5
◎	—	—	—	—	XB6
◎	○	○	—	◎ <sup>Note 8)</sup>	XC3
◎ <sup>Note 5)</sup>	◎ <sup>Note 7)</sup>	◎ <sup>Note 7)</sup>	—	—	XC4
○	—	—	—	—	XC5
◎ <sup>Note 5)</sup>	◎	◎	—	◎	XC6
◎	○	○	◎	◎	XC7
◎ <sup>Note 5)</sup>	○	—	○	○	XC8
◎ <sup>Note 6)</sup>	○	—	○	◎	XC9
◎	○	—	○	◎	XC10
○	○	○	○	○	XC11
○	○	○	—	—	XC12
◎	◎	◎	◎	◎	XC14
◎	◎	◎	◎	◎	XC15
◎	○	○	—	—	XC22
◎	○	—	◎	◎	XC27
◎	○	○	◎	◎	XC28
◎	○	○	◎	◎	XC29
—	○	○	◎	◎	XC30
◎	○	○	—	—	XC35
○	○	○	◎	◎	XC65
—	—	—	◎	—	XC68
○	—	—	—	—	XC85
○	—	—	—	—	XC88
○	—	—	—	—	XC89
○	—	—	—	—	XC91
○	—	—	—	—	X1184

Note 5) Available only for locking at head end.  
 Note 6) Available only for locking at rod end.  
 Note 7) Standard for the air-hydro type  
 Note 8) CA2□Q series has no cushion. Only XC3BC, XC3CD and XC3DA are available.

- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2**
- CS1
- CS2

- D-□
- X□
- Technical Data

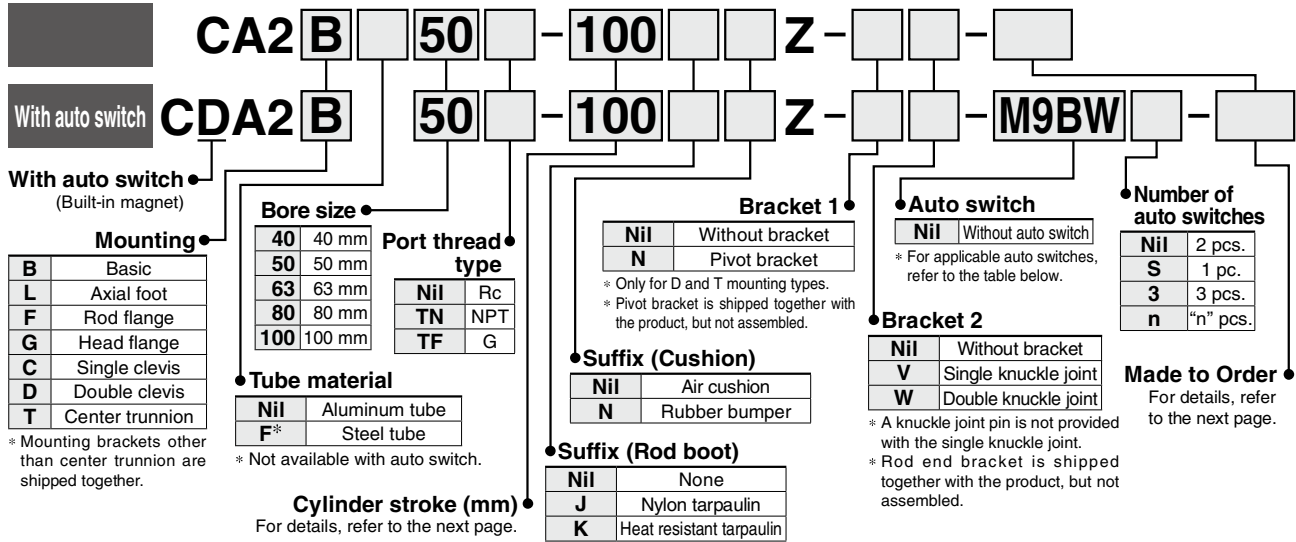
# Air Cylinder: Standard Type Double Acting, Single Rod

## CA2 Series

∅40, ∅50, ∅63, ∅80, ∅100



### How to Order



### Applicable Auto Switches/Refer to pages 1575 to 1701 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-wired connector	Applicable load				
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC			
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	○	○	IC circuit	—			
				3-wire (PNP)				—	●	●	○	○						
				2-wire	—	●	●	○	○									
		Terminal conduit		3-wire (NPN)	24 V	12 V	—	G39C	G39	—	—	—	—			—	IC circuit	Relay, PLC
				2-wire				—	●	●	○	○						
				3-wire (NPN)	5 V, 12 V	—	M9NW	—	●	●	○	○						
	3-wire (PNP)	—	●	●			○	○										
	Grommet	2-wire	24 V	12 V	—	M9PW	—	●	●	○	○	IC circuit	Relay, PLC					
		3-wire (NPN)				—	●	●	○	○								
		3-wire (PNP)	—	●	●	○	○											
	Grommet	2-wire	24 V	12 V	—	M9BW	—	●	●	○	○			IC circuit	Relay, PLC			
		3-wire (NPN)				—	●	●	○	○								
3-wire (PNP)		—	●	●	○	○												
Terminal conduit	2-wire	24 V	12 V	—	M9NA*1	—	○	○	●	○	IC circuit	Relay, PLC						
	3-wire (NPN)				—	○	○	●	○									
	3-wire (PNP)	—	○	○	●	○												
Grommet	2-wire	24 V	12 V	—	M9BA*1	—	○	○	●	○			IC circuit	Relay, PLC				
	3-wire (NPN)				—	○	○	●	○									
	3-wire (PNP)	—	○	○	●	○												
Terminal conduit	4-wire (NPN)	24 V	12 V	—	F59F	G59F	●	—	●	○	IC circuit	Relay, PLC						
	2-wire (Non-polar)				—	—	—	—	—	—					—			
	3-wire (NPN equivalent)	—	5 V	—	A96	—	●	—	●	—								
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	12 V	—	A93	—	●			●	●	—	IC circuit	Relay, PLC	
								100 V	A90	—			●	—	—			—
								100 V or less	A54	B54			●	—	●			—
								200 V or less	A64	B64	●	—	●	—				
								200 V or less	A33C	A33	—	—	—	—				
		Terminal conduit		100 V, 200 V	A34C	A34	—	—	—	—	—	PLC						
				—	A44C	A44	—	—	—	—								
				—	A59W	B59W	●	—	●	—								
				—	—	—	—	—	—	—								
				—	—	—	—	—	—	—								

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. A water-resistant type cylinder is recommended for use in an environment which requires water resistance.

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
1 m..... M (Example) M9NWM  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NwZ

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

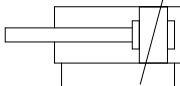
\* Since there are other applicable auto switches than listed above, refer to page 523 for details.  
\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.  
\* The D-A9□/M9□□□/P3DWA□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)





**Symbol**

Double acting



Air cushion



**Made to Order: Individual Specifications**  
(For details, refer to page 524.)

Symbol	Specifications
-X1184	Cylinder with heat resistant reed auto switch (-10 to 120°C)

**Made to Order**

[Click here for details](#)

Symbol	Specifications
-XA	Change of rod end shape
-XB5	Oversized rod cylinder*
-XB6	Heat resistant cylinder (-10 to 150°C)
-XC3	Special port location*
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (-10 to 110°C)
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC12	Tandem cylinder
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluororubber seal
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC28	Compact flange made of SS400
-XC29	Double knuckle joint with spring pin
-XC30	Rod trunnion
-XC35	With coil scraper
-XC65	Made of stainless steel (Combination of XC7 and XC68)
-XC68	Made of stainless steel (with hard chrome plated piston rod)
-XC85	Grease for food processing equipment
-XC88	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)
-XC89	Spatter resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)
-XC91	Spatter resistant coil scraper, Grease for welding (Piston rod: S45C)

For special port location (-XC3), the mounting bracket and port location can be determined using the standard product corresponding to the operating conditions.

\* The cover shape is the same as the current product.

For made of stainless steel (-XC6), use made of stainless steel (with hard chrome plated piston rod) (-XC68) that the surface treatment is performed on the piston rod with the same specifications.

Refer to pages 517 to 523 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Operating range
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.

**Specifications**

Bore size (mm)		40	50	63	80	100	
Fluid		Air					
Action		Double acting					
Proof pressure		1.5 MPa					
Maximum operating pressure		1.0 MPa					
Ambient and fluid temperature		Without auto switch: -10 to 70°C*1 With auto switch : -10 to 60°C*1					
Minimum operating pressure		0.05 MPa					
Piston speed		50 to 500 mm/s					
Cushion		Air cushion or Rubber bumper					
Stroke length tolerance		Up to 250 st: <sup>+1.0</sup> / <sub>0</sub> 251 to 1000 st: <sup>+1.4</sup> / <sub>0</sub> 1001 to 1500 st: <sup>+1.8</sup> / <sub>0</sub> 1501 to 1800 st: <sup>+2.2</sup> / <sub>0</sub>					
Lubrication		Not required (Non-lube)					
Mounting		Basic, Foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion					
Allowable kinetic energy (J)*2	Air cushion	When activated	2.8	4.6	7.8	16	29
	Rubber bumper	When not activated	0.33	0.56	0.91	1.5	2.68

\*1 No freezing

\*2 Activate the air cushion when operating the cylinder. If this is not done, the piston rod assembly or the tie-rods will be damaged when the allowable kinetic energy exceeds the values shown in the above table.

**Standard Strokes**

Bore size	Standard stroke Note 1)		Max. manufacturable stroke
	Stroke range ①	Stroke range ②	
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	Up to 1800	Up to 2700
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600		
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700		

Note 1) Intermediate strokes not listed above are produced upon receipt of order.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages. In addition, the products that exceed the stroke range ① might not be able to fulfill the specifications due to the deflection etc.

Note 3) Please consult with SMC for manufacturability and the part numbers when exceeding the stroke range ②.

Note 4) The stroke range with rod boot is 20 to 1800 mm. Please consult with SMC when exceeding 1800 mm strokes.

Note 5) Using a stroke of a length which is smaller than the effective cushion length may result in reduced air cushion performance. Refer to "Technical Data 1" on page 1901 for details on the effective cushion length.

**Minimum Stroke for Auto Switch Mounting**

**⚠ Caution**

The minimum stroke for mounting varies with the auto switch type and cylinder mounting type. In particular, the center trunnion type needs careful attention. (For details, refer to pages 521 and 522.)

**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

**Accessories**

Mounting		Basic	Axial foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●	●

\* Refer to page 485 for part numbers and dimensions.

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

D-□

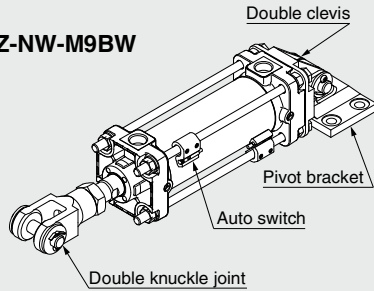
-X□

Technical Data

# CA2 Series

## Ordering Example of Cylinder Assembly

Cylinder model:  
**CDA2D50-100Z-NW-M9BW**



Mounting D: Double clevis  
Pivot bracket N: Yes  
Rod end bracket W: Double knuckle joint  
Auto switch D-M9BW: 2 pcs.

\* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

## Weights/Aluminum Tube (Steel Tube)

Bore size (mm)		40	50	63	80	100	
Basic weight	Basic	Aluminum tube	0.73	1.06	1.53	2.73	3.71
		Steel tube	0.78	1.12	1.62	2.91	3.98
	Axial foot	Aluminum tube	0.91	1.25	1.83	3.40	4.64
		Steel tube	0.96	1.31	1.92	3.58	4.91
	Flange	Aluminum tube	1.09	1.48	2.28	4.18	5.57
		Steel tube	1.14	1.54	2.37	4.36	5.84
	Single clevis	Aluminum tube	0.95	1.37	2.12	3.84	5.43
		Steel tube	1.00	1.43	2.21	4.02	5.70
	Double clevis	Aluminum tube	0.99	1.46	2.28	4.13	5.95
		Steel tube	1.04	1.52	2.37	4.31	6.22
	Trunnion	Aluminum tube	1.08	1.51	2.29	4.28	5.93
		Steel tube	1.13	1.57	2.38	4.46	6.20
Additional weight per 50 mm of stroke	All mounting brackets	Aluminum tube	0.20	0.25	0.31	0.46	0.58
		Steel tube	0.28	0.35	0.43	0.7	0.87
Accessories	Single knuckle	0.23	0.26	0.26	0.60	0.83	
	Double knuckle (with pin)	0.37	0.43	0.43	0.87	1.27	

Calculation:

Example) **CA2L40-100Z**  
(Axial foot, ø40, 100 stroke)

- Basic weight..... 0.91 kg
  - Additional weight..... 0.20/50 stroke
  - Cylinder stroke ..... 100 stroke
- $$0.91 + 0.20 \times 100/50 = 1.31 \text{ kg}$$

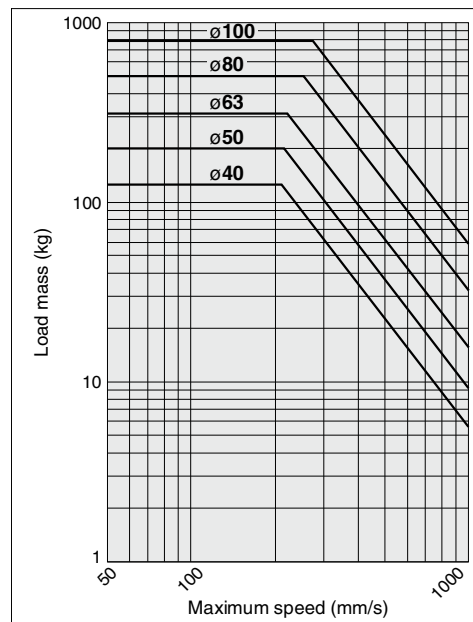
## Mounting Brackets/Part No.

Bore size (mm)	40	50	63	80	100
Axial foot*	CA2-L04	CA2-L05	CA2-L06	CA2-L08	CA2-L10
Flange	CA2-F04	CA2-F05	CA2-F06	CA2-F08	CA2-F10
Single clevis	CA2-C04	CA2-C05	CA2-C06	CA2-C08	CA2-C10
Double clevis**	CA2-D04	CA2-D05	CA2-D06	CA2-D08	CA2-D10

\* When axial foot brackets are used, order two pieces per cylinder.

\*\* A clevis pin, flat washers and split pins are shipped together with double clevis.

## Allowable Kinetic Energy



(Example) Find the upper limit of rod end load when an air cylinder of ø63 is operated at 500 mm/s.

From a point indicating 500 mm/s on the axis of abscissas, extend a line upward and find a point where it intersects with a line for the 63 mm bore size. Extend a line from the intersection to the left and find a load mass 60 kg.



## Water Resistant

CDA2 **Mounting type** **Bore size** **Port thread type** **R** **Stroke** **Suffix** **Z** — **M9□A(V)L** **-XC68**

With auto switch (Built-in magnet)

Water resistant air cylinder

<b>R</b>	NBR seal (Nitrile rubber)
<b>V</b>	FKM seal (Fluororubber)

Water resistant 2-color indicator solid state auto switch

Made to Order

### Specifications

<b>Action</b>	Double acting, Single rod
<b>Bore size (mm)</b>	40, 50, 63, 80, 100
<b>Cushion</b>	Air cushion
<b>Auto switch mounting</b>	Tie-rod mounting
<b>Made to Order</b>	XC68: Made of stainless steel (with hard chrome plated piston rod)

\* Specifications other than the above are the same as the standard basic type.  
Note 1) Excluding the air-hydro type and the type with a rod boot of the CA2 series.  
Note 2) Combination of auto switches and steel tube is not available.  
For details, refer to page 1125.

### Dimensions

\* The dimensions are the same as the standard double acting, single rod type. Refer to page 475 for details.

## Cylinder with Stable Lubrication Function (Lube-retainer)

CDA2 **Mounting type** **Bore size** **M** **Stroke** **Z** — **Pivot bracket** **Rod end bracket** — **Auto switch**

With auto switch (Built-in magnet)

Cylinder with Stable Lubrication Function (Lube-retainer)

\* D: Available only for with auto switch.

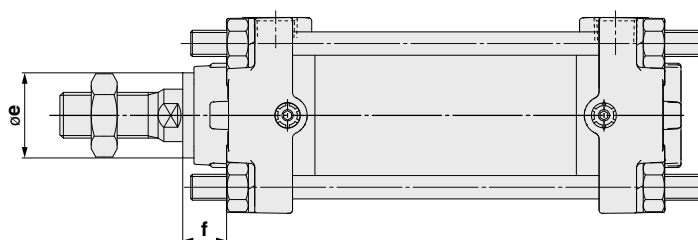


### Specifications

<b>Bore size (mm)</b>	<b>40, 50, 63, 80, 100</b>
<b>Action</b>	Double acting, Single rod
<b>Minimum operating pressure</b>	0.1 MPa
<b>Piston speed</b>	50 to 500 mm/s
<b>Cushion</b>	Air cushion

\* Specifications other than the above are the same as the standard type.

### Dimensions (Dimensions other than those shown below are the same as the standard type.)



(mm)		
Bore size	$\phi e$	$f$
<b>40</b>	26	13.5
<b>50</b>	30	12.5
<b>63</b>	30	12.5
<b>80</b>	36	16.5
<b>100</b>	42	16

\* The mounting dimensions of the mounting bracket are the same as the standard type.

For details, refer to the [Web Catalog](#).

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

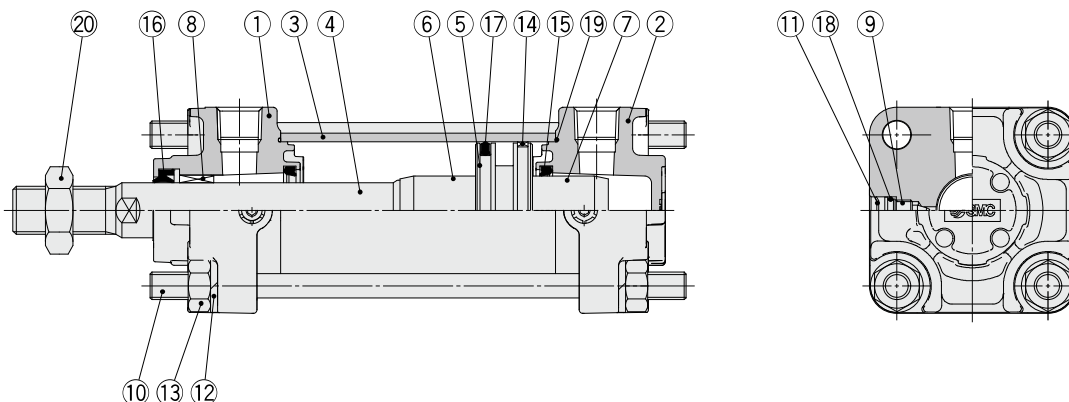
D-□

-X□

Technical  
Data

# CA2 Series

## Construction



### Component Parts

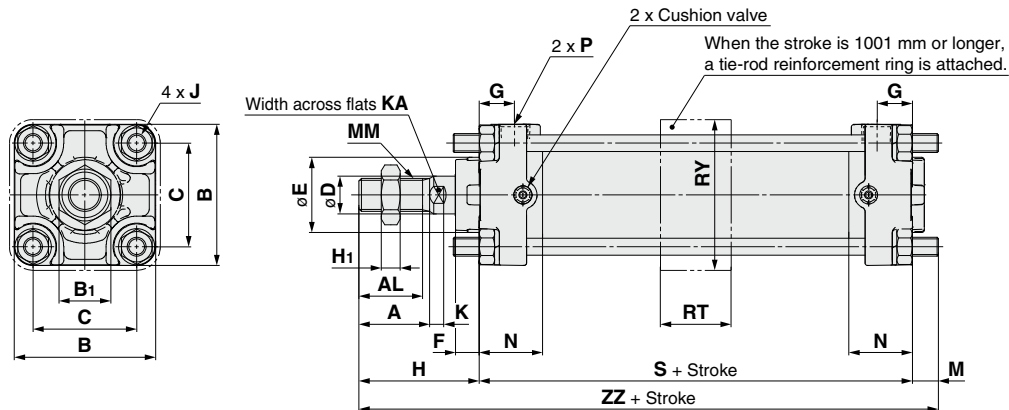
No.	Description	Material	Note
1	<b>Rod cover</b>	Aluminum die-casted	Trivalent chromated
2	<b>Head cover</b>	Aluminum die-casted	Trivalent chromated
3	<b>Cylinder tube</b>	Aluminum alloy	Hard anodized
4	<b>Piston rod</b>	Carbon steel	Hard chrome plating
5	<b>Piston</b>	Aluminum alloy	
6	<b>Cushion ring</b>	Aluminum alloy	Anodized
7	<b>Cushion ring B</b>	Aluminum alloy	Anodized
8	<b>Bushing</b>	Bearing alloy	
9	<b>Cushion valve</b>	Steel wire	Trivalent zinc chromated
10	<b>Tie-rod</b>	Carbon steel	Trivalent zinc chromated
11	<b>Retaining ring</b>	Spring steel	Phosphate coating
12	<b>Spring washer</b>	Steel wire	Trivalent zinc chromated
13	<b>Tie-rod nut</b>	Rolled steel	Trivalent zinc chromated
14	<b>Wear ring</b>	Resin	
15	<b>Cushion seal</b>	Urethane	
16	<b>Rod seal</b>	NBR	
17	<b>Piston seal</b>	NBR	
18	<b>Cushion valve seal</b>	NBR	
19	<b>Cylinder tube gasket</b>	NBR	
20	<b>Rod end nut</b>	Rolled steel	Trivalent zinc chromated

### Replacement Parts: Seal Kit

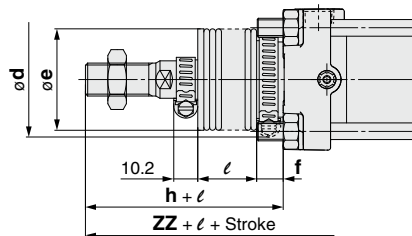
Bore size (mm)	Kit no.	Contents
40	CA2-40Z-PS	Set of the nos. 15, 16, 17, 19
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	

- \* Seal kit includes 15, 16, 17, 19. Order the seal kit based on each bore size.
- \* Do not disassemble the trunnion type. Refer to page 525.
- \* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.  
**Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)**

**Basic: CA2B**



With rod boot



- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	G	H <sub>1</sub>	J	K	KA	M		MM
														Without reinforcement ring	With reinforcement ring	
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	11	M14 x 1.5
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	12	M18 x 1.5
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	15	M18 x 1.5
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	17	19	M22 x 1.5
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	17	19	M26 x 1.5

Bore size (mm)	N	P	RT	RY	S	Without rod boot			With rod boot						
						H	ZZ		d	e	f	h	l	ZZ	
							Without reinforcement ring	With reinforcement ring						Without reinforcement ring	With reinforcement ring
40	27	1/4	30	64	84	51	146	146	56	43	11.2	59	1/4 stroke	154	154
50	30	3/8	30	76	90	58	159	160	64	52	11.2	66	1/4 stroke	167	168
63	31	3/8	40	92	98	58	170	171	64	52	11.2	66	1/4 stroke	178	179
80	37	1/2	45	112	116	71	204	206	76	65	12.5	80	1/4 stroke	213	215
100	40	1/2	50	136	126	72	215	217	76	65	14	81	1/4 stroke	224	226

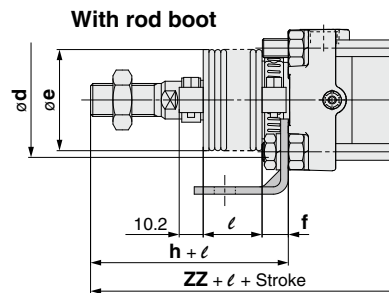
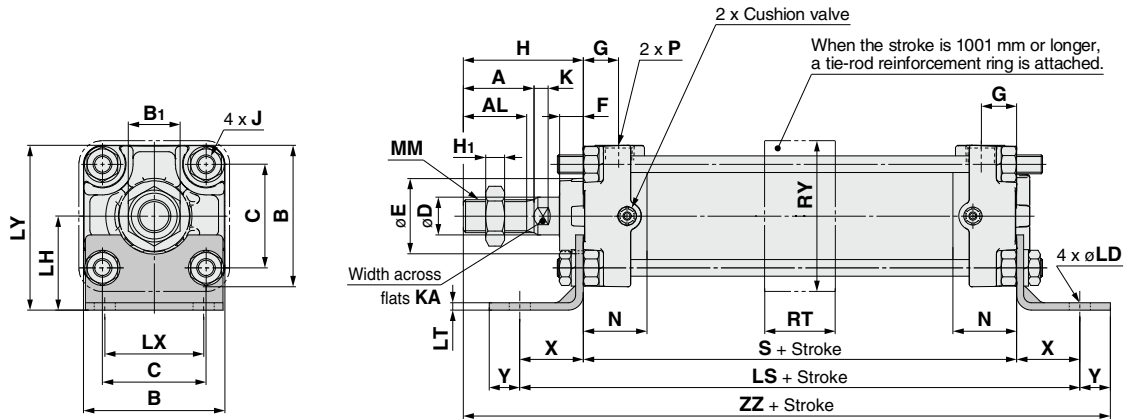
Note 1) When a flange bracket is mounted on the head cover side of the basic type with bore size of  $\phi 50$  to  $\phi 100$  and stroke of 1001 mm or more, it is necessary to loosen the tie-rod to adjust the M dimension. When head flange type is ordered, adjustment is not necessary.

Note 2) For models with bore size of  $\phi 50$  to  $\phi 100$  and stroke of 1001 mm or more, do not mount a flange bracket on the rod cover side of the basic type since H dimension is different from those shown above. When rod flange type is used, order with the part number with bracket.

- D-
- X
- Technical Data

# CA2 Series

## Axial Foot: CA2L



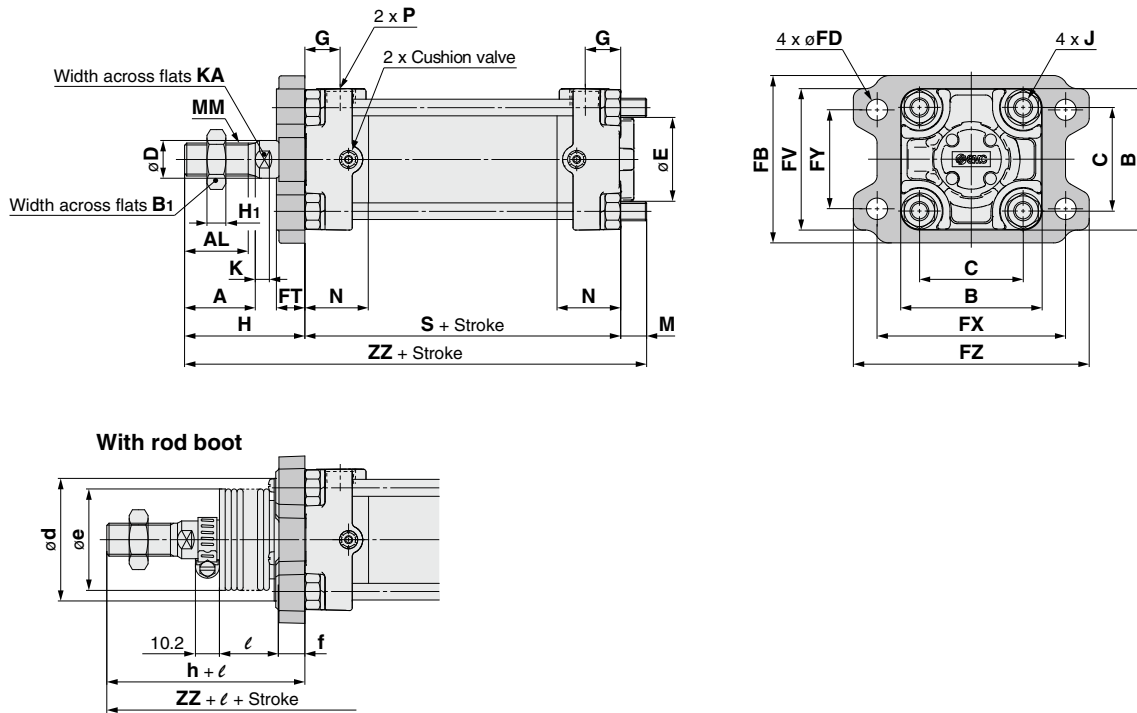
(mm)

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	G	H <sub>1</sub>	J	K	KA	LD	LH	LS	LT	LX	LY
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9	40	138	3.2	42	70
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2	50	80
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2	59	93
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	13.5	65	204	4.5	76	116
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	13.5	75	212	6	92	133

Bore size (mm)	MM	N	P	S	X	Y	RT	RY	Without rod boot		With rod boot					
									H	ZZ	d	e	f	h	l	ZZ
40	M14 x 1.5	27	1/4	84	27	13	30	64	51	175	56	43	11.2	59	1/4 stroke	183
50	M18 x 1.5	30	3/8	90	27	13	30	76	58	188	64	52	11.2	66	1/4 stroke	196
63	M18 x 1.5	31	3/8	98	34	16	40	92	58	206	64	52	11.2	66	1/4 stroke	214
80	M22 x 1.5	37	1/2	116	44	16	45	112	71	247	76	65	12.5	80	1/4 stroke	256
100	M26 x 1.5	40	1/2	126	43	17	50	136	72	258	76	65	14.0	81	1/4 stroke	267

**Rod Flange: CA2F**

Stroke of 1000 mm or less



CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

(mm)

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H <sub>1</sub>	J	K	KA
40	30	27	60	22	44	16	32	71	9	12	60	80	42	100	15	8	M8 x 1.25	6	14
50	35	32	70	27	52	20	40	81	9	12	70	90	50	110	17	11	M8 x 1.25	7	18
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	11	M10 x 1.25	7	18
80	40	37	102	32	78	25	52	119	13.5	18	102	130	76	160	21	13	M12 x 1.75	10	22
100	40	37	116	41	92	30	52	133	13.5	18	116	150	92	180	21	16	M12 x 1.75	10	26

Bore size (mm)	M	MM	N	P	S	Without rod boot		With rod boot					
						H	ZZ	*d	e	f	h	ℓ	ZZ
40	11	M14 x 1.5	27	1/4	84	51	146	52	43	15	59	1/4 stroke	154
50	11	M18 x 1.5	30	3/8	90	58	159	58	52	15	66	1/4 stroke	167
63	14	M18 x 1.5	31	3/8	98	58	170	58	52	17.5	66	1/4 stroke	178
80	17	M22 x 1.5	37	1/2	116	71	204	80	65	21.5	80	1/4 stroke	213
100	17	M26 x 1.5	40	1/2	126	72	215	80	65	21.5	81	1/4 stroke	224

★For installing an air cylinder, when a hole must be made to accommodate the rod portion, make sure to machine a hole that is larger than the outer diameter of the boot mounting bracket ød.

D-□

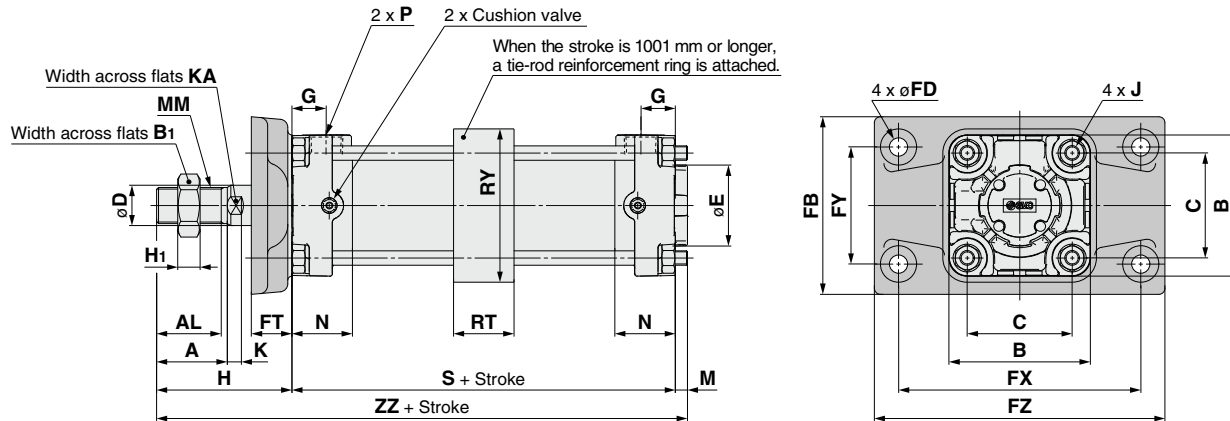
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Technical Data

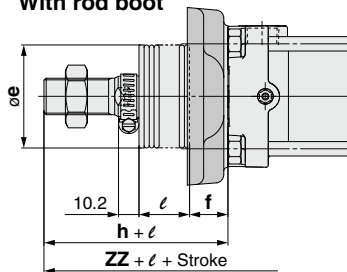
# CA2 Series

## Rod Flange: CA2F

Stroke of 1001 mm or more



With rod boot



(mm)

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	FB	FD	FT	FX	FY	FZ	G	H <sub>1</sub>	J	K	KA	M
40	30	27	60	22	44	16	32	71	9	12	80	42	100	15	8	M8 x 1.25	6	14	11
50	35	32	70	27	52	20	40	88	9	20	120	58	144	17	11	M8 x 1.25	7	18	6
63	35	32	85	27	64	20	40	105	11.5	23	140	64	170	17	11	M10 x 1.25	7	18	10
80	40	37	102	32	78	25	52	124	13.5	28	164	84	198	21	13	M12 x 1.75	10	22	12
100	40	37	116	41	92	30	52	140	13.5	29	180	100	220	21	16	M12 x 1.75	10	26	12

Bore size (mm)	MM	N	P	RT	RY	S	Without rod boot		With rod boot				
							H	ZZ	*e	f	h	$\ell$	ZZ
40	M14 x 1.5	27	1/4	30	64	84	51	146	52	19	66	1/4 stroke	162
50	M18 x 1.5	30	3/8	30	76	90	67	163	52	19	66	1/4 stroke	162
63	M18 x 1.5	31	3/8	40	92	98	71	179	52	19	66	1/4 stroke	174
80	M22 x 1.5	37	1/2	45	112	116	87	215	65	21	80	1/4 stroke	208
100	M26 x 1.5	40	1/2	50	136	126	89	227	65	21	81	1/4 stroke	219

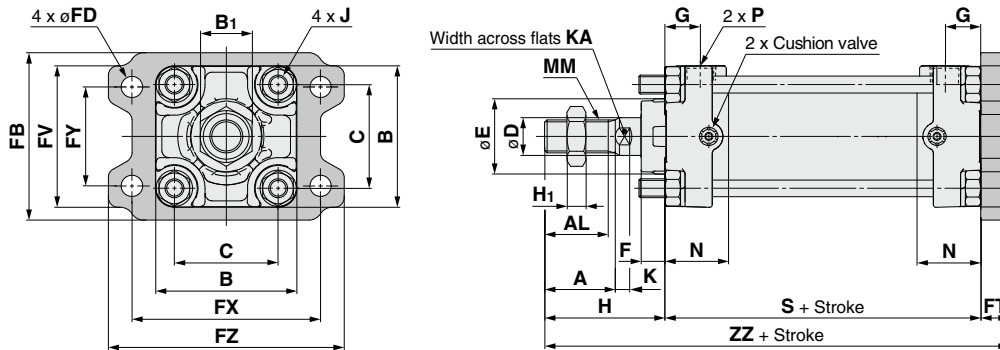
★For installing an air cylinder, when a hole must be made to accommodate the rod portion, make sure to machine a hole that is larger than the outer diameter of the boot  $\phi e$ .

Note 1) For flange type with bore size of  $\phi 40$ , the same flange bracket is used for all strokes.

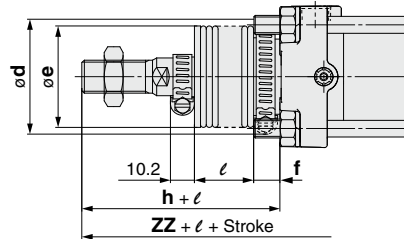
Note 2) For models with bore size of  $\phi 50$  to  $\phi 100$  and stroke of 1001 mm or more, do not mount a flange bracket on the rod cover side of the basic type since H dimension is different from those shown above. When rod flange type is used, order with the part number with bracket.

**Head Flange: CA2G**

Stroke of 1000 mm or less



With rod boot



- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	FB	FD	FT	FV	FX	FY	FZ	G	H <sub>1</sub>	J
40	30	27	60	22	44	16	32	10	71	9	12	60	80	42	100	15	8	M8 x 1.25
50	35	32	70	27	52	20	40	10	81	9	12	70	90	50	110	17	11	M8 x 1.25
63	35	32	85	27	64	20	40	10	101	11.5	15	86	105	59	130	17	11	M10 x 1.25
80	40	37	102	32	78	25	52	14	119	13.5	18	102	130	76	160	21	13	M12 x 1.75
100	40	37	116	41	92	30	52	14	133	13.5	18	116	150	92	180	21	16	M12 x 1.75

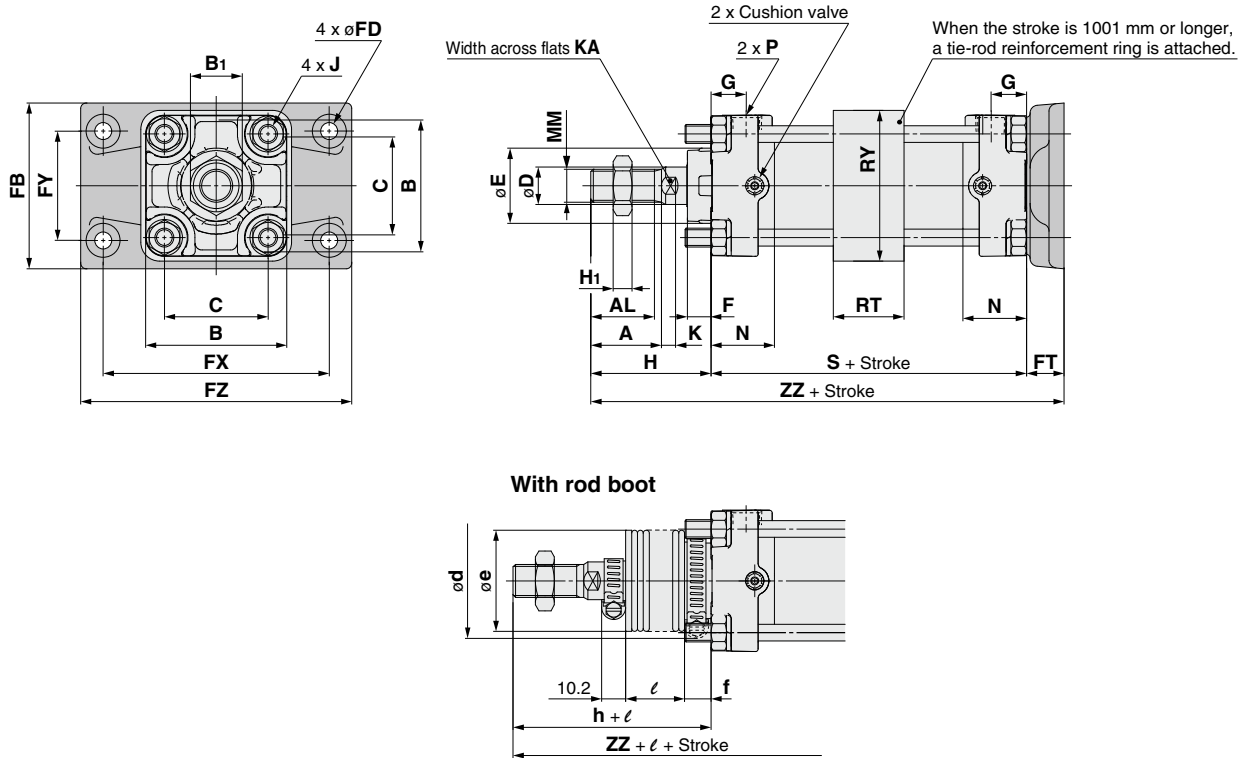
Bore size (mm)	K	KA	MM	N	P	S	Without rod boot		With rod boot					
							H	ZZ	d	e	f	h	ℓ	ZZ
40	6	14	M14 x 1.5	27	1/4	84	51	147	56	43	11.2	59	1/4 stroke	155
50	7	18	M18 x 1.5	30	3/8	90	58	160	64	52	11.2	66	1/4 stroke	168
63	7	18	M18 x 1.5	31	3/8	98	58	171	64	52	11.2	66	1/4 stroke	179
80	10	22	M22 x 1.5	37	1/2	116	71	205	76	65	12.5	80	1/4 stroke	214
100	10	26	M26 x 1.5	40	1/2	126	72	216	76	65	14.0	81	1/4 stroke	225

- D-
- X
- Technical Data

# CA2 Series

## Head Flange: CA2G

Stroke of 1001 mm or more



Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	FB	FD	FT	FX	FY	FZ	G	H <sub>1</sub>	J	K	KA
	40	30	27	60	22	44	16	30	71	9	12	80	42	100	15	8	M8 x 1.25	6
50	35	32	70	27	52	20	40	88	9	20	120	58	144	17	11	M8 x 1.25	7	18
63	35	32	85	27	64	20	40	105	11.5	23	140	64	170	17	11	M10 x 1.25	7	18
80	40	37	102	32	78	25	52	124	13.5	28	164	84	198	21	13	M12 x 1.75	10	22
100	40	37	116	41	92	30	52	140	13.5	29	180	100	220	21	16	M12 x 1.75	10	26

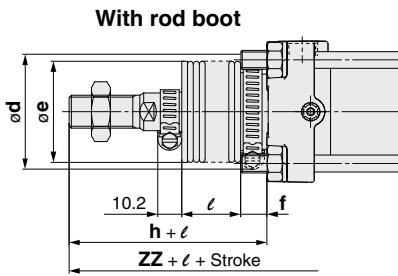
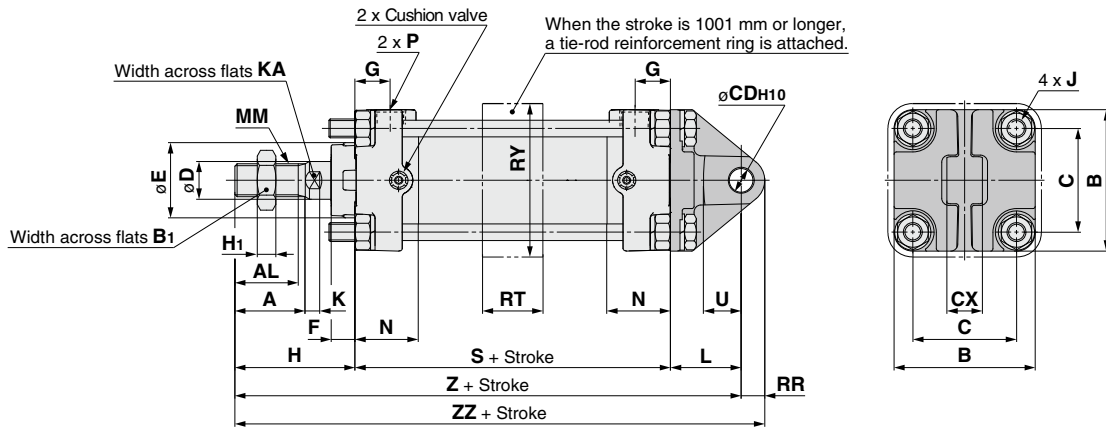
Bore size (mm)	MM	N	P	S	RT	RY	Without rod boot		With rod boot					
							H	ZZ	d	e	f	h	ℓ	ZZ
40	M14 x 1.5	27	1/4	84	30	64	51	147	56	43	11.2	59	1/4 stroke	155
50	M18 x 1.5	30	3/8	90	30	76	58	168	64	52	11.2	66	1/4 stroke	176
63	M18 x 1.5	31	3/8	98	40	92	58	179	64	52	11.2	66	1/4 stroke	187
80	M22 x 1.5	37	1/2	116	45	112	71	215	76	65	12.5	80	1/4 stroke	224
100	M26 x 1.5	40	1/2	126	50	136	72	227	76	65	14	81	1/4 stroke	236

Note 1) For flange type with bore size of  $\phi 40$ , the same flange bracket is used for all strokes.

Note 2) When a flange bracket is mounted on the head cover side of the basic type with bore size of  $\phi 50$  to  $\phi 100$  and stroke of 1001 mm or more, it is necessary to loosen the tie-rod to adjust the M dimension. When head flange type is ordered, adjustment is not necessary.



**Single Clevis: CA2C**



- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2**
- CS1
- CS2

(mm)

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	CD <sub>H10</sub>	CX	D	E	F	G	H <sub>1</sub>	J	K	KA	L
40	30	27	60	22	44	10 <sup>+0.058</sup> <sub>0</sub>	15 <sup>-0.1</sup> <sub>-0.3</sub>	16	32	10	15	8	M8 x 1.25	6	14	30
50	35	32	70	27	52	12 <sup>+0.070</sup> <sub>0</sub>	18 <sup>-0.1</sup> <sub>-0.3</sub>	20	40	10	17	11	M8 x 1.25	7	18	35
63	35	32	85	27	64	16 <sup>+0.070</sup> <sub>0</sub>	25 <sup>-0.1</sup> <sub>-0.3</sub>	20	40	10	17	11	M10 x 1.25	7	18	40
80	40	37	102	32	78	20 <sup>+0.084</sup> <sub>0</sub>	31.5 <sup>-0.1</sup> <sub>-0.3</sub>	25	52	14	21	13	M12 x 1.75	10	22	48
100	40	37	116	41	92	25 <sup>+0.084</sup> <sub>0</sub>	35.5 <sup>-0.1</sup> <sub>-0.3</sub>	30	52	14	21	16	M12 x 1.75	10	26	58

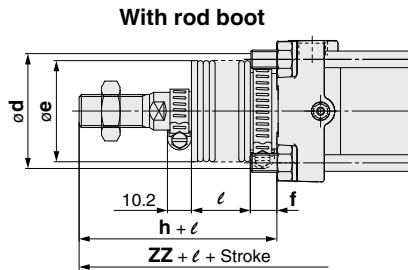
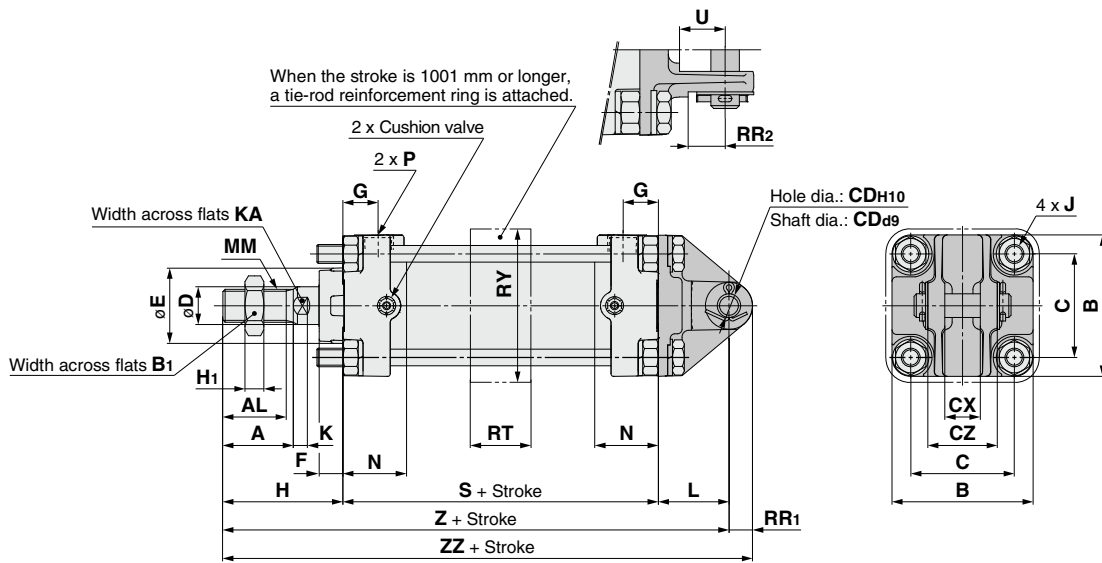
  

Bore size (mm)	MM	N	P	RR	S	U	Without rod boot			With rod boot						
							H	Z	ZZ	d	e	f	h	$\ell$	Z	ZZ
40	M14 x 1.5	27	1/4	10	84	16	51	165	175	56	43	11.2	59	1/4 stroke	173	183
50	M18 x 1.5	30	3/8	12	90	19	58	183	195	64	52	11.2	66	1/4 stroke	191	203
63	M18 x 1.5	31	3/8	16	98	23	58	196	212	64	52	11.2	66	1/4 stroke	204	220
80	M22 x 1.5	37	1/2	20	116	28	71	235	255	76	65	12.5	80	1/4 stroke	244	264
100	M26 x 1.5	40	1/2	25	126	36	72	256	281	76	65	14.0	81	1/4 stroke	265	290

- D-
- X
- Technical Data

# CA2 Series

## Double Clevis: CA2D



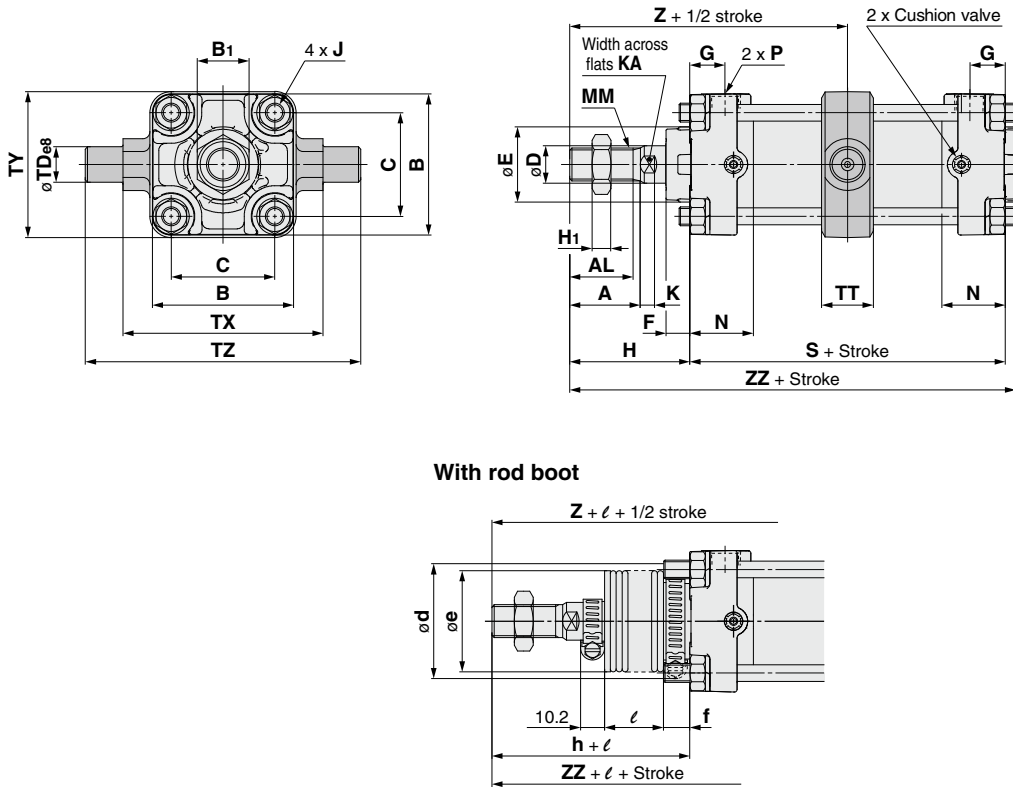
																	(mm)
Bore size (mm)	A	AL	B	B <sub>1</sub>	C	CDH <sub>10</sub>	CX	CZ	D	E	F	G	H <sub>1</sub>	J	K	KA	L
40	30	27	60	22	44	10 <sup>+0.058</sup> <sub>0</sub>	15 <sup>+0.3</sup> <sub>+0.1</sub>	29.5	16	32	10	15	8	M8 x 1.25	6	14	30
50	35	32	70	27	52	12 <sup>+0.070</sup> <sub>0</sub>	18 <sup>+0.3</sup> <sub>+0.1</sub>	38	20	40	10	17	11	M8 x 1.25	7	18	35
63	35	32	85	27	64	16 <sup>+0.070</sup> <sub>0</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	49	20	40	10	17	11	M10 x 1.25	7	18	40
80	40	37	102	32	78	20 <sup>+0.084</sup> <sub>0</sub>	31.5 <sup>+0.3</sup> <sub>+0.1</sub>	61	25	52	14	21	13	M12 x 1.75	10	22	48
100	40	37	116	41	92	25 <sup>+0.084</sup> <sub>0</sub>	35.5 <sup>+0.3</sup> <sub>+0.1</sub>	64	30	52	14	21	16	M12 x 1.75	10	26	58

Bore size (mm)	MM	N	P	RR <sub>1</sub>	RR <sub>2</sub>	S	U	Without rod boot			With rod boot						
								H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ
40	M14 x 1.5	27	1/4	10	16	84	16	51	165	175	56	43	11.2	59	1/4 stroke	173	183
50	M18 x 1.5	30	3/8	12	19	90	19	58	183	195	64	52	11.2	66	1/4 stroke	191	203
63	M18 x 1.5	31	3/8	16	23	98	23	58	196	212	64	52	11.2	66	1/4 stroke	204	220
80	M22 x 1.5	37	1/2	20	28	116	28	71	235	255	76	65	12.5	80	1/4 stroke	244	264
100	M26 x 1.5	40	1/2	25	23.5	126	36	72	256	281	76	65	14.0	81	1/4 stroke	265	290

\* A clevis pin, flat washers and split pins are included.

**Center Trunnion: CA2T**



- CJ1
- CJP
- CJ2
- JCM
- CM2
- CM3
- CG1
- CG3
- JMB
- MB
- MB1
- CA2
- CS1
- CS2

(mm)

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	G	H <sub>1</sub>	J	K	KA	MM	N	P	S
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126

Bore size (mm)	TD <sub>es</sub>	TT	TX	TY	TZ	Without rod boot			With rod boot						
						H	Z	ZZ	d	e	f	h	$\ell$	Z	ZZ
40	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	85	62	117	51	93	140	56	43	11.2	59	1/4 stroke	101	148
50	15 <sup>-0.032</sup> <sub>-0.059</sub>	22	95	74	127	58	103	154	64	52	11.2	66	1/4 stroke	111	162
63	18 <sup>-0.032</sup> <sub>-0.059</sub>	28	110	90	148	58	107	162	64	52	11.2	66	1/4 stroke	115	170
80	25 <sup>-0.040</sup> <sub>-0.073</sub>	34	140	110	192	71	129	194	76	65	12.5	80	1/4 stroke	138	203
100	25 <sup>-0.040</sup> <sub>-0.073</sub>	40	162	130	214	72	135	206	76	65	14.0	81	1/4 stroke	144	215

\* Do not disassemble the trunnion type. Refer to page 525.

- D-□
- X□
- Technical Data

# CA2 Series

## Trunnion and Double Clevis Pivot Bracket

- Strength is the same as cylinder brackets.

### Applicable Series

Bracket type	Applicable series
Trunnion pivot bracket	CA2
Double clevis pivot bracket	CA2

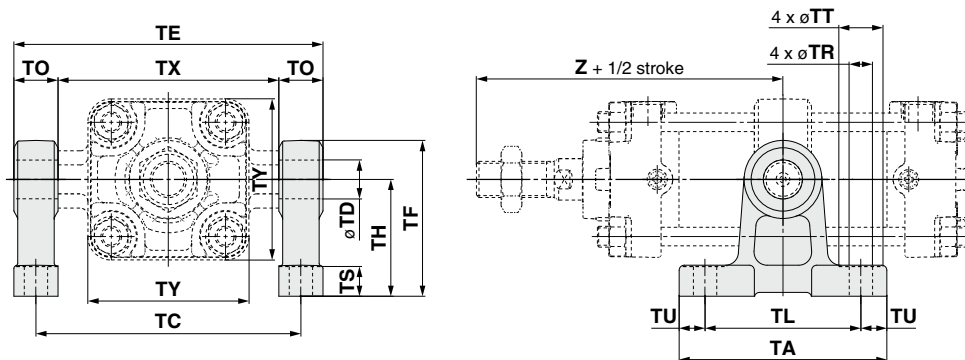
\* Please contact SMC at the time of mounting.

Bore size	CA2□40	CA2□50	CA2□63	CA2□80	CA2□100
Description	CA2-S04		CA2-S06	MB-S10	
Trunnion pivot bracket	CA2-S04		CA2-S06	MB-S10	
Double clevis pivot bracket	CA2-B04	CA2-B05	CA2-B06	CA2-B08	CA2-B10

\* Order 2 trunnion pivot brackets per cylinder.

### Trunnion pivot bracket

Material: Cast iron

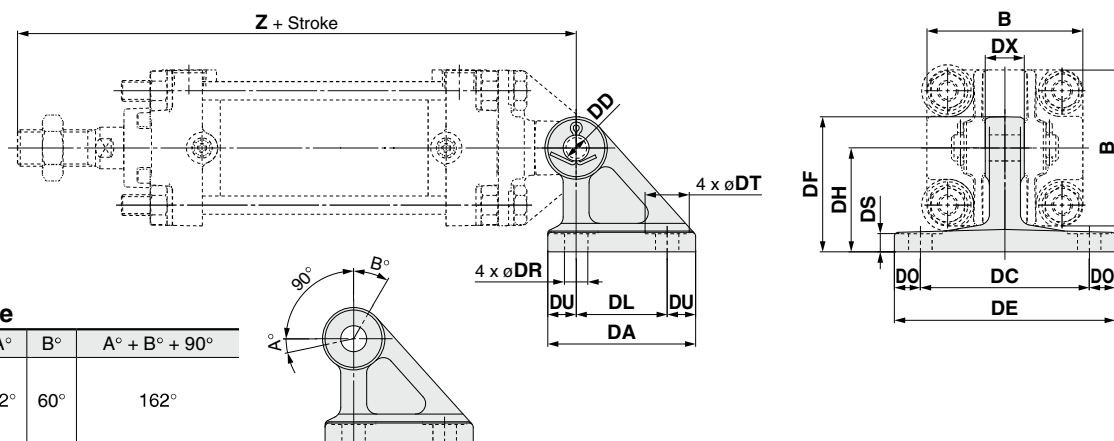


(mm)

Part no.	Bore size (mm)	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	TY	Z	TD-H10 (Hole)
CA2-S04	40	80	60	10	102	85	119	17	9	17	12	45	60	62	93	15 <sup>+0.070</sup> <sub>0</sub>
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	103	15 <sup>+0.070</sup> <sub>0</sub>
CA2-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	107	18 <sup>+0.070</sup> <sub>0</sub>
MB-S10	80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	129	25 <sup>+0.084</sup> <sub>0</sub>
	100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	135	25 <sup>+0.084</sup> <sub>0</sub>

### Double clevis pivot bracket

Material: Cast iron



### Rotating Angle

Bore size (mm)	A°	B°	A° + B° + 90°
40 to 100	12°	60°	162°

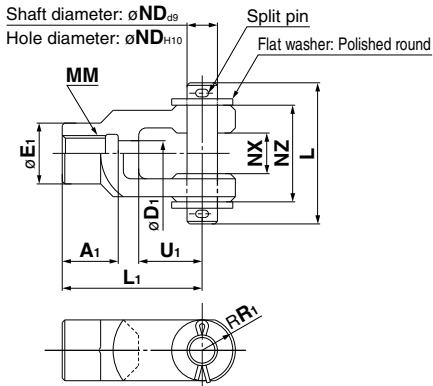
(mm)

Part no.	Bore size (mm)	DA	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	DF	B	Z	DDH10 (Hole)
CA2-B04	40	57	35	11	65	15	85	10	9	17	8	40	52	60	165	10 <sup>+0.058</sup> <sub>0</sub>
CA2-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	183	12 <sup>+0.070</sup> <sub>0</sub>
CA2-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	196	16 <sup>+0.070</sup> <sub>0</sub>
CA2-B08	80	93	60	16.5	100	31.5	130	15	13.5	24	12	65	90	102	235	20 <sup>+0.084</sup> <sub>0</sub>
CA2-B10	100	93	60	16.5	100	35.5	130	15	13.5	24	12	65	90	116	256	25 <sup>+0.084</sup> <sub>0</sub>

# CA2 Series

# Dimensions of Accessories

## Y Type Double Knuckle Joint

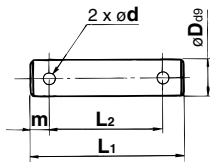


Material: Cast iron (mm)

Part no.	Applicable bore size	A1	E1	D1	L1	MM	R1	U1	ND	NX	NZ	L	Split pin size	Flat washer size
Y-04D	40	22	24	10	55	M14 x 1.5	13	25	12	16 <sup>+0.3</sup> <sub>-0.1</sub>	38	55.5	ø3 x 18 L	Polished round 12
Y-05D	50, 63	27	28	14	60	M18 x 1.5	15	27	12	16 <sup>+0.3</sup> <sub>-0.1</sub>	38	55.5	ø3 x 18 L	Polished round 12
Y-08D	80	37	36	18	71	M22 x 1.5	19	28	18	28 <sup>+0.3</sup> <sub>-0.1</sub>	55	76.5	ø4 x 25 L	Polished round 18
Y-10D	100	37	40	21	83	M26 x 1.5	21	38	20	30 <sup>+0.3</sup> <sub>-0.1</sub>	61	83	ø4 x 30 L	Polished round 20

\* A knuckle pin, split pins and flat washers are included.

## Clevis Pin/Knuckle Pin

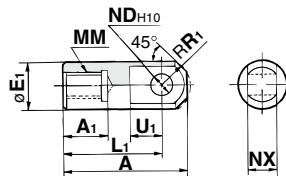


Material: Carbon steel (mm)

Part no.	Applicable bore size		Dd9	L1	L2	m	d Drill through	Included split pin	Included flat washer
	Clevis	Knuckle							
CDP-2A	40	—	10 <sup>-0.040</sup> <sub>-0.076</sub>	46	38	4	3	ø3 x 18 L	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 18 L	Polished round 12
CDP-4A	63	—	16 <sup>-0.050</sup> <sub>-0.093</sub>	71	61	5	4	ø4 x 25 L	Polished round 16
CDP-5A	—	80	18 <sup>-0.050</sup> <sub>-0.093</sub>	76.5	66.5	5	4	ø4 x 25 L	Polished round 18
CDP-6A	80	100	20 <sup>-0.065</sup> <sub>-0.117</sub>	83	73	5	4	ø4 x 30 L	Polished round 20
CDP-7A	100	—	25 <sup>-0.065</sup> <sub>-0.117</sub>	88	78	5	4	ø4 x 36 L	Polished round 24

\* Split pins and flat washers are included.

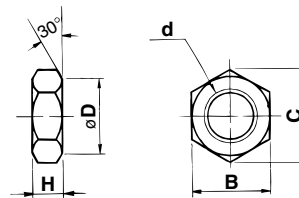
## I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

Part no.	Applicable bore size	A	A1	E1	L1	MM	R1	U1	ND <sub>H10</sub>	NX
I-04A	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-05A	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-08A	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-10A	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)



Material: Rolled steel (mm)

Part no.	Applicable bore size	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

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-□

-X□

Technical Data

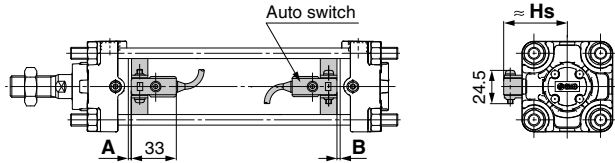
# CA2 Series

# Auto Switch Mounting

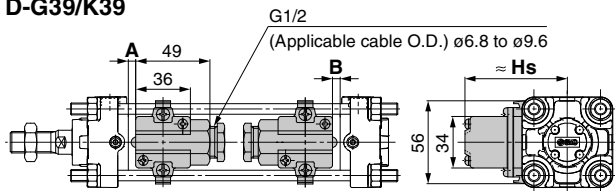
## Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

### <Band mounting>

D-B5□/B64/B59W

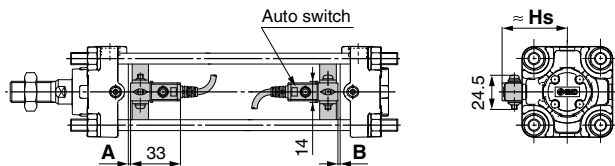


D-A3□  
D-G39/K39

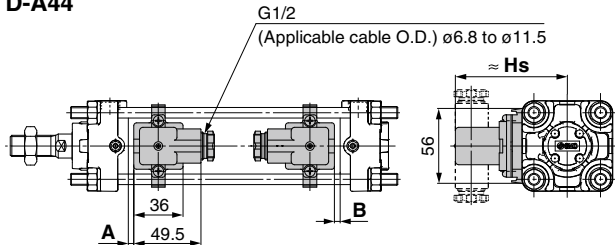


D-G5□/K59  
D-G5□W/K59W

D-G5BA  
D-G59F/G5NT



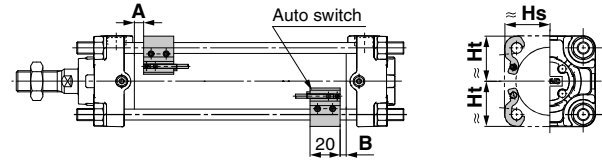
D-A44



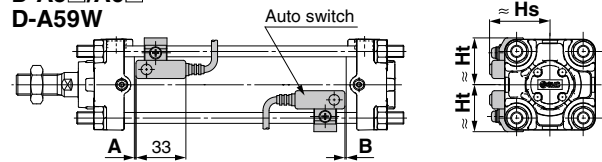
### <Tie-rod mounting>

D-M9□/M9□V  
D-M9□W/M9□WV  
D-M9□A/M9□AV  
D-A9□/A9□V

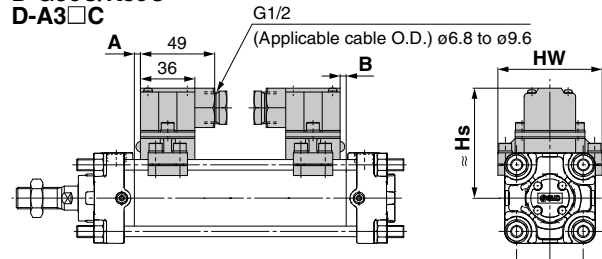
D-Y59□/Y69□/Y7P/Y7PV  
D-Y7□W/Y7□WV  
D-Y7BA  
D-Z7□/Z80



D-A5□/A6□  
D-A59W

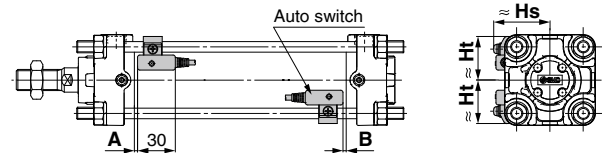


D-G39C/K39C  
D-A3□C

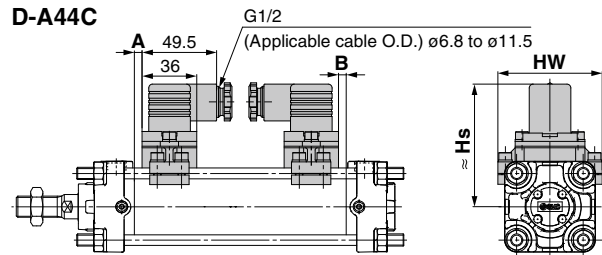


D-F5□/J59  
D-F5NT

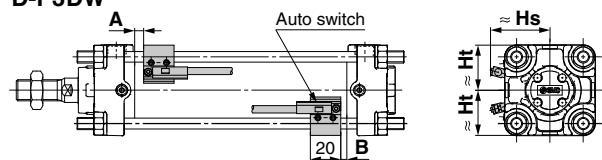
D-F5□W/J59W  
D-F5BA/F59F



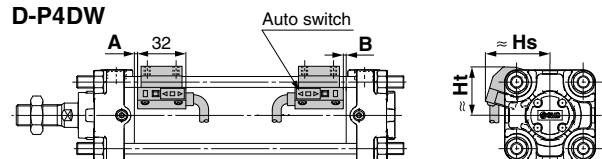
D-A44C



D-P3DWA  
D-P3DW



D-P4DW



CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

D-□

-X□

Technical  
Data

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

### Auto Switch Proper Mounting Position (Standard type)

(mm)

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA D-Z7□ D-Z80 D-B59W		D-P3DWA		D-P4DW		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA		D-F5NT		D-A59W		D-G39 D-G39C D-K39 D-K39C D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F		D-B5□ D-B64	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
<b>40</b>	9	9	5	5	2.5	2.5	4.5	4.5	2	2	5.5	5.5	10.5	10.5	3	3	0	0	1	1	0	0
<b>50</b>	9.5	8.5	5.5	4.5	3	2	5	4	2.5	1.5	6	5	11	10	3.5	2.5	0	0	1.5	0.5	0	0
<b>63</b>	12.5	11.5	8.5	7.5	6	5	8	7	5.5	4.5	9	8	14	13	6.5	5.5	2.5	1.5	4.5	3.5	3	2
<b>80</b>	16.5	13.5	12.5	9.5	10	7	12	9	9.5	6.5	13	10	18	15	10.5	7.5	6.5	3.5	8.5	5.5	7	4
<b>100</b>	18	16	14	12	11.5	9.5	13.5	11.5	11	9	14.5	12.5	19.5	17.5	12	10	8	6	10	8	8.5	6.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

### Auto Switch Proper Mounting Height (Standard type)

(mm)

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-M9□V D-M9□WV D-M9□AV		D-A9□V		D-Y59□ D-Y7P D-Y7BA D-Y7□W D-Z7□ D-Z80		D-Y69□ D-Y7PV D-Y7□WV		D-P3DWA		D-P4DW		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F D-B5□ D-B64 D-B59W		D-G39 D-K39 D-A3□		D-A44		D-F5□ D-J59 D-F5□W D-F5BA D-F59F D-F5NT		D-A5□ D-A59W		D-G39C D-K39C D-A3□C		D-A44C	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
<b>40</b>	30	30	34	30	31	30	30	30	30	30	30	37.5	35	42.5	33	37	71.5	81.5	38	31.5	38.5	31.5	73	69	81	69		
<b>50</b>	34	34	38	34	35	34	34	34	34	34	41.5	39	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77			
<b>63</b>	41	41	44	41	41.5	41	41	41	41	41	50	41	52	43	49	83.5	93.5	47	43	46.5	43	85.5	91	93.5	91			
<b>80</b>	49.5	49	52.5	49	50	49	49.5	49	49.5	49	58	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107			
<b>100</b>	56.5	56	61	56	58.5	56	56.5	55.5	57.5	55.5	66	56	66	58.5	68	102.5	112.5	61	57.5	61.5	57.5	104	121	112	121			

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

**Auto Switch Proper Mounting Position (Non-rotating rod type, With end lock)**

(mm)

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□VW D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□VW D-Y7BA D-B59W D-Z7□ D-Z80		D-P3DWA		D-P4DW		D-G39 D-G39C D-K39 D-K39C D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F		D-B5□ D-B64		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA		D-F5NT		D-A59W	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
<b>40</b>	10	8	6	4	4	1	5.5	3.5	3.5	0.5	0.5	0	2.5	0	1	0	7	4	12	9	4.5	1.5
<b>50</b>	10	8	6	4	3.5	1.5	5.3	3.5	3	1	0	0	2	0	0.5	0	6.5	4.5	11.5	9.5	4	2
<b>63</b>	12.5	11.5	8.5	7.5	6	5	8	7	5.5	4.5	2.5	1.5	4.5	3.5	3	2	9	8	14	13	6.5	5.5
<b>80</b>	16	14	12	10	9.5	7.5	11.5	9.5	9	7	6	4	8	6	6.5	4.5	12.5	10.5	17.5	15.5	10	8
<b>100</b>	17.5	16.5	13.5	12.5	11	10	13	12	10.5	9.5	7.5	6.5	9.5	8.5	8	7	14	13	19	18	11.5	10.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

**Auto Switch Proper Mounting Height (Non-rotating rod type, With end lock)**

(mm)

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-M9□V D-M9□VW D-M9□AV		D-A9□V		D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z80		D-Y69□ D-Y7PV D-Y7□VW		D-P3DWA		D-P4DW		D-G5□ D-K59 D-G5□W D-K59W D-G59F D-G5BA D-G5NT D-B5□ D-B64 D-B59W		D-G39 D-K39 D-A3□		D-A44		D-F5□ D-J59 D-F5□W D-F59F D-F5BA D-F5NT		D-A5□ D-A59W		D-G39C D-K39C D-A3□C		D-A44C	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
<b>40</b>	30	30	34	30	31	30	30	30	30	30	30	37.5	35	42.5	33	37	71.5	81.5	38	31.5	38.5	31.5	73	69	81	69		
<b>50</b>	34	34	38	34	35	34	34	34	34	34	34	41.5	39	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77		
<b>63</b>	41	41	44	41	41.5	41	41	41	41	41	41	50	41	52	43	49	83.5	93	47	43	46.5	43	85.5	91	93.5	91		
<b>80</b>	49.5	49	52.5	49	50	49	49.5	49	49.5	49	49.5	58	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107		
<b>100</b>	56.5	56	61	56	58.5	56	58.5	55.5	57.5	55.5	66	56	66	58.5	68	102.5	112.5	61	57.5	61.5	57.5	104	121	112	121			

- CJ1**
- CJP**
- CJ2**
- JCM**
- CM2**
- CM3**
- CG1**
- CG3**
- JMB**
- MB**
- MB1**
- CA2**
- CS1**
- CS2**

- D-□**
- X□**
- Technical Data



# CA2 Series

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

### Auto Switch Proper Mounting Position (Air-hydro type)

(mm)

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA D-B59W D-Z7□ D-Z80				D-P3DW		D-P4DW		D-G39 D-G39C D-K39 D-K39C D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F		D-B5□ D-B64		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA		D-F5NT		D-A59W	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	9.5	8.5	5.5	4.5	3.5	1.5	5.5	3.5	3	1	0	0	2	0	0.5	0	6.5	4.5	11.5	9.5	4	2		
50	10	8	—	—	3.5	1.5	5.5	3.5	3	1	0	0	2	0	0.5	0	6.5	4.5	11.5	9.5	4	2		
63	12.5	11.5	8.5	7.5	6	5	3	1.5	5.5	4	2.5	1.5	4.5	3.5	3	2	9	8	14	13	6.5	5.5		
80	16	14	12	10	9.5	7.5	6	4.5	9	7	6	4	8	6	6.5	4.5	4.5	12.5	17.5	15.5	10	8		
100	17.5	16.5	13.5	12.5	11	10	8	6.5	10.5	9	7.5	6.5	9.5	8.5	8	7	14	13	19	18	11.5	10.5		

\* D-A9□ and D-A9□V types cannot be mounted on ø50.

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

### Auto Switch Proper Mounting Height (Air-hydro type)

(mm)

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-M9□V D-M9□WV D-M9□AV		D-A9□V		D-Y59□ D-Y7P D-Y7BA D-Y7□W D-Z7□ D-Z80				D-Y69□ D-Y7PV D-Y7□WV		D-P3DW		D-P4DW		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F D-B5□ D-B64 D-B59W		D-G39 D-K39 D-A3□		D-A44		D-F5□ D-J59 D-F5□W D-F5BA D-F59F D-F5NT		D-A5□ D-A59W		D-G39C D-K39C D-A3□C		D-A44C	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
40	30	30	35	30	32	30	30	30	30.5	30	38	30	43	33.5	38	72.5	82.5	38.5	31	40	31	73	69	81	69					
50	34	34	39	34	—	—	34	34	35	34	42	34	47	38	43.5	78	88	42.5	35	43.5	35	78.5	77	86.5	77					
63	41	41	46	41	43.5	41	41	41	42.5	41	49	41	53	44	50.5	85	95	48	42	49	42	85.5	91	93.5	91					
80	49.5	49	54	49	51.5	49	49.5	48.5	51	48.5	56	49	60	52	59	93.5	103.5	54	50	55.5	50	94	107	102	107					
100	57	56	62.5	56	59.5	56	58.5	56	59	56	65	56	67	59	69.5	104	114	62	57.5	63	57.5	104	121	112	121					

\* D-A9□ and D-A9□V types cannot be mounted on ø50.

## Operating Range

(mm)

Auto switch model	Bore size				
	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4.5	5	5.5	5	6
D-A9□/A9□V	7.5 (7)	8.5 (—)	9.5 (9)	9.5 (9)	10.5 (9)
D-Z7□/Z80	8.5	7.5	9.5	9.5	10.5
D-A3□/A44 D-A3□C/A44C	9	10	11	11	11
D-A5□/A6□					
D-B5□/B64					
D-A59W	13	13	14	14	15
D-B59W	14	14	17	16	18

Auto switch model	Bore size				
	40	50	63	80	100
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA	8	7	5.5	6.5	6.5
D-F5□/J59/F5□W D-J59W/F5BA D-F5NT/F59F	4	4	4.5	4.5	4.5
D-G5□/K59/G5□W D-K59W/G5BA D-G5NT/G59F	5	6	6.5	6.5	7
D-G39/K39 D-G39C/K39C	9	9	10	10	11
D-P3DWA	4.5	4.5	5.5	5.5	5.5
D-P3DW <sup>Note 3)</sup>	4.5	5	6	5.5	6
D-P4DW	4	4	4.5	4	4.5

\* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Note 1) ( ): For CDA2□H and CDA2W□H Series.

Note 2) D-A9□ and D-A9□V types cannot be mounted on ø50 of the CDA2□H and CDA2W□H series.

Note 3) Applicable to the CDA2□H and CDA2W□H series.

**Minimum Stroke for Auto Switch Mounting**

n: Number of auto switches (mm)

Auto switch model	Number of auto switches	Brackets other than center trunnion	Center trunnion					
			ø40	ø50	ø63	ø80	ø100	
<b>D-M9□</b> <b>D-M9□W</b>	2 (Different surfaces and same surface) 1	15	80		85	90	95	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-M9□V</b> <b>D-M9□WV</b>	2 (Different surfaces and same surface) 1	10	55		60	65	70	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-M9□A</b>	2 (Different surfaces and same surface) 1	15	80		85	95	100	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-M9□AV</b>	2 (Different surfaces and same surface) 1	10	60		65	70	75	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-A9□</b>	2 (Different surfaces and same surface) 1	15	75		80	85	90	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-A9□V</b>	2 (Different surfaces and same surface) 1	10	50		55	60	65	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-F5□/J59</b> <b>D-F5□W/J59W</b> <b>D-F5BA/F59F</b> <b>D-A5□/A6</b>	2 (Different surfaces and same surface) 1	15	90		100	110	120	
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-F5NT</b>	2 (Different surfaces and same surface) 1	25	110		120	130	140	
	n (Same surface)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
<b>D-A59W</b>	2 (Different surfaces and same surface) 1	20	90		100	110	120	
	n (Same surface)	$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
	1	15	90		100	110	120	
<b>D-G5□/K59</b> <b>D-G5□W</b> <b>D-K59W</b> <b>D-G5BA</b> <b>D-G59F</b> <b>D-G5NT</b> <b>D-B5□/B64</b>	2 Different surfaces	15	90		100	110		
	2 Same surface	75	90		100	110		
	n	Different surfaces	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>		$100 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$110 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
	1	10	90		100	110		
<b>D-B59W</b>	2 Different surfaces	20	90		100	110		
	2 Same surface	75	90		100	110		
	n	Different surfaces	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>		$100 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$110 + 50 (n-2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
1	15	90		100	110			

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.  
 Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

- CJ1**
- CJP**
- CJ2**
- JCM**
- CM2**
- CM3**
- CG1**
- CG3**
- JMB**
- MB**
- MB1**
- CA2**
- CS1**
- CS2**

- D-□**
- X□**
- Technical Data

# CA2 Series

## Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches	Brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-G39 D-K39 D-A3□	2	Different surfaces	35	75	80	90	
		Same surface	100	100	100	100	
	n	Different surfaces	$35 + 30(n - 2)$ (n = 2, 3, 4...)	$75 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
		Same surface	$100 + 100(n - 2)$ (n = 2, 3, 4...)	$100 + 100(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>			
1	10	75	80	90			
D-A44	2	Different surfaces	35	75	80	90	
		Same surface	55	75	80	90	
	n	Different surfaces	$35 + 30(n - 2)$ (n = 2, 3, 4...)	$75 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 30(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
		Same surface	$55 + 50(n - 2)$ (n = 2, 3, 4...)	$75 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
1	10	75	80	90			
D-G39C D-K39C D-A3□C	2	Different surfaces	20	75	80	90	
		Same surface	100	100	100	100	
	n	Different surfaces	$20 + 35(n - 2)$ (n = 2, 3, 4...)	$75 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
		Same surface	$100 + 100(n - 2)$ (n = 2, 3, 4, 5...)	$100 + 100(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>			
1	10	75	80	90			
D-A44C	2	Different surfaces	20	75	80	90	
		Same surface	55	75	80	90	
	n	Different surfaces	$20 + 35(n - 2)$ (n = 2, 3, 4...)	$75 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 35(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
		Same surface	$55 + 50(n - 2)$ (n = 2, 3, 4...)	$75 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$90 + 50(n - 2)$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	
1	10	75	80	90			
D-Y59□/Y7P D-Y7□W D-Z7□/Z80	2 (Different surfaces and same surface) 1	15	80	85	90	95	105
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>
D-Y69□/Y7PV D-Y7□WV	2 (Different surfaces and same surface) 1	10	65	75	80	90	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
D-Y7BA	2 (Different surfaces and same surface) 1	20	95	100	105	110	
	n	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$95 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$100 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$105 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$110 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	
D-P3DWA	2 (Different surfaces and same surface) 1	15	85				
	n	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$85 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>				
D-P3DW <sup>Note 3)</sup>	2 (Different surfaces and same surface) 1	15	85				
	n	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$85 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>				
D-P4DW	2 (Different surfaces and same surface) 1	15	120	130	140		
	n	$15 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) <sup>Note 1)</sup>	$120 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$130 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>	$140 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) <sup>Note 2)</sup>		

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

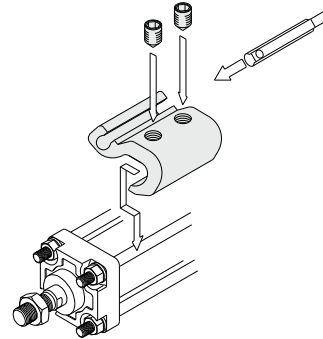
Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Note 3) Only applicable to the CDA2□H and CDA2W□H series.

## Auto Switch Mounting Brackets/Part No.

### <Tie-rod mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BA7-040	BA7-040	BA7-063	BA7-080	BA7-080
D-F5□/J59 D-F5□W/J59W D-F59F/F5NT D-A5□/A6□ D-A59W	BT-04	BT-04	BT-06	BT-08	BT-08
D-G39C/K39C D-A3□C/A44C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA D-Z7□/Z80	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P3DWA	BK7-040S	BK7-040S	BA10-063S	BA10-080S	BA10-080S
D-P3DW <small>(Note 2)</small>	BMB9-050S	BMB9-050S	BA9T-063S	BA9T-080S	BA9T-080S
D-P4DW	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080



\* The figure shows the mounting example for the D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V) types.

### <Band mounting>

#### Except air-hydro type

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-G39/K39 D-A3□/A44	BDS-04M	BDS-05M	BMB1-063	BMB1-080	BMB1-100
D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-B5□/B64 D-B59W	BH2-040	BA5-050	BAF-06	BAF-08	BAF-10

#### Air-hydro type

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-G39/K39 D-A3□/A44	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-B5□/B64 D-B59W	BA-04	BA-05	BA-06	BA-08	BA-10

Note 1) Auto switch brackets are included in the D-A3□C/A44C/G39C/K39C types. Specify the part number as follows depending on the cylinder size when ordering.  
(Example) ø40: D-A3□C-4, ø50: D-A3□C-5, ø63: D-A3□C-6, ø80: D-A3□C-8, ø100: D-A3□C-10

#### [Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is also available. Use it in accordance with the operating environment.  
(Since the auto switch mounting bracket and band are not included, order them separately.)

BBA1: For D-A5/A6/F5/J5 types  
BBA3: For D-B5/B6/G5/K5 types

Note 2) Only applicable to the CDA2□H and CDA2W□H series.

Note 3) Refer to pages 1681 and 1689 for details on the BBA1 and BBA3.

The above stainless steel screws are used when a cylinder is shipped with D-F5BA or G5BA auto switches. When only an auto switch is shipped independently, the BBA1 or BBA3 is attached.

Note 4) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the above auto switch mounting brackets (BA7-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6 L stainless steel set screws included in the BBA1.

Note 5) There is a difference in the cylinder tube thickness depending on the cylinder model. Use caution when a band mounting type is used as an applicable auto switch and a cylinder model is changed.

### Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to pages 1575 to 1701 for the detailed specifications.

Type	Model	Electrical entry	Features
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		Diagnostic indication (2-color indicator)
	D-M9NWV/M9PWV/M9BWW		Water resistant (2-color indicator)
	D-Y7NWW/Y7PWV/Y7BWW		—
	D-M9NAV/M9PAV/M9BAV		Diagnostic indication (2-color indicator)
	D-Y59A/Y59B/Y7P	Grommet (In-line)	Water resistant (2-color indicator)
	D-F59/F5P/J59		With timer
	D-Y7NW/Y7PW/Y7BW		Magnetic field resistant (2-color indicator)
	D-F59W/F5PW/J59W		—
	D-F5BA/Y7BA		Without indicator light
D-F5NT/G5NT	Grommet (Perpendicular)	—	
D-P5DW		Without indicator light	
D-A93V/A96V		—	
D-A90V	Grommet (In-line)	—	
D-A53/A56/B53/Z73/Z76		Without indicator light	
D-A67/Z80		Without indicator light	

\* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1648 and 1649.

\* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to pages 1593 and 1595.

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

D-□

-X□

Technical Data

# CA2 Series

# Made to Order: Individual Specifications

Please contact SMC for detailed dimensions, specifications and lead times.



## 1 Cylinder with Heat Resistant Reed Auto Switch (-10 to 120°C) Symbol **-X1184**

### Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	

### How to Order

CDA2 Standard model no. Z - Pivot bracket Rod end bracket - Heat resistant reed auto switch   - X1184

Switch model		Number of switches	
Symbol	Description	Symbol	Description
Nil	Without switch	S	1 pc.
B30	D-B30	Nil	2 pcs.
B30J	D-B30J		
B31	D-B31		
B31J	D-B31J		
B35	D-B35		
B35J	D-B35J		

Cylinder with heat resistant reed auto switch

\* For details about auto switches, refer to page 1671.

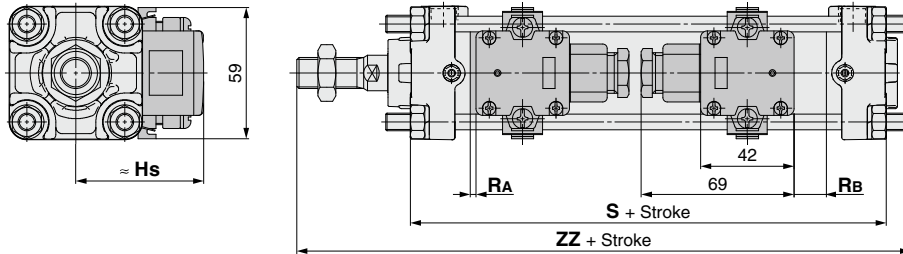
### Specifications

Ambient temperature range	-10°C to 120°C
Seal material	Fluororubber
Grease	Heat resistant grease

### Warning Precautions

Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

### Dimensions (Dimensions other than below are the same as standard type.)



(mm)

Bore size	Hs	RA	RB	S	ZZ	Minimum mounting stroke		Auto switch mounting bracket part number
						Other than center trunnion	Center trunnion	
40	57.5	4	13	99	161		180 st or more	BD1-04M
50	62.5	4	13	105	174	1 pc. : 50 st or more	180 st or more	BD1-05M
63	69	7	16	113	185	2 pcs.: Different surfaces 50 st or more	190 st or more	BD1-06M
80	78	5.5	23.5	131	219	2 pcs.: Same surface 220 st or more	200 st or more	BD1-08M
100	88.5	7.5	25.5	141	230		210 st or more	BD1-10M



# CA2 Series

## Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

### Handling

#### ⚠ Caution

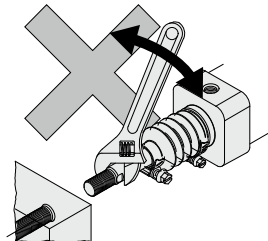
- Do not open the cushion valve beyond the stopper.**  
A retaining ring is installed as a cushion valve retention mechanism. Do not open the cushion valve beyond it. If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.

Bore size (mm)	Width across flats	Socket wrench
<b>40, 50</b>	2.5	JIS 4648 Hexagonal wrench key 2.5
<b>63, 80, 100</b>	4	JIS 4648 Hexagonal wrench key 4

- Use the air cushion at the end of cylinder stroke.**  
Otherwise, the tie-rod or piston rod assembly will be damaged.

#### ⚠ Caution

- Do not use a pneumatic type as an air-hydro cylinder. It can cause oil leak.**
- Do not rotate the piston rod when the rod boot is fixed.**  
Before rotating the piston rod, loosen the band to avoid twisting the rod boot.
- Install the rod boot with the breathing hole facing downwards or in a direction suitable to prevent dust, moisture etc. from entering easily into the rod boot.**



### Disassembly/Replacement

#### ⚠ Caution

- Use a socket wrench when the bracket is replaced.**  
If other tools are used, the nut or other parts may be deformed or the work efficiency may decrease. For applicable sockets, refer to the table below.

Bore size (mm)	Nut	Width across flats	Socket	Tightening torque (N·m)
<b>40, 50</b>	DA00040	13	JIS B4636 + Two-angle socket 13	7.4
	(M8 x 1.25, Hexagon nut 3 types)			
<b>63</b>	DA00010	17	JIS B4636 + Two-angle socket 17	20
	(M10 x 1.25, Hexagon nut 3 types)			
<b>80, 100</b>	DA00131	19	JIS B4636 + Two-angle socket 19	29
	(M12 x 1.75, Hexagon nut 3 types)			

- Do not replace the bushing.**  
As the bushing is press-fit, replace the cover assembly when the bushing must be replaced.
- When a seal is replaced, apply grease to the new seal before it is assembled.**  
Operation of the cylinder without greasing will result in extreme abrasion of the seal, causing premature air leakage.
- Do not disassemble the trunnion type cylinder because the mounting precision is required.**  
It is difficult to align the axial center of the trunnion with the axial center of the cylinder. Thus, if this type of cylinder is disassembled and reassembled, the required dimensional accuracy cannot be attained, which may lead to malfunctions.

#### Water Resistant Air Cylinder

Water resistant air cylinders are also available in CA2 series, which are suitable for use on machine tools, where exposure to coolant is possible and applicable for food machinery and automobile washing equipment in an environment where water splashes. Please contact SMC for more information.

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

**CA2**

CS1

CS2

D-

-X

Technical Data