

Air Cylinder

ø40, ø50, ø63, ø80, ø100

New

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
New CA2

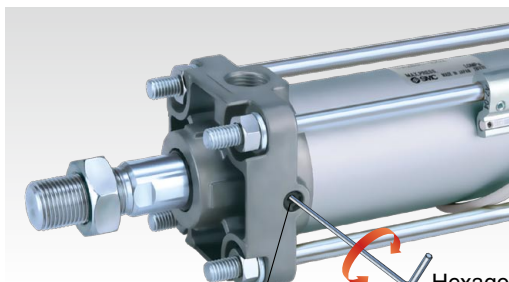
(1.54 kg)
Existing model



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.

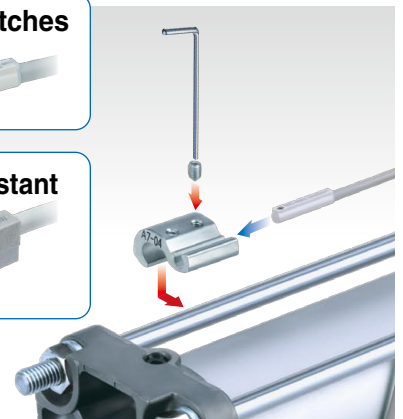
Compact auto switches

- D-M9□
- D-A9□



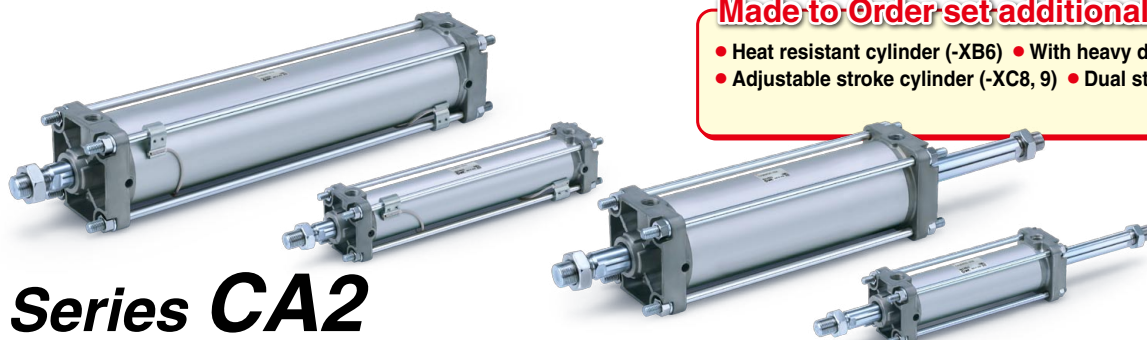
Magnetic field resistant auto switches

- D-P3DW
- D-P4DW



Made-to-Order set additionally

- Heat resistant cylinder (-XB6)
- With heavy duty scraper (-XC4)
- Adjustable stroke cylinder (-XC8, 9)
- Dual stroke cylinder (-XC10, 11) etc. are added.



Series CA2



CAT.ES20-222C

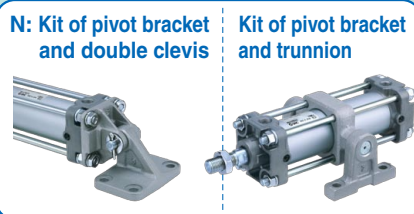
Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately
 Note) Mounting bracket is shipped together with the product, but not assembled.

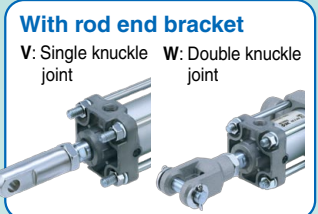
Example) **CDA2** **D** 40-100Z- **N** **W** -M9BW

• Mounting

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



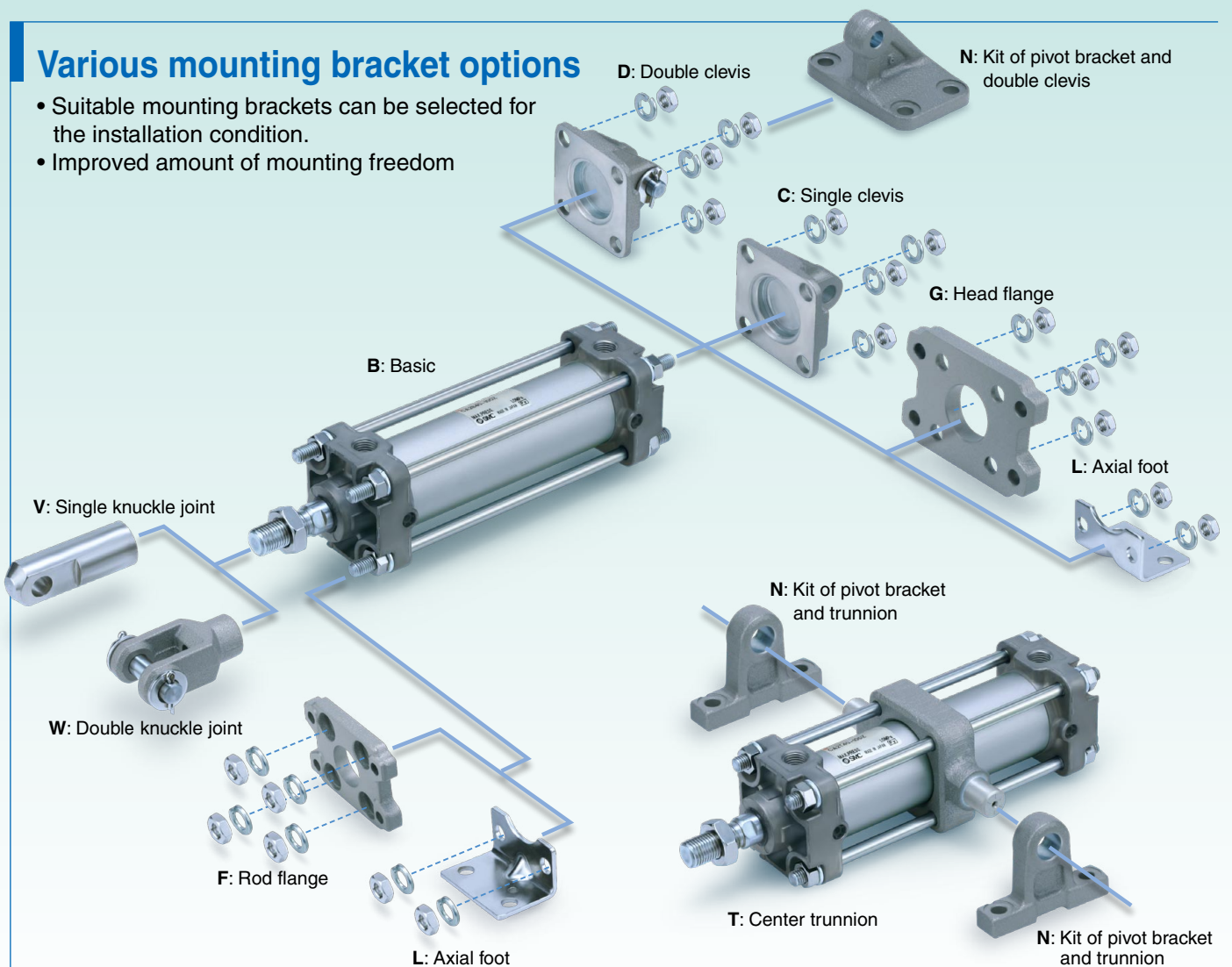
Rod end bracket	
Nil	None
V	Single knuckle joint
W	Double knuckle joint



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

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.

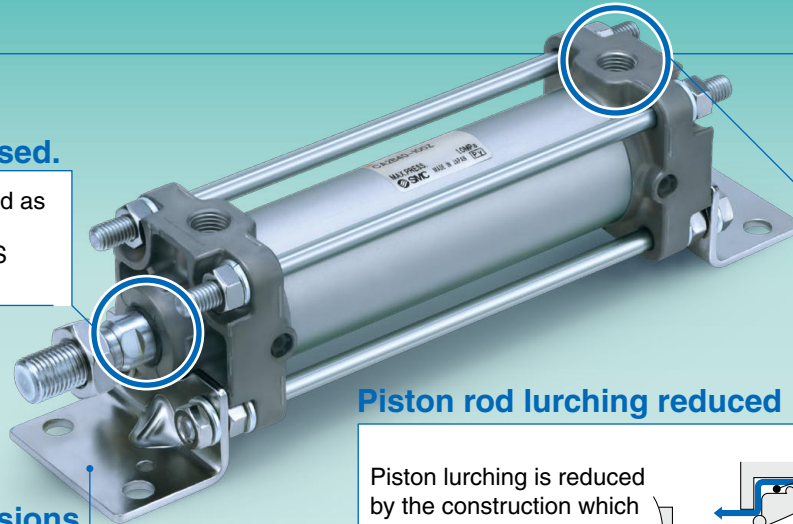
Bore size (mm)	New CA2	Reduction rate	Existing model	(kg)
40	0.93	12%	1.06	
50	1.31	15%	1.54	
63	1.84	14%	2.15	
80	3.17	11%	3.56	
100	4.29	10%	4.76	

* Compared to 50 stroke for each size

No substances hazardous to the environment are used.

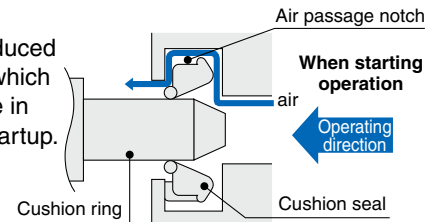
Lead free bushing is used as sliding material. Compliant with EU RoHS directive.

Mounting dimensions are the same as the existing 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	
Standard 	Single rod	●	●	●	●	●	●	●	Page 5
	Double rod	●	●	●	●	●	●	●	Page 21
Non-rotating rod 	Single rod	●	●	●	●	●	●	●	Page 29
	Double rod	●	●	●	●	●	●	●	Page 33
With end lock 	Single rod	●	●	●	●	●	●	●	Page 37
Air-hydro 	Single rod	●	●	●	●	●	●	●	Page 43
	Double rod	●	●	●	●	●	●	●	Page 47
Smooth Cylinder 	Single rod	●	●	●	●	●	●	●	CAT.ES20-235
Low friction 	Use the new series "Smooth Cylinder Series CA2Y" to realize both-direction low friction and low-speed operation. (Refer to the WEB catalog or "CAT.ES20-235" catalog.)								

* For details about the clean series, refer to the **WEB catalog**.

Combinations of Standard Products and Made to Order Specifications

Series CA2

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

Symbol	Specifications	Applicable bore size	CA2 (Standard type)		CA2K ^{Note 4)} (Non-rotating rod type)	
			Double acting			
			Single rod	Double rod	Single rod	Double rod
Series	Action/Type	Page	Page 5	Page 21	Page 29	Page 33
Standard	Standard	ø40 to ø100	●	●	●	●
CDA2-□Z	Built-in magnet		●	●	●	●
Long st	Long stroke		●	●	○	○
CA2□-□JZ	With rod boot (Nylon tarpaulin)		●	●	●	●
CA2□-□KZ	With rod boot (Heat resistant tarpaulin)		●	●	●	●
10-, 11-	Clean series ^{Note 4)}	ø40 to ø63	●	○	—	—
25A-	Copper (Cu) and Zinc (Zn)-free ^{Note 1)}	ø40 to ø100	●	○	—	—
20-	Copper ^{Note 2)} and Fluorine-free		●	●	●	●
CA2□R	Water resistant (NBR seal)	ø40 to ø100	●	○	—	—
CA2□V	Water resistant (FKM seal)		●	○	—	—
CA2□M	Cylinder with stable lubrication function (Lube-retainer)		●	○	—	—
XA□	Change of rod end shape	ø40 to ø100	◎	◎	◎	○
XB5	Oversized rod cylinder ^{Note 4)}		◎	○	—	—
XB6	Heat resistant cylinder (-10 to 150°C)		◎	◎	—	—
XC3	Special port location ^{Note 4)}		◎	◎	○	○
XC4	With heavy duty scraper		◎	◎	—	—
XC5	Heat resistant cylinder (-10 to 110°C)		◎	◎	—	—
XC6	Made of stainless steel ^{Note 4)}		—	—	—	—
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		◎	◎	○	○
X1184	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

Note 3) For details about the smooth cylinder, refer to the **WEB catalog** or "CAT.ES20-235" catalog.

Note 4) The cover shape is the same as the existing product.

Use the new series "Smooth Cylinder Series CA2Y" to realize both-direction low friction and low-speed operation. (Refer to the WEB catalog or "CAT.ES20-235" catalog.)

CBA2 ^{Note 4)} (With end lock)		CA2□H ^{Note 4)} (Air-hydro type)		CA2Y (Smooth Cylinder)	CA2□Q ^{Note 4)} (Low friction type)	
Double acting						
Single rod	Single rod	Double rod	Single rod	Single rod		
Page 37	Page 43	Page 47	—	Page 51		
						Symbol
●	●	●	●	●	●	Standard
●	●	●	●	●	●	CDA2-□Z
●	●	●	○	○	○	Long st
●	●	●	○	○	○	CA2□-□JZ
●	●	●	○	○	○	CA2□-□KZ
● ^{Note 5)}	—	—	—	—	—	10-, 11-
—	—	—	◎	—	—	25A-
●	○	○	—	—	—	20-
● ^{Note 5)}	○	○	—	—	—	CA2□R
● ^{Note 5)}	○	○	—	—	—	CA2□V
—	—	—	—	—	—	CA2□M
◎	◎	○	◎	◎	◎	XA□
○	○	○	—	—	—	XB5
◎	—	—	—	—	—	XB6
◎	○	○	—	—	◎ ^{Note 8)}	XC3
◎ ^{Note 5)}	◎ ^{Note 7)}	◎ ^{Note 7)}	—	—	—	XC4
○	—	—	—	—	—	XC5
◎ ^{Note 5)}	◎	◎	—	◎	◎	XC6
◎	○	○	◎	◎	◎	XC7
◎ ^{Note 5)}	○	—	○	○	○	XC8
◎ ^{Note 6)}	○	—	○	◎	◎	XC9
◎	○	—	○	◎	◎	XC10
○	○	○	○	○	○	XC11
○	○	○	○	—	—	XC12
◎	◎	◎	◎	◎	◎	XC14
◎	◎	◎	◎	◎	◎	XC15
◎	○	○	—	—	—	XC22
◎	○	—	◎	◎	◎	XC27
◎	○	○	◎	◎	◎	XC28
◎	○	○	◎	◎	◎	XC29
—	○	○	◎	◎	◎	XC30
◎	○	○	—	—	—	XC35
○	○	○	◎	◎	◎	XC65
—	—	—	◎	—	—	XC68
○	—	—	—	—	—	XC85
○	—	—	—	—	—	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) Series CA2□Q has no cushion. Only XC3BC, XC3CD and XC3DA are available.

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
		CA2□H
Air-hydro	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H
Low Friction		CA2□Q
		Auto Switch
Made to Order		

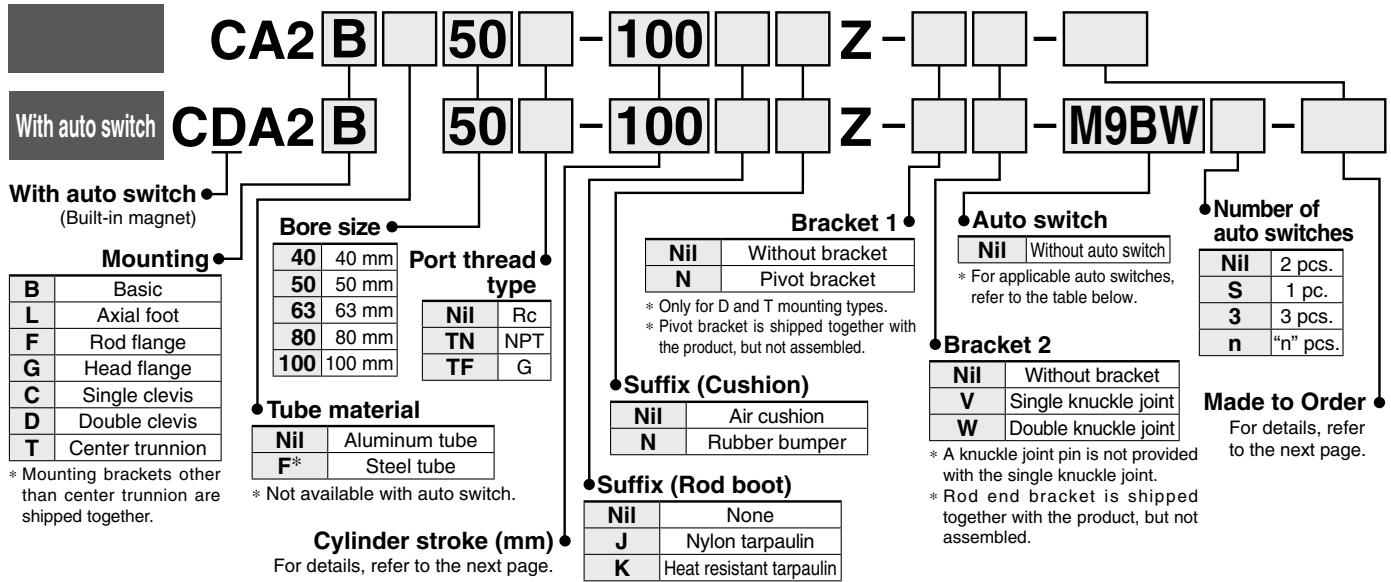
Air Cylinder: Standard Type Double Acting, Single Rod

Series CA2

ø40, ø50, ø63, ø80, ø100

RoHS

How to Order



Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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	—	●	●	●	○	○			—	—																									
				3-wire (PNP)			M9P	—	●	●	●	○	○																													
				2-wire	M9B	—	●	●	●	○	○																															
		Terminal conduit		3-wire (NPN)	12 V	G39C	G39	—	—	—	—	—	—	—	IC circuit			Relay, PLC																								
				2-wire		K39C	K39	—	—	—	—	—	—	—																												
				3-wire (NPN)	24 V	5 V, 12 V	M9NW	—	●	●	●	○	○	—																												
	3-wire (PNP)	M9PW	—	●			●	●	○	○																																
	Grommet	2-wire	12 V	M9BW	—	●	●	●	○	○	—																															
		3-wire (NPN)		24 V	5 V, 12 V	M9NA*1	—	○	○	●		○	—																													
		3-wire (PNP)	M9PA*1			—	○	○	●	○		○																														
	With diagnostic output (2-color indication)	2-wire (Non-polar)	5 V, 12 V	M9BA*1	—	○	○	●	○	○		—																														
				2-wire	12 V	24 V	5 V, 12 V	—	G5BA*1	—				—	●	○	IC circuit																									
4-wire (NPN)				F59F				G59F	●	—				●	○	○																										
Magnetic field resistant (2-color indication)	2-wire (Non-polar)	—	—	—	—	—	P3DW	—	●	—	●			●	○	—		—																								
							P4DW	—	—	—	●		●	○	○																											
							Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)		24 V	12 V	—				—	—	—	—	—	—	—	—																
											No	2-wire															24 V	12 V	—	—	—	—	—	—	—							
											Yes						100 V																			A93	—	●	●	●	●	IC circuit
											No						100 V or less																			A90	—	●	—	●	—	
No	100 V, 200 V	A54	B54	●	—	●					●					—																										
Terminal conduit	200 V or less	A64	B64	●	—	●					—	—																														
	—	A33C	A33	—	—	—	—	—																																		
DIN terminal	Yes	—	—	—	—	—	—		—	—	—	—	—	—	—		—																									
								Grommet								100 V, 200 V		A34C	A34	—	—	—	—	—																		
Diagnostic indication (2-color indication)	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—																										
								—									A44C	A44	—	—	—	—	—	—																		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																										

*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 * Solid state auto switches marked with "○" are produced upon receipt of order.
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWX

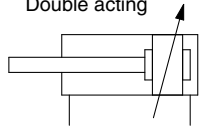
* Since there are other applicable auto switches than listed above, refer to page 58 for details.
 * For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.
 For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.
 * The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Air Cylinder: Standard Type Double Acting, Single Rod **Series CA2**



Symbol

Double acting



Air cushion



Made to Order

(For details, refer to pages 61 to 78.)

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

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

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.

* The cover shape is the same as the existing product.

Refer to pages 52 to 58 for cylinders with auto switches.
<ul style="list-style-type: none"> 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: $^{+1.0}_0$ 251 to 1000 st: $^{+1.4}_0$ 1001 to 1500 st: $^{+1.8}_0$ 1501 to 1800 st: $^{+2.2}_0$						
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
		When not activated	0.33	0.56	0.91	1.5	2.68
	Rubber bumper		1.8	3.6	6.0	12.0	12.0

*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 of the Best Pneumatics No. 2 or the **WEB catalog**. 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.

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 56 and 57.)

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	●	●	●	●	●	●	●

Standard Double Acting, Single Rod **CA2**
 Double Acting, Double Rod **CA2W**
 Non-rotating Rod Double Acting, Single Rod **CA2K**
 Double Acting, Double Rod **CA2KW**
 With End Lock **CBA2**
 Air-hydrro Double Acting, Single Rod **CA2H**
 Double Acting, Double Foot **CA2WH**
 Low Friction **CA2Q**
 Auto Switch **CA2Q**
 Made to Order

Series CA2

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
- $$0.91 + 0.20 \times 100/50 = 1.31 \text{ kg}$$

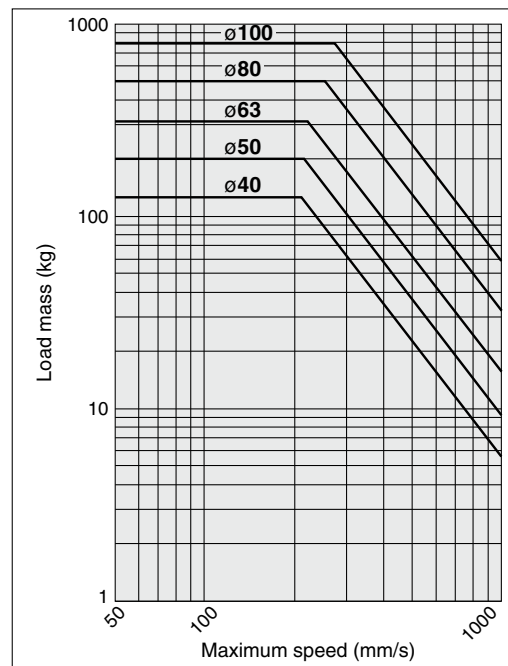
Mounting Brackets/Part No.

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

With auto switch (Built-in magnet)

Water resistant 2-color indication solid state auto switch

Made to Order

Water resistant air cylinder

R	NBR seal (Nitrile rubber)
V	FKM seal (Fluororubber)

Specifications

Action	Double acting, Single rod
Bore size (mm)	40, 50, 63, 80, 100
Cushion	Air cushion
Auto switch mounting	Tie-rod mounting
Made to Order	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 the **WEB catalog** or the Best Pneumatics No. 2.

Dimensions

* The dimensions are the same as the standard double acting, single rod type. Refer to page 10 for details.

Cylinder with Stable Lubrication Function (Lube-retainer)

CDA2 **Mounting style** **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.

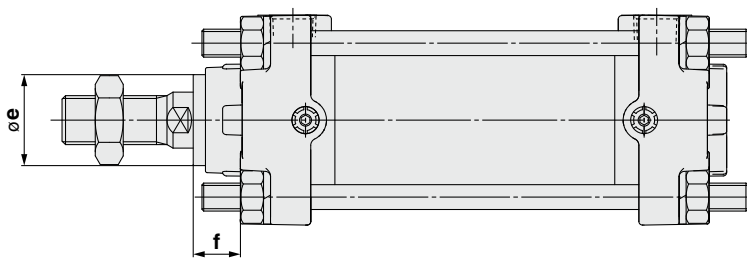


Specifications

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



Bore size	øe	f (mm)
40	26	13.5
50	30	12.5
63	30	12.5
80	36	16.5
100	42	16

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

For details, refer to the **WEB catalog**.

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydro Double Acting, Single Rod **CA2□H**

Double Acting, Double Rod **CA2W□H**

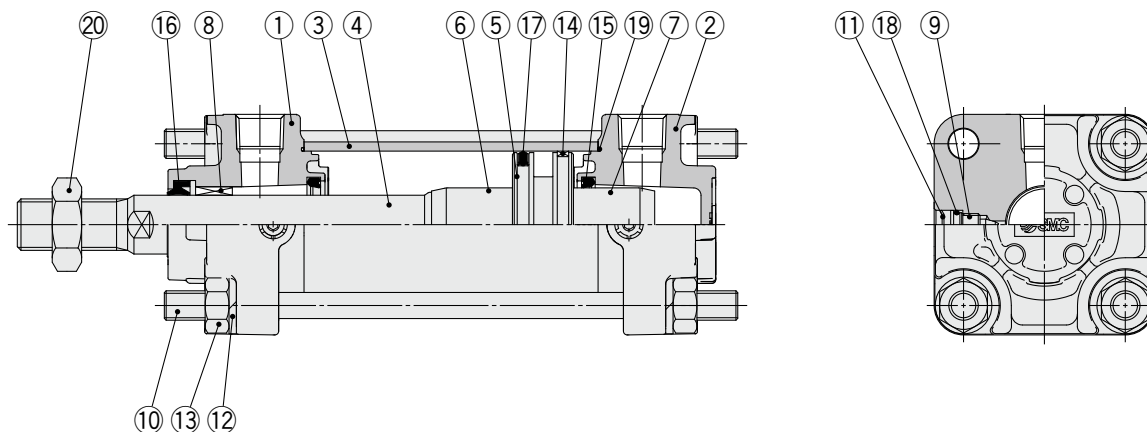
Low Friction **CA2□Q**

Auto Switch

Made to Order

Series CA2

Construction



Component Parts

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

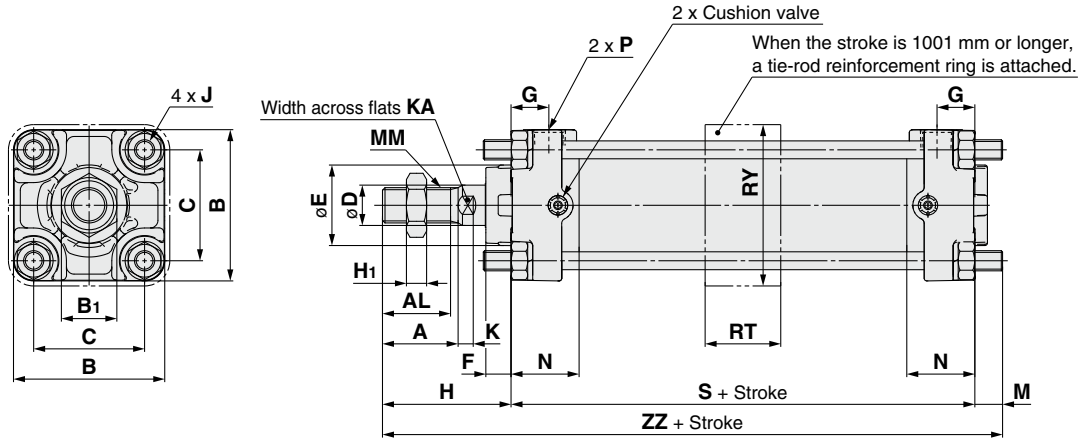
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
40	CA2-40Z-PS	Set of the nos. ⑮, ⑯, ⑰, ⑱
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	

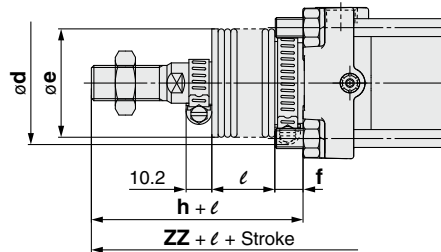
- * Seal kit includes ⑮, ⑯, ⑰, ⑱. Order the seal kit based on each bore size.
- * Do not disassemble the trunnion type. Refer to page 79.
- * Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

Air Cylinder: Standard Type Double Acting, Single Rod **Series CA2**

Basic: CA2B



With rod boot



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	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 ø50 to ø100 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 ø50 to ø100 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.

Standard Double Acting, Single Rod **CA2**

Standard Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Non-rotating Rod Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydraulic Double Acting, Single Rod **CA2H**

Air-hydraulic Double Acting, Double Rod **CA2WH**

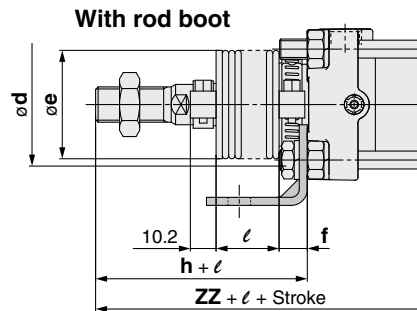
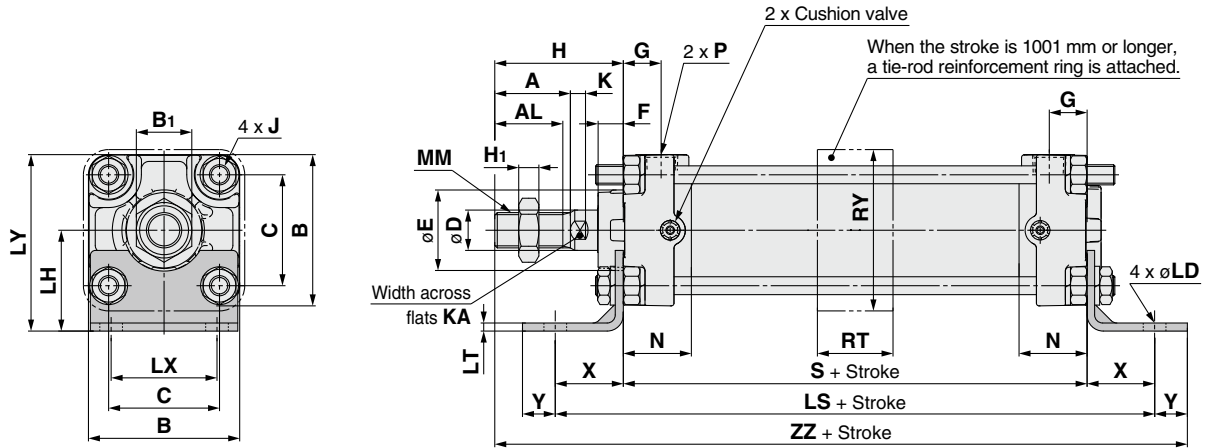
Low Friction **CA2Q**

Auto Switch

Made to Order

Series CA2

Axial Foot: CA2L

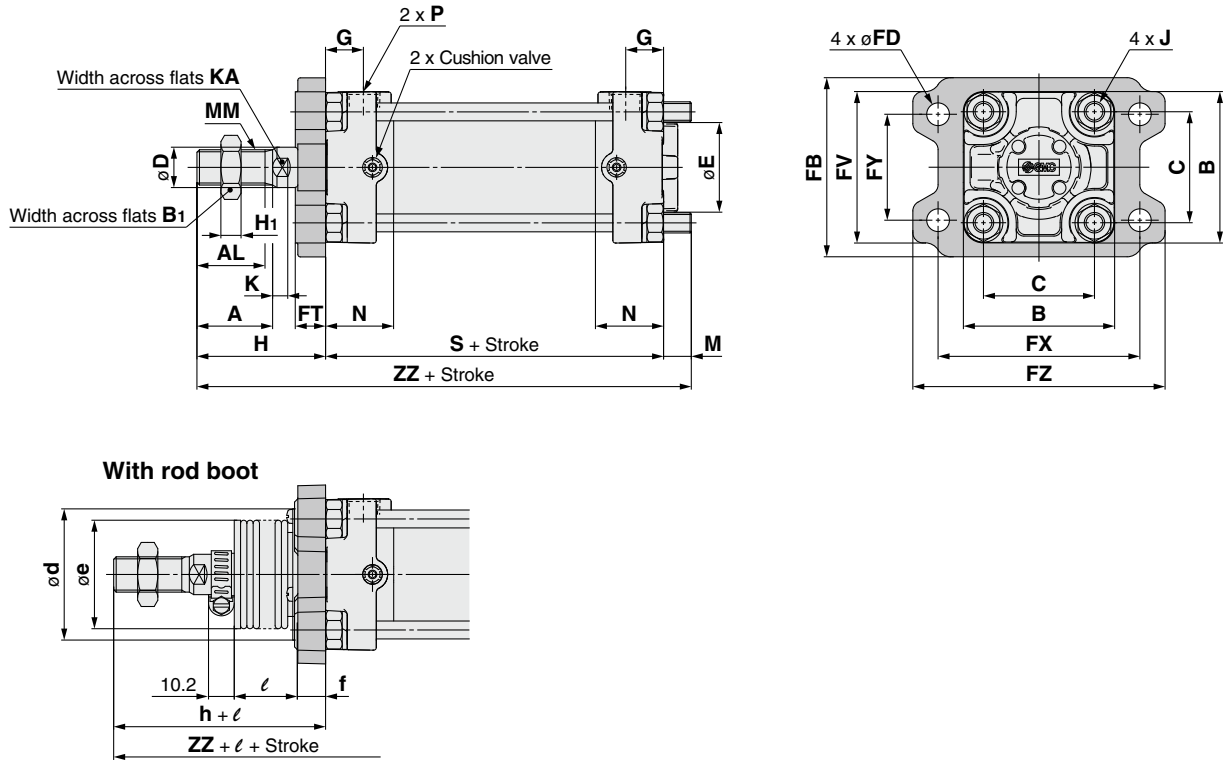


Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	LD	LH	LS	LT	LX	LY
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9	40	138	3.2	42	70
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2	50	80
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2	59	93
80	40	37	102	32	78	25	52	14	21	13	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



Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H ₁	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.

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydraulic Double Acting, Single Rod **CA2H**

Double Acting, Double Rod **CA2WH**

Low Friction **CA2Q**

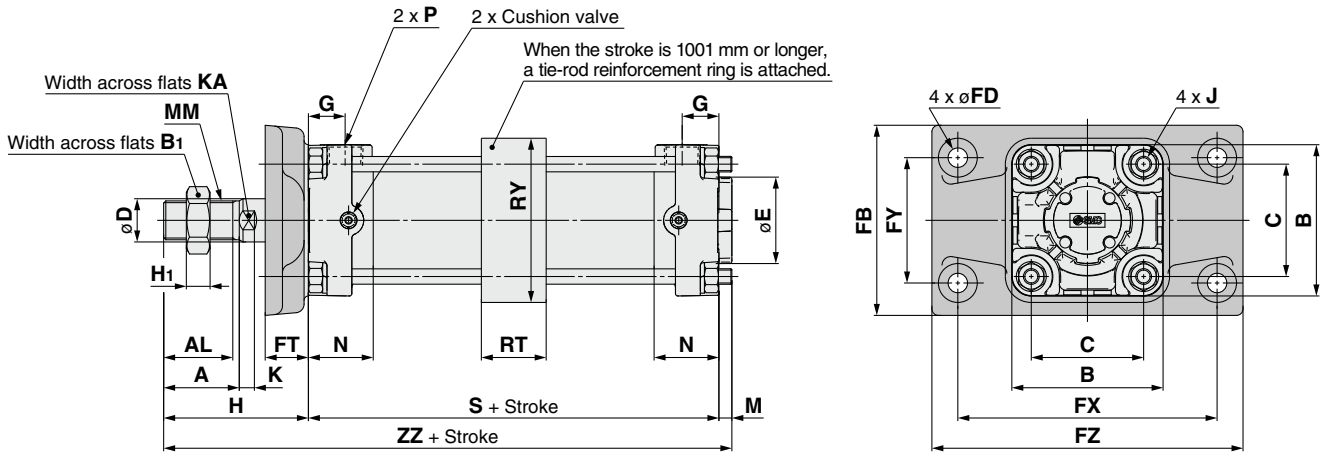
Auto Switch

Made to Order

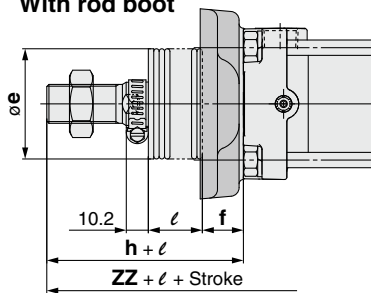
Series CA2

Rod Flange: CA2F

Stroke of 1001 mm or more



With rod boot



Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FX	FY	FZ	G	H ₁	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	l	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

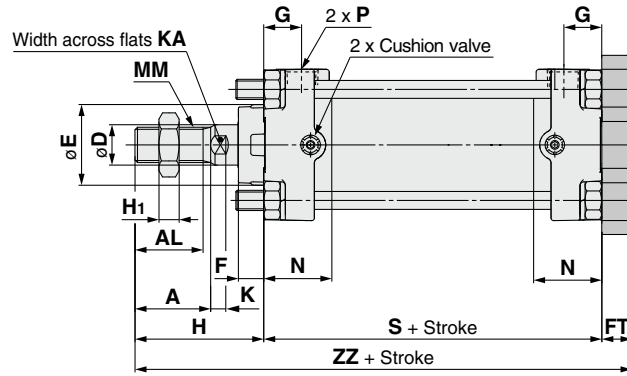
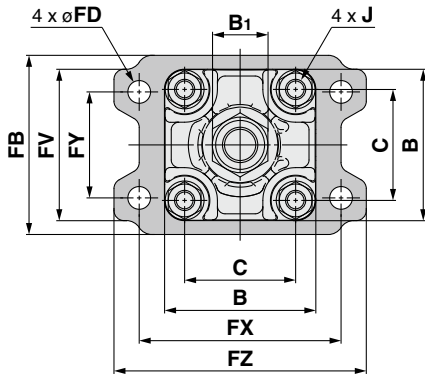
★For installing an air cylinder, when a hole must be made to accommodate the rod portion, make sure to machine a hole that is larger than the outer diameter of the boot øe.

Note 1) For flange type with bore size of ø40, the same flange bracket is used for all strokes.

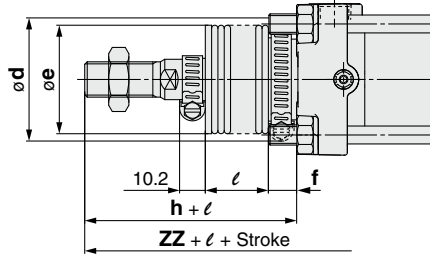
Note 2) For models with bore size of ø50 to ø100 and stroke of 1001 mm or more, do not mount a flange bracket on the rod cover side of the basic type since H dimension is different from those shown above. When rod flange type is used, order with the part number with bracket.

Head Flange: CA2G

Stroke of 1000 mm or less



With rod boot



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	FB	FD	FT	FV	FX	FY	FZ	G	H ₁	J
	40	30	27	60	22	44	16	32	10	71	9	12	60	80	42	100	15	8
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

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydraulic Double Acting, Single Rod **CA2H**

Double Acting, Double Rod **CA2WH**

Low Friction **CA2Q**

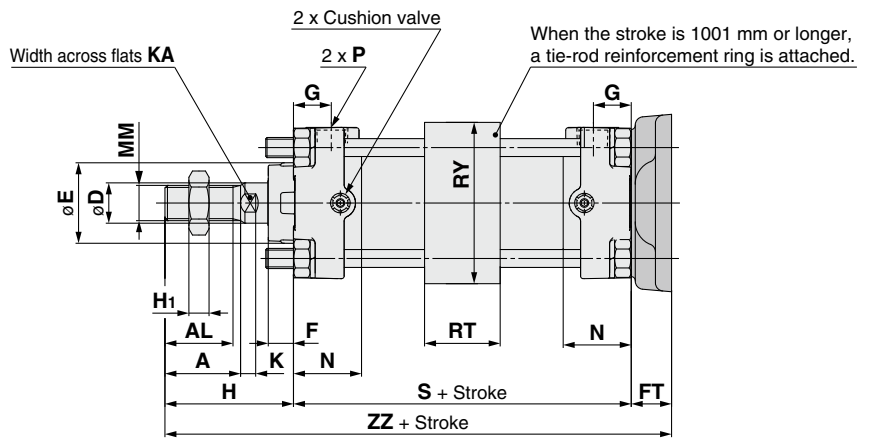
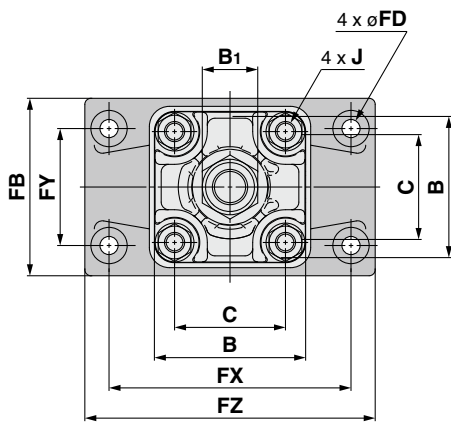
Auto Switch

Made to Order

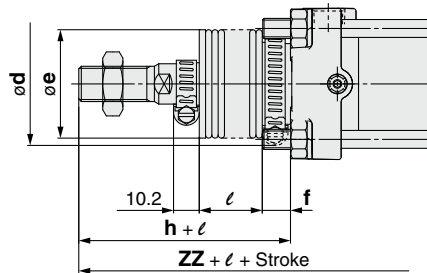
Series CA2

Head Flange: CA2G

Stroke of 1001 mm or more



With rod boot



Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FX	FY	FZ	G	H ₁	J	K	KA
40	30	27	60	22	44	16	30	71	9	12	80	42	100	15	8	M8 x 1.25	6	14
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

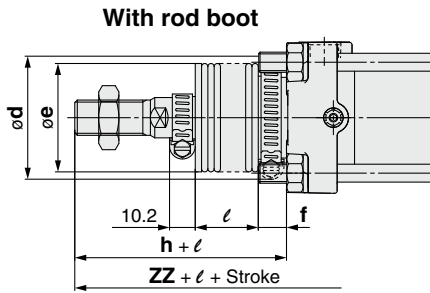
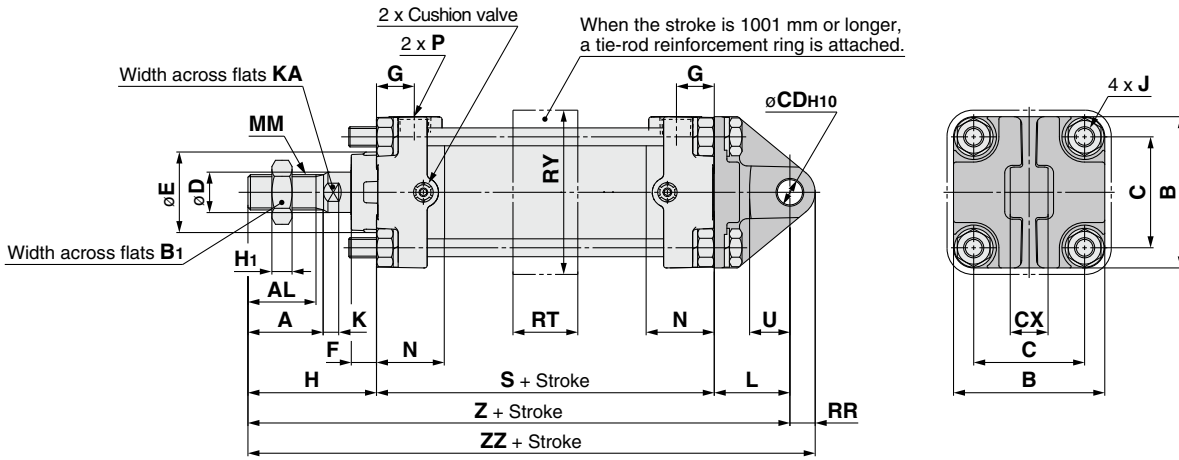
(mm)

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



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

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydraulic Double Acting, Single Rod **CA2□H**

Double Acting, Double Rod **CA2W□H**

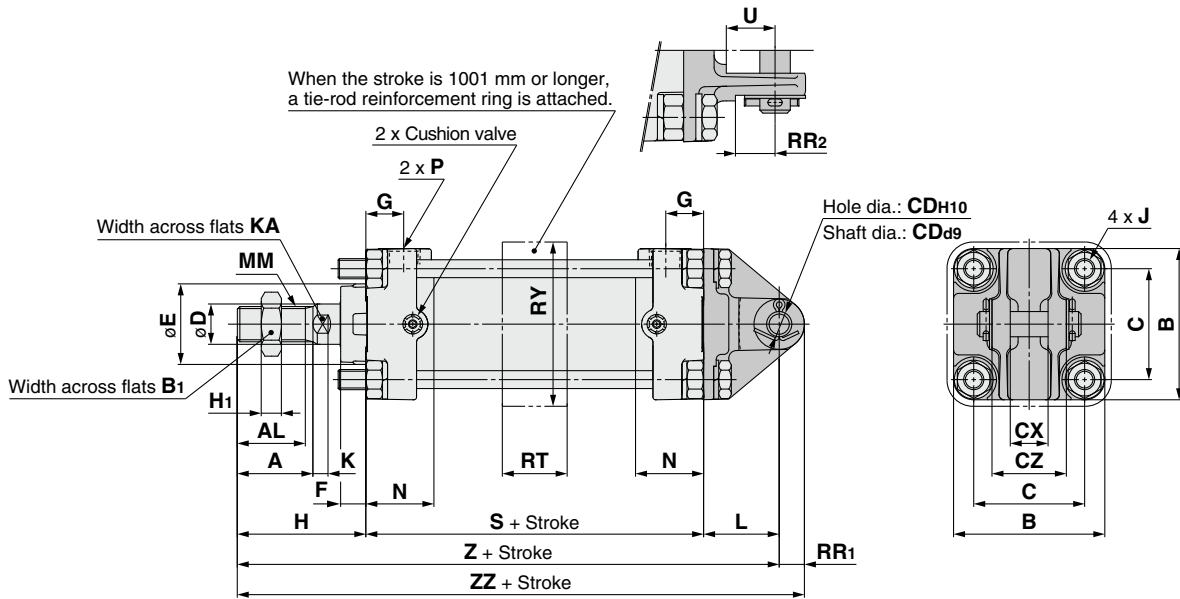
Low Friction **CA2□Q**

Auto Switch

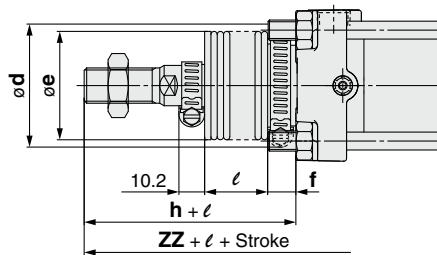
Made to Order

Series CA2

Double Clevis: CA2D



With rod boot

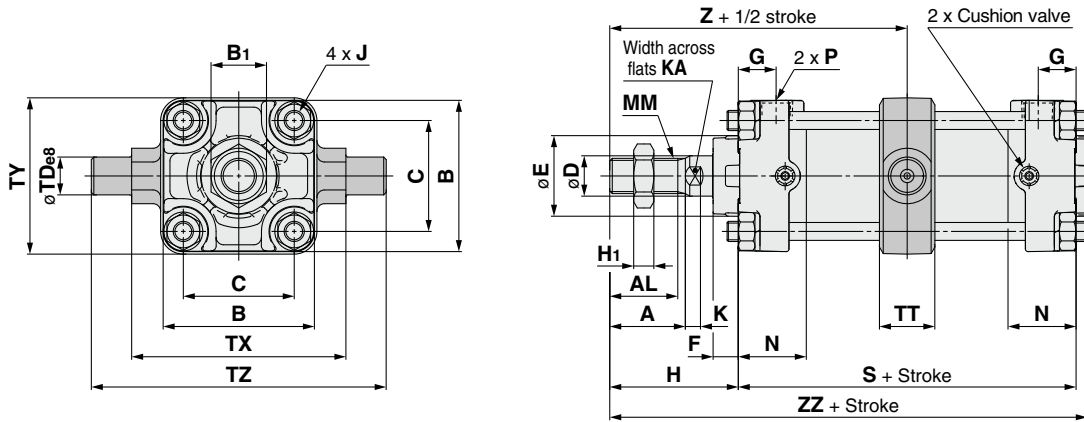


Bore size (mm)	A	AL	B	B ₁	C	CD _{H10}	CX	CZ	D	E	F	G	H ₁	J	K	KA	L
	40	30	27	60	22	44	10 ^{+0.058} ₀	15 ^{+0.3} _{+0.1}	29.5	16	32	10	15	8	M8 x 1.25	6	14
50	35	32	70	27	52	12 ^{+0.070} ₀	18 ^{+0.3} _{+0.1}	38	20	40	10	17	11	M8 x 1.25	7	18	35
63	35	32	85	27	64	16 ^{+0.070} ₀	25 ^{+0.3} _{+0.1}	49	20	40	10	17	11	M10 x 1.25	7	18	40
80	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{+0.3} _{+0.1}	61	25	52	14	21	13	M12 x 1.75	10	22	48
100	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{+0.3} _{+0.1}	64	30	52	14	21	16	M12 x 1.75	10	26	58

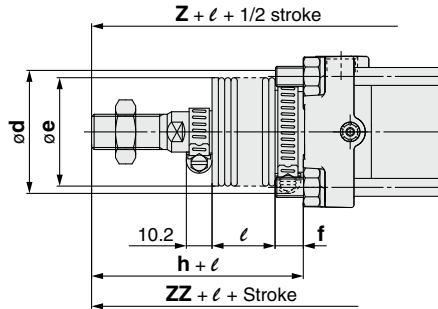
Bore size (mm)	MM	N	P	RR ₁	RR ₂	S	U	Without rod boot			With rod boot						
								H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ
40	M14 x 1.5	27	1/4	10	16	84	16	51	165	175	56	43	11.2	59	1/4 stroke	173	183
50	M18 x 1.5	30	3/8	12	19	90	19	58	183	195	64	52	11.2	66	1/4 stroke	191	203
63	M18 x 1.5	31	3/8	16	23	98	23	58	196	212	64	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



With rod boot



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	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
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 _{e8}	TT	TX	TY	TZ	Without rod boot			With rod boot						
						H	Z	ZZ	d	e	f	h	l	Z	ZZ
						40	15 ^{-0.032} _{-0.059}	22	85	62	117	51	93	140	56
50	15 ^{-0.032} _{-0.059}	22	95	74	127	58	103	154	64	52	11.2	66	1/4 stroke	111	162
63	18 ^{-0.032} _{-0.059}	28	110	90	148	58	107	162	64	52	11.2	66	1/4 stroke	115	170
80	25 ^{-0.040} _{-0.073}	34	140	110	192	71	129	194	76	65	12.5	80	1/4 stroke	138	203
100	25 ^{-0.040} _{-0.073}	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 79.

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
	Air-hydro	Double Acting, Single Rod CA2□H
Low Friction	Double Acting, Double Rod	CA2W□H
		CA2□Q
		Auto Switch
		Made to Order

Series CA2

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

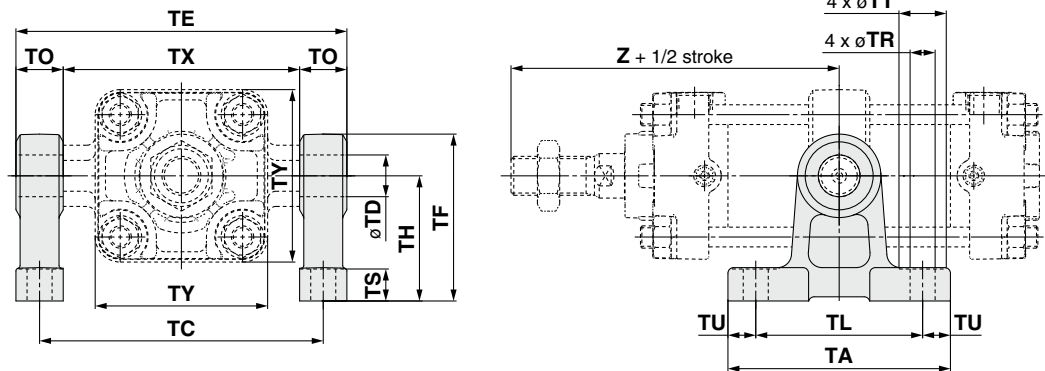
* Please contact SMC at the time of mounting.

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

* Order 2 trunnion pivot brackets per cylinder.

Trunnion pivot bracket

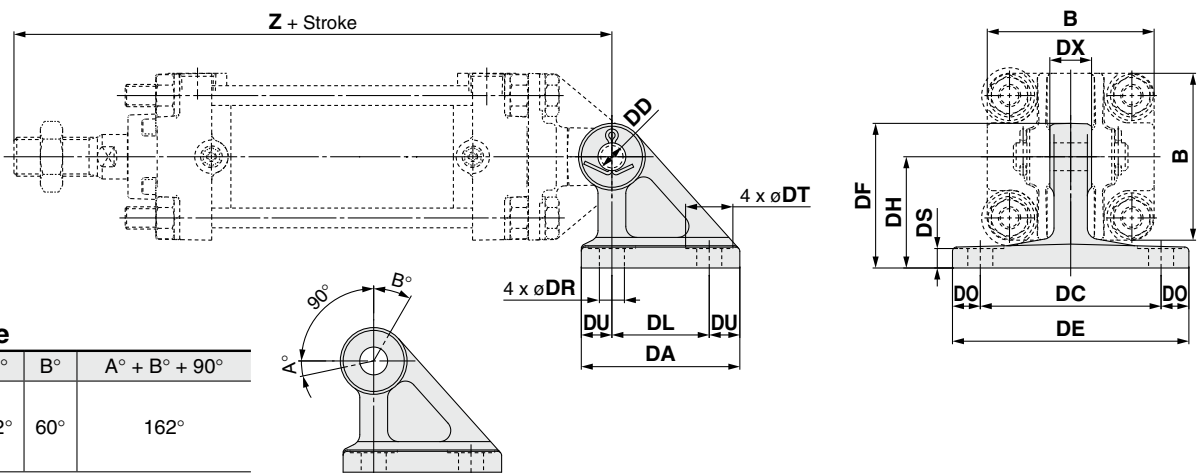
Material: Cast iron



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 ^{+0.070} ₀
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	103	15 ^{+0.070} ₀
CA2-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	107	18 ^{+0.070} ₀
MB-S10	80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	129	25 ^{+0.084} ₀
	100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	135	25 ^{+0.084} ₀

Double clevis pivot bracket

Material: Cast iron



Rotating Angle

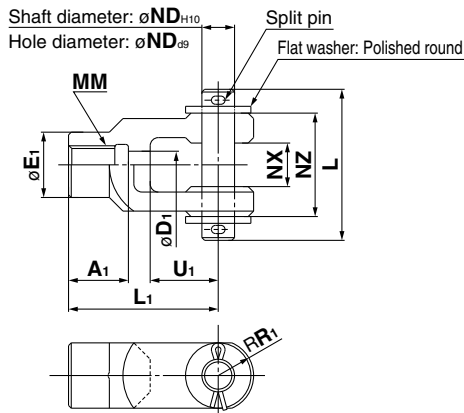
Bore size (mm)	A°	B°	A° + B° + 90°
40 to 100	12°	60°	162°

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 ^{+0.058} ₀
CA2-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	183	12 ^{+0.070} ₀
CA2-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	196	16 ^{+0.070} ₀
CA2-B08	80	93	60	16.5	100	31.5	130	15	13.5	24	12	65	90	102	235	20 ^{+0.084} ₀
CA2-B10	100	93	60	16.5	100	35.5	130	15	13.5	24	12	65	90	116	256	25 ^{+0.084} ₀

Series CA2

Dimensions of Accessories

Y Type Double Knuckle Joint



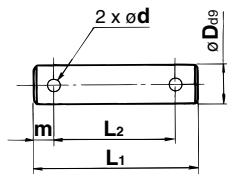
Material: Cast iron

(mm)

Part no.	Applicable bore size	A ₁	E ₁	D ₁	L ₁	MM	R ₁	U ₁	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 ^{+0.3} / _{+0.1}	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 ^{+0.3} / _{+0.1}	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 ^{+0.3} / _{+0.1}	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 ^{+0.3} / _{+0.1}	61	83	ø4 x 30 L	Polished round 20

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

Clevis Pin/Knuckle Pin



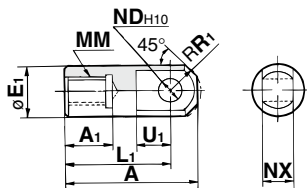
Material: Carbon steel

(mm)

Part no.	Applicable bore size		Dd9	L ₁	L ₂	m	d Drill through	Included split pin	Included flat washer
	Clevis	Knuckle							
CDP-2A	40	—	10 ^{-0.040} / _{-0.076}	46	38	4	3	ø3 x 18 L	Polished round 10
CDP-3A	50	40, 50, 63	12 ^{-0.050} / _{-0.093}	55.5	47.5	4	3	ø3 x 18 L	Polished round 12
CDP-4A	63	—	16 ^{-0.050} / _{-0.093}	71	61	5	4	ø4 x 25 L	Polished round 16
CDP-5A	—	80	18 ^{-0.050} / _{-0.093}	76.5	66.5	5	4	ø4 x 25 L	Polished round 18
CDP-6A	80	100	20 ^{-0.065} / _{-0.117}	83	73	5	4	ø4 x 30 L	Polished round 20
CDP-7A	100	—	25 ^{-0.065} / _{-0.117}	88	78	5	4	ø4 x 36 L	Polished round 24

* Split pins and flat washers are included.

I Type Single Knuckle Joint

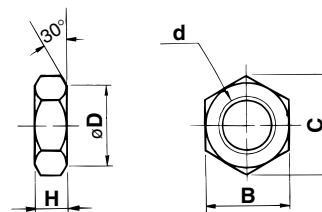


Material: Free cutting sulfur steel

(mm)

Part no.	Applicable bore size	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND _{H10}	NX
I-04A	40	69	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} / ₀	16 ^{-0.1} / _{-0.3}
I-05A	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 ^{+0.070} / ₀	16 ^{-0.1} / _{-0.3}
I-08A	80	91	37	36	71	M22 x 1.5	22.5	26	18 ^{+0.070} / ₀	28 ^{-0.1} / _{-0.3}
I-10A	100	105	37	40	83	M26 x 1.5	24.5	28	20 ^{+0.084} / ₀	30 ^{-0.1} / _{-0.3}

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

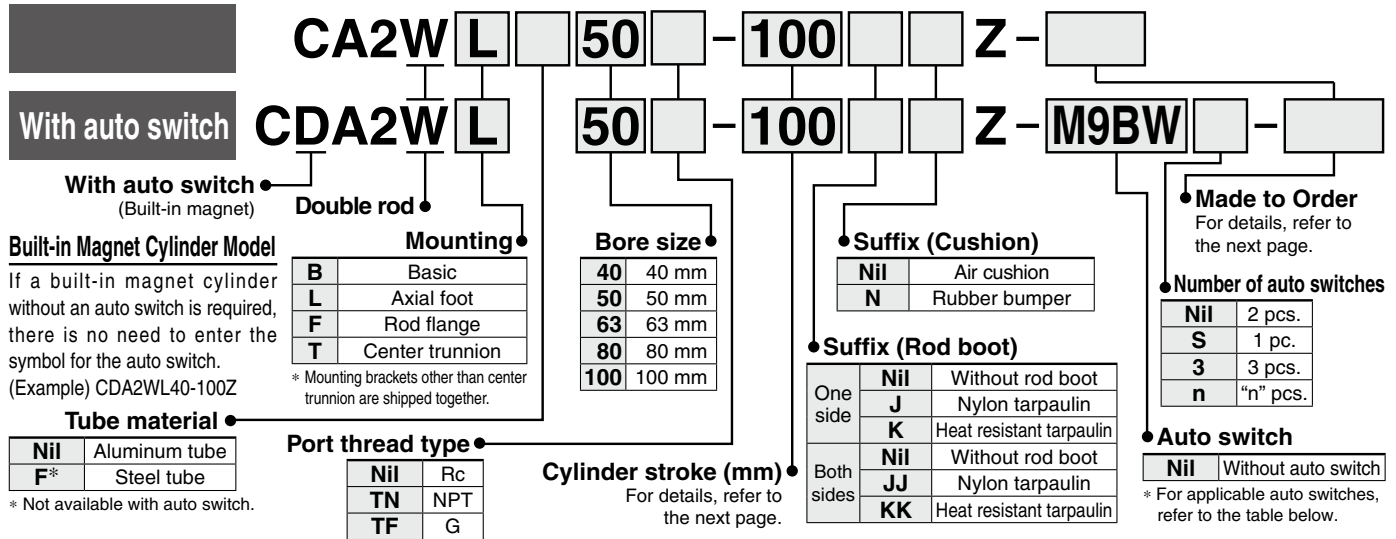
Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydro Double Acting, Single Rod CA2H
 Double Acting, Double Rod CA2WH
 Low Friction CA2Q
 Auto Switch
 Made to Order

Air Cylinder: Standard Type Double Acting, Double Rod Series CA2W

∅40, ∅50, ∅63, ∅80, ∅100



How to Order



Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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)															
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	M9N	—	●	●	●	○	○	IC circuit	—												
				3-wire (PNP)			M9P	—	●	●	●	○	○														
				2-wire	M9B	—	●	●	●	○	○																
		Terminal conduit		3-wire (NPN)	24 V	12 V	G39C	G39	—	—	—	—	—			—	—										
				2-wire			K39C	K39	—	—	—	—	—			—											
				3-wire (NPN)	5 V, 12 V	—	M9NW	—	●	●	●	○	○			IC circuit											
	3-wire (PNP)	M9PW	—	●			●	●	○	○																	
	Diagnostic indication (2-color indication)	Grommet	Yes	24 V	12 V	—	—	M9BW	—	●	●	●	○	○	IC circuit	Relay, PLC											
								2-wire	K59W	—	●	●	●	○			○										
				Terminal conduit	3-wire (NPN)	5 V, 12 V	—	M9NA*1	—	○	○	●	○	○			—										
		3-wire (PNP)			M9PA*1			—	○	○	●	○	○														
		2-wire			M9BA*1	—	○	○	●	○	○																
Water resistant (2-color indication)		Grommet		—	24 V	12 V	—	—	—	G5BA*1	—	—	●	○			○	—									
	With diagnostic output (2-color indication)		4-wire (NPN)						5 V, 12 V	—	F59F	G59F	●	—	●	○	○		IC circuit								
			2-wire (Non-polar)								P3DW	—	●	—	●	●	○			—							
Magnetic field resistant (2-color indication)	Grommet	Yes	24 V	—	—	—	P4DW	—	—	—	●	●	○	—													
							—	—	—	—	—	—	—		—	—	—										
Reed auto switch	—	Grommet	Yes	2-wire	24 V	12 V	—	—	—	●	—	●	—	—	IC circuit	—											
																	Terminal conduit	100 V	A93	—	●	●	●	●	—	IC circuit	
																		100 V or less	A90	—	●	—	●	—	—		
																		100 V, 200 V	A54	B54	●	—	●	●			—
																		200 V or less	A64	B64	●	—	●	—			
		DIN terminal															—	A33C	A33	—	—	—	—	—			
																	—	A34C	A34	—	—	—	—				
																	100 V, 200 V	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 3 m.....L (Example) M9NWL
1 m.....M (Example) M9NWM 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 58 for details.

* For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.

For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.

* The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Air Cylinder: Standard Type Double Acting, Double Rod **Series CA2W**

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				
Minimum operating pressure	0.08 MPa				
Piston speed	50 to 500 mm/s				
Ambient and fluid temperature	Without auto switch: -10 to 70°C* With auto switch : -10 to 60°C*				
Cushion	Air cushion or Rubber bumper				
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$ 251 to 1000 st: $^{+1.4}_0$				
Lubrication	Not required (Non-lube)				
Mounting	Basic, Axial foot, Rod flange, Center trunnion				

* No freezing

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 1000	Up to 1800
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	Up to 1200	
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	Up to 1500	

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 of the Best Pneumatics No. 2 or the **WEB catalog**. 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 1400 mm. Please consult with SMC when exceeding 1400 mm strokes.

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 56 and 57.)

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	Foot	Flange	Center trunnion
Standard	Rod end nut		●	●	●	●
	Single knuckle joint		●	●	●	●
Option	Double knuckle joint (with pin)		●	●	●	●
	With rod boot		●	●	●	●

Weights/Aluminum Tube (Steel Tube)

		Bore size (mm)	40	50	63	80	100
Basic weight	Basic	Aluminum tube	0.92	1.38	1.86	3.32	4.55
		Steel tube	0.97	1.44	1.96	3.5	4.83
	Axial foot	Aluminum tube	1.11	1.6	2.19	3.99	5.54
		Steel tube	1.16	1.66	2.29	4.17	5.82
	Flange	Aluminum tube	1.29	1.83	2.65	4.77	6.47
		Steel tube	1.34	1.89	2.75	4.95	6.75
Trunnion	Aluminum tube	1.28	1.86	2.66	4.87	6.83	
	Steel tube	1.33	1.92	2.76	5.05	7.11	
Additional weight per 50 mm of stroke	All mounting brackets	Aluminum tube	0.28	0.37	0.44	0.66	0.86
	Steel tube	0.35	0.47	0.55	0.89	1.15	
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:

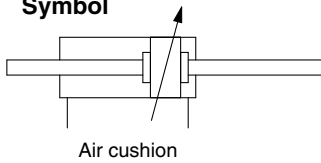
(Example) **CA2WL40-100**

(Axial foot, ø40, 100 stroke)

- Basic weight
.....1.18 (Axial foot, ø40)
 - Additional weight
.....0.28/50 stroke
 - Cylinder stroke
.....100 stroke
- 1.18 + 0.28 x 100/50 = 1.74 kg



Symbol



Made to Order
(For details, refer to pages 61 to 78.)

Symbol	Specifications
-XA □	Change of rod end shape
-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
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluororubber seal
-XC28	Compact flange made of SS400
-XC35	With coil scraper
-XC58	Water resistant/ Built-in hard plastic magnet*
-XC59	Fluororubber seal/ Built-in hard plastic magnet*
-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

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

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.

* The cover shape is the same as the existing product.

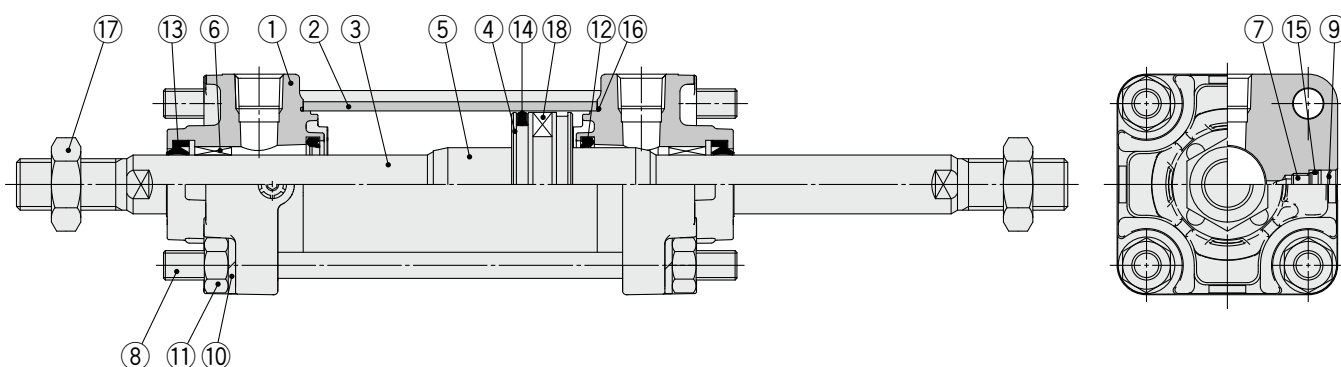
Refer to pages 52 to 58 for cylinders with auto switches.

- 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.

Standard Double Acting, Single Rod **CA2**
 Double Acting, Double Rod **CA2W**
 Non-rotating Rod Double Acting, Single Rod **CA2K**
 Double Acting, Double Rod **CA2KW**
 With End Lock **CBA2**
 Air-hydro Double Acting, Single Rod **CA2H**
 Double Acting, Double Rod **CA2WH**
 Low Friction **CA2Q**
 Auto Switch **Auto Switch**
 Made to Order **Made to Order**

Series CA2W

Construction



Component Parts

No.	Description	Material	Q'ty	Note
1	Rod cover	Aluminum die-casted	2	Trivalent chromated
2	Cylinder tube	Aluminum alloy	1	Hard anodized
3	Piston rod	Carbon steel	1	Hard chrome plating
4	Piston	Aluminum alloy	1	
5	Cushion ring	Aluminum alloy	2	Anodized
6	Bushing	Bearing alloy	1	
7	Cushion valve	Steel wire	2	Trivalent zinc chromated
8	Tie-rod	Carbon steel	4	Trivalent zinc chromated
9	Retaining ring	Spring steel	2	Phosphate coating
10	Spring washer	Steel wire	8	Trivalent zinc chromated
11	Tie-rod nut	Rolled steel	8	Trivalent zinc chromated
12	Cushion seal	Urethane	2	
13	Rod seal	NBR	2	
14	Piston seal	NBR	1	
15	Cushion valve seal	NBR	2	
16	Cylinder tube gasket	NBR	2	
17	Rod end nut	Rolled steel	2	Trivalent zinc chromated
18	Magnet	—	(1)	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
	Pneumatic type	
40	CA2W40Z-PS	Set of the nos. ⑫, ⑬, ⑭, ⑯
50	CA2W50Z-PS	
63	CA2W63Z-PS	
80	CA2W80Z-PS	
100	CA2W100Z-PS	

* Do not disassemble the trunnion type. Refer to page 79.

* Seal kit includes ⑫, ⑬, ⑭, ⑯. Order the seal kit based on each bore size.

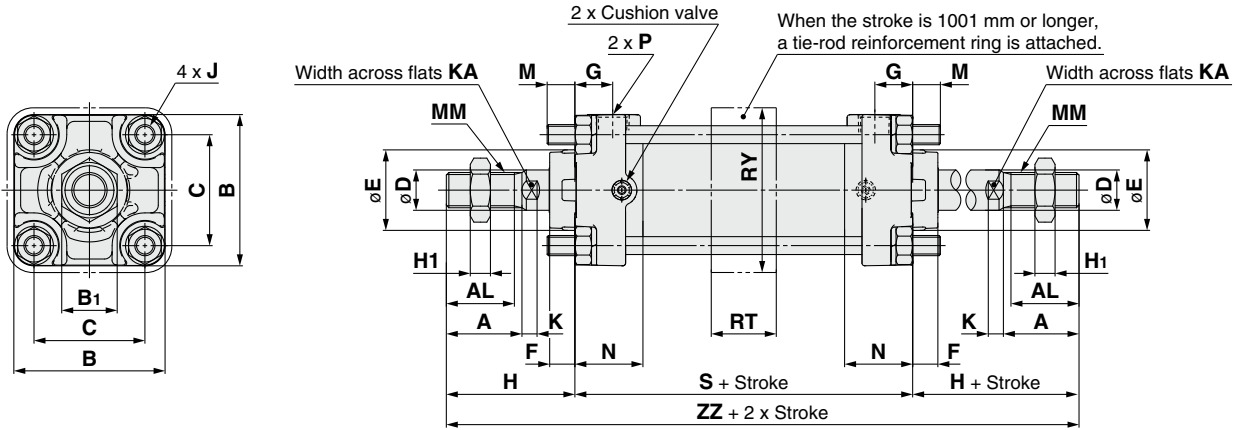
* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).

Order with the following part number when only the grease pack is needed.

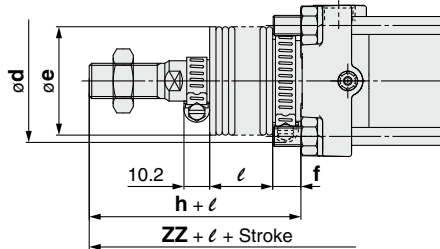
Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

Air Cylinder: Standard Type Double Acting, Double Rod **Series CA2W**

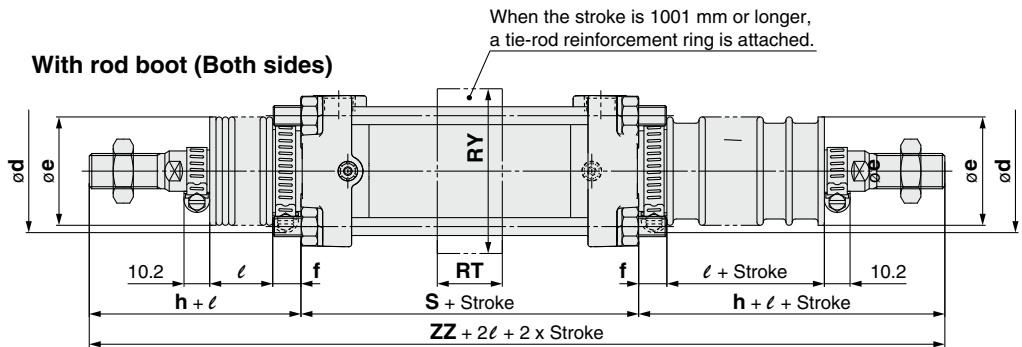
Basic: CA2WB



With rod boot (One side)



With rod boot (Both sides)



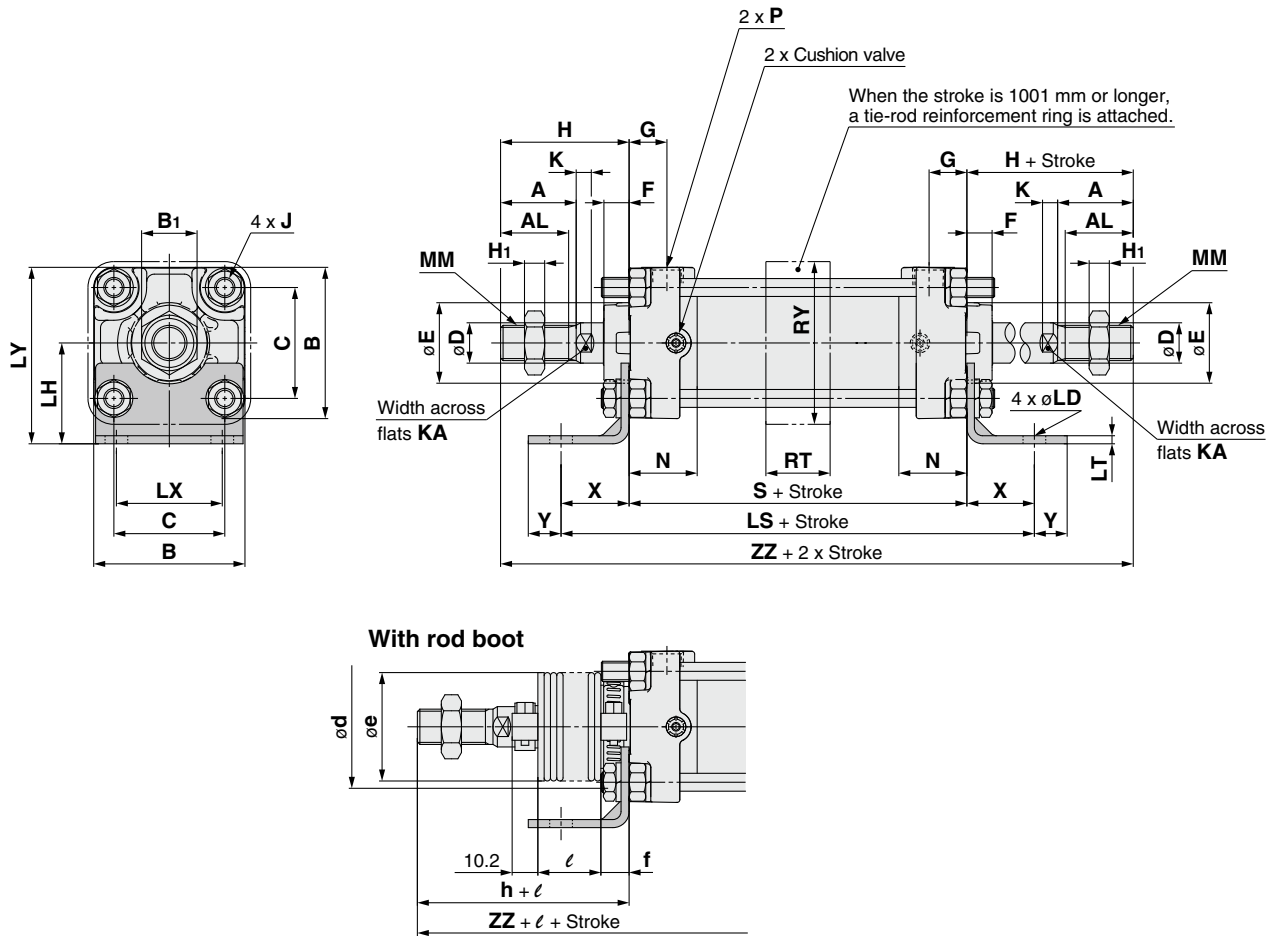
Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	M	MM
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	17	M22 x 1.5
100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

Bore size (mm)	N	P	RT	RY	S	Without rod boot		With rod boot (One side)					(Both sides)	
						H	ZZ	d	e	f	h	ℓ	ZZ	ZZ
40	27	1/4	30	64	84	51	186	56	43	11.2	59	1/4 stroke	194	202
50	30	3/8	30	76	90	58	206	64	52	11.2	66	1/4 stroke	214	222
63	31	3/8	40	92	98	58	214	64	52	11.2	66	1/4 stroke	222	230
80	37	1/2	45	112	116	71	258	76	65	12.5	80	1/4 stroke	267	276
100	40	1/2	50	136	126	72	270	76	65	14.0	81	1/4 stroke	279	288

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydro	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H
Low Friction		CA2□Q
		Auto Switch
		Made to Order

Series CA2W

Axial Foot: CA2WL



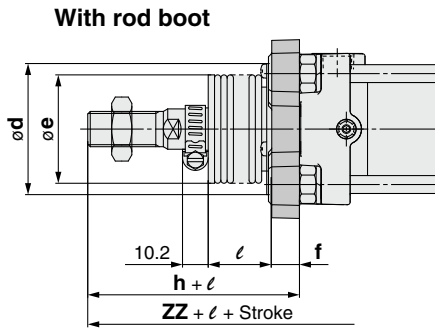
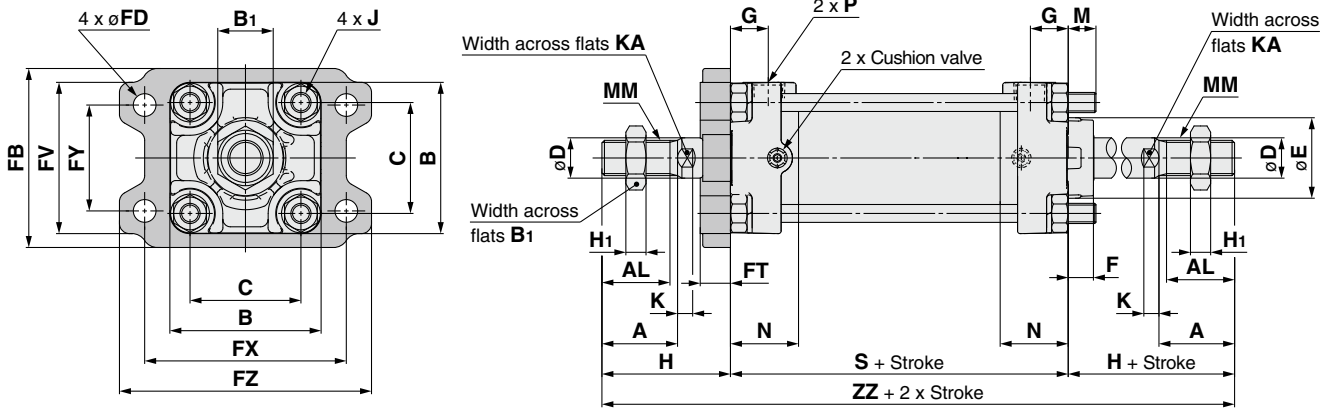
(mm)

Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	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	RT	RY	S	X	Y	Without rod boot		With rod boot (One side)					(Both sides)	
									H	ZZ	d	e	f	h	ℓ	ZZ	ZZ
40	M14 x 1.5	27	1/4	30	64	84	27	13	51	186	56	43	11.2	59	1/4 stroke	194	202
50	M18 x 1.5	30	3/8	30	76	90	27	13	58	206	64	52	11.2	66	1/4 stroke	214	222
63	M18 x 1.5	31	3/8	40	92	98	34	16	58	214	64	52	11.2	66	1/4 stroke	222	230
80	M22 x 1.5	37	1/2	45	112	116	44	16	71	258	76	65	12.5	80	1/4 stroke	267	276
100	M26 x 1.5	40	1/2	50	136	126	43	17	72	270	76	65	14.0	81	1/4 stroke	279	288

Rod Flange: CA2WF

Stroke of 1000 mm or less



Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H ₁	J	K	KA	M
	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	11
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	11	M10 x 1.25	7	18	14
80	40	37	102	32	78	25	52	119	13.5	18	102	130	76	160	21	13	M12 x 1.75	10	22	17
100	40	37	116	41	92	30	52	133	13.5	18	116	150	92	180	21	16	M12 x 1.75	10	26	17

Bore size (mm)	MM	N	P	S	Without rod boot		With rod boot (One side)						(Both sides)	
					H	ZZ	*d	e	f	h	ℓ	ZZ	ZZ	
40	M14 x 1.5	27	1/4	84	51	186	52	43	15	59	1/4 stroke	194	202	
50	M18 x 1.5	30	3/8	90	58	206	58	52	15	66	1/4 stroke	214	222	
63	M18 x 1.5	31	3/8	98	58	214	58	52	17.5	66	1/4 stroke	222	230	
80	M22 x 1.5	37	1/2	116	71	258	80	65	21.5	80	1/4 stroke	267	276	
100	M26 x 1.5	40	1/2	126	72	270	80	65	21.5	81	1/4 stroke	279	288	

★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 ϕ d.

Standard Double Acting, Single Rod CA2

Double Acting, Double Rod CA2W

Non-rotating Rod Double Acting, Single Rod CA2K

Double Acting, Double Rod CA2KW

With End Lock CBA2

Air-hydraulic Double Acting, Single Rod CA2H

Double Acting, Double Rod CA2WH

Low Friction CA2Q

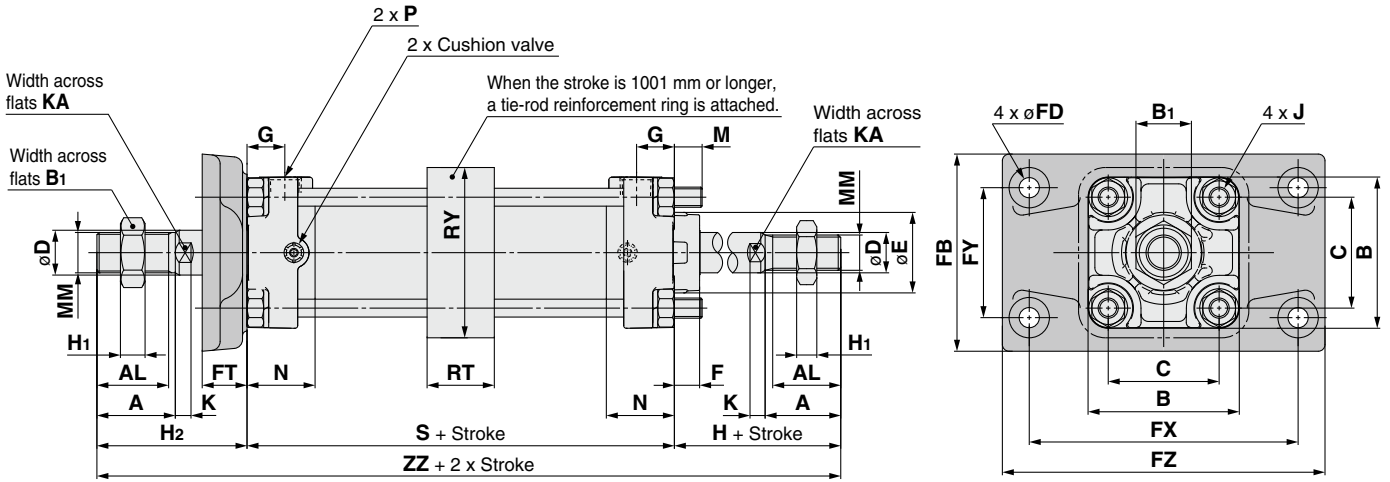
Auto Switch

Made to Order

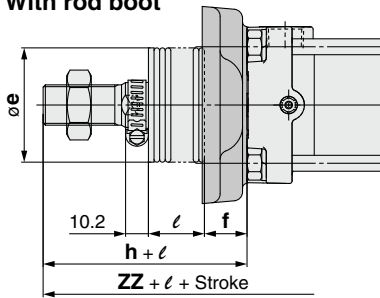
Series CA2W

Rod Flange: CA2W

Stroke of 1001 mm or more



With rod boot



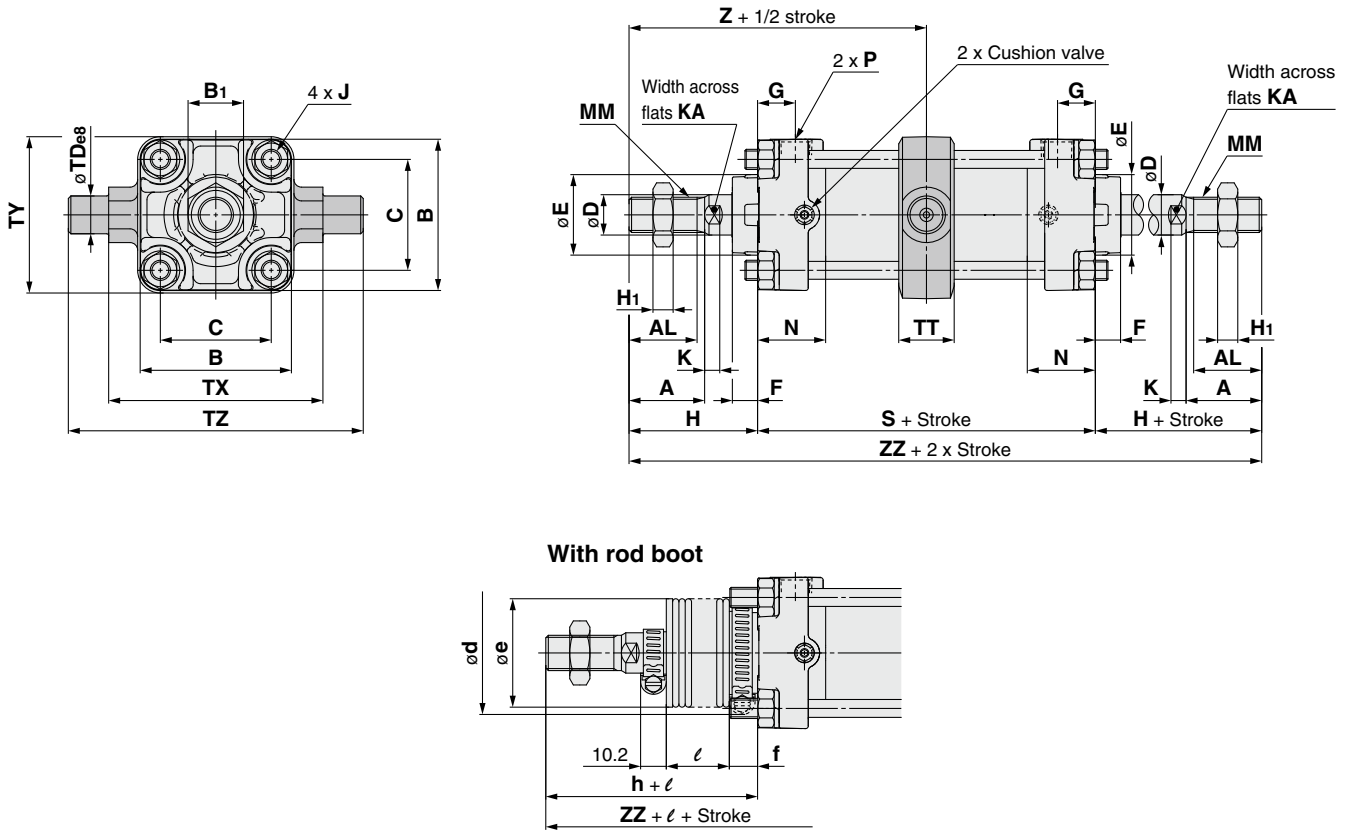
Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FX	FY	FZ	G	H ₁	J	K	KA	M
40	30	27	60	22	44	16	32	71	9	12	80	42	100	15	8	M8 x 1.25	6	14	11
50	35	32	70	27	52	20	40	88	9	20	120	58	144	17	11	M8 x 1.25	7	18	6
63	35	32	85	27	64	20	40	105	11.5	23	140	64	170	17	11	M10 x 1.25	7	18	10
80	40	37	102	32	78	25	52	124	13.5	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 (One side)					(Both sides)	
							H	H ₂	ZZ	d	e	f	h	ℓ	ZZ	ZZ
40	M14 x 1.5	27	1/4	30	76	84	51	51	186	52	43	15	59	1/4 stroke	194	202
50	M18 x 1.5	30	3/8	30	76	90	58	67	215	58	52	19	66	1/4 stroke	214	222
63	M18 x 1.5	31	3/8	40	92	98	58	71	227	58	52	19	66	1/4 stroke	222	230
80	M22 x 1.5	37	1/2	45	112	116	71	87	274	80	65	21	80	1/4 stroke	266	276
100	M26 x 1.5	40	1/2	50	136	126	72	89	287	80	65	21	81	1/4 stroke	279	288

Note 1) For flange type with bore size of ø40, the same bracket is used for all strokes.

Note 2) For models with bore size of ø50 to ø100 and stroke of 1001 mm or more, do not mount a flange bracket on basic cylinders since H dimension is different from those shown above. When rod flange type is used, order with the part number with bracket.

Center Trunnion: CA2WT



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	MM	N	P	S	TD _{e8}
	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	15 ^{-0.032} _{-0.059}
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	18 ^{-0.032} _{-0.059}
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	25 ^{-0.040} _{-0.073}
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	25 ^{-0.040} _{-0.073}

Bore size (mm)	TT	TX	TY	TZ	Without rod boot			With rod boot (One side)						(Both sides)		
					H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ	Z	ZZ
40	22	85	62	117	51	93	186	56	43	11.2	59	1/4 stroke	101	194	101	202
50	22	95	74	127	58	103	206	64	52	11.2	66	1/4 stroke	111	214	111	222
63	28	110	90	148	58	107	214	64	52	11.2	66	1/4 stroke	115	222	115	230
80	34	140	110	192	71	129	258	76	65	12.5	80	1/4 stroke	138	267	138	276
100	40	162	130	214	72	135	270	76	65	14.0	81	1/4 stroke	144	279	144	288

* Do not disassemble the trunnion type. Refer to page 79.

Standard Double Acting, Single Rod **CA2**
 Double Acting, Double Rod **CA2W**
 Non-rotating Rod Double Acting, Single Rod **CA2K**
 Double Acting, Double Rod **CA2KW**
 With End Lock **CBA2**
 Air-hydro Double Acting, Single Rod **CA2H**
 Double Acting, Double Rod **CA2WH**
 Low Friction **CA2Q**
 Auto Switch
 Made to Order

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod

Series CA2K

∅40, ∅50, ∅63

How to Order

CA2K L 40 - 200 -

With auto switch CDA2K L 40 - 200 - M9BW -

With auto switch (Built-in magnet)
Non-rotating rod

Built-in Magnet Cylinder Model
 If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
 (Example) CDA2KL40-100

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Port thread type

Nil	Rc
TN	NPT
TF	G

Bore size

40	40 mm
50	50 mm
63	63 mm

Cylinder stroke (mm)
 For details, refer to the next page.

Suffix (Cushion)

Nil	Air cushion
N	Without cushion

Suffix (Rod boot)

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Auto switch

Nil	Without auto switch
-----	---------------------

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Made to Order
 For details, refer to the next page.

* For applicable auto switches, refer to the table below.

Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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)						
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit			
				3-wire (PNP)				M9P	—	●	●	●	○					
				2-wire	12 V	M9B	—	●	●	●	○	○						
		Terminal conduit		3-wire (NPN)	12 V	G39C	G39	—	—	—	—	—	—	—		—		
				2-wire		K39C	K39	—	—	—	—	—	—	—				
				3-wire (NPN)	5 V, 12 V	M9NW	—	●	●	●	○	○	○					
	3-wire (PNP)	M9PW	—	●		●	●	○	○									
	Diagnostic indication (2-color indication)	Grommet	Yes	2-wire	24 V	12 V	—	M9BW	—	●	●	●	○	○	○	IC circuit		
				3-wire (NPN)				M9NA*1	—	○	○	●	○	○				
				3-wire (PNP)	M9PA*1	—	○	○	●	○	○							
		Terminal conduit		2-wire	12 V	M9BA*1	—	○	○	●	○	○						
				3-wire (NPN)		—	—	—	—	—	—	—	—					
3-wire (PNP)				—	—	—	—	—	—	—	—							
Water resistant (2-color indication)	Grommet	—	2-wire	12 V	—	—	M9BA*1	—	○	○	●	○	○	—				
			3-wire (NPN)				—	—	—	—	—	—	—		—			
With diagnostic output (2-color indication)	Grommet	—	4-wire (NPN)	5 V, 12 V	—	—	F59F	G59F	●	—	●	○	○	○	IC circuit			
			2-wire (Non-polar)				P3DW	—	●	—	●	●	○	—	—			
Magnetic field resistant (2-color indication)	Grommet	—	2-wire (Non-polar)	—	—	—	P4DW	—	—	—	●	●	○	—				
			—				—	—	—	—	—	—	—	—	—			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—		
				2-wire				24 V	12 V	—	—	100 V	A93	—	●		●	●
					100 V or less	A90	—					●	—	●	—	—	—	—
				Terminal conduit	200 V or less	A54	B54	●	—	●	●	—	—	—	—	—	Relay, PLC	
		—			A64	B64	●	—	●	—	—	—	—					
		DIN terminal		Yes	—	100 V, 200 V	A33C	A33	—	—	—	—	—	—	—	—	—	PLC
					—	A34C	A34	—	—	—	—	—	—	—	—	—	—	
					—	A44C	A44	—	—	—	—	—	—	—	—	—	—	Relay, PLC
					—	A59W	B59W	●	—	●	—	—	—	—	—	—	—	

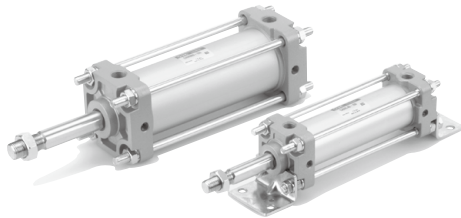
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWX

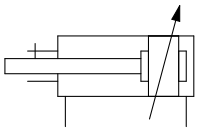
* Since there are other applicable auto switches than listed above, refer to page 58 for details.
 * For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.
 For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.
 * The D-A9□/M9□□□/□P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod **Series CA2K**

Non-rotating accuracy: $\pm 0.8^\circ$
Same mounting dimensions as those of standard cylinder



Symbol
Air cushion



Made to Order

Made to Order
(For details, refer to pages 61 to 78.)

Symbol	Specifications
-XA□	Change of rod end shape
-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
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC28	Compact flange made of SS400

Refer to pages 52 to 58 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
Fluid	Air		
Proof pressure	1.5 MPa		
Maximum operating pressure	1.0 MPa		
Minimum operating pressure	0.05 MPa		
Ambient and fluid temperature	Without auto switch: -10 to 70°C^* With auto switch : -10 to 60°C^*		
Piston speed	50 to 500 mm/s		
Cushion	Air cushion		
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$, 251 to 600 st: $^{+1.4}_0$		
Rod non-rotating accuracy	$\pm 0.8^\circ$		
Allowable rotational torque	0.44 N·m or less		
Lubrication	Not required (Non-lube)		
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion		

* No freezing

Standard Strokes In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on pages 56 and 57.

Bore size	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500*
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600*

* Intermediate strokes not listed above are also available.
Please consult with SMC for longer strokes than the strokes marked with "*".

Weights

Bore size (mm)	40	50	63	
Basic weight	Basic	0.88	1.32	1.91
	Axial foot	1.07	1.54	2.25
	Flange	1.25	1.77	2.70
	Single clevis	1.11	1.66	2.54
	Double clevis	1.15	1.75	2.70
Additional weight per 50 mm of stroke	Trunnion	1.24	1.80	2.71
		0.20	0.25	0.30
Accessories	Single knuckle	0.23	0.26	0.26
	Double knuckle (with pin)	0.37	0.43	0.43

Calculation: (Example) **CA2KL40-100**

- Basic weight..... 1.07 (Axial foot, $\phi 40$)
 - Additional weight..... 0.20/50 stroke
 - Cylinder stroke 100 stroke
- $$1.07 + 0.20 \times 100/50 = 1.47 \text{ kg}$$

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. 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 56 and 57.)

Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydro Double Acting, Single Rod CA2H
 Double Acting, Double Rod CA2WH
 Low Friction CA2Q
 Auto Switch
 Made to Order

⚠ Precautions

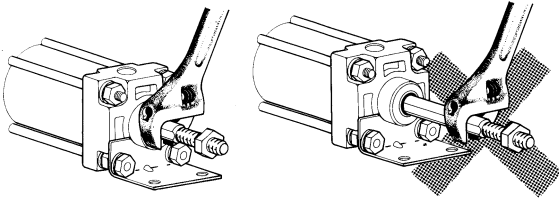
Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Handling

⚠ Caution

1. Avoid applications in which rotational torque is applied to the piston rod.

If rotational torque is applied, the non-rotating guide will be deformed, resulting in a loss of non-rotating accuracy. Also, to screw a bracket or a nut onto the threaded portion at the end of the piston rod, make sure that the piston rod is fully retracted, and place a wrench on the parallel section of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.



Disassembly/Replacement

⚠ Caution

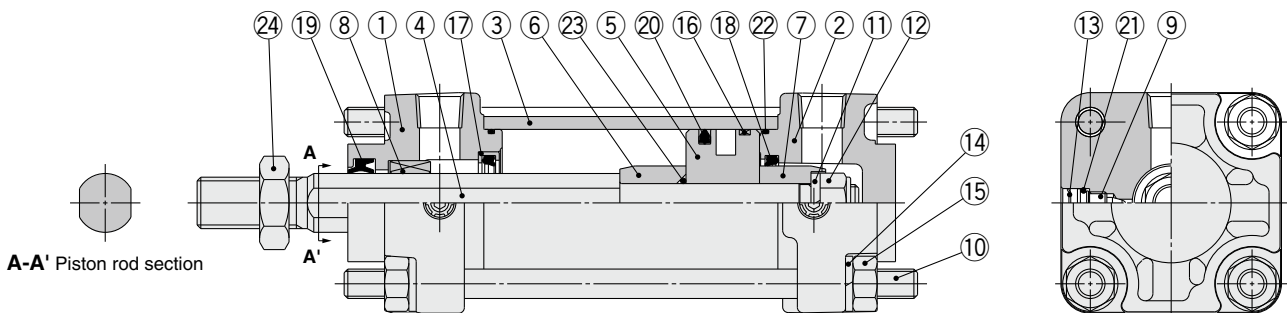
1. Please consult with SMC when the rod seal is to be replaced.

A rod seal may allow air leakage depending on the position where it is installed. Therefore, please consult with SMC when a rod seal is to be replaced.

2. Do not replace the non-rotating guide.

Since the non-rotating guide is press fitted, the entire cover assembly needs to be replaced instead of a single part.

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Metallic painted
2	Head cover	Aluminum die-casted	Metallic painted
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Carbon steel	Hard chrome plating
5	Piston	Aluminum alloy	Chromated
6	Cushion ring A	Rolled steel	Zinc chromated
7	Cushion ring B	Rolled steel	Zinc chromated
8	Non-rotating guide	Oil-impregnated sintered alloy	
9	Cushion valve	Steel wire	Trivalent zinc chromated
10	Tie-rod	Carbon steel	Trivalent zinc chromated
11	Spring washer	Steel wire	Trivalent zinc chromated
12	Piston nut	Rolled steel	Trivalent zinc chromated
13	Retaining ring	Spring steel	Phosphate coating
14	Spring washer	Steel wire	Trivalent zinc chromated
15	Tie-rod nut	Rolled steel	Trivalent zinc chromated
16	Wear ring	Resin	

No.	Description	Material	Note
17	Cushion seal holder	Aluminum alloy	
18	Cushion seal	Urethane	
19	Rod seal	NBR	
20	Piston seal	NBR	
21	Cushion valve seal	NBR	
22	Cylinder tube gasket	NBR	
23	Piston gasket	NBR	O-ring
24	Rod end nut	Rolled steel	Trivalent zinc chromated

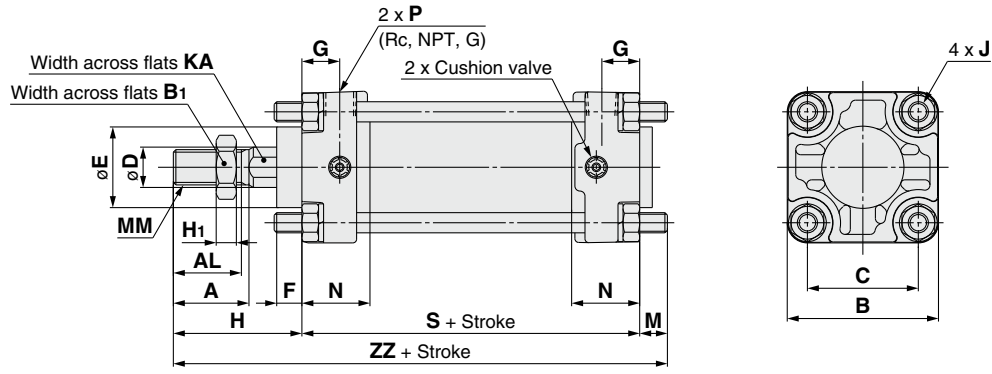
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
40	CA2K40-PS	Set of the nos. 18, 19, 20, 22.
50	CA2K50-PS	
63	CA2K63-PS	

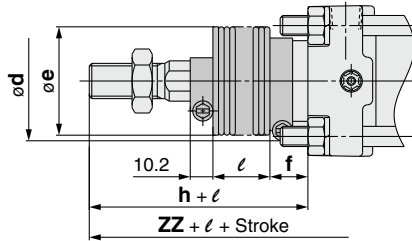
* Seal kit includes 18, 19, 20 and 22. Order the seal kit based on each bore size.
* Do not disassemble the trunnion type. Refer to page 79.

* Seal kit includes a grease pack (ø40, ø50: 10 g, over ø63: 20 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: CA2KB



With rod boot



Bore size (mm)	Stroke range (mm)		A	AL	B	B ₁	C	D	E	F	G	H ₁	J	KA	M	MM
	Without rod boot	With rod boot														
40	Up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	14	11	M14 x 1.5
50	Up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	18	11	M18 x 1.5
63	Up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	18	14	M18 x 1.5

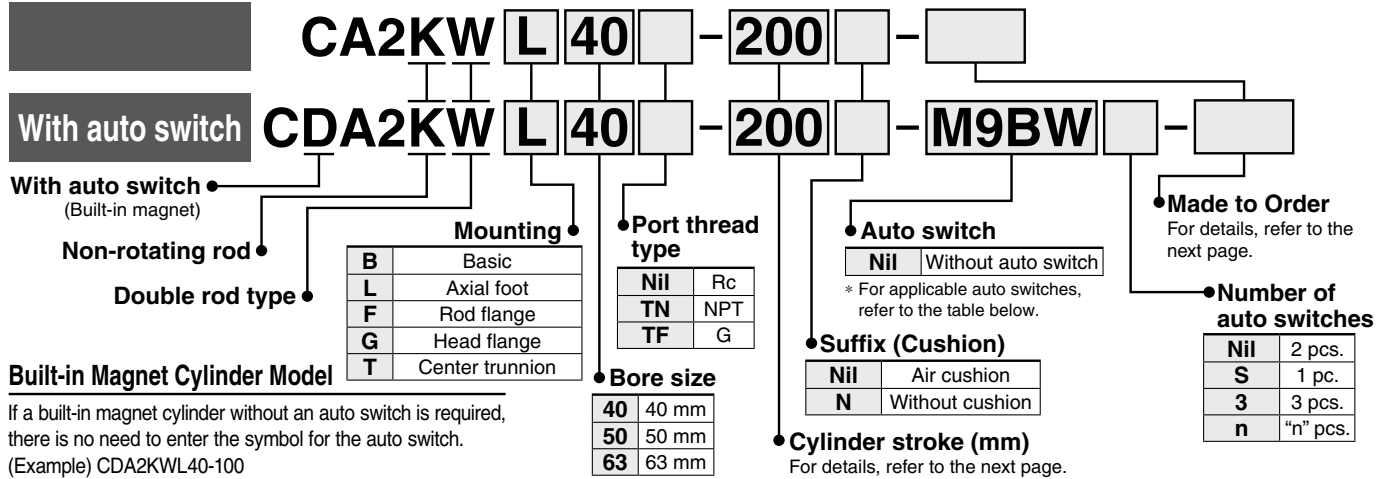
Bore size (mm)	N	P	S	Without rod boot		With rod boot					
				H	ZZ	d	e	f	h	l	ZZ
40	27	1/4	84	51	146	56	43	11.2	59	1/4 stroke	154
50	30	3/8	90	58	159	64	52	11.2	66	1/4 stroke	167
63	31	3/8	98	58	170	64	52	11.2	66	1/4 stroke	178

The dimensions for each mounting type are the same as those for the standard double acting single rod model. Refer to pages 11 to 19.

Standard	Double Acting, Single Rod	CA2
Standard	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
Non-rotating Rod	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydro	Double Acting, Single Rod	CA2□H
Air-hydro	Double Acting, Double Rod	CA2W□H
Low Friction		CA2□Q
		Auto Switch
		Made to Order

Air Cylinder: Non-rotating Rod Type Double Acting, Double Rod Series CA2KW ø40, ø50, ø63

How to Order



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDA2KWL40-100

Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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	●	●	●	○	○			—	—		
				3-wire (PNP)				—	G59	●	—	●	○	○					
				2-wire	—	M9P	●	●	●	○	○								
		Terminal conduit		—	—	—	—	100 V, 200 V	—	M9B	●	●	●	○	○				
										—	K59	●	—	●	○			○	
										—	J51	●	—	●	○			○	
	Diagnostic indication (2-color indication)	Grommet	Yes	24 V	3-wire (NPN)	12 V	—	—	G39C	G39	—	—	—	—	—	—			
					2-wire				—	K39C	K39	—	—	—			—		
					3-wire (NPN)	5 V, 12 V	—	—	—	—	M9NW	—	●	●			●	○	○
					3-wire (PNP)						—	G59W	●	—			●	○	○
					2-wire	12 V	—	—	—	—	M9PW	—	●	●			●	○	○
					—						G5PW	●	—	●			○	○	
Water resistant (2-color indication)	Grommet	—	24 V	3-wire (NPN)	5 V, 12 V	—	—	M9NA*1	—	○	○	●	○	○	—	—			
				3-wire (PNP)				—	M9PA*1	—	○	○	●	○			○		
				2-wire	12 V	—	—	—	—	M9BA*1	—	○	○	●			○	○	
				—						G5BA*1	—	—	●	○			○		
With diagnostic output (2-color indication)	Grommet	—	—	—	—	—	F59F	G59F	●	—	●	○	○	IC circuit	—				
Magnetic field resistant (2-color indication)							2-wire (Non-polar)	—	—	—	—	P3DW	—	●		—	●	○	○
Reed auto switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—			
				—				100 V	A93	—	●	●	●	●	—		—		
				No	24 V	12 V	—		—	—	100 V or less	A90	—	●	—		●	—	IC circuit
				Yes				100 V, 200 V			A54	B54	●	—	●		—	—	—
				No	200 V or less	A64	B64	●	—	●	—	—	—						
		Terminal conduit	Yes	—	—	—	—	—	—	A33C	A33	—	—	—	—	—	—		
									—	A34C	A34	—	—	—	—	—	—		
									—	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. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

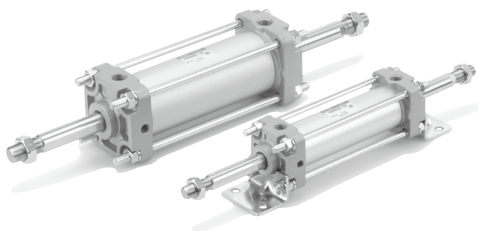
* Since there are other applicable auto switches than listed above, refer to page 58 for details.

* For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.
For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.

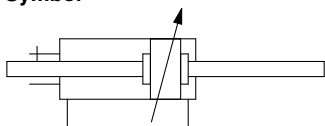
* The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Air Cylinder: Non-rotating Rod Type Double Acting, Double Rod **Series CA2KW**

Non-rotating accuracy: $\pm 0.8^\circ$
Same mounting dimensions as those of standard cylinder



Symbol



Made to Order
 (For details, refer to pages 61 to 78.)

Symbol	Specifications
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC28	Compact flange made of SS400

Refer to pages 52 to 58 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
Fluid	Air		
Proof pressure	1.5 MPa		
Maximum operating pressure	1.0 MPa		
Minimum operating pressure	0.08 MPa		
Ambient and fluid temperature	Without auto switch: -10 to 70°C^* With auto switch : -10 to 60°C^*		
Piston speed	50 to 500 mm/s		
Cushion	Air cushion		
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$, 251 to 600 st: $^{+1.4}_0$		
Rod non-rotating accuracy	$\pm 0.8^\circ$		
Allowable rotational torque	0.44 N·m or less		
Lubrication	Not required (Non-lube)		
Mounting	Basic, Axial foot, Rod flange, Head flange, Center trunnion		

* No freezing

Standard Strokes

In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on pages 56 and 57.

Bore size	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500*
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600*

* Intermediate strokes not listed above are also available.
 Please consult with SMC for longer strokes than the strokes marked with “*”.

Weights/Aluminum Tube

Bore size (mm)		40	50	63
Basic weight	Basic	1.01	1.54	2.17
	Axial foot	1.20	1.76	2.50
	Flange	1.38	1.99	2.96
	Trunnion	1.37	2.02	2.97
Additional weight per 50 mm of stroke		0.27	0.36	0.42
Accessories	Single knuckle	0.23	0.26	0.26
	Double knuckle (with pin)	0.37	0.43	0.43

Calculation: (Example) **CA2KWL40-100**

- Basic weight..... 1.20 (Axial foot, $\phi 40$)
- Additional weight..... 0.27/50 stroke
- Cylinder stroke 100 stroke

$$1.20 + 0.27 \times 100/50 = 1.74 \text{ kg}$$

Production of Types with Rod Boot

Series CA2KW is also available with rod boot. Please consult with SMC for more information.

Minimum Stroke for Auto Switch Mounting

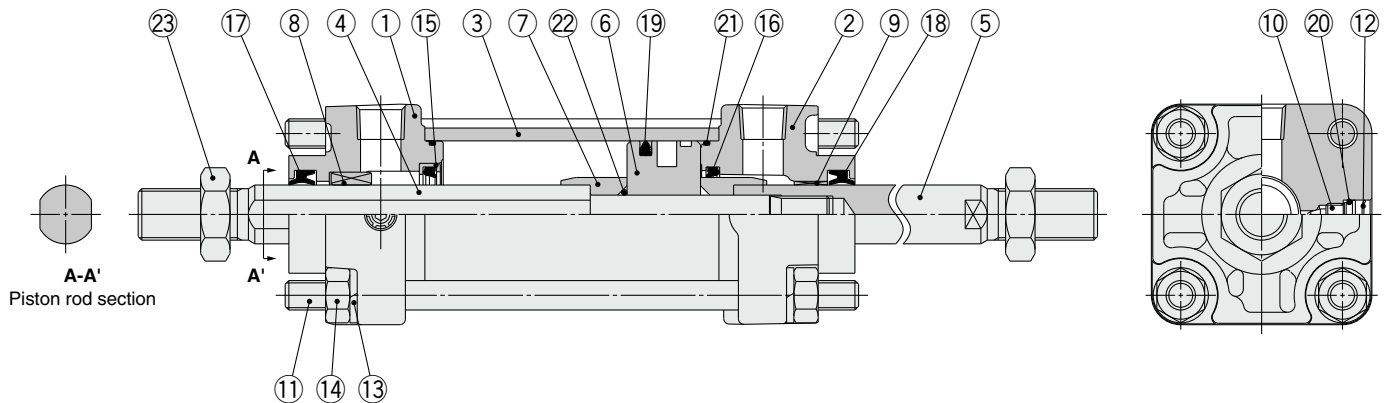
⚠ Caution

1. 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 56 and 57.)

Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydr Double Acting, Single Rod CA2H
 Double Acting, Double Rod CA2WH
 Low Friction CA2Q
 Auto Switch
 Made to Order

Series CA2KW

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover A	Aluminum alloy	Metallic painted
2	Rod cover B	Aluminum die-casted	Metallic painted
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod A	Carbon steel	Hard chrome plating
5	Piston rod B	Carbon steel	Hard chrome plating
6	Piston	Aluminum alloy	Chromated
7	Cushion ring	Rolled steel	Zinc chromated
8	Non-rotating guide	Oil-impregnated sintered alloy	
9	Bushing	Bearing alloy	
10	Cushion valve	Steel wire	Trivalent zinc chromated
11	Tie-rod	Carbon steel	Trivalent zinc chromated
12	Retaining ring	Spring steel	Phosphate coating
13	Spring washer	Steel wire	Trivalent zinc chromated
14	Tie-rod nut	Rolled steel	Trivalent zinc chromated
15	Cushion seal holder	Aluminum alloy	
16	Cushion seal	Urethane	
17	Rod seal A	NBR	
18	Rod seal B	NBR	
19	Piston seal	NBR	
20	Cushion valve seal	NBR	
21	Cylinder tube gasket	NBR	
22	Piston gasket	NBR	O-ring
23	Rod end nut	Rolled steel	Trivalent zinc chromated

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
40	CA2KW40-PS	Set of the nos. ⑯, ⑰, ⑱, ⑲, ㉑.
50	CA2KW50-PS	
63	CA2KW63-PS	

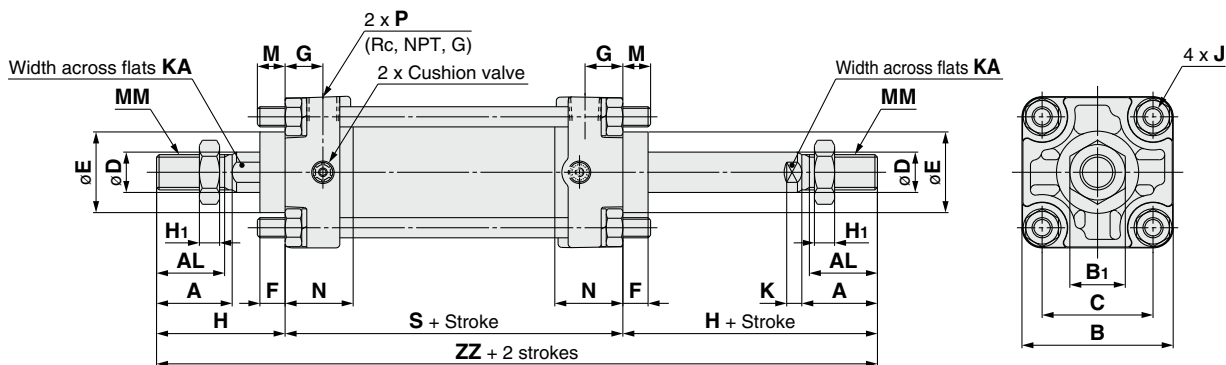
* Seal kit includes ⑯, ⑰, ⑱, ⑲, and ㉑. Order the seal kit based on each bore size.

* Do not disassemble the trunnion type. Refer to page 79.

* 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: CA2KWB



Bore size (mm)	Stroke range (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	M	MM	N	P	S	H	ZZ
40	Up to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	51	186
50	Up to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	58	206
63	Up to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	58	214

The dimensions for each mounting type are the same as those for the standard double acting double rod model. Refer to pages 25 to 28.

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock	Double Acting, Single Rod	CBA2
	Double Acting, Double Rod	CA2□H
Air-hydro	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H
Low Friction	Double Acting, Single Rod	CA2□Q
	Double Acting, Double Rod	CA2W□Q
Auto Switch	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H
Made to Order	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H

Air Cylinder: With End Lock

Series CBA2

∅40, ∅50, ∅63, ∅80, ∅100

How to Order

CBA2 L **50** - **150** - **H N**

With auto switch **CDBA2 L** **50** - **150** - **H N** - **M9BW** -

With auto switch
(Built-in magnet)

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Cylinder stroke (mm)
For details, refer to the next page.

Port thread type

Nil	Rc
TN	NPT
TF	G

Bore size

40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Lock position

H	Head end lock
R	Rod end lock
W	Double end lock

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Manual release

N	Non-locking type
L	Locking type

Auto switch

Nil	Without auto switch
------------	---------------------

* For applicable auto switches, refer to the table below.

Made to Order
For details, refer to the next page.

Suffix (Cushion)

Nil	Air cushion
N	Without cushion

Suffix (Rod boot)

Nil	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDBA2L40-100-HN

Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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)				—	G59	●	—	●	○	○									
				2-wire				—	M9P	●	●	●	○	○									
		Terminal conduit		3-wire (NPN)	12 V	—	—	G5P	●	—	●	○	○										
				2-wire			—	M9B	●	●	●	○	○										
				3-wire (NPN)			24 V	5 V, 12 V	—	—	K59	●	—	●	○			○					
	2-wire	—	M9NW	●	●	●				○	○												
	3-wire (PNP)	—	G39C	—	G39	—				—	—	—											
	Diagnostic indication (2-color indication)	Grommet	Yes	—	3-wire (NPN)	24 V	5 V, 12 V	—	—	G59W	●	—	●	○	○	IC circuit	Relay, PLC						
					3-wire (PNP)				—	M9PW	●	●	●	○	○								
					2-wire				—	M9BW	●	●	●	○	○								
					3-wire (NPN)				12 V	—	—	K59W	●	—	●			○	○				
3-wire (PNP)					24 V						5 V, 12 V	—	M9NA*1	—	○			○	●	○	○		
2-wire													M9PA*1	—	○			○	●	○	○		
3-wire (PNP)	M9BA*1	—	○	○		●	○	○															
Water resistant (2-color indication)	Grommet	—	—	2-wire	24 V	12 V	—	—	G5BA*1	—	—	●	○	○	—	—							
With diagnostic output (2-color indication)				4-wire (NPN)				5 V, 12 V	—	F59F	G59F	●	—	●			○	○	IC circuit				
				Magnetic field resistant (2-color indication)						2-wire (Non-polar)	—	P3DW	—	●			—	●		●	○	○	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equiv.)	24 V	12 V	—	A96	—	●	—	●	—	—	IC circuit	—							
				Terminal conduit				2-wire	24 V	12 V	—	A93	—	●			●	●	—	IC circuit	Relay, PLC		
								DIN terminal				100 V or less	A90	—			●	—	●			—	—
												100 V, 200 V	A54	B54			●	—	●			—	—
												200 V or less	A64	B64			●	—	●			—	—
		Grommet		Yes	—	—	24 V	12 V	—	—	A33C	A33	—	—	—	—	—	PLC					
											A44C	A44	—	—	—	—			—	—			
											A34C	A34	—	—	—	—			—	—			
											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. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

* Since there are other applicable auto switches than listed above, refer to page 58 for details.

* For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2. For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.

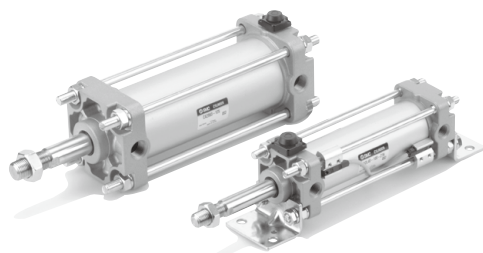
* The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Maintains the cylinder's original position even if the air supply is interrupted.

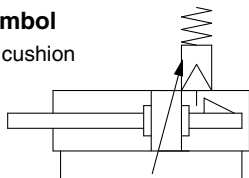
When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

Same dimensions as those of the standard cylinder (Series CA2)

Non-locking and locking types are standard for manual release.



Symbol
Air cushion



Made to Order
(For details, refer to pages 61 to 78.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (-10 to 150°C)
-XC3	Special port location
-XC4*1	With heavy duty scraper
-XC6*1	Made of stainless steel
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC8*1	Adjustable stroke cylinder/Adjustable extension type
-XC9*2	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-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
-XC35*1	With coil scraper

*1 For head end lock only

*2 For rod end lock only

Refer to pages 52 to 58 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				
Proof pressure	1.5 MPa				
Maximum operating pressure	1.0 MPa				
Minimum operating pressure	0.15 MPa*1				
Ambient and fluid temperature	Without auto switch: -10 to 70°C*2 With auto switch : -10 to 60°C*2				
Piston speed	50 to 500 mm/s				
Cushion	Air cushion				
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$ 251 to 1000 st: $^{+1.4}_0$ 1001 to 1500 st: $^{+1.8}_0$				
Lubrication	Not required (Non-lube)				
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion				

*1 0.05 MPa except locking parts.

*2 No freezing

Lock Specifications

Lock position	Head end, Rod end, Double end				
Holding force (Max.) (N)	ø40	ø50	ø63	ø80	ø100
	860	1340	2140	3450	5390
Backlash	2 mm or less				
Manual release	Non-locking type, Locking type				

Accessories

For details, refer to page 20.

Accessories	Standard			Option		
	Rod end nut	Clevis pin	Lock release bolt (N type only)	Single knuckle joint	Double knuckle joint (with pin)	Rod boot
Mounting						
Basic	●	—	●	●	●	●
Axial foot	●	—	●	●	●	●
Rod flange	●	—	●	●	●	●
Head flange	●	—	●	●	●	●
Single clevis	●	—	●	●	●	●
Double clevis*	●	●	●	●	●	●
Center trunnion	●	—	●	●	●	●

* Double clevis and double knuckle joint types are packed with pin, split pin and flat washer.

Standard Strokes

Bore size	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
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

* Types with auto switch have different minimum strokes. Refer to pages 56 and 57.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. 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 56 and 57.)

Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydro Double Acting, Single Rod CA2H
 Double Acting, Double Rod CA2WH
 Low Friction CA2Q
 Auto Switch
 Made to Order

Series CBA2

Weights/Aluminum Tube (Steel Tube)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis	1.16 (1.21)	1.79 (1.84)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per 50 mm of stroke	All mounting brackets (Except steel tube trunnion)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Steel tube trunnion	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
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

* Values inside the parentheses are those for the steel tube type.

Lock Unit Additional Weights

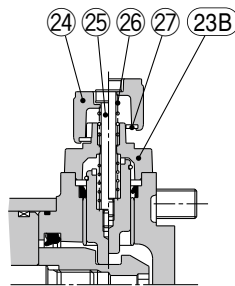
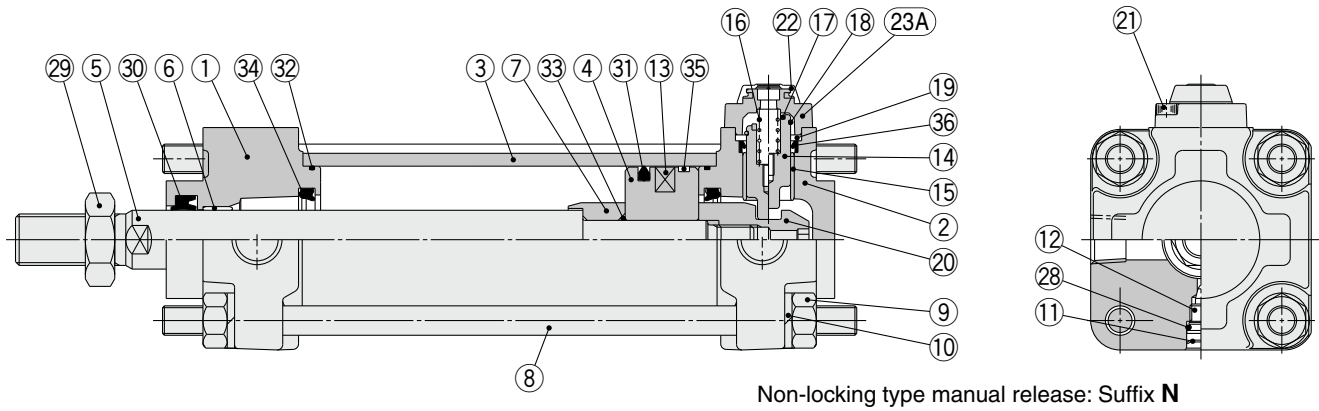
Bore size (mm)		40	50	63	80	100
Non-locking type manual release (N)	Head end lock (H)	0.02	0.03	0.03	0.10	0.12
	Rod end lock (R)	0.02	0.02	0.02	0.07	0.06
	Double end lock (W)	0.04	0.05	0.05	0.17	0.18
Locking type manual release (L)	Head end lock (H)	0.04	0.05	0.05	0.13	0.15
	Rod end lock (R)	0.04	0.04	0.04	0.10	0.09
	Double end lock (W)	0.08	0.09	0.09	0.23	0.24

Calculation: (Example) **CBA2L40-100-HN**

- Basic weight..... 1.08 kg (ø40, Axial foot)
 - Additional weight.... 0.22/50 stroke
 - Cylinder stroke 100 stroke
 - Lock unit weight 0.02 kg
(Head end lock, Non-locking type manual release)
- $$1.08 + 0.22 \times 100/50 + 0.02 = \mathbf{1.54 \text{ kg}}$$

Construction

Head end lock



Locking type manual release: Suffix L

Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum die-casted	Metallic painted
2	Head cover	Aluminum die-casted	Metallic painted
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston	Aluminum alloy	Chromated
5	Piston rod	Carbon steel	Hard chrome plating
6	Bushing	Bearing alloy	
7	Cushion ring A	Rolled steel	Electroless nickel plating
8	Tie-rod	Carbon steel	Zinc chromated
9	Tie-rod nut	Rolled steel	Trivalent zinc chromated
10	Spring washer	Steel wire	Trivalent zinc chromated
11	Retaining ring	Spring steel	Phosphate coating
12	Cushion valve	Steel wire	Trivalent zinc chromated
13	Magnet*	—	* With auto switch
14	Lock piston	Carbon steel	Quench hard chrome plating
15	Lock bushing	Lead-bronze casted	
16	Lock spring	Stainless steel	
17	Bumper	Urethane	
18	C-ring	Steel wire	Zinc chromated
19	Seal retainer	Rolled steel	Zinc chromated
20	Cushion ring nut	Chromium molybdenum steel	Quench, Electroless nickel plating
21	Hexagon socket head cap screw	Chromium molybdenum steel	Black zinc chromated
22	Rubber cap	Chloroprene rubber	
23A	Cap A	Aluminum casted	Black coated
23B	Cap B	Carbon steel	Oxide film treated

No.	Description	Material	Note
24	M/O knob	Zinc die-casted	Black coated
25	M/O bolt	Chromium molybdenum steel	Black zinc chromated, Red painted
26	M/O spring	Steel wire	Zinc chromated
27	Stopper ring	Carbon steel	Zinc chromated
28	Cushion valve seal	NBR	
29	Rod end nut	Rolled steel	Trivalent zinc chromated
30	Rod seal	NBR	
31	Piston seal	NBR	
32	Cylinder tube gasket	NBR	
33	Piston gasket	NBR	
34	Cushion seal	NBR	
35	Wear ring	Resin	
36	Lock piston seal	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.		Contents
	One end lock	Double end lock	
40	MBB40-PS	MBB40-PS-W	Set of the nos. 30, 31, 32, 34, 36.
50	MBB50-PS	MBB50-PS-W	
63	MBB63-PS	MBB63-PS-W	
80	MBB80-PS	MBB80-PS-W	
100	MBB100-PS	MBB100-PS-W	

* Seal kit includes 30, 31, 32, 34 and 36. Order the seal kit based on each bore size.

* Do not disassemble the trunnion type. Refer to page 79.

* 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.

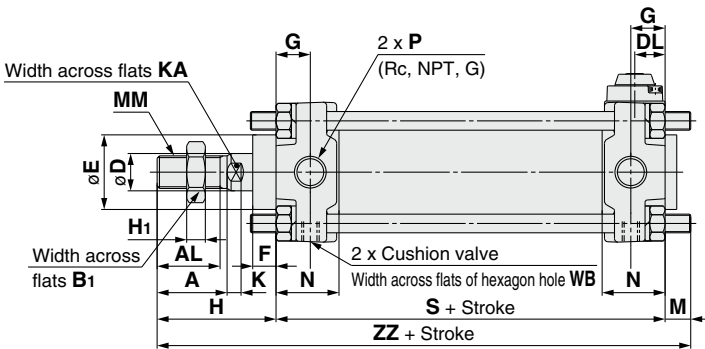
Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

Standard	Double Acting, Single Rod	CA2
Non-rotating Rod	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
Non-rotating Rod	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydr	Double Acting, Single Rod	CA2H
Air-hydr	Double Acting, Double Rod	CA2WH
Low Friction		CA2Q
		Auto Switch
		Made to Order

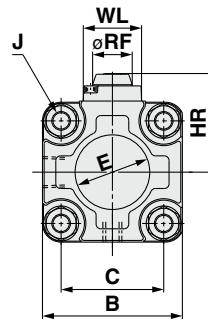
Series CBA2

Basic (Dimensions are common to head end lock, rod end lock and double end lock types.)

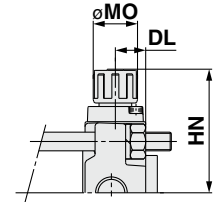
Head end lock: CBA2B Bore size - Stroke -HN



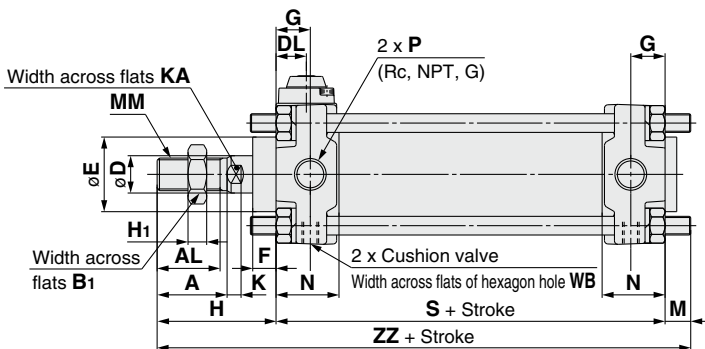
Non-locking type manual release:
Suffix N



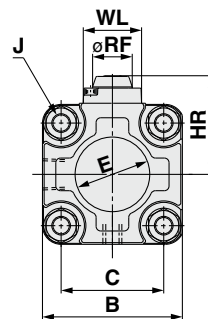
Locking type manual release:
Suffix L



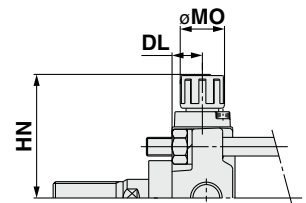
Rod end lock: CBA2B Bore size - Stroke -RN



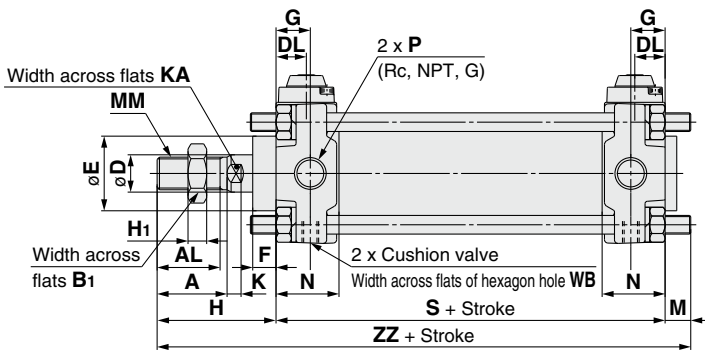
Non-locking type manual release:
Suffix N



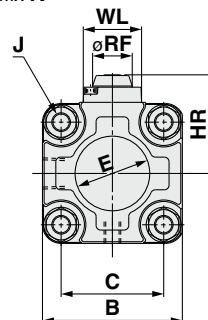
Locking type manual release:
Suffix L



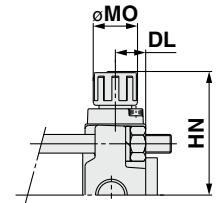
Double end lock: CBA2B Bore size - Stroke -WN



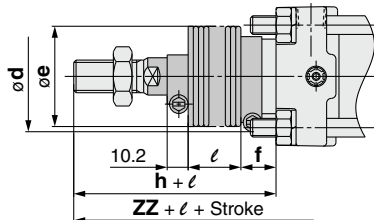
Non-locking type manual release:
Suffix N



Locking type manual release:
Suffix L



With rod boot



With Rod Boot

Bore size (mm)	Stroke range (mm)	d	e	f	h	l	ZZ
40	20 to 500	56	43	11.2	59	1/4 stroke	154
50	20 to 600	64	52	11.2	66	1/4 stroke	167
63	20 to 600	64	52	11.2	66	1/4 stroke	178
80	20 to 750	76	65	12.5	80	1/4 stroke	213
100	20 to 750	76	65	14	81	1/4 stroke	224

Bore size (mm)	Stroke range	A	AL	B	B ₁	C	D	DL	E	F	G	H	H ₁	HR	HN (Max.)	J	K	KA	M	MM	MO	N	P	RF	S	WB	WL	ZZ
40	Up to 500	30	27	60	22	44	16	13	32	10	15	51	8	42.3	56	M8 x 1.25	6	14	11	M14 x 1.5	19	27	1/4	17	84	2.5	25	146
50	Up to 600	35	32	70	27	52	20	13	40	12	17	58	11	47.3	61	M8 x 1.25	7	18	11	M18 x 1.5	19	30	3/8	17	90	2.5	25	159
63	Up to 600	35	32	85	27	64	20	15.5	40	10	17	58	11	54.8	68.5	M10 x 1.25	7	18	14	M18 x 1.5	19	31	3/8	17	98	4	25	170
80	Up to 750	40	37	102	32	78	25	18.5	52	14	21	71	13	65.8	80.5	M12 x 1.75	11	22	17	M22 x 1.5	23	37	1/2	21	116	4	40	204
100	Up to 750	40	37	116	41	92	30	20	52	14	21	72	16	72.8	87.5	M12 x 1.75	11	26	17	M26 x 1.5	23	40	1/2	21	126	4	40	215

The dimensions for each mounting type are the same as those for the standard double acting single rod model. Refer to pages 11 to 19.



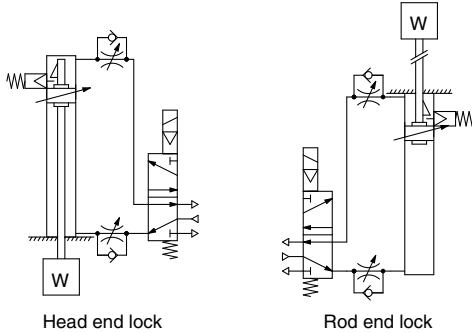
Series CBA2 Specific Product Precautions

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Use the Recommended Pneumatic Circuit

⚠ Caution

This is necessary for proper operation and release of the lock.



Handling

⚠ Caution

- Do not use a 3 position solenoid valve.**
Avoid using this cylinder in combination with a 3 position solenoid valve (particularly the closed center metal seal type). If air pressure becomes sealed inside the port on the lock mechanism side, the cylinder cannot be locked. Even if the lock is released at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to release as time elapses.
- Back pressure is required to release end lock.**
Be sure air is supplied to the side of the cylinder without a lock mechanism (side of the piston rod without lock for double end lock), before starting up, as in the above figures. Otherwise, the lock may not be released. (Refer to “Releasing the Lock”.)
- Release the lock when mounting or adjusting the cylinder.**
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.
- Operate with a load ratio of 50% or less.**
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
- Do not operate multiple synchronized cylinders.**
Avoid applications in which two or more cylinders with end lock are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.
- Use a speed controller with meter-out control.**
If operated under meter-in control, the lock may not be released.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**
The lock may not be engaged or released if the piston in the cylinder has not reached the stroke end.

Operating Pressure

⚠ Caution

- Supply air pressure of 0.15 MPa or higher to the port on the lock mechanism side, as it is necessary for releasing the lock.

Exhaust Speed

⚠ Caution

- When the pressure on the lock mechanism side drops to 0.05 MPa or below, the lock engages automatically. If the piping on the lock mechanism side is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some time due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the EXH port of the solenoid valve.

Relation to Cushion

⚠ Caution

- When the cushion valve on the lock mechanism side is fully closed or almost closed, the piston rod may not be able to reach the stroke end, resulting in lock engagement failure. Furthermore, if the lock becomes engaged while the cushion valve is almost fully closed, it may become impossible to be released. Therefore, the cushion valve must be adjusted properly.

Releasing the Lock

⚠ Caution

- To release the lock, make sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended pneumatic circuits.) If the lock is released, while the port on the side without a lock mechanism is in the exhausted state and the load is being applied to the lock mechanism, undue force may be applied to the lock mechanism, causing the lock mechanism to be damaged. Also, it could be extremely dangerous, because the piston rod could move suddenly.

Manual Release

⚠ Caution

1. Non-locking type manual release

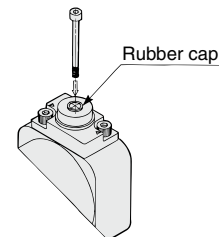
Insert the bolt, which is provided as an accessory, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to release the lock. Releasing the bolt will re-engage the lock.

The bolt size, pulling force, and the stroke are listed below.

Bore size (mm)	Thread size	Pulling force	Stroke (mm)
40, 50, 63	M3 x 0.5 x 30 L or more	10 N	3
80, 100	M5 x 0.8 x 40 L or more	24.5 N	3

* Remove the bolt for normal operation.

* It can cause lock malfunction or faulty release.

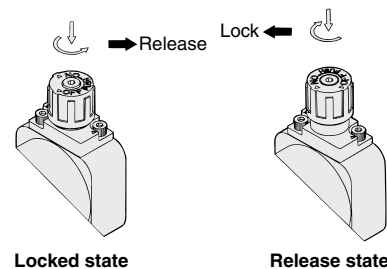


2. Locking type manual release

Push the M/O knob and turn it 90° counterclockwise. The lock is released when the ▲ mark on the cap is aligned with the ▼ OFF mark on the M/O knob (and the lock will remain released).

To engage the lock, push the M/O knob all the way in and turn it 90° clockwise to align the ▲ mark on the cap with the ▼ ON mark on the M/O knob. At this time, make sure that the knob stops by clicking into place.

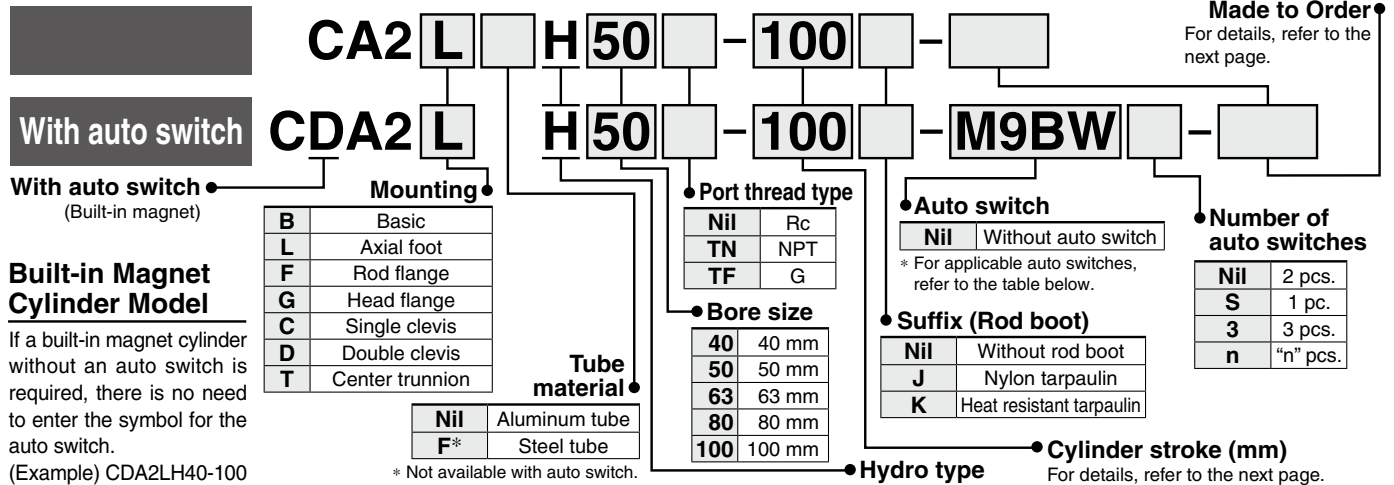
Failure to click it into place properly can cause the lock to release.



Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydraulic Double Acting, Single Rod CA2H
 Double Acting, Double Rod CA2WH
 Low Friction CA2Q
 Auto Switch
 Made to Order

Air Cylinder: Air-hydro Type Double Acting, Single Rod Series CA2□H ø40, ø50, ø63, ø80, ø100

How to Order



Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 for further information on auto switches.

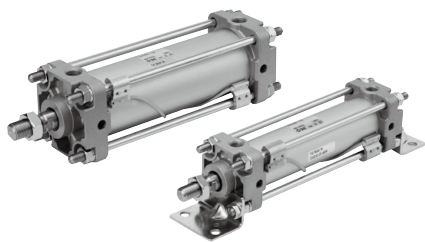
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load									
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)											
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	○	IC circuit									
				3-wire (PNP)				—	G59	●	—	●	○		○								
				2-wire	—	G5P	●	—	●	○	○												
		Terminal conduit		3-wire (NPN)	24 V	12 V	—	G39C	G39	—	—	—	—		—	—							
				2-wire				K39C	K39	—	—	—	—		—								
				3-wire (NPN)				M9NW	—	●	●	●	○		○		IC circuit						
	Grommet	3-wire (PNP)	24 V	12 V	—	—	G59W	●	—	●	○	○	—										
		2-wire				M9PW	—	●	—	●	○	○											
		3-wire (NPN)				—	G5PW	●	—	●	○	○											
	Diagnostic indication (2-color indication)	Grommet	Yes	24 V	12 V	—	—	—	M9BW	—	●	●	●	○	○	—							
									3-wire (PNP)	—	K59W	●	—	●	○		○						
									2-wire	—	M9NA*1	—	○	○	●		○	○					
Terminal conduit		3-wire (PNP)							24 V	12 V	—	—	—	—	M9PA*1		—	○	○	●	○	○	—
		2-wire													M9BA*1		—	○	○	●	○	○	
		4-wire (NPN)													—		G5BA*1	—	—	—	●	○	
Magnetic field resistant (2-color indication)	Grommet	—	—	2-wire (Non-polar)	—	—	—	F59F	G59F	●	—	●	○	○	IC circuit								
								P3DW	—	●	—	●	●	○	—								
								P4DW	—	—	—	—	—	—	—	—	—	—					
								—	—	—	—	—	—	—	—	—	—	—					
Reed auto switch	—	Grommet	Yes	3-wire (NPN equiv.)	24 V	12 V	—	A96**	—	●	—	●	—	—	IC circuit	Relay, PLC							
								100 V	A93**	—	●	●	●	—	—								
								100 V or less	A90**	—	●	—	●	—	—								
								100 V, 200 V	A54	B54	●	—	●	—	—								
								200 V or less	A64	B64	●	—	●	—	—								
		Terminal conduit		—				A33C	A33	—	—	—	—	—	—		—	—					
				—				A34C	A34	—	—	—	—	—	—		—						
				—				A44C	A44	—	—	—	—	—	—		—						
				100 V, 200 V				—	—	—	—	—	—	—	—		—						
				—				A59W	B59W	●	—	●	—	—	—		—						
DIN terminal	Grommet	Yes	—	—	—	—	—	—	—	—	—	—	—	PLC									
								—	—	—	—	—	—	—	—	—	Relay, PLC						

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
 1 m..... M (Example) M9NWM **D-A9□ and D-A9□V types cannot be mounted on ø50. Use D-Z7□ and D-Z80 instead.
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWZ

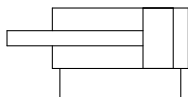
* Since there are other applicable auto switches than listed above, refer to page 58 for details.
 * For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.
 For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.
 * The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

Air Cylinder: Air-hydro Type Double Acting, Single Rod **Series CA2□H**



Symbol

Double acting, without cushion



Made to Order

(For details, refer to pages 61 to 78.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC6	Made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length

Note) Since a heavy duty scraper (-XC4) is installed as standard, there is no need to specify it.

⚠ Precautions

Setting

⚠ Caution

- Do not use the cylinder near fire or on equipment or machinery whose ambient temperature exceeds 60°C. Since the air-hydro cylinder uses flammable hydraulic fluid, there is danger of potential fire.

Selection

⚠ Caution

- Keep the air-hydro cylinder load at 50% or less than the theoretical output.

For the air-hydro cylinder to achieve performance that is close to that of the hydraulic cylinder in constant-speed operation and stopping accuracy, the load must be kept at 50% or less than theoretical output.

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 56 and 57.)

Refer to pages 52 to 58 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
Type	Air-hydro				
Fluid	Turbine oil				
Action	Double acting				
Proof pressure	1.5 MPa				
Maximum operating pressure	1.0 MPa				
Ambient and fluid temperature	5 to 60°C				
Minimum operating pressure	0.1 MPa				
Piston speed	0.5 to 300 mm/s				
Cushion	None				
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$ 251 to 1000 st: $^{+1.4}_0$ 1001 to 1500 st: $^{+1.8}_0$				
Mounting	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion				

Standard Strokes

In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on pages 56 and 57.

Bore size	Standard stroke ^{Note)}	Long stroke (L and F only)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	800
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1200
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	ø80: 1400 ø100: 1500

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

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 ●	●	●	●	●	●	●

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Weights/Aluminum Tube (Steel Tube)

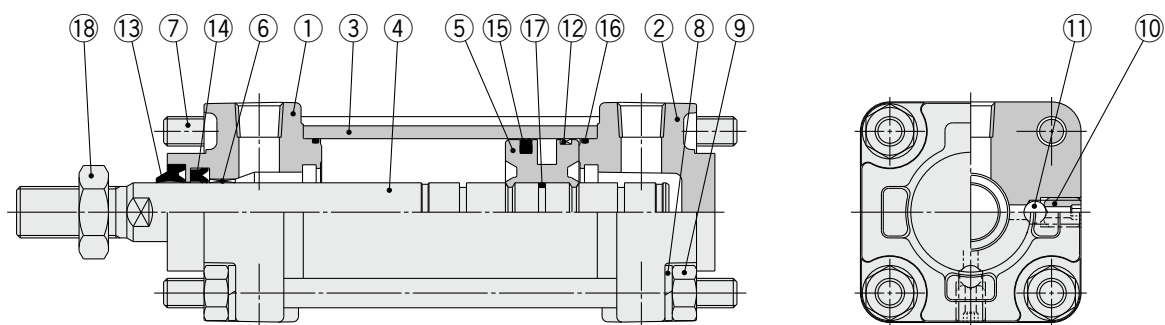
Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis	1.16 (1.21)	1.79 (1.83)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per 50 mm of stroke	All mounting brackets (Except steel tube trunnion)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Steel tube trunnion	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
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)
CA2LH40-100
(Axial foot, ø40, 100 stroke)
● Basic weight
.....1.08 kg
● Additional weight
.....0.22/50 stroke
● Cylinder stroke
.....100 stroke
1.08 + 0.22 x
100/50 = **1.52 kg**
* Values inside the parentheses are those for the steel tube type.

Standard Double Acting, Single Rod CA2
 Non-rotating Rod Double Acting, Double Rod CA2K
 With End Lock Double Acting, Double Rod CA2KW
 Air-hydro Double Acting, Single Rod CA2□H
 Double Acting, Double Rod CA2W□H
 Low Friction CA2□Q
 Auto Switch
 Made to Order

Series CA2□H

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Metallic painted
2	Head cover	Aluminum alloy	Metallic painted
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Carbon steel	Hard chrome plating
5	Piston	Aluminum alloy	Chromated
6	Bushing	Bearing alloy	
7	Tie-rod	Carbon steel	Trivalent zinc chromated
8	Spring washer	Rolled steel	Trivalent zinc chromated
9	Tie-rod nut	Rolled steel	Trivalent zinc chromated
10	Air release valve	Chromium molybdenum steel	Black zinc chromated
11	Check ball	Bearing steel	
12	Wear ring	Resin	
13	Scraper	NBR	
14	Rod seal	NBR	
15	Piston seal	NBR	
16	Cylinder tube gasket	NBR	
17	Piston gasket	NBR	
18	Rod end nut	Rolled steel	Trivalent zinc chromated

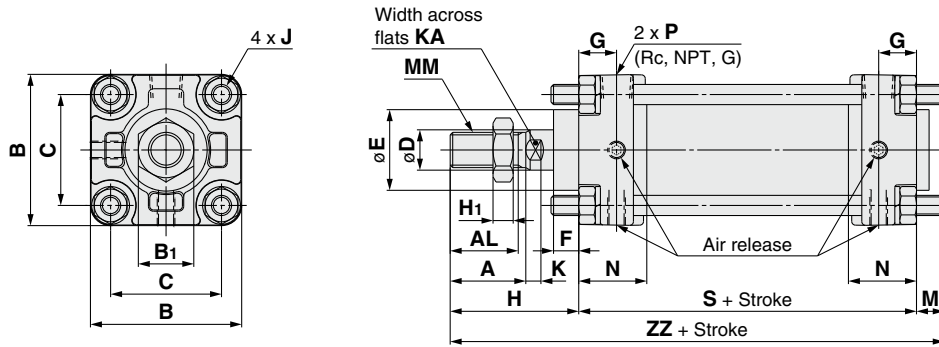
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
	Air-hydro type	
40	CA2H40A-PS	Set of the nos. ⑭, ⑮, ⑯.
50	CA2H50A-PS	
63	CA2H63A-PS	
80	CA2H80A-PS	
100	CA2H100A-PS	

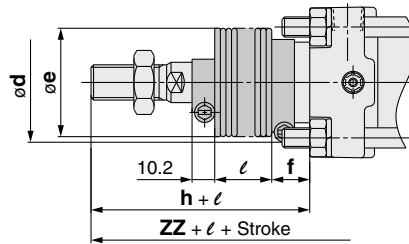
- * Do not disassemble the trunnion type. Refer to page 79.
- * Seal kit includes ⑭, ⑮ and ⑯. Order the seal kit based on each bore size.
- * Seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g).
- Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

Air Cylinder: Air-hydro Type Double Acting, Single Rod **Series CA2□H**

Basic: CA2BH



With rod boot



Bore size (mm)	Stroke range (mm)		A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	M	MM	N	P
	Without rod boot	With rod boot																	
40	Up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4
50	Up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8
63	Up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8
80	Up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2
100	Up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2

Bore size (mm)	S	Without rod boot		With rod boot					
		H	ZZ	d	e	f	h	l	ZZ
40	84	51	146	56	43	11.2	59	1/4 stroke	154
50	90	58	159	64	52	11.2	66	1/4 stroke	167
63	98	58	170	64	52	11.2	66	1/4 stroke	178
80	116	71	204	76	65	12.5	80	1/4 stroke	213
100	126	72	215	76	65	14	81	1/4 stroke	224

The dimensions for each mounting type are the same as those for the standard double acting single rod model. Refer to pages 11 to 19.

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock	CA2	CBA2
	Air-hydro	CA2□H
Low Friction	Double Acting, Double Rod	CA2W□H
	CA2□Q	CA2□Q
Auto Switch	Auto Switch	
Made to Order	Made to Order	

Air Cylinder: Air-hydro Type Double Acting, Double Rod Series CA2W□H

∅40, ∅50, ∅63, ∅80, ∅100

How to Order

CA2W L □ H 50 □ - 100 □ - □ Made to Order
For details, refer to the next page.

With auto switch CDA2W L □ H 50 □ - 100 □ - M9BW □ - □

With auto switch (Built-in magnet) Double rod type

Mounting

B	Basic
L	Axial foot
F	Rod flange
T	Center trunnion

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Hydro type

Port thread type

Nil	Rc
TN	NPT
TF	G

Auto switch

Nil	Without auto switch
------------	---------------------

* For applicable auto switches, refer to the table below.

Suffix (Rod boot)

One side	Nil	Without rod boot
	J	Nylon tarpaulin
Both sides	K	Heat resistant tarpaulin
	Nil	Without rod boot
	JJ	Nylon tarpaulin
	KK	Heat resistant tarpaulin

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Bore size

40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Cylinder stroke (mm)
For details, refer to the next page.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDA2WLH40-100

Applicable Auto Switches/Refer to the WEB catalog or the Best Pneumatics No. 2 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)				M9P	—	●	●	●	○	○									
				2-wire				M9B	—	●	●	●	○	○									
		3-wire (NPN)		G39C	G39	—	—	—	—	—	—												
		2-wire		K39C	K39	—	—	—	—	—	—												
		3-wire (NPN)		M9NW	—	●	●	●	○	○	IC circuit												
	3-wire (PNP)	M9PW	—	●	●	●	○	○															
	2-wire	M9BW	—	●	●	●	○	○															
	3-wire (NPN)	M9NA *1	—	○	○	●	○	○															
	3-wire (PNP)	M9PA *1	—	○	○	●	○	○															
	2-wire	M9BA *1	—	○	○	●	○	○															
	Water resistant (2-color indication)	Grommet	—	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9NA *1	—	○	○	●	○	○	—	—						
3-wire (PNP)					M9PA *1				—	○	○	●	○	○									
2-wire					M9BA *1				—	○	○	●	○	○									
4-wire (NPN)					G59W				—	●	—	●	○	○									
2-wire					K59W				—	●	—	●	○	○									
4-wire (NPN)					F59F				G59F	●	—	●	○	○	IC circuit								
2-wire (Non-polar)					P3DW				—	●	—	●	○	○									
—					P4DW				—	—	—	●	●	○				—					
—					A96 **				—	●	—	●	—	—				—	IC circuit	—			
3-wire (NPN equiv.)					A93 **				—	●	●	●	—	—									
Reed auto switch	—	Grommet	Yes	2-wire	24 V	12 V	—	A90 **	—	●	—	●	—	—	IC circuit	Relay, PLC							
								A54	B54	●	—	●	—	—									
								A64	B64	●	—	●	—	—									
								A33C	A33	—	—	—	—	—									
								A34C	A34	—	—	—	—	—									
		Terminal conduit						—	—	—	—	—	—	—	A44C	A44	—	—	—	—	—	PLC	
															A59W	B59W	●	—	●	—			—
															—	—	—	—	—	—			—
															—	—	—	—	—	—			—
															—	—	—	—	—	—			—
DIN terminal	—	—	—	—	—	—	—	A44C	A44	—	—	—	—	—	Relay, PLC								
								A59W	B59W	●	—	●	—			—							
Grommet	Diagnostic indication (2-color indication)	—	—	—	—	—	—	A96 **	B59W	●	—	●	—	—	—								
								A93 **	—	●	●	●	—			—							

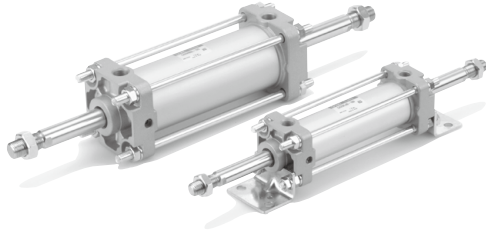
*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW * Solid state auto switches marked with "○" are produced upon receipt of order.
1 m..... M (Example) M9NWM **D-A9□ and D-A9□V types cannot be mounted on ∅50. Use D-Z7□ and D-Z80 instead.
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

* Since there are other applicable auto switches than listed above, refer to page 58 for details.
* For details about auto switches with pre-wired connector, refer to the WEB catalog or the Best Pneumatics No. 2.
* For the D-P3DW□, refer to the WEB catalog or the Best Pneumatics No. 2.
* The D-A9□/M9□□□/P3DW□ auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

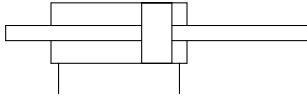
Air Cylinder: Air-hydro Type Double Acting, Double Rod **Series CA2W□H**

Specifications



Symbol

Without cushion



Made to Order

(For details, refer to pages 61 to 78.)

Symbol	Specifications
-XC6	Made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length

(Note) Since a heavy duty scraper (-XC4) is installed as standard, there is no need to specify it.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. 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 56 and 57.)

Refer to pages 52 to 58 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.

Bore size (mm)	40	50	63	80	100
Type	Air-hydro				
Fluid	Turbine oil				
Action	Double acting				
Proof pressure	1.5 MPa				
Maximum operating pressure	1.0 MPa				
Minimum operating pressure	0.16 MPa				
Piston speed	0.5 to 300 mm/s				
Ambient and fluid temperature	5 to 60°C				
Cushion	None				
Stroke length tolerance	Up to 250 st: $^{+1.0}_0$, 251 to 750 st: $^{+1.4}_0$				
Mounting	Basic, Axial foot, Rod flange, Center trunnion				

Standard Strokes In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on pages 56 and 57.

Bore size	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
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

* Intermediate strokes not listed above are produced upon receipt of order.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Accessories

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

Weights/Aluminum Tube (Steel Tube)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic	1.03 (1.08)	1.59 (1.64)	2.26 (2.30)	3.94 (4.09)	5.57 (5.78)
	Axial foot	1.22 (1.27)	1.81 (1.86)	2.59 (2.63)	4.61 (4.76)	6.65 (6.77)
	Flange	1.40 (1.45)	2.05 (2.09)	3.05 (3.09)	5.39 (5.55)	7.49 (7.70)
	Trunnion	1.39 (1.49)	2.07 (2.18)	3.06 (3.25)	5.49 (5.78)	7.85 (8.24)
Additional weight per 50 mm of stroke	All mounting brackets (Except steel tube trunnion)	0.30 (0.35)	0.40 (0.47)	0.50 (0.55)	0.71 (0.89)	0.92 (1.15)
	Steel tube trunnion	(0.44)	(0.58)	(0.77)	(1.06)	(1.35)
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) **CA2WLH40-100** (Axial foot, ø40, 100 stroke)

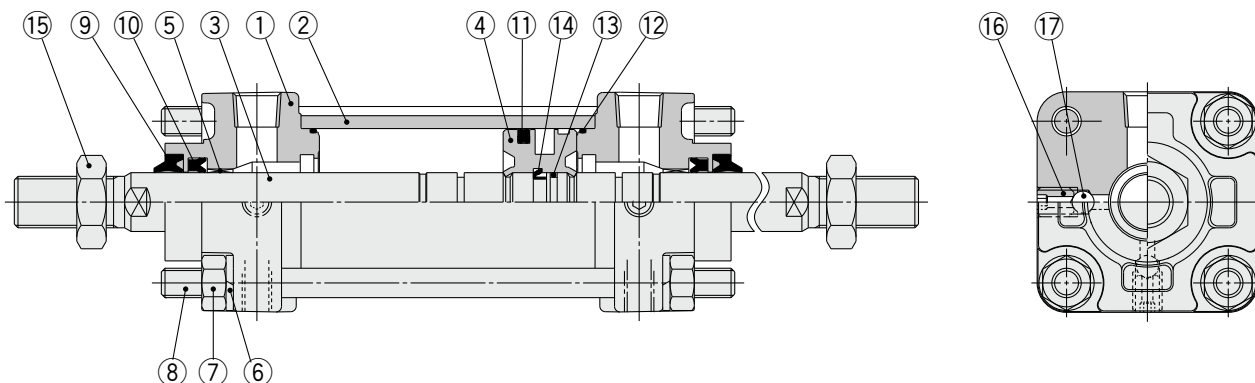
- Basic weight..... 1.22 (Axial foot, ø40)
 - Additional weight..... 0.30/50 stroke
 - Cylinder stroke 100 stroke
- $$1.22 + 0.30 \times 100/50 = 1.82 \text{ kg}$$

* Values inside the parentheses are those for the steel tube type.

Standard Double Acting, Single Rod CA2
Double Acting, Double Rod CA2W
Non-rotating Rod Double Acting, Single Rod CA2K
Double Acting, Double Rod CA2KW
With End Lock CBA2
Air-hydro Double Acting, Single Rod CA2□H
Double Acting, Double Rod CA2W□H
Low Friction CA2□Q
Auto Switch
Made to Order

Series CA2W□H

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Metallic painted
2	Cylinder tube	Aluminum alloy	Hard anodized
3	Piston rod	Carbon steel	Hard chrome plating
4	Piston	Aluminum alloy	Chromated
5	Bushing	Bearing alloy	
6	Spring washer	Rolled steel	Chromated
7	Tie-rod nut	Rolled steel	Nickel plating
8	Tie-rod	Carbon steel	Zinc chromated
9	Scraper	NBR	
10	Rod seal	NBR	
11	Piston seal	NBR	
12	Cylinder tube gasket	NBR	
13	Piston gasket	NBR	
14	Piston holder	Urethane	
15	Rod end nut	Rolled steel	Nickel plating
16	Air release valve	Chromium molybdenum steel	Black zinc chromated
17	Check ball	Bearing steel	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
	Air-hydro type	
40	CA2WH40A-PS	Set of the nos. ⑩, ⑪, ⑫.
50	CA2WH50A-PS	
63	CA2WH63A-PS	
80	CA2WH80A-PS	
100	CA2WH100A-PS	

* Do not disassemble the trunnion type. Refer to page 79.

* Seal kit includes ⑩, ⑪ and ⑫. Order the seal kit based on each bore size.

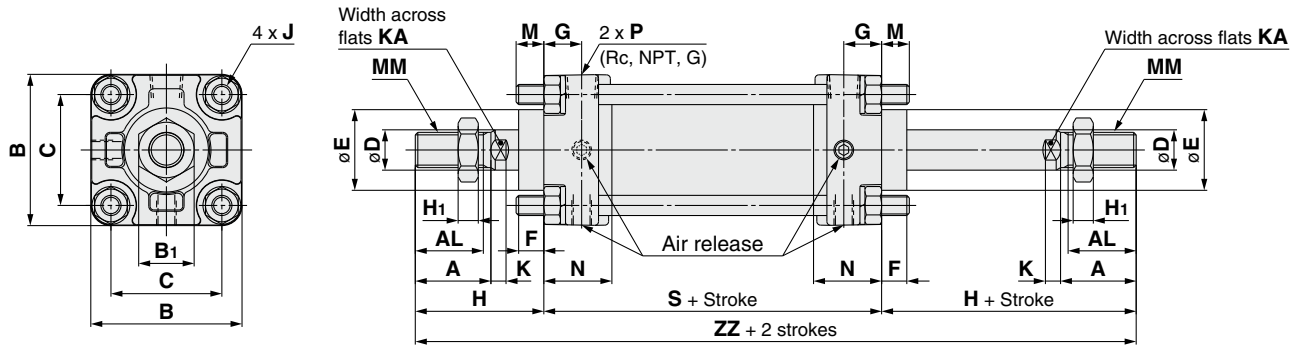
* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g).

Order with the following part number when only the grease pack is needed.

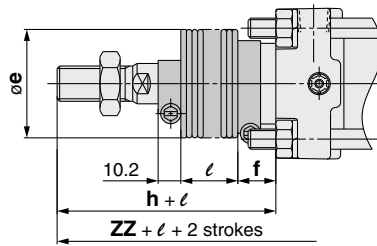
Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

Air Cylinder: Air-hydro Type Double Acting, Double Rod **Series CA2W□H**

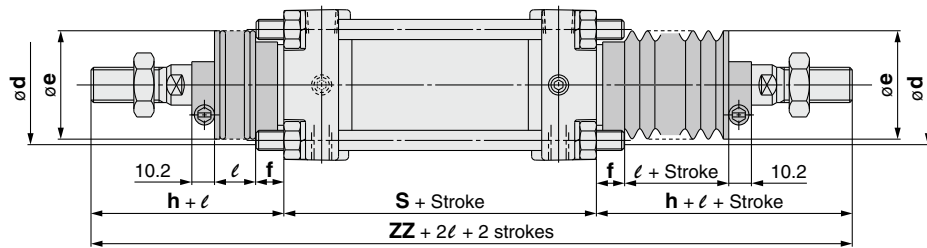
Basic: CA2WBH



With rod boot (One side)



With rod boot (Both sides)



Bore size (mm)	Stroke range (mm)		A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	M	MM	N
	Without rod boot	With rod boot																
40	Up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27
50	Up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30
63	Up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31
80	Up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	11	22	17	M22 x 1.5	37
100	Up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	11	26	17	M26 x 1.5	40

Bore size (mm)	P	S	Without rod boot		With rod boot (One side)						(Both sides)	
			H	ZZ	d	e	f	h	l	ZZ	ZZ	
40	1/4	84	51	186	56	43	11.2	59	1/4 stroke	194	202	
50	3/8	90	58	206	64	52	11.2	66	1/4 stroke	214	222	
63	3/8	98	58	214	64	52	11.2	66	1/4 stroke	222	230	
80	1/2	116	71	258	76	65	12.5	80	1/4 stroke	267	276	
100	1/2	126	72	270	76	65	14.0	81	1/4 stroke	279	288	

The dimensions for each mounting type are the same as those for the standard double acting double rod model. Refer to pages 25 to 28.

Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock	Double Acting, Single Rod	CBA2
	Double Acting, Double Rod	CA2□H
Air-hydro	Double Acting, Single Rod	CA2□H
	Double Acting, Double Rod	CA2W□H
Low Friction	Double Acting, Single Rod	CA2□Q
	Double Acting, Double Rod	CA2W□Q
Auto Switch		
Made to Order		

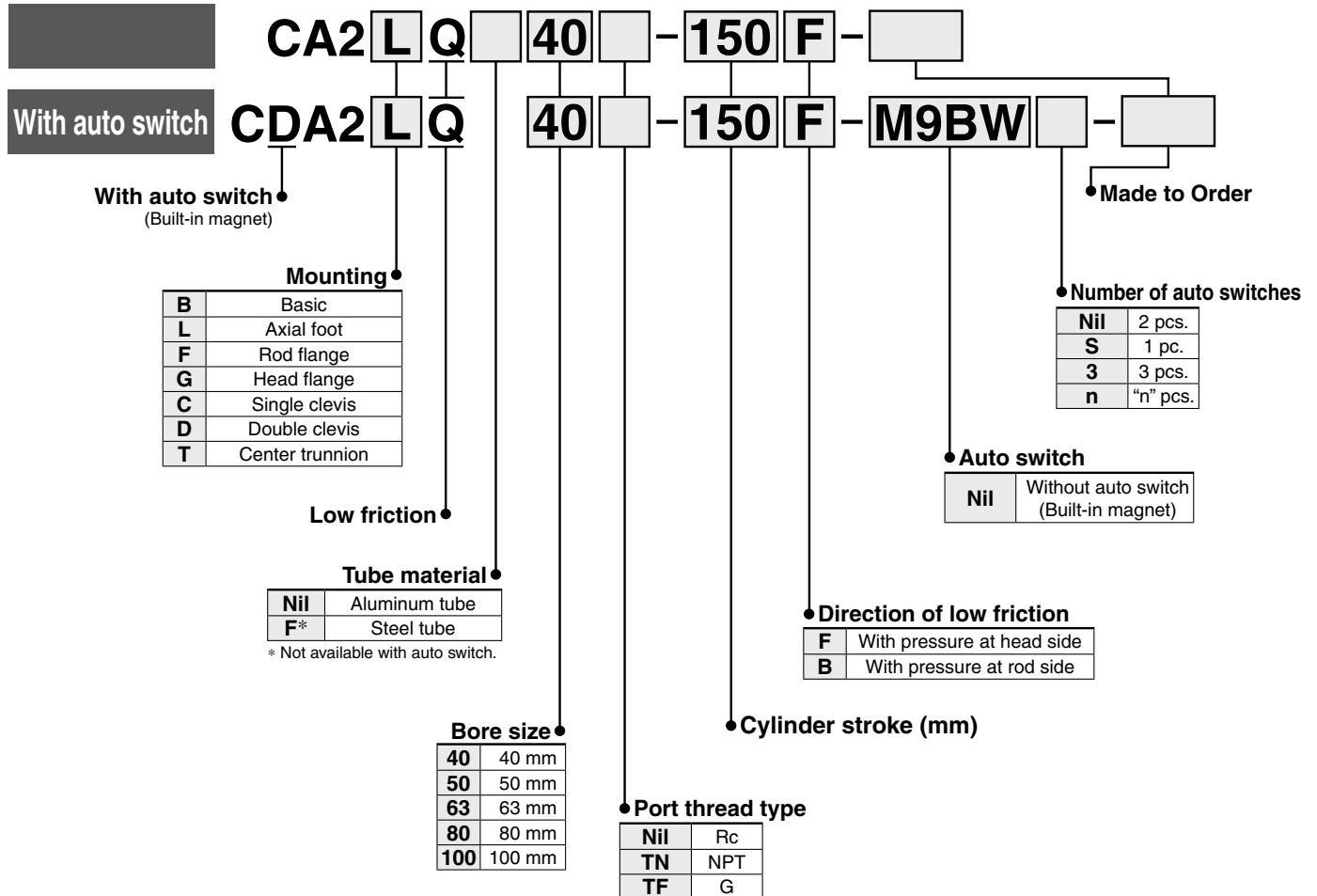
Air Cylinder: Low Friction Type Double Acting, Single Rod

Series CA2□Q

∅40, ∅50, ∅63, ∅80, ∅100

Use the new "Smooth Cylinder Series CA2Y" to realize dual-side low friction and low-speed operation. (Refer to the WEB catalog or "CAT.ES20-235" catalog.)

How to Order



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDA2BQ40-100

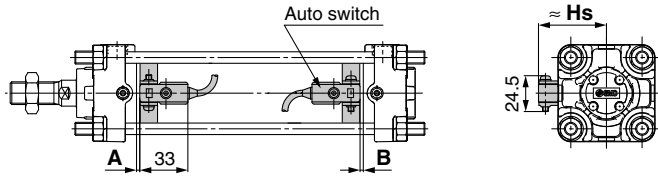
Series CA2

Auto Switch Mounting

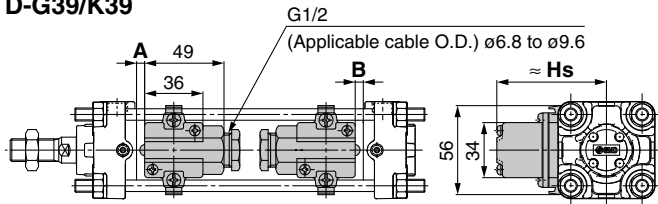
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-B5□/B64/B59W

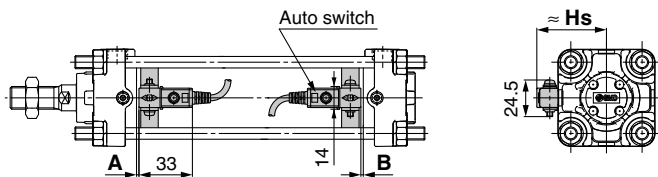


D-A3□
D-G39/K39

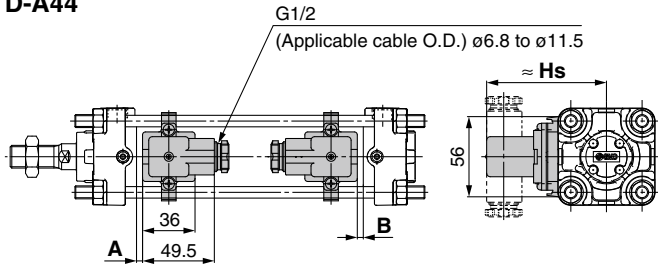


D-G5□/K59
D-G5□W/K59W

D-G5BA
D-G59F/G5NT



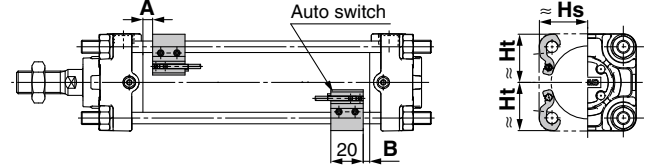
D-A44



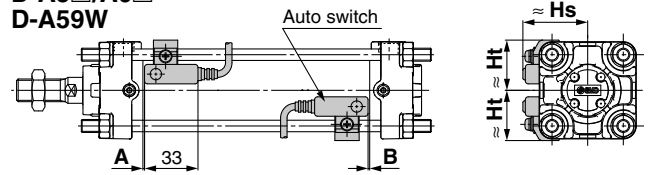
<Tie-rod mounting>

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

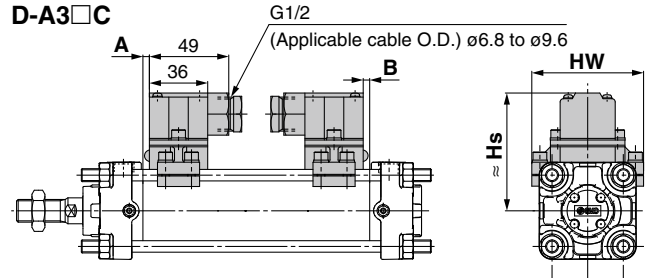
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BA
D-Z7□/Z80



D-A5□/A6□
D-A59W

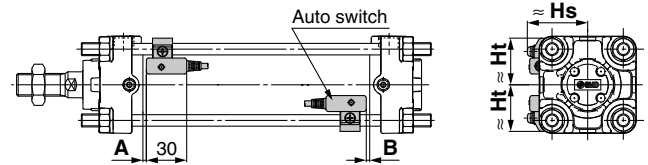


D-G39C/K39C
D-A3□C

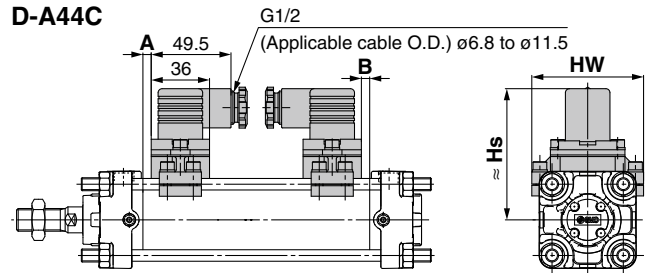


D-F5□/J59
D-F5NT

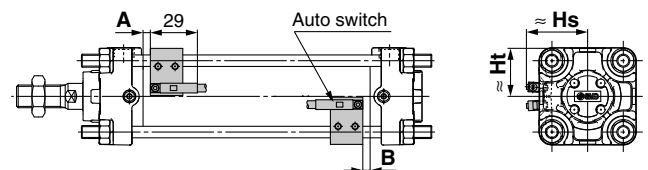
D-F5□W/J59W
D-F5BA/F59F



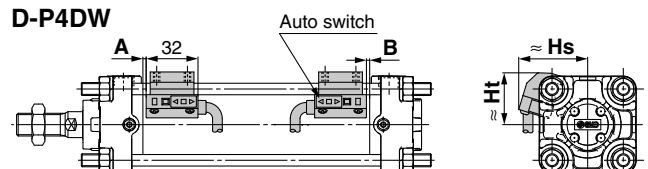
D-A44C



D-P3DW



D-P4DW



Standard	Double Acting, Single Rod	CA2
	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydro	Double Acting, Single Rod	CA2H
	Double Acting, Double Rod	CA2WH
Low Friction		CA2Q
		Auto Switch
		Made to Order

Series CA2

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-P3DW		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
40	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
50	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
63	12.5	11.5	8.5	7.5	6	5	3	2.5	5.5	4.5	9	8	14	13	6.5	5.5	2.5	1.5	4.5	3.5	3	2
80	16.5	13.5	12.5	9.5	10	7	7.5	4	9.5	6.5	13	10	18	15	10.5	7.5	6.5	3.5	8.5	5.5	7	4
100	18	16	14	12	11.5	9.5	9	6.5	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-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-J59W D-F5BA D-F59F D-F5NT		D-A5□ D-A6□ 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	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
40	30	30	34	30	31	30	30	30	30	30	30	38	30	42.5	33	37	71.5	81.5	38	31.5	38.5	31.5	73	69	81	69				
50	34	34	38	34	35	34	34	34	34	34	34	42	34	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77				
63	41	41	44	41	41.5	41	41	41	41	41	41	49	41	52	43	49	83.5	93.5	47	43	46.5	43	85.5	91	93.5	91				
80	49.5	49	52.5	49	50	49	49.5	49	49.5	49	49.5	56	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107				
100	56.5	56	61	56	58.5	56	56.5	55.5	57.5	55.5	65	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□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
40	10	8	6	4	4	1	6	3	3.5	0.5	0.5	0	2.5	0	1	0	7	4	12	9	4.5	1.5
50	10	8	6	4	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	4.5	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	12.5	10.5	17.5	15.5	10	8
100	17.5	16.5	13.5	12.5	11	10	8	6.5	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□WV 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□WV		D-P3DW		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-J59W D-F59F D-F5BA D-F5NT		D-A5□ D-A6□ 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	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
40	30	30	34	30	31	30	30	30	30	30	38	30	42.5	33	37	71.5	81.5	38	31.5	38.5	31.5	73	69	81	69				
50	34	34	38	34	35	34	34	34	34	34	42	34	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77				
63	41	41	44	41	41.5	41	41	41	41	41	49	41	52	43	49	83.5	93	47	43	46.5	43	85.5	91	93.5	91				
80	49.5	49	52.5	49	50	49	49.5	49	49.5	49	56	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107				
100	56.5	56	61	56	58.5	56	58.5	55.5	57.5	55.5	65	56	66	58.5	68	102.5	112.5	61	57.5	61.5	57.5	104	121	112	121				

Standard | Double Acting, Single Rod | **CA2**

Double Acting, Double Rod | **CA2W**

Non-rotating Rod | Double Acting, Single Rod | **CA2K**

Double Acting, Double Rod | **CA2KW**

With End Lock | **CBA2**

Air-hydro | Double Acting, Single Rod | **CA2H**

Double Acting, Double Rod | **CA2WH**

Low Friction | **CA2Q**

Auto Switch

Made to Order

Series CA2

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
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□V D-M9□W D-M9□WV 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-J59W D-F5BA D-F59F D-F5NT		D-A5□ D-A6□ 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	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	
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-G5NBL	35	35	40	40	40
D-G39/K39 D-G39C/K39C	9	9	10	10	11
D-P3DW	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 Series CDA2□H and CDA2W□H.

Note 2) D-A9□ and D-A9□V types cannot be mounted on ø50 of 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	
D-M9□ D-M9□W	2 (Different surfaces and same surface) 1	15	80					
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$80 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-M9□V D-M9□WV	2 (Different surfaces and same surface) 1	10	55					
	n	$10 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$55 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-M9□A	2 (Different surfaces and same surface) 1	15	80					
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$80 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-M9□AV	2 (Different surfaces and same surface) 1	10	60					
	n	$10 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$60 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-A9□	2 (Different surfaces and same surface) 1	15	75					
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$75 + 40 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-A9□V	2 (Different surfaces and same surface) 1	10	50					
	n	$10 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$50 + 30 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-F5□/J59 D-F5□W/J59W D-F5BA/F59F D-A5□/A6	2 (Different surfaces and same surface) 1	15	90					
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$90 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-F5NT	2 (Different surfaces and same surface) 1	25	110					
	n (Same surface)	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$110 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
D-A59W	2 (Different surfaces and same surface) 1	20	90					
	n (Same surface)	$20 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$90 + 55 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>					
	1	15	90					
D-G5□/K59 D-G5□W D-K59W D-G5BA D-G59F D-G5NT D-B5□/B64	2	Different surfaces	15					
		Same surface	75					
	n	Different surfaces	$15 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$90 + 50 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>				
		Same surface	$75 + 50 (n-2)$ <small>(n = 2, 3, 4...)</small>	$90 + 50 (n-2)$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>				
1	10	90						
D-B59W	2	Different surfaces	20					
		Same surface	75					
	n	Different surfaces	$20 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>	$90 + 50 \frac{(n-4)}{2}$ <small>(n = 4, 8, 12, 16...)^{Note 2)}</small>				
		Same surface	$75 + 50 (n-2)$ <small>(n = 2, 3, 4...)</small>	$90 + 50 (n-2)$ <small>(n = 2, 4, 6, 8...)^{Note 1)}</small>				
1	15	90						

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.

Standard
Double Acting, Single Rod
CA2

Non-rotating Rod
Double Acting, Double Rod
CA2W

Non-rotating Rod
Double Acting, Single Rod
CA2K

Non-rotating Rod
Double Acting, Double Rod
CA2KW

With End Lock
CBA2

Air-hydra
Double Acting, Single Rod
CA2H

Air-hydra
Double Acting, Double Rod
CA2WH

Low Friction
CA2Q

Auto Switch

Made to Order

Series CA2

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...) ^{Note 1)}		$80 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
		Same surface	$100 + 100(n - 2)$ (n = 2, 3, 4...)	$100 + 100(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}				
	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...) ^{Note 1)}		$80 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 30(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
		Same surface	$55 + 50(n - 2)$ (n = 2, 3, 4...)	$75 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}		$80 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
	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...) ^{Note 1)}		$80 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
		Same surface	$100 + 100(n - 2)$ (n = 2, 3, 4, 5...)	$100 + 100(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}				
	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...) ^{Note 1)}		$80 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 35(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
		Same surface	$55 + 50(n - 2)$ (n = 2, 3, 4...)	$75 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}		$80 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	$90 + 50(n - 2)$ (n = 2, 4, 6, 8...) ^{Note 1)}	
	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...) ^{Note 1)}	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	
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...) ^{Note 1)}	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}		$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	
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...) ^{Note 1)}	$95 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}		$100 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$105 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$110 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	
D-P3DW	2 (Different surfaces and same surface) 1	15	85					
	n	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) ^{Note 1)}	$85 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)					
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...) ^{Note 1)}	$120 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}		$130 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}	$140 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) ^{Note 2)}		

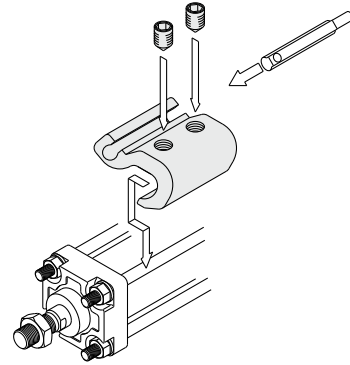
Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

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

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/F59NT 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-P3DW	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-G5NB 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-G5NB 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) Refer to the **WEB catalog** or the Best Pneumatics No. 2 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 3) 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 4) 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 the **WEB catalog** or the Best Pneumatics No. 2 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 indication)
	D-M9NWV/M9PWV/M9BWW		Water resistant (2-color indication)
	D-Y7NWV/Y7PWV/Y7BWW		—
	D-M9NAV/M9PAV/M9BAV		Diagnostic indication (2-color indication)
	D-Y59A/Y59B/Y7P	Grommet (In-line)	Water resistant (2-color indication)
	D-F59/F5P/J59		With timer
	D-Y7NW/Y7PW/Y7BW		Magnetic field resistant (2-color indication)
	D-F59W/F5PW/J59W		—
	D-F5BA/Y7BA		Without indicator light
D-F5NT/G5NT	Grommet (In-line)	—	
D-P5DW		Without indicator light	
D-A93V/A96V		—	
Reed	D-A90V	Grommet (Perpendicular)	Without indicator light
	D-A53/A56/B53/Z73/Z76	Grommet (In-line)	—
	D-A67/Z80		Without indicator light

* With pre-wired connector is also available for solid state auto switches. For details, refer to the **WEB catalog** or the Best Pneumatics No. 2.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to the **WEB catalog** or the Best Pneumatics No. 2.

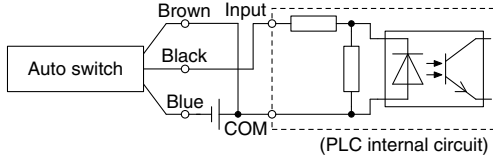
Standard	Double Acting, Single Rod	CA2
Non-rotating Rod	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
Non-rotating Rod	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydro	Double Acting, Single Rod	CA2H
Air-hydro	Double Acting, Double Rod	CA2WH
Low Friction		CA2Q
		Auto Switch
		Made to Order

Prior to Use

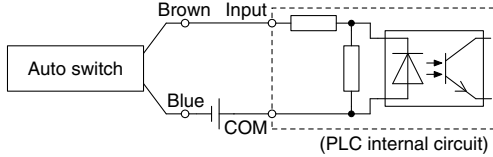
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

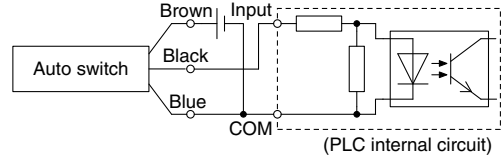


2-wire

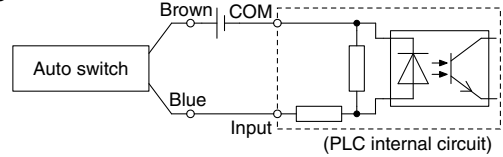


Source Input Specifications

3-wire, PNP



2-wire



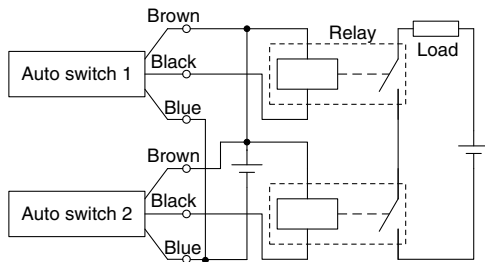
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Example of AND (Series) and OR (Parallel) Connection

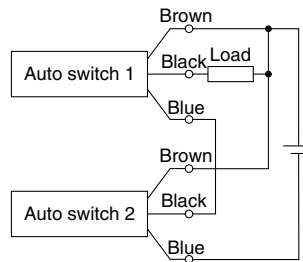
* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

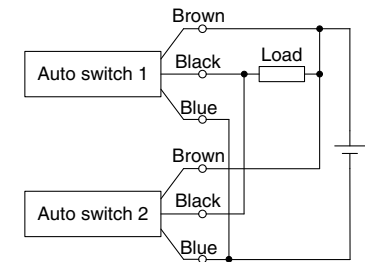
(Using relays)



(Performed with auto switches only)

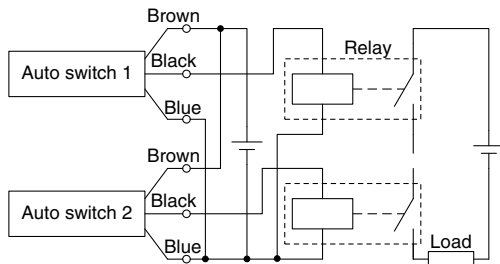


3-wire OR connection for NPN output

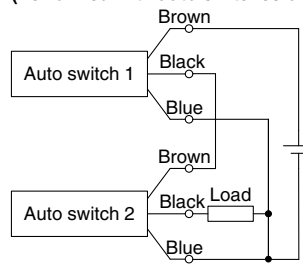


3-wire AND connection for PNP output

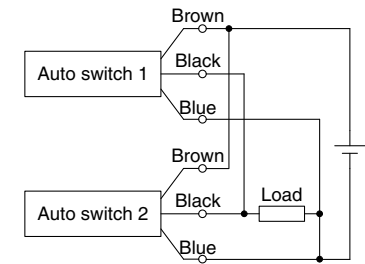
(Using relays)



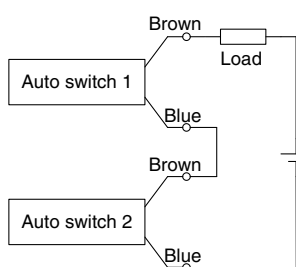
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

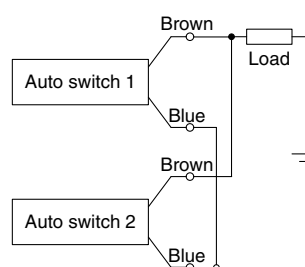


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state. Auto switches with load voltage less than 20 V cannot be used.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \\ &\quad \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply is 24 VDC
Internal voltage drop in auto switch is 4 V.

2-wire OR connection



(Solid state)
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \\ &\quad \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 k Ω .
Leakage current from auto switch is 1 mA.

Made to Order	Auto Switch	<p>Low Friction</p> <p>CA2□□Q</p>	<p>Air-hydro</p> <p>Double Acting, Double Rod CA2W□□H</p> <p>Double Acting, Single Rod CA2□□H</p>	<p>With End Lock</p> <p>CBA2</p>	<p>Non-rotating Rod</p> <p>Double Acting, Double Rod CA2KW</p> <p>Double Acting, Single Rod CA2K</p>	<p>Standard</p> <p>Double Acting, Double Rod CA2W</p> <p>Double Acting, Single Rod CA2</p>
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Series CA2

Simple Specials/Made to Order



Please contact SMC for detailed specifications, delivery and prices.

Simple Specials The following special specifications can be ordered as a simplified Made-to-Order. There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

Symbol	Specifications	CA2 (Standard type) Double acting	
		Single rod	Double rod
-XA0 to 30	Change of rod end shape	●	●
-XC14	Change of trunnion bracket mounting position	●	●
-XC15	Change of tie-rod length	●	●

Made to Order

Symbol	Specifications	CA2 (Standard type) Double acting	
		Single rod	Double rod
-XB5	Oversized rod cylinder	● Note 1)	
-XB6	Heat resistant cylinder (-10 to 150°C)	●	●
-XC3	Special port location	● Note 1)	● Note 1)
-XC4	With heavy duty scraper	●	●
-XC5	Heat resistant cylinder (-10 to 110°C)	●	●
-XC6	Made of stainless steel		
-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	●	
-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	●	
-X1184	Cylinder with heat resistant reed auto switch (-10 to 120°C)	●	

Note 1) The cover shape is the same as the existing product.

CA2K ^{Note 1)} (Non-rotating rod type) Double acting		CA2□H ^{Note 1)} (Air-hydro type) Double acting		CBA2 ^{Note 1)} (With end lock) Double acting	Symbol	Page
Single rod	Double rod	Single rod	Double rod	Single rod		
●		●		●	-XA0 to 30	Page 63
●	●	●	●	●	-XC14	Page 65
●	●	●	●	●	-XC15	Page 65
CA2K (Non-rotating rod type) Double acting		CA2□H (Air-hydro type) Double acting		CBA2 (With end lock) Double acting	Symbol	Page
Single rod	Double rod	Single rod	Double rod	Single rod		
				●	-XB5	Page 66
				●	-XB6	Page 66
				●	-XC3	Page 67
				●	-XC4	Page 67
				●	-XC5	Page 68
		●	●	●	-XC6	Page 68
●	●			●	-XC7	Page 68
●				●	-XC8	Page 69
●				●	-XC9	Page 70
●				●	-XC10	Page 71
●				●	-XC11	Page 72
●				●	-XC12	Page 73
				●	-XC22	Page 73
●				●	-XC27	Page 73
●	●			●	-XC28	Page 74
				●	-XC29	Page 74
				●	-XC30	Page 75
				●	-XC35	Page 75
				●	-XC65	Page 76
				●	-XC68	Page 76
				●	-XC85	Page 77
				●	-X1184	Page 78

Standard	Double Acting, Single Rod	CA2
Standard	Double Acting, Double Rod	CA2W
Non-rotating Rod	Double Acting, Single Rod	CA2K
Non-rotating Rod	Double Acting, Double Rod	CA2KW
With End Lock		CBA2
Air-hydro	Double Acting, Single Rod	CA2□H
Air-hydro	Double Acting, Double Rod	CA2W□H
Low Friction		CA2□Q
Auto Switch		Auto Switch
Made to Order		Made to Order

Series CA2 Simple Specials

These changes are dealt with Simple Specials System.

For details, refer to the Simple Specials System in the WEB catalog.
<http://www.smcworld.com>

1 Change of Rod End Shape Symbol -XA0 to XA30

Series	Action	Symbol for change of rod end shape	Note	
Standard type	CA2	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
	CA2W	Double acting, Double rod	XA0 to 30	Except pivot bracket and rod end bracket
Non-rotating rod type	CA2K	Double acting, Single rod	XA0, 1, 6, 10, 11, 13, 14, 17, 19, 21	
With end lock	CBA2	Double acting, Single rod	XA0 to 30	
Air-hydro type	CA2□H	Double acting, Single rod	XA1, 3, 5 to 8, 10, 11, 13 to 23, 26 to 30	

Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "*" will be as follows to the rod diameter (D). Enter any special dimension you desire.
- $D \leq 6 \rightarrow D - 1 \text{ mm}$, $6 < D \leq 25 \rightarrow D - 2 \text{ mm}$, $D > 25 \rightarrow D - 4 \text{ mm}$
In the case of double rod type and single acting retraction type, enter the dimensions when the rod is retracted.

Symbol: A0 	Symbol: A1 	Symbol: A2 	Symbol: A3
Symbol: A4 	Symbol: A5 	Symbol: A6 	Symbol: A7
Symbol: A8 	Symbol: A9 	Symbol: A10 	Symbol: A11
Symbol: A12 	Symbol: A13 	Symbol: A14 	Symbol: A15

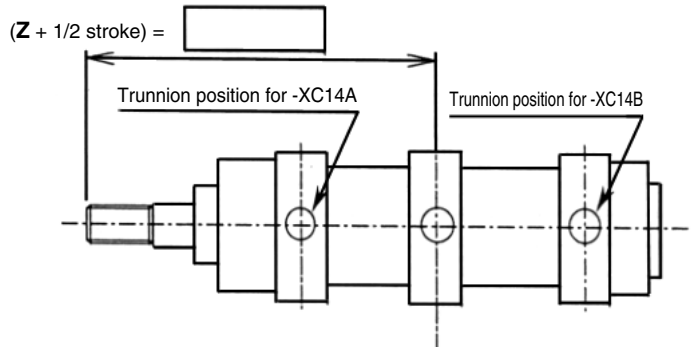
<p>Symbol: A16</p>	<p>Symbol: A17</p>	<p>Symbol: A18</p>	<p>Symbol: A19</p>
<p>Symbol: A20</p>	<p>Symbol: A21</p>	<p>Symbol: A22</p>	<p>Symbol: A23</p>
<p>Symbol: A24</p>	<p>Symbol: A25</p>	<p>Symbol: A26</p>	<p>Symbol: A27</p>
<p>Symbol: A28</p>	<p>Symbol: A29</p>	<p>Symbol: A30</p>	

Standard	Double Acting, Double Rod	CA2W
Standard	Double Acting, Single Rod	CA2
Non-rotating Rod	Double Acting, Double Rod	CA2KW
Non-rotating Rod	Double Acting, Single Rod	CA2K
With End Lock		CBA2
Air-hydra	Double Acting, Single Rod	CA2□H
Air-hydra	Double Acting, Double Rod	CA2W□H
Low Friction		CA2□Q
		Auto Switch
		Made to Order

2 Change of Trunnion Bracket Mounting Position

The position for mounting the trunnion pivot bracket on the cylinder can be moved from the standard mounting position to any desired position.

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
Non-rotating rod type	CA2K	Double acting, Single rod	
	CA2KW	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	
Air-hydro type	CA2□H	Double acting, Single rod	
	CA2W□H	Double acting, Double rod	



Precautions

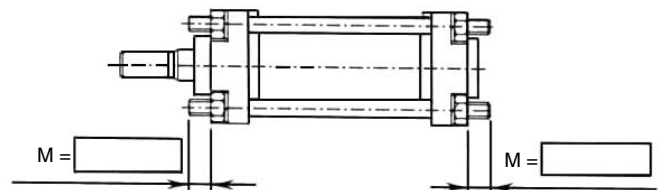
1. Specify "Z + 1/2 stroke" in the case the trunnion bracket position is not -XC14A, B or trunnion is not a center trunnion.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. The possible range of trunnion bracket mounting position is indicated in the table below.
4. Some trunnion mounting positions do not allow auto switch mounting. Please consult with SMC for more information.
5. When the trunnion position is changed to somewhere close to the cover for the end lock cylinder, there is a possibility that the lock part and the trunnion pivot bracket may interfere with each other. Change the lock position (-X3) at the same time.

Symbol Bore size	Z + 1/2 stroke (mm)					
	For -XC14A	For -XC14B	For -XC14		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
40	89	97 + Stroke	89.5	96.5 + Stroke	93 + 1/2 stroke	1
50	99	107 + Stroke	99.5	106.5 + Stroke	103 + 1/2 stroke	1
63	103	111 + Stroke	103.5	110.5 + Stroke	107 + 1/2 stroke	1
80	125	133 + Stroke	125.5	132.5 + Stroke	129 + 1/2 stroke	1
100	132	138 + Stroke	132.5	137.5 + Stroke	135 + 1/2 stroke	1

3 Change of Tie-rod Length

Cylinder with M dimension for tie-rod length changed from the standard length.

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
Non-rotating rod type	CA2K	Double acting, Single rod	
	CA2KW	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	
Air-hydro type	CA2□H	Double acting, Single rod	
	CA2W□H	Double acting, Double rod	



Tie-rod Length Changeable Range (mm)

Bore size	All bore size
M Min.	0
M Max.	300

Precautions

1. To order, specify the M dimension as well as the part number.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. Tie-rod length changeable range is described in the table on the right.
4. The M dimension of the bracket mounting side of Flange (F, G), Clevis (C, D) types cannot be specified.

Series CA2 Made to Order

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



1 Oversized Rod Cylinder

Symbol
-XB5

A cylinder that has been made stronger through the use of a piston rod with a larger diameter. It is used for long stroke applications that pose the risk of bending or buckling of the piston rod. (Please contact SMC if a lateral load must be applied to it.)

Applicable Series

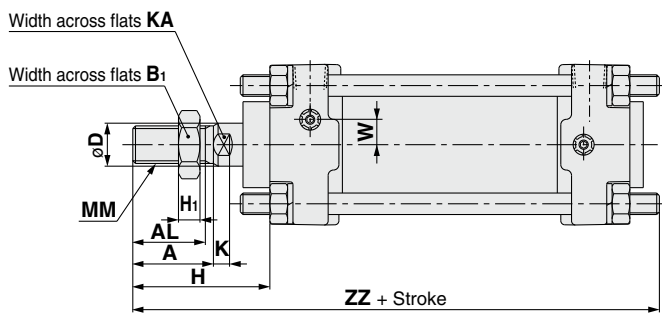
Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	

How to Order

CA2 Mounting style Bore size - Stroke - **XB5**
Oversized rod cylinder

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

Series CA



Bore size	(mm)										
	A	AL	B ₁	øD	H	H ₁	K	KA	MM	W	ZZ
40	35	32	27	20	58	11	7	18	M18 x 1.5	9	153
50	40	37	32	25	71	13	11	22	M22 x 1.5	9	172
63	40	37	32	25	71	13	11	22	M22 x 1.5	9	183
80	40	37	41	30	72	16	11	26	M26 x 1.5	0	205
100	50	47	46	36	85	18	15	31	M30 x 1.5	0	228

2 Heat Resistant Cylinder (-10 to 150°C)

Symbol
-XB6

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from -10°C.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except with auto switch
	CA2W	Double acting, Double rod	Except with auto switch
With end lock	CBA2	Double acting, Single rod	Except with auto switch

- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. But, as for the one with auto switch, and the heat resistant cylinder with heat resistant auto switch, please contact SMC.
 Note 4) Piston speed is ranged from 50 to 500 mm/s.

How to Order

Standard model no. - **XB6**
Heat resistant cylinder

Specifications

Ambient temperature range	-10°C to 150°C
Seal material	Fluororubber
Grease	Heat resistant grease
Specifications other than above and external dimensions	Same as standard type

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.

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydro Double Acting, Single Rod **CA2H**

Double Acting, Double Rod **CA2WH**

Low Friction **CA2Q**

Auto Switch

Made to Order

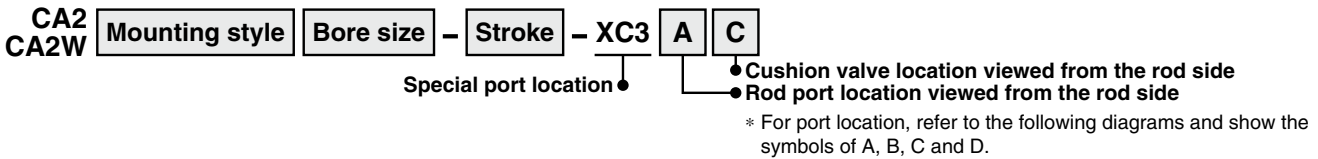
3 Special Port Location

Compared with the standard type, a cylinder which changes the connection port location of rod/head cover and the location of cushion valve.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

How to Order



Specifications: Same as standard type

Relationship between Port Location and Cushion Valve Location

Series	Corresponding symbol of mounting bracket (Positional relationships)						
CA2 CA2W	Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
	<ol style="list-style-type: none"> As shown in the above diagram, the symbols for the positions of the ports and cushion valves are as follows: viewed from the rod side, the top position is rendered A; then, B, C, and D, in the clockwise direction. The type in which the ports and the cushion valves are combined is applicable only when the rod cover and the head cover are changed to the same positions. The symbol indicated as "-XC3[A][B]" is the standard specification, and there are no part numbers A or B. Those shown above are the same as standard, other than the symbols that indicate the positions of the ports and the cushion valves. 						
CBA2	Port and cushion needle are at the same rod/head position. Symbols of port location, cushion needle position and lock position are as the following diagrams. 			When the mounting bracket is attached, the conditions placed like below are on a basis. 			
	Diagrams seen from the rod side						

4 With Heavy Duty Scraper

Symbol
-XC4

It is suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-casted equipment, construction machinery, or industrial vehicles.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

Note) Air-hydro type is equipped with heavy duty scraper as standard.

How to Order

Standard model no. - **XC4**
 With heavy duty scraper

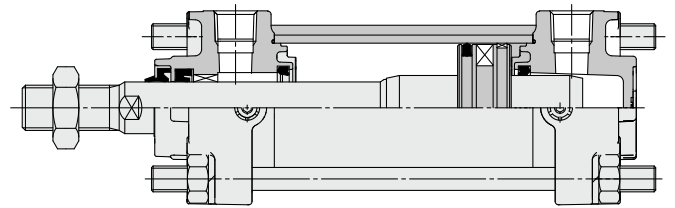
Specifications: Same as standard type

⚠ Caution

Do not replace heavy duty scrapers.

- Since heavy duty scrapers are press-fit, do not replace the cover only, but rather the entire rod cover assembly.

Construction (Dimensions are the same as standard.)



Symbol
-XC5

5 Heat Resistant Cylinder (-10 to 110°C)

Cylinder which changed the seal material for heat resistance (up to 110°C) in order to use under the severe ambient temperature condition which exceeds the standard specifications of -10 to 70°C.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except with auto switch
	CA2W	Double acting, Double rod	Except with auto switch

How to Order

Standard model no. - **XC5**
 Heat resistant cylinder

Specifications

Ambient temperature range	-10°C to 110°C
Seal material	Fluororubber
With auto switch	Unavailable Note 2)

Specifications other than above and external dimensions	Same as standard type
----------------------------------------------------------------	-----------------------

Note 1) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Note 2) Manufacturing built-in magnet type and the one with auto switch is impossible.

Note 3) Material of rod boot is heat resistant tarpaulin.

6 Made of Stainless Steel

Symbol
-XC6

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Description	Model	Action	Note
With end lock	CBA2 Note)	Double acting, Single rod	
Air-hydro type	CA2□H	Double acting, Single rod	
	CA2W□H	Double acting, Double rod	

Note) Head end lock only

How to Order

Standard model no. - **XC6**
 Made of stainless steel

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Max. manufacturable stroke (mm)	Double acting, Single rod: 1500 Double acting single rod with rod boot: 1000

Specifications other than above and external dimensions	Same as standard type
----------------------------------------------------------------	-----------------------

7 Tie-rod, Cushion Valve, Tie-rod Nut, etc. Made of Stainless Steel

Symbol
-XC7

When using in locations where the rust generation or corrosion likelihood exists, the standard parts material have been partly changed to the stainless steel.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
Non-rotating rod type	CA2K	Double acting, Single rod	
	CA2KW	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

How to Order

Standard model no. - **XC7**
 Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel

Specifications

Component parts changed to stainless steel	Tie-rod, Tie-rod nut, Mounting bracket nut, Cushion valve, Lock nut
---------------------------------------------------	---------------------------------------------------------------------

Additional specifications	Same as standard type
Dimensions	Same as standard type

Standard Double Acting, Single Rod CA2
 Double Acting, Double Rod CA2W
 Non-rotating Rod Double Acting, Single Rod CA2K
 Double Acting, Double Rod CA2KW
 With End Lock CBA2
 Air-hydro Double Acting, Single Rod CA2□H
 Double Acting, Double Rod CA2W□H
 Low Friction CA2□Q
 Auto Switch
 Made to Order

Series CA2

Symbol
-XC8

8 Adjustable Stroke Cylinder/Adjustable Extension Type

It adjusts the extending stroke by the stroke adjustable mechanism equipped in the head side. (After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
Non-rotating rod type	CA2K	Double acting, Single rod	
With end lock	CBA2	Double acting, Single rod	

Specifications

Stroke adjustment symbol	A	B
Stroke adjustment range (mm)	0 to 25	0 to 50
Additional specifications	Same as standard type	

How to Order

CA2 [Mounting style] [Bore size] - [Stroke] [Suffix] [Stroke adjustment symbol] Z - [Pivot bracket] [Rod end bracket] - **XC8**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable extension type

CA2K [Mounting style] [Bore size] - [Stroke] [Suffix] [Stroke adjustment symbol] - **XC8**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable extension type

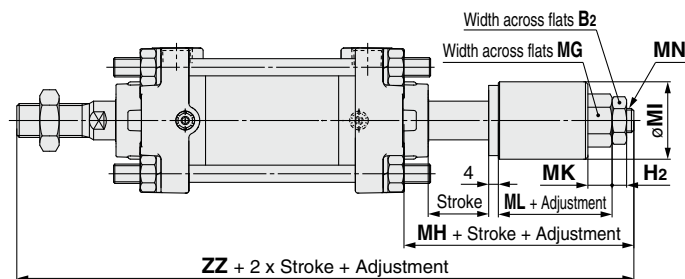
CBA2 [Mounting style] [Bore size] - [Stroke] [Stroke adjustment symbol] - H [Manual release type] - **XC8**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable extension type



Warning Precautions

1. When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
2. To adjust the stroke, make sure to secure the wrench flats of the stopper bracket by a wrench, etc. before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side could loosen first. It may cause an accident or malfunction.

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



Bore size	B2	H2	MG	MH	MI	MK	ML	MN	ZZ
40	17	6	19	45	32	10	22	M10 x 1.25	180
50	22	8	24	49	38	13	24	M14 x 1.5	197
63	22	8	24	49	38	13	24	M14 x 1.5	205
80	24	10	27	66	45	14	32	M16 x 1.5	253
100	30	12	32	69	55	17	35	M20 x 1.5	267

9 Adjustable Stroke Cylinder/Adjustable Retraction Type

Symbol
-XC9

The retract stroke of the cylinder can be adjusted by the adjusting bolt.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except head flange and clevis types
Non-rotating rod type	CA2K	Double acting, Single rod	Except head flange and clevis types
With end lock	CBA2	Double acting, Single rod	Except head flange and clevis types

Specifications

Stroke adjustment symbol	A	B
Stroke adjustment range (mm)	0 to 25	0 to 50
Additional specifications	Same as standard type	

How to Order

CA2 Mounting style Type Bore size - Stroke Suffix Stroke adjustment symbol **Z** - Pivot bracket Rod end bracket - **XC9**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable retraction type

CA2K Mounting style Type Bore size - Stroke Suffix Stroke adjustment symbol - **XC9**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable retraction type

CBA2 Mounting style Bore size - Stroke Suffix Stroke adjustment symbol - **R** Manual release type - **XC9**
* Except head flange and clevis types
Adjustable stroke cylinder/Adjustable retraction type

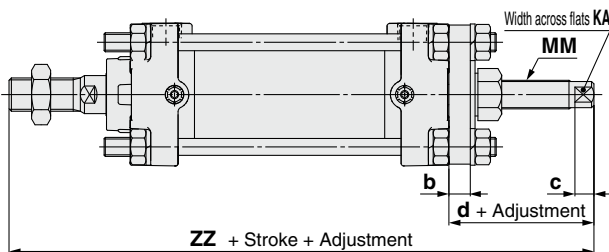
(After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)



⚠ Caution Precautions

- When air is supplied to the cylinder, if the stroke adjusting bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjusting bolt could fly out or air could be discharged, which could injure personnel or damage the peripheral equipment.
- Adjust the stroke when the cylinder is not pressurized. If it is adjusted in the pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

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



CA2							(mm)
Bore size	b	c	d	KA	MM	ZZ	
40	9	8	36	8	M12 x 1.25	171	
50	11	8	42	13	M16 x 1.5	190	
63	11	8	44	17	M20 x 1.5	200	
80	15	10	54	19	M24 x 1.5	241	
100	15	10	55.5	19	M24 x 1.5	253.5	

CA2K, CBA2 (With rod end lock only)							(mm)
Bore size	b	c	d	KA	MM	ZZ	
40	9	8	44	11	M16 x 1.5	179	
50	11	8	42	11	M16 x 1.5	190	
63	11	8	48	14	M20 x 1.5	204	
80	15	10	55	19	M24 x 1.5	242	
100	15	10	57	19	M24 x 1.5	255	

Standard
Double Acting, Single Rod
CA2

Double Acting, Double Rod
CA2W

Non-rotating Rod
Double Acting, Single Rod
CA2K

Double Acting, Double Rod
CA2KW

With End Lock
CBA2

Air-hydro
Double Acting, Single Rod
CA2H

Double Acting, Double Rod
CA2WH

Low Friction
CA2Q

Auto Switch

Made to Order

Series CA2

Symbol
-XC10

10 Dual Stroke Cylinder/Double Rod Type

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except clevis and trunnion types, pivot bracket and rod end bracket
Non-rotating rod type	CA2K	Double acting, Single rod	Except clevis and trunnion types
With end lock	CBA2	Double acting, Single rod	Except clevis and trunnion types

Specifications

Bore size (mm)	40 to 100
Maximum manufacturable stroke (mm)	Stroke A + B = 1000
Additional specifications	Same as standard type

How to Order

CA2 [Mounting style] [Type] [Bore size] - [Stroke A] [Suffix] + [Stroke B] [Suffix] Z - **XC10**
* Except clevis and trunnion types

Dual stroke cylinder/Double rod type

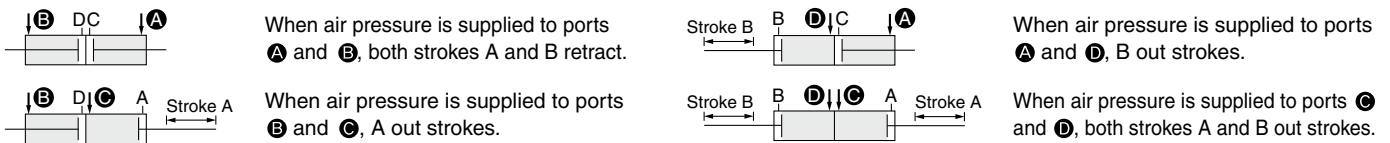
CA2K [Mounting style] [Type] [Bore size] - [Stroke A] [Suffix] + [Stroke B] [Suffix] - **XC10**
* Except clevis and trunnion types

Dual stroke cylinder/Double rod type

CBA2 [Mounting style] [Type] [Bore size] - [Stroke A] [Suffix] - [Symbol of lock] [Manual release type] + [Stroke B] [Suffix] - [Lock location] [Manual release type] - **XC10**
* Except clevis and trunnion types

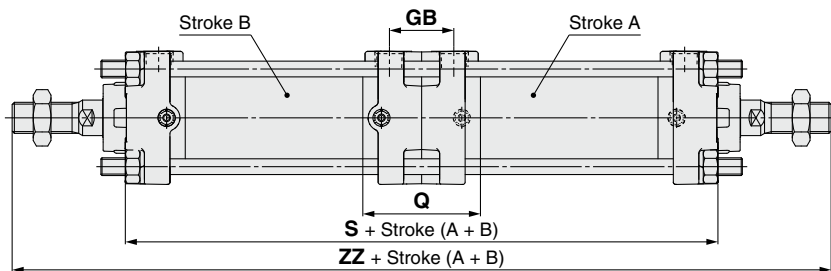
Dual stroke cylinder/Double rod type

Function



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

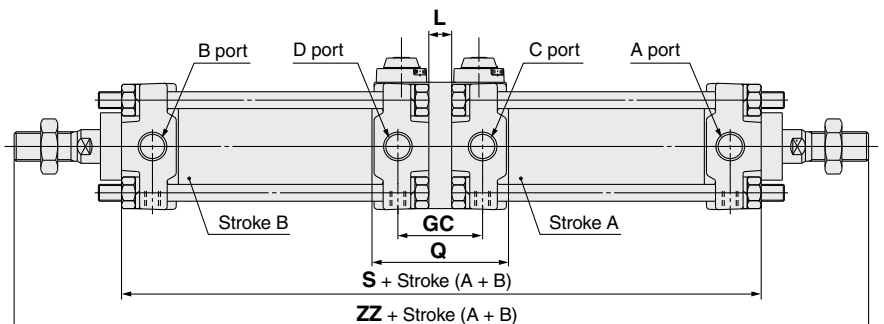
Series CA2/CA2K



Bore size	GB	Q	S	ZZ
40	29	53	167	269
50	33	59	179	295
63	33	61	195	311
80	41	73	231	373
100	41	79	251	395

Series CBA2

Bore size (mm)	GC	L	Q	S	ZZ
40	42	12	66	180	282
50	48	14	74	194	310
63	48	14	76	210	326
80	58	16	90	248	390
100	60	18	98	270	414



* The above diagram shows head side lock type and manual releasing non-locking type. Dimensions of rod side locking type, both-side lock style and manual releasing lock type are the same as dimensions in the above table.

11 Dual Stroke Cylinder/Single Rod Type

Symbol
-XC11

Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except trunnion type
Non-rotating rod type	CA2K	Double acting, Single rod	Except trunnion type

Specifications

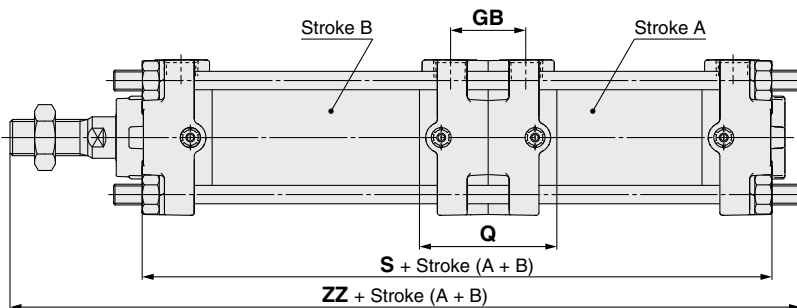
Bore size	40 to 100
Maximum manufacturable stroke	Stroke A + Stroke B = 1000
Specifications other than above	Same as standard type

How to Order

CA2 Mounting style Type Bore size - Stroke A Suffix + Stroke B-A Suffix **Z** - Pivot bracket Rod end bracket - **XC11**
 * Except trunnion type Dual stroke cylinder/Single rod type

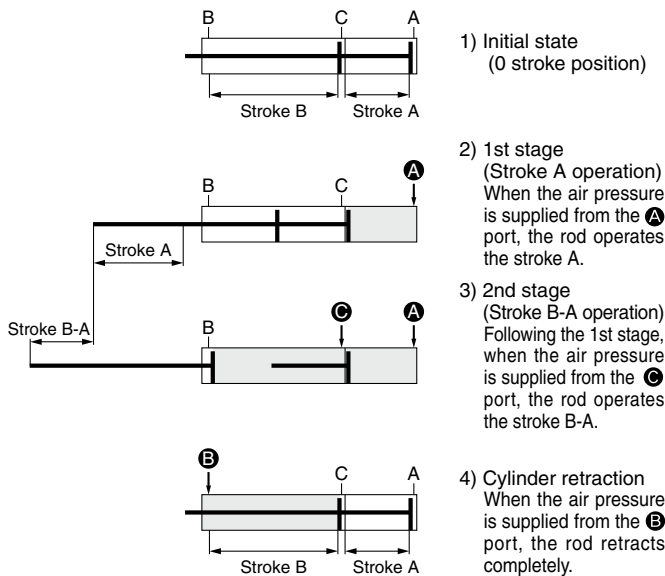
CA2K Mounting style Type Bore size - Stroke A Suffix + Stroke B-A Suffix - **XC11**
 * Except trunnion type Dual stroke cylinder/Single rod type

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

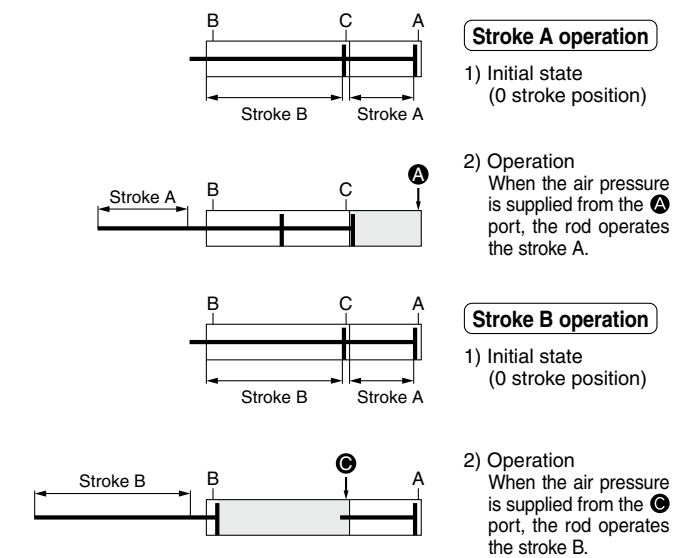


Bore size	GB	Q	S	ZZ
40	29	53	168	230
50	33	59	180	249
63	33	61	196	268
80	41	73	232	320
100	41	79	252	341

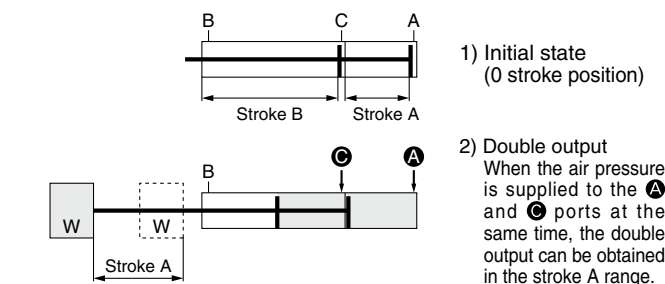
Functional description of dual stroke cylinder



Stroke A or Stroke B operation can be made individually.



Double output is possible.



Caution Precautions

- Do not supply air until the cylinder is fixed with the attached bolt.
- If air is supplied without securing the cylinder, the cylinder could lurch, posing the risk of bodily injury or damage to the peripheral equipment.

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CA2**

Air-hydro Double Acting, Single Rod **CA2H**

Double Acting, Double Rod **CA2WH**

Low Friction **CA2Q**

Auto Switch

Made to Order

Series CA2

12 Tandem Cylinder

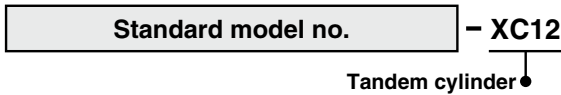
Symbol
-XC12

This is a cylinder produced with two air cylinders in line allowing double the output force.

Applicable Series

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

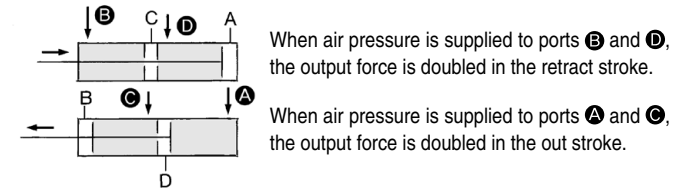
How to Order



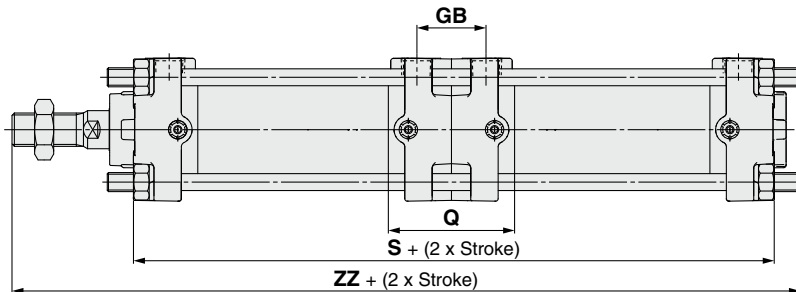
Specifications

Bore size	40 to 100
Maximum manufacturable stroke	500
Specifications other than above	Same as standard type

Function



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



Bore size	GB	Q	S	ZZ
40	29	53	169	231
50	33	59	181	250
63	33	61	197	269
80	41	73	233	321
100	41	79	253	342

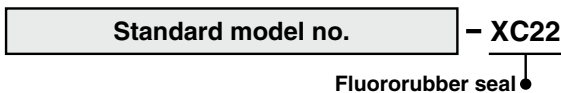
13 Fluororubber Seal

Symbol
-XC22

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

How to Order



Specifications

Seal material	Fluororubber
Ambient temperature range	With auto switch ^{Note 1)} : -10°C to 60°C Without auto switch : -10°C to 70°C (No freezing)
Specifications other than above and external dimensions	Same as standard type

Note 1) Please contact SMC, as the type of chemical and the operating temperature may not allow the use of this product.

Note 2) Cylinders with auto switches can also be produced; however, auto switch related parts (auto switch units, mounting brackets, built-in magnets) are the same as standard products. Before using these, please contact SMC regarding their suitability for the operating environment.

14 Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel

Symbol
-XC27

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

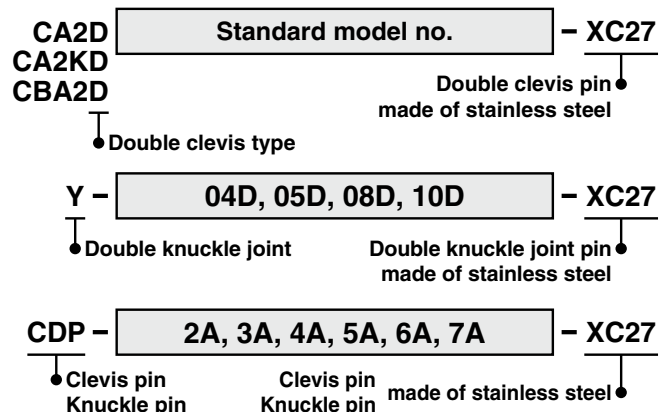
Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except rod end bracket
Non-rotating rod type	CA2K	Double acting, Single rod	
With end lock	CBA2	Double acting, Single rod	

Specifications

Mounting	Only double clevis type (D), double knuckle joint
Pin and retaining ring material	Stainless steel 304
Specifications other than above	Same as standard type

How to Order



15 Compact Flange Made of SS400

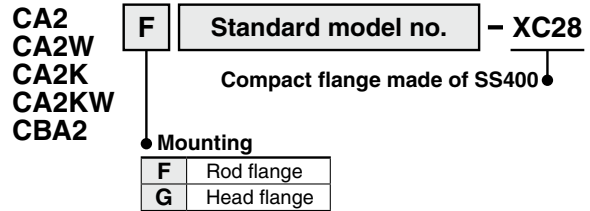
Symbol
-XC28

Width of a flange bracket on the rod and head side has the same dimensions as the cylinder's rod cover to save the mounting space. (Flange shape and FV-dimension are only different from the standard type.)

Applicable Series

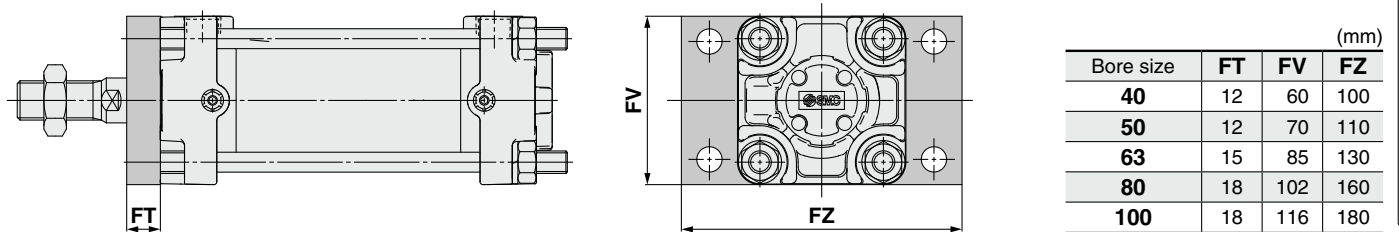
Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
Non-rotating rod type	CA2K	Double acting, Single rod	
	CA2KW	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

How to Order



Specifications: Same as standard type

Dimensions



* Other dimensions are the same as flange on the rod side and head side of standard type. (Figure is the case of flange on the rod side.)

16 Double Knuckle Joint with Spring Pin

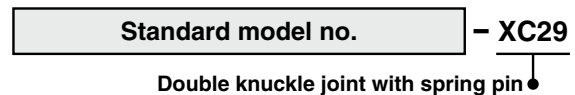
Symbol
-XC29

To prevent loosening of the double knuckle joint of standard air cylinder.

Applicable Series

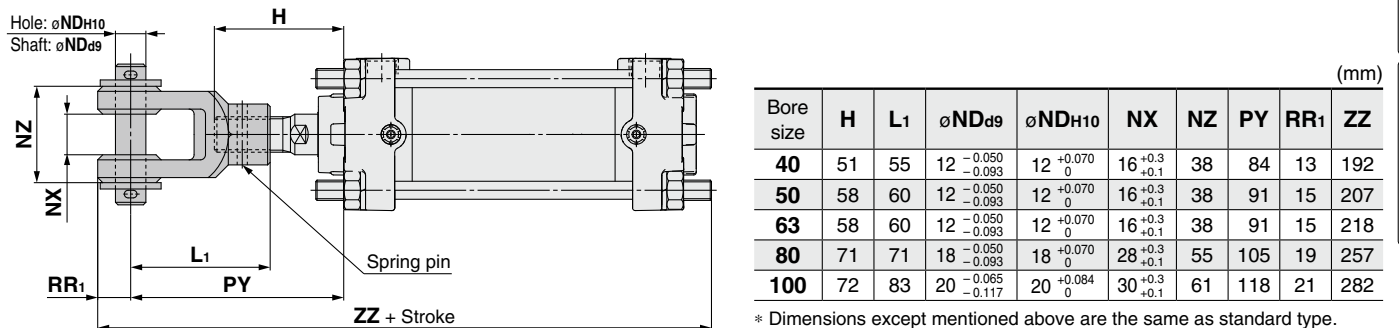
Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	Except rod end bracket
With end lock	CBA2	Double acting, Single rod	

How to Order



Specifications: Same as standard type

Dimensions (For mounting bracket, pin is shipped together.)



* Dimensions except mentioned above are the same as standard type.

Standard Double Acting, Single Rod **CA2**

Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydraulic Double Acting, Single Rod **CA2□H**

Double Acting, Double Rod **CA2W□H**

Low Friction **CA2□Q**

Auto Switch

Made to Order

Series CA2

17 Rod Trunnion

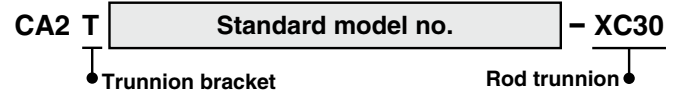
Symbol
-XC30

This cylinder shortens the distance between the fulcrum and the rod end by installing a trunnion bracket in front of the rod side cover.

Applicable Series

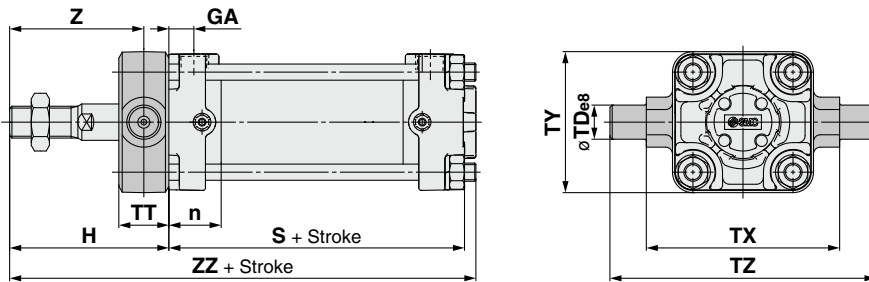
Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	

How to Order



Specifications: Same as standard type

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



(mm)

Symbol	Stroke range	n	GA	H	S	TD _{e8}	TT	TX	TY	TZ	Z	ZZ
Bore size 40	Up to 1000	23	11	66	80	15 ^{-0.032} _{-0.059}	22	85	62	117	55	151
50	Up to 1000	26	13	71	86	15 ^{-0.032} _{-0.059}	22	95	74	127	60	163
63	Up to 1000	27	13	79	94	18 ^{-0.032} _{-0.059}	28	110	90	148	65	179
80	Up to 1000	32	16	94.5	111	25 ^{-0.040} _{-0.073}	34	140	110	192	77.5	212.5
100	Up to 1000	35	16	100	121	25 ^{-0.040} _{-0.073}	40	162	130	214	80	229

18 With Coil Scraper

Symbol
-XC35

It gets rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and protects the seals etc.

Applicable Series

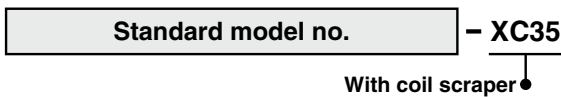
Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	
With end lock	CBA2	Double acting, Single rod	

Specifications: Same as standard type

Dimensions: Same as standard type

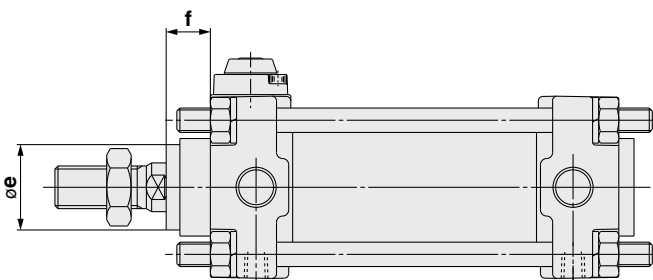
* For air cylinders with end lock, refer to the table below.

How to Order



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

Series CBA2



Bore size	øe	f
		With rod end lock, With double end lock
40	28	14.5
50	32	16.5
63	32	14
80	37	16
100	44	17.5

The above diagram shows the rod end lock and non-locking type manual release.

Series CBA2 head end lock is the same as the standard type. The dimensions of the non-locking type manual release are the same as indicated above.

19 Made of Stainless Steel (Combination of XC7 and XC68)

Symbol
-XC65

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	

How to Order

Standard model no. **- XC65**
 Made of stainless steel (Combination of XC7 and XC68)

Specifications

Parts changed to stainless steel	Tie-rod, Tie-rod nut, Cushion valve, Piston rod (with hard chrome plated), Rod end nut
Specifications other than above and external dimensions	Same as standard type

Maximum Manufacturable Stroke (mm)

Double acting, Single rod	Double acting single rod with rod boot
1600	1400

20 Made of Stainless Steel (With Hard Chrome Plated Piston Rod)

Symbol
-XC68

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	

How to Order

Standard model no. **- XC68**
 Made of stainless steel
 (With hard chrome plated piston rod)

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard type

Maximum Manufacturable Stroke (mm)

Double acting, Single rod	Double acting single rod with rod boot
1600	1400

Standard Double Acting, Single Rod **CA2**

Standard Double Acting, Double Rod **CA2W**

Non-rotating Rod Double Acting, Single Rod **CA2K**

Non-rotating Rod Double Acting, Double Rod **CA2KW**

With End Lock **CBA2**

Air-hydro Double Acting, Single Rod **CA2□H**

Air-hydro Double Acting, Double Rod **CA2W□H**

Low Friction **CA2□Q**

Auto Switch

Made to Order

21 Grease for Food Processing Equipment

Food grade grease (certified by NSF-H1) is used as lubricant.

Applicable Series

Description	Model	Action	Note
Standard type	CA2	Double acting, Single rod	
	CA2W	Double acting, Double rod	

How to Order

Standard model no. **-XC85**
Grease for food processing equipment

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.

Not installable zone

Food zone.....An environment where the raw materials and materials of food products, semi-finished food products and food products that make direct or indirect contact in a normal processing process.

Splash zone.....An area where a portion of food products accidentally splash and stick under the intended operating conditions. An environment where food products that enter this area do not return to the food product contact portion again, and are not used as food products.

Installable zone

Non-food zone.....An environment where there is no contact with food.

Note 1) Avoid using this product in the food zone.
(Refer to the figure on the right.)

Note 2) When the product is used in an area of liquid splash, or a water resistant function is required for the product, please consult with SMC.

Note 3) Operate without lubrication from a pneumatic system lubricator.

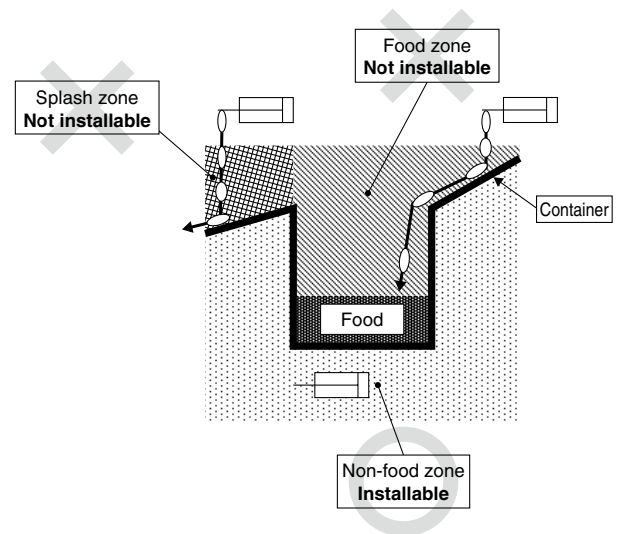
Note 4) Use the following grease pack for the maintenance work.

GR-H-010 (Grease: 10 g)

Note 5) Please contact SMC for details about the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Specifications

Ambient temperature range	-10°C to 70°C
Seal material	Nitrile rubber
Grease	Grease for food
Auto switch	Mountable
Dimensions	Same as standard type
Additional specifications	Same as standard type



22 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	n	n pcs.
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 the **WEB catalog** or the Best Pneumatics No. 2.

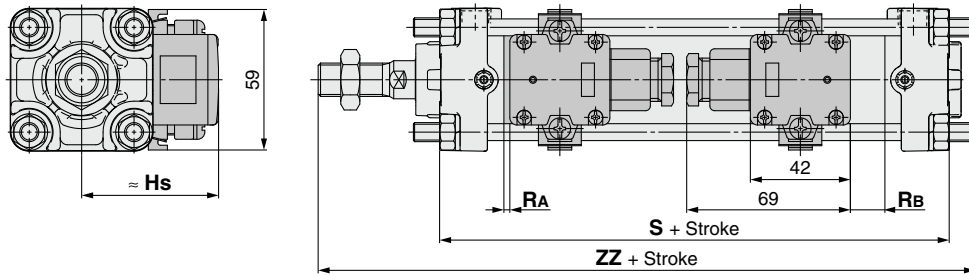
Specifications

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.)



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

(mm)

Standard
Double Acting, Double Rod
CA2W
Double Acting, Single Rod
CA2K
Non-rotating Rod
Double Acting, Double Rod
CA2KW
With End Lock
CBA2
Air-hydro
Double Acting, Double Rod
CA2W□H
Double Acting, Single Rod
CA2□H
Low Friction
CA2□Q
Auto Switch
Made to Order



Series CA2

Specific Product Precautions

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

Handling

⚠ Caution

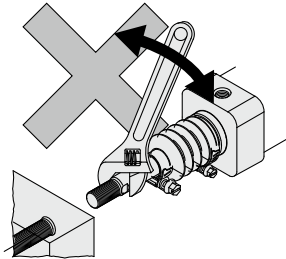
- Do not open the cushion valve beyond the stopper.**
A retaining ring is installed as a cushion valve retention mechanism. Do not open the cushion valve beyond it. If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.

Bore size (mm)	Width across flats	Socket wrench
40, 50	2.5	JIS 4648 Hexagonal wrench key 2.5
63, 80, 100	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)
40, 50	DA00040	13	JIS B4636 + Two-angle socket 13	7.4
	(M8 x 1.25, Hexagon nut 3 types)			
63	DA00010	17	JIS B4636 + Two-angle socket 17	20
	(M10 x 1.25, Hexagon nut 3 types)			
80, 100	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.
- The trunnion type cylinder requires accuracy in assembly.**
The trunnion type cylinder may lose dimensional accuracy and malfunction when it is disassembled and reassembled because the axial center of the trunnion and that of the cylinder will not be aligned easily.


Water Resistant Air Cylinder


Water resistant air cylinders are also available in Series CA2, 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.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution


SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Revision history

Edition B * Heat resistant cylinder (-XB6), With heavy duty scraper (-XC4), Adjustable stroke cylinder (-XC8, 9) and Dual stroke cylinder (-XC10, 11) etc. are added.
* Number of pages increased from 36 to 44. RW

Edition C * Rubber bumper is added.
* The standard stroke tables are changed.
* The existing products: Non-rotating rod type (CA2K), With end lock (CBA2) and Air-hydro type (CA2□H) are added.
* Number of pages increased from 44 to 84. SZ

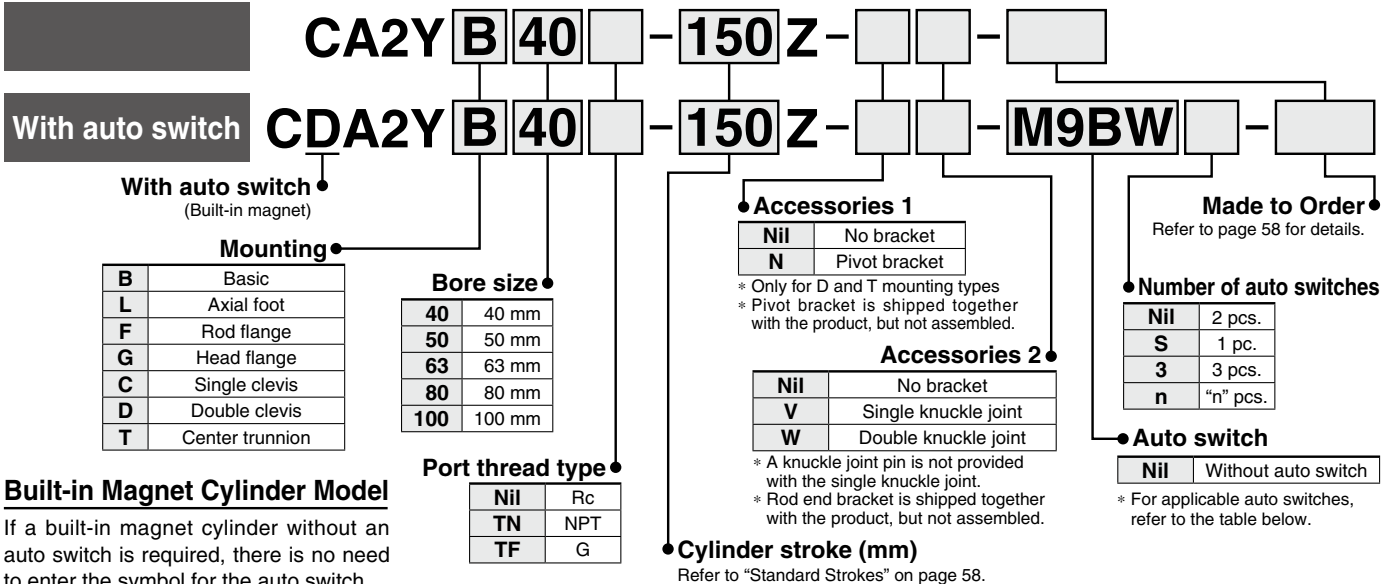
 **Safety Instructions** Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

Smooth Cylinder

Series CA2Y

ø40, ø50, ø63, ø80, ø100

How to Order



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDA2YB40-100Z

* Refer to "Ordering Example of Cylinder Assembly" on page 58-1.

Applicable Auto Switches/Refer to the WEB catalog or Best Pneumatics No. 3 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)					
Solid state auto switch	—	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	○	IC circuit	Relay, PLC		
				3-wire (PNP)				M9P	●	●	●	○	○				
				2-wire	—	12 V	M9B	●	●	●	○	○					
		Terminal conduit		Grommet	Yes	3-wire (NPN)	24 V	12 V	—	J51	●	●	●	○		○	—
						2-wire				G39C G39	—	—	—	—		—	
						3-wire (NPN)	5 V, 12 V	M9NW	●	●	●	○	○				
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (PNP)	24 V	12 V	—	M9PW	●	●	●	○	○	IC circuit			
				2-wire				M9BW	●	●	●	○	○				
				3-wire (NPN)	5 V, 12 V	M9NA*1	—	○	○	●	○	○	IC circuit				
	3-wire (PNP)	5 V, 12 V	M9PA*1	—	○	○	●	○	○								
	Water resistant (2-color indication)	Grommet	No	2-wire	24 V	12 V	—	M9PA*1	—	○	○	●	○	○		—	
				3-wire (NPN)				5 V, 12 V	F59F G59F	●	—	●	○	○			IC circuit
3-wire (PNP)				5 V, 12 V	P3DW	—	●	—	●	○	○						
With diagnostic output (2-color indication)	Grommet	No	4-wire (NPN)	24 V	12 V	—	P4DW	—	—	—	●	●	○	—			
			2-wire (Non-polar)				—	—	—	—	—	—	—				
			Magnetic field resistant (2-color indication)	Grommet	Yes	3-wire (NPN equivalent)	24 V	12 V	—	A96**	—	●	—	●	—	IC circuit	
2-wire	100 V	A93**				—				●	●	●	—	IC circuit			
Diagnostic indication (2-color indication)	Grommet	Yes				2-wire	24 V	12 V	—	100 V or less	A90**	—	●		—	●	—
			100 V, 200 V	A54 B54	●					—	●	—	—				
			200 V or less	A64 B64	●					—	●	—	—				
			—	A33C A33	—					—	—	—	—				
			100 V, 200 V	A34C A34	—					—	—	—	—				
			—	A44C A44	—					—	—	—	—				
—	Grommet	Yes	2-wire	24 V	12 V	—	A59W B59W	●	—	●	—	—	PLC Relay, PLC				
							—	—	—	—	—	—		—			

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

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

* Since there are other applicable auto switches then listed above, refer to page 69 for details.
* For details about auto switches with pre-wired connector, refer to the WEB catalog or Best Pneumatics No. 3.
For the D-P3DW□, refer to the WEB catalog or Best Pneumatics No. 3.
* The D-A9□/M9□□□/P3DW auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

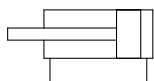
- CJ2Y-Z
- CM2Y-Z
- CG1Y-Z
- MBY-Z
- CA2Y-Z
- CS2Y
- CQSY
- CQ2Y-Z
- CJ2X-Z
- CM2X-Z
- CQSX
- CQ2X
- CUX
- Auto Switch
- Made to Order

Series CA2Y



Symbol

Without cushion



Made to Order
(For details, refer to pages 174 to 191.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-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
-XC65	Made of stainless steel (Combination of XC7 and XC68)
-XC68	Made of stainless steel (with hard chrome plated piston rod)

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
40	CA2Y40Z-PS	Rod seal 1 pc.
50	CA2Y50Z-PS	Piston seal 1 pc.
63	CA2Y63Z-PS	Cylinder tube gasket 2 pcs.
80	CA2Y80Z-PS	Grease pack (10 g) 1 pc.
100	CA2Y100Z-PS	

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	40	50	63	80	100
Action	Double acting				
Piston speed	5 to 500 mm/s				
Fluid	Air				
Proof pressure	1.05 MPa				
Maximum operating pressure	0.7 MPa				
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C				
Cushion	None				
Lubrication	Not required (Non-lube)				
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion				
Allowable leakage rate	0.5 L/min (ANR)				

Minimum Operating Pressure

Bore size (mm)	40	50	63	80	100
Minimum operating pressure	0.02	0.01			

Unit: MPa

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. manufacturable stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	1000
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	1000

Note 1) Intermediate strokes not listed above are also available.

Please consult with SMC for strokes outside the above ranges.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or the **WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

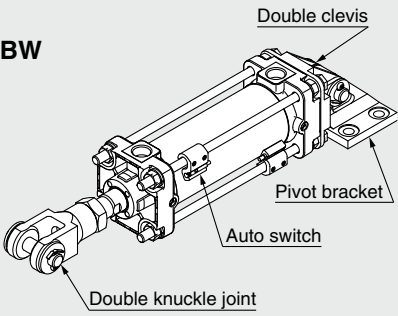
Accessories

Mounting		Basic	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)	●	●	●	●	●	●	●

Series CA2Y

Ordering Example of Cylinder Assembly

Cylinder model:
CDA2YD40-150Z-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.

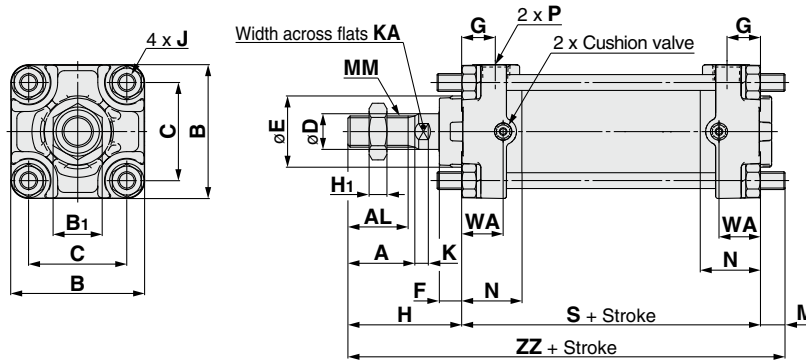
Weights/Aluminum Tube

Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.73	1.06	1.53	2.73	3.71
	Axial foot	0.91	1.25	1.83	3.40	4.64
	Flange	1.09	1.48	2.28	4.18	5.57
	Single clevis	0.95	1.37	2.12	3.84	5.43
	Double clevis	0.99	1.46	2.28	4.13	5.95
	Trunnion	1.08	1.51	2.29	4.28	5.93
Additional weight per 50 mm of stroke	All mounting brackets	0.20	0.25	0.31	0.46	0.58
Accessories	Single knuckle joint	0.23	0.26	0.26	0.60	0.83
	Double knuckle joint (with pin)	0.37	0.43	0.43	0.87	1.27

Calculation (Example) **CA2YL40-100Z** (Axial foot, ø40, 100 st)

- Basic weight.....0.91kg
 - Additional weight.....0.20/50 stroke
 - Cylinder stroke.....100 stroke
-
- 0.91 + 0.20 x 100/50 = **1.31 kg**

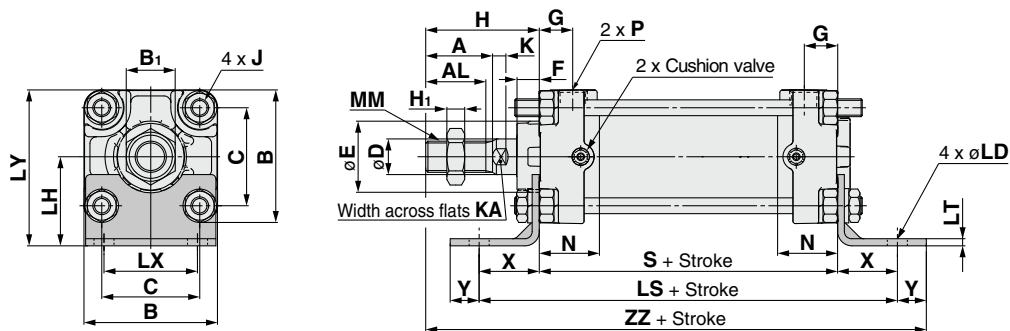
Basic: CA2YB



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H	H ₁	J	K	KA
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	M	MM	N	P	S	WA	ZZ
40	11	M14 x 1.5	27	1/4	84	18.5	146
50	11	M18 x 1.5	30	3/8	90	18.5	159
63	14	M18 x 1.5	31	3/8	98	23	170
80	17	M22 x 1.5	37	1/2	116	28.5	204
100	17	M26 x 1.5	40	1/2	126	28.5	215

Axial Foot: CA2YL



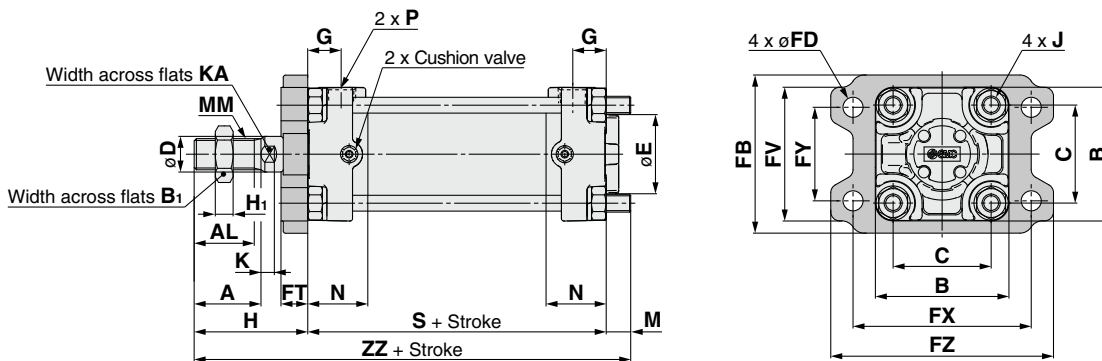
Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H	H ₁	J	K	KA	LD	LH	LS	LT
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	9	40	138	3.2
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	9	45	144	3.2
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	13.5	65	204	4.5
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	13.5	75	212	6

Bore size (mm)	LX	LY	MM	N	P	S	X	Y	ZZ
40	42	70	M14 x 1.5	27	1/4	84	27	13	175
50	50	80	M18 x 1.5	30	3/8	90	27	13	188
63	59	93	M18 x 1.5	31	3/8	98	34	16	206
80	76	116	M22 x 1.5	37	1/2	116	44	16	247
100	92	133	M26 x 1.5	40	1/2	126	43	17	258

- Smooth Cylinders
- CJ2Y-Z
- CM2Y-Z
- CG1Y-Z
- MBY-Z
- CA2Y-Z
- CS2Y
- CQSY
- CQ2Y-Z
- Low Speed Cylinders
- CJ2X-Z
- CM2X-Z
- CQSX
- CQ2X
- CUX
- Auto Switch
- Made to Order

Series CA2Y

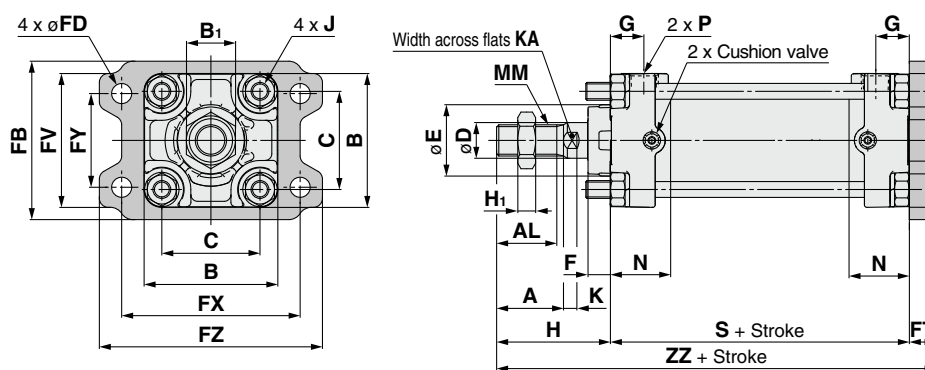
Rod Flange: CA2YF



Bore size (mm)	A	AL	B	B ₁	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H	H ₁	J	K
40	30	27	60	22	44	16	32	71	9	12	60	80	42	100	15	51	8	M8 x 1.25	6
50	35	32	70	27	52	20	40	81	9	12	70	90	50	110	17	58	11	M8 x 1.25	7
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	58	11	M10 x 1.25	7
80	40	37	102	32	78	25	52	119	13.5	18	102	130	76	160	21	71	13	M12 x 1.75	10
100	40	37	116	41	92	30	52	133	13.5	18	116	150	92	180	21	72	16	M12 x 1.75	10

Bore size (mm)	KA	M	MM	N	P	S	ZZ
40	14	11	M14 x 1.5	27	1/4	84	146
50	18	11	M18 x 1.5	30	3/8	90	159
63	18	14	M18 x 1.5	31	3/8	98	170
80	22	17	M22 x 1.5	37	1/2	116	204
100	26	17	M26 x 1.5	40	1/2	126	215

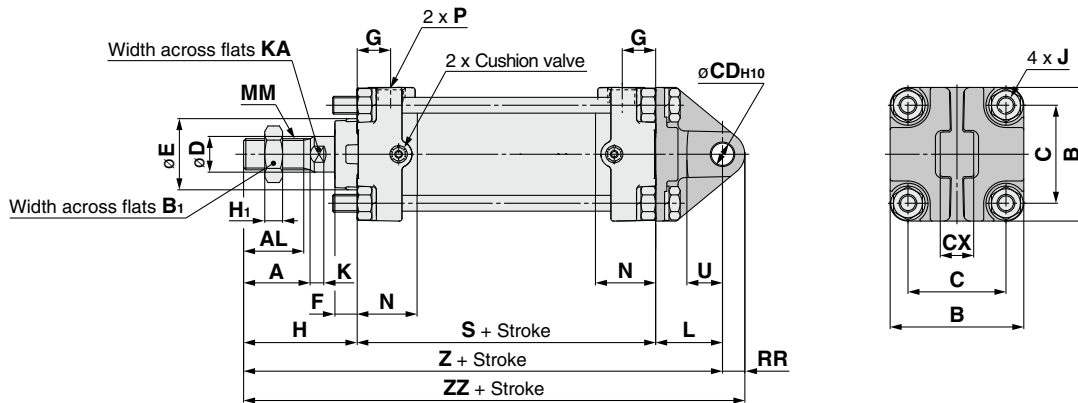
Head Flange: CA2YG



Bore size (mm)	A	AL	B	B ₁	C	D	E	F	FB	FD	FT	FV	FX	FY	FZ	G	H	H ₁
40	30	27	60	22	44	16	32	10	71	9	12	60	80	42	100	15	51	8
50	35	32	70	27	52	20	40	10	81	9	12	70	90	50	110	17	58	11
63	35	32	85	27	64	20	40	10	101	11.5	15	86	105	59	130	17	58	11
80	40	37	102	32	78	25	52	14	119	13.5	18	102	130	76	160	21	71	13
100	40	37	116	41	92	30	52	14	133	13.5	18	116	150	92	180	21	72	16

Bore size (mm)	J	K	KA	MM	N	P	S	ZZ
40	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84	147
50	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90	160
63	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98	171
80	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116	205
100	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126	216

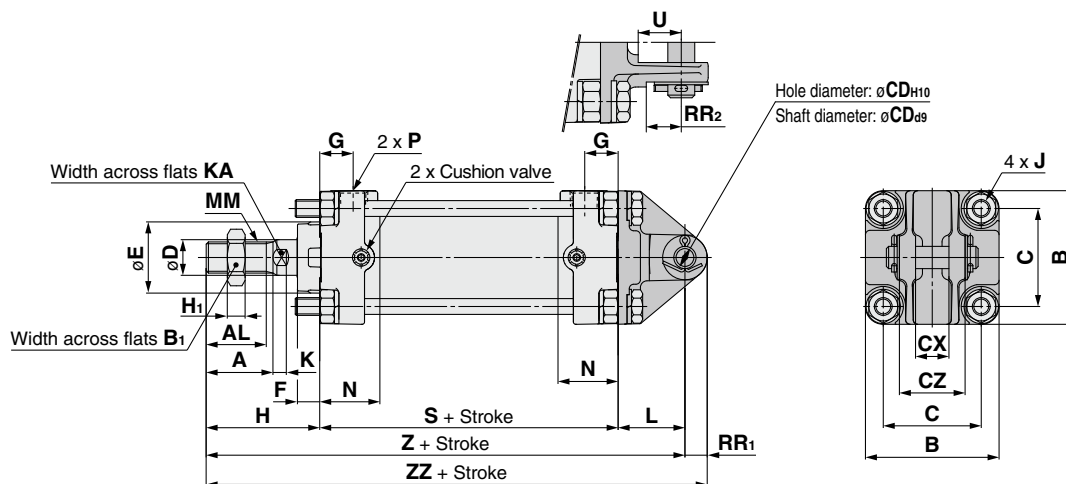
Single Clevis: CA2YC



Bore size (mm)	A	AL	B	B ₁	C	CD _{H10}	CX	D	E	F	G	H	H ₁	J	K	KA
40	30	27	60	22	44	10 ^{+0.058} ₀	15 ^{-0.1} _{-0.3}	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	12 ^{+0.070} ₀	18 ^{-0.1} _{-0.3}	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	16 ^{+0.070} ₀	25 ^{-0.1} _{-0.3}	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{-0.1} _{-0.3}	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{-0.1} _{-0.3}	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	L	MM	N	P	RR	S	U	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	165	175
50	35	M18 x 1.5	30	3/8	12	90	19	183	195
63	40	M18 x 1.5	31	3/8	16	98	23	196	212
80	48	M22 x 1.5	37	1/2	20	116	28	235	255
100	58	M26 x 1.5	40	1/2	25	126	36	256	281

Double Clevis: CA2YD



* A pin and retaining rings are shipped together with double clevis and/or double knuckle joint. (mm)

Bore size (mm)	A	AL	B	B ₁	C	CD _{H10}	CX	CZ	D	E	F	G	H	H ₁	J	K	KA
40	30	27	60	22	44	10 ^{+0.058} ₀	15 ^{+0.3} _{+0.1}	29.5	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	12 ^{+0.070} ₀	18 ^{+0.3} _{+0.1}	38	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	16 ^{+0.070} ₀	25 ^{+0.3} _{+0.1}	49	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{+0.3} _{+0.1}	61	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{+0.3} _{+0.1}	64	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	L	MM	N	P	RR ₁	RR ₂	S	U	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	16	84	16	165	175
50	35	M18 x 1.5	30	3/8	12	19	90	19	183	195
63	40	M18 x 1.5	31	3/8	16	23	98	23	196	212
80	48	M22 x 1.5	37	1/2	20	28	116	28	235	255
100	58	M26 x 1.5	40	1/2	25	23.5	126	36	256	281

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

Smooth Cylinders

CJ2Y-Z

CM2Y-Z

CG1Y-Z

MBY-Z

CA2Y-Z

CS2Y

CQSY

CQ2Y-Z

Low Speed Cylinders

CJ2X-Z

CM2X-Z

CQSX

CQ2X

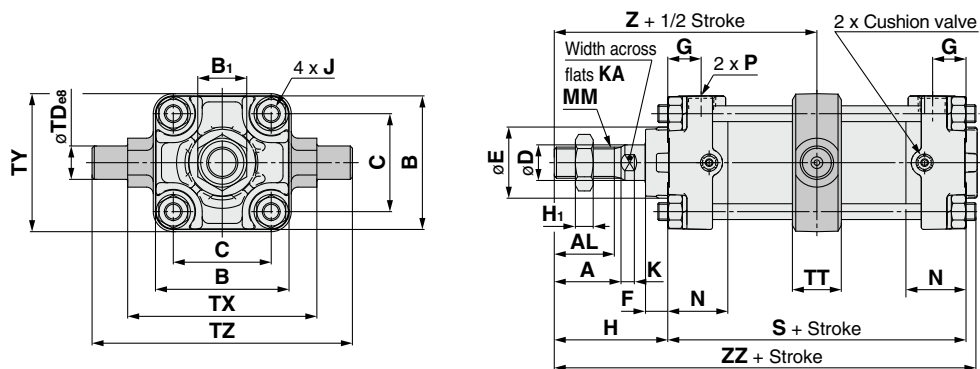
CUX

Auto Switch

Made to Order

Series CA2Y

Center Trunnion: CA2YT



(mm)

Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H	H ₁	J	K	KA	MM	N	P
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2

Bore size (mm)	S	TD _{e8}	TT	TX	TY	TZ	Z	ZZ
40	84	15 ^{-0.032} _{-0.059}	22	85	62	117	93	140
50	90	15 ^{-0.032} _{-0.059}	22	95	74	127	103	154
63	98	18 ^{-0.032} _{-0.059}	28	110	90	148	107	162
80	116	25 ^{-0.040} _{-0.073}	34	140	110	192	129	194
100	126	25 ^{-0.040} _{-0.073}	40	162	130	214	135	206

* Do not disassemble the trunnion type. (Refer to the standard type.)

Trunnion and Double Clevis Pivot Bracket

- Strength is the same as cylinder brackets.

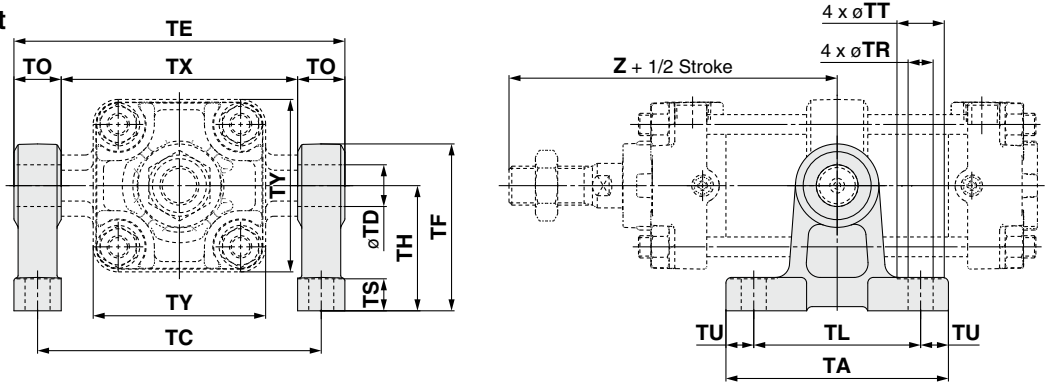
Type

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

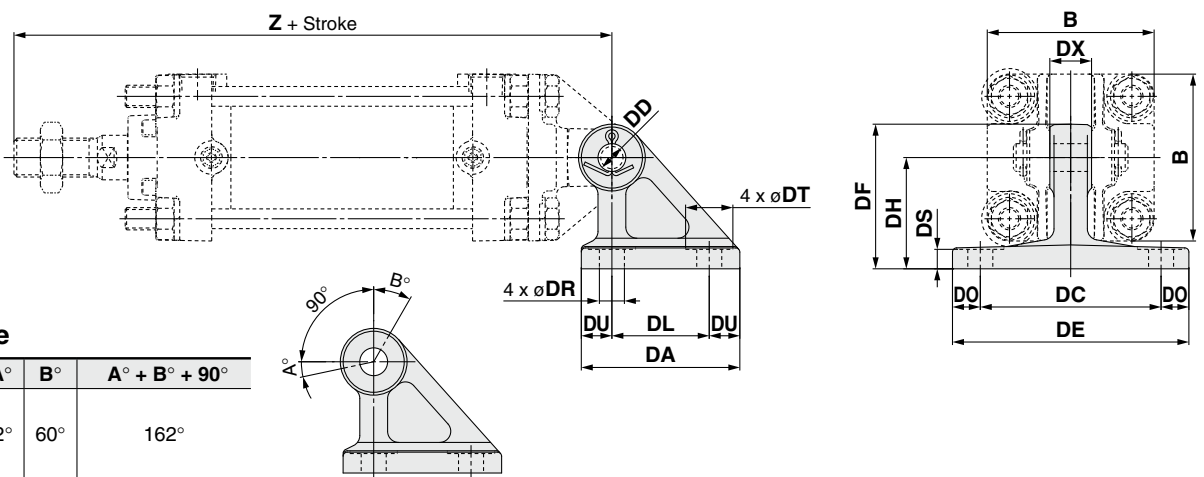
Material: Cast iron



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 ^{+0.070} ₀
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	103	15 ^{+0.070} ₀
CA2-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	107	18 ^{+0.070} ₀
MB-S10	80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	129	25 ^{+0.084} ₀
	100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	135	25 ^{+0.084} ₀

Double clevis pivot bracket

Material: Cast iron



Rotating Angle

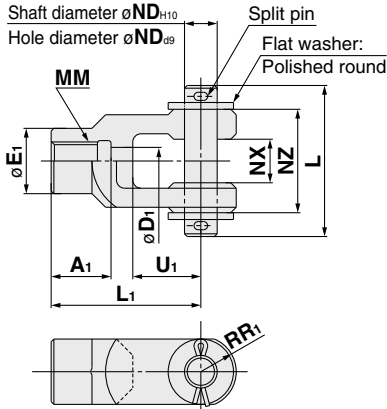
Bore size (mm)	A°	B°	A° + B° + 90°
40 to 100	12°	60°	162°

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 ^{+0.058} ₀
CA2-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	183	12 ^{+0.070} ₀
CA2-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	196	16 ^{+0.070} ₀
CA2-B08	80	93	60	16.5	100	31.5	130	15	13.5	24	12	65	90	102	235	20 ^{+0.084} ₀
CA2-B10	100	93	60	16.5	100	35.5	130	15	13.5	24	12	65	90	116	256	25 ^{+0.084} ₀

Series CA2Y

Dimensions of Accessories

Y Type Double Knuckle Joint



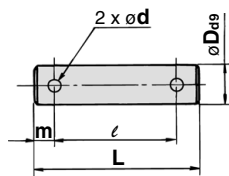
Material: Cast iron

(mm)

Part no.	Applicable bore size (mm)	A ₁	E ₁	D ₁	L ₁	MM	RR ₁	U ₁	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 ^{+0.3} _{-0.1}	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 ^{+0.3} _{-0.1}	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 ^{+0.3} _{-0.1}	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 ^{+0.3} _{-0.1}	61	83	ø4 x 30 ℓ	Polished round 20

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

Clevis Pin/Knuckle Pin



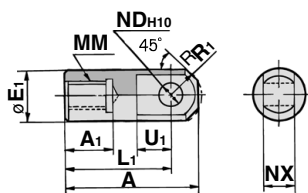
Material: Carbon steel

(mm)

Part no.	Applicable bore size		Dd9	L	ℓ	m	d Drill through	Included split pin	Included flat washer
	Clevis	Knuckle							
CDP-2A	40	—	10 ^{-0.040} _{-0.076}	46	38	4	3	ø3 x 18 ℓ	Polished round 10
CDP-3A	50	40, 50, 63	12 ^{-0.050} _{-0.093}	55.5	47.5	4	3	ø3 x 18 ℓ	Polished round 12
CDP-4A	63	—	16 ^{-0.050} _{-0.093}	71	61	5	4	ø4 x 25 ℓ	Polished round 16
CDP-5A	—	80	18 ^{-0.050} _{-0.093}	76.5	66.5	5	4	ø4 x 25 ℓ	Polished round 18
CDP-6A	80	100	20 ^{-0.065} _{-0.117}	83	73	5	4	ø4 x 30 ℓ	Polished round 20
CDP-7A	100	—	25 ^{-0.065} _{-0.117}	88	78	5	4	ø4 x 36 ℓ	Polished round 24

* Split pins and flat washers are included.

I Type Single Knuckle Joint

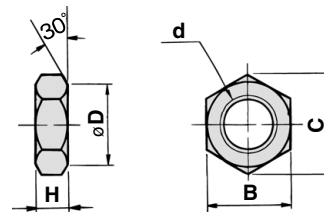


Material: Free cutting sulfur steel

(mm)

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND ^{H10}	NX
I-04A	40	69	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}
I-05A	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}
I-08A	80	91	37	36	71	M22 x 1.5	22.5	26	18 ^{+0.070} ₀	28 ^{-0.1} _{-0.3}
I-10A	100	105	37	40	83	M26 x 1.5	24.5	28	20 ^{+0.084} ₀	30 ^{-0.1} _{-0.3}

Rod End Nut (Standard)



Material: Rolled steel

(mm)

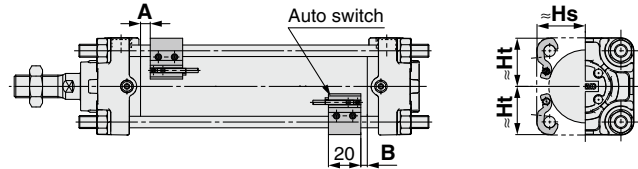
Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37.0	31
NT-10	100	M26 x 1.5	16	41	47.3	39

Series CA2Y Auto Switch Mounting

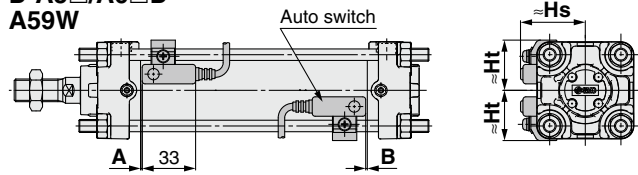
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

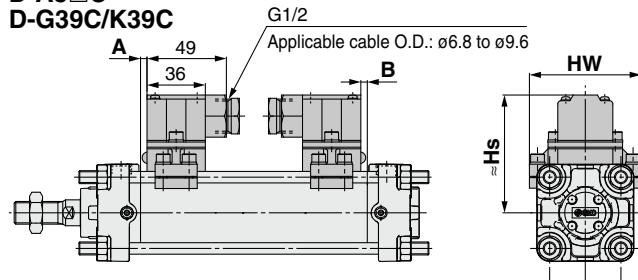
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BA



D-A5□/A6□D-
A59W

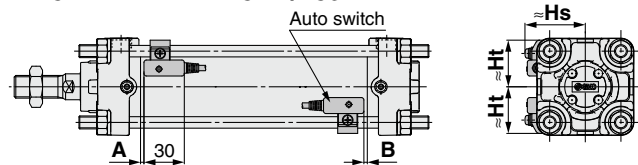


D-A3□C
D-G39C/K39C

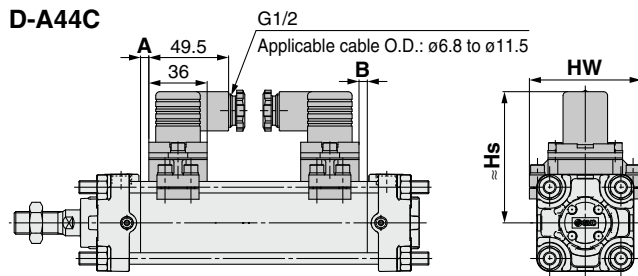


D-F5□/J5□
D-F5NT

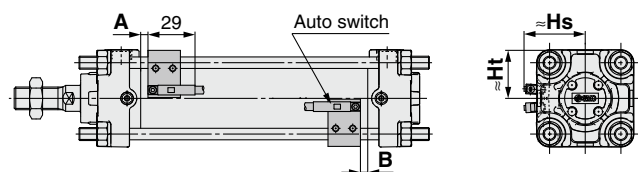
D-F5□W/J59W
D-F5BA/F59F



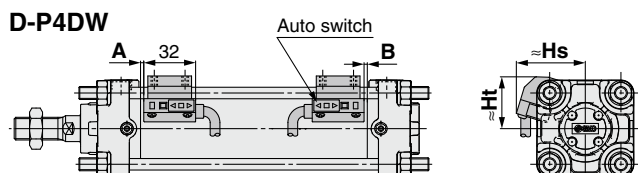
D-A44C



D-P3DW

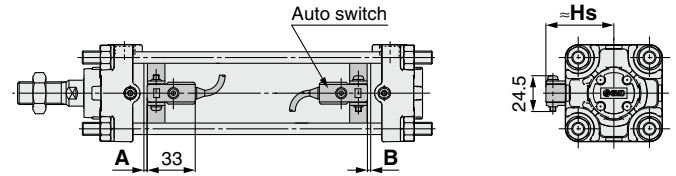


D-P4DW

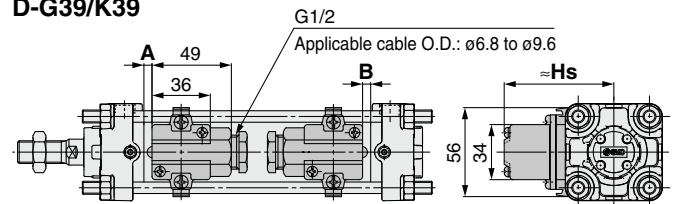


<Band mounting>

D-B5□/B64/B59W

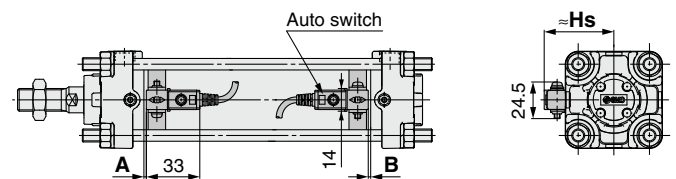


D-A3□
D-G39/K39

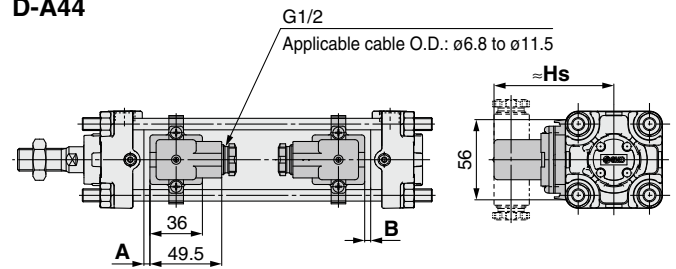


D-G5□/K59
D-G5□W/K59W

D-G5BAL
D-G59F/G5NTL



D-A44



CJ2Y-Z

CM2Y-Z

CG1Y-Z

MBY-Z

CA2Y-Z

CS2Y

CQSY

CQ2Y-Z

CJ2X-Z

CM2X-Z

CQSX

CQ2X

CUX

Auto Switch

Made to Order

Smooth Cylinders

Low Speed Cylinders

Series CA2Y

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

Auto Switch Proper Mounting Position

(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-J51		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA D-Z7□ D-Z80 D-B59W		D-P3DW		D-P4DW		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA		D-A59W		D-F5NT		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	A
40	9	9	5	5	2.5	2.5	4.5	4.5	2	2	5.5	5.5	3	3	10.5	10.5	0	0	1	1	0	0	
50	9.5	8.5	5.5	4.5	3	2	5	4	2.5	1.5	6	5	3.5	2.5	11	10	0	0	1.5	0.5	0	0	
63	12.5	11.5	8.5	7.5	6	5	3	2.5	5.5	4.5	9	8	6.5	5.5	14	13	2.5	1.5	4.5	3.5	3	2	
80	16.5	13.5	12.5	9.5	10	7	7.5	4	9.5	6.5	13	10	10.5	7.5	18	15	6.5	3.5	8.5	5.5	7	4	
100	18	16	14	12	11.5	9.5	9	6.5	11	9	14.5	12.5	12	10	19.5	17.5	8	6	10	8	8.5	6.5	

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

Auto Switch Mounting Height

(mm)

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7BA D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-P3DW		D-P4DW		D-B5□ D-B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-F5BA D-F59F D-F5NT		D-A3□C D-G39C D-K39C		D-A44C		
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
40	30	30	31	30	34	30	30	30	30	30	30	38	30	42.5	33	37	71.5	81.5	38.5	31.5	38	31.5	73	69	81	69			
50	34	34	35	34	38	34	34	34	34	34	34	42	34	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77			
63	41	41	41.5	41	44	41	41	41	41	41	41	49	41	52	43	49	83.5	93.5	46.5	43	47	43	85.5	91	93.5	91			
80	49.5	49	50	49	52.5	49	49.5	49	49.5	49	49.5	56	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107			
100	56.5	56	58.5	56	61	56	56.5	55.5	57.5	55.5	65	56	66	58.5	68	102.5	112.5	61.5	57.5	61	57.5	104	121	112	121				

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	8.5	9.5	9.5	10.5
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□/J5□/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-G5NBL	35	35	40	40	40
D-G39/K39 D-G39C/K39C	9	9	10	10	11
D-P3DW	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.

Minimum Stroke for Auto Switch Mounting

			n: Number of auto switches (mm)				
Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-M9□ D-M9□W	2 (Different surfaces and same surface) 1	15	80	85	90	95	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□V D-M9□WV	2 (Different surfaces and same surface) 1	10	55	60	65	70	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□A	2 (Different surfaces and same surface) 1	15	80	85	95	100	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□AV	2 (Different surfaces and same surface) 1	10	60	65	70	75	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A9□	2 (Different surfaces and same surface) 1	15	75	80	85	90	
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A9□V	2 (Different surfaces and same surface) 1	10	50	55	60	65	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A5□/A6 D-F5□/J5 D-F5□W/J59W D-F5BA/F59F	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...) Note 1)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A59W	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...) Note 1)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
	1	15	90	100	110	120	
D-F5NT	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...) Note 1)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G5BA D-G59F D-G5NT	2	Different surfaces	15	90	100	110	
		Same surface	75				
	n	Different surfaces	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	$100 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	
1	10	90	100	110			
D-B59W	2	Different surfaces	20	90	100	110	
		Same surface	75				
	n	Different surfaces	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	$100 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8...) Note 1)	
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.

CJ2Y-Z
 CM2Y-Z
 CG1Y-Z
 MBY-Z
 CA2Y-Z
 CS2Y
 CQSY
 CQ2Y-Z
 CJ2X-Z
 CM2X-Z
 CQSX
 CQ2X
 CUX
 Auto Switch
 Made to Order

Series CA2Y

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

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

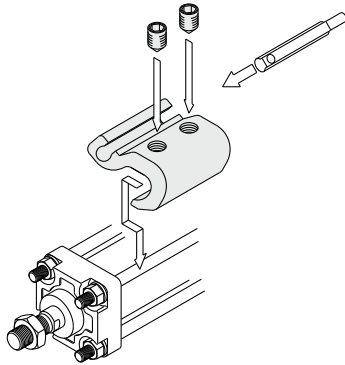
Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

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

Auto Switch Mounting Brackets/Part No.

<Tie-rod mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	BA7-040	BA7-040	BA7-063	BA7-080	BA7-080
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5NT	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□C/A44C D-G39C/K39C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P3DW	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-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types.

<Band mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A3□/A44 D-G39/K39	BDS-04M	BDS-05M	BMB1-063	BMB1-080	BMB1-100
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-G5NB	BH2-040	BA5-050	BAF-06	BAF-08	BAF-10

Note 1) The auto switch mounting bracket is 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 is not included, order it separately.)

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

Note 2) Refer to the **WEB catalog** or Best Pneumatics No. 3 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 3) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BA7-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6L stainless steel set screws included in the BBA1.

Note 4) There is a difference in the cylinder tube thickness depending on the cylinder model. When a band mounting type is used as an applicable auto switch and a cylinder model is changed, use caution.

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

Refer to the **WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features	
Reed	D-A93V/A96V	Grommet (Perpendicular)	—	
	D-A90V		Without indicator light	
	D-A53/A56/B53/Z73/Z76	Grommet (In-line)	—	
	D-A67/Z80		Without indicator light	
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—	
	D-Y69A/Y69B/Y7PV		Diagnostic indication (2-color indication)	
	D-M9NWV/M9PWV/M9BWW			Water resistant (2-color)
	D-Y7NWV/Y7PWV/Y7BWW			
	D-M9NAV/M9PAV/M9BAV		—	
	D-Y59A/Y59B/Y7P	Grommet (In-line)	—	
	D-F59/F5P/J59		Diagnostic indication (2-color indication)	
	D-Y7NW/Y7PW/Y7BW			Water resistant (2-color)
	D-F59W/F5PW/J59W			
	D-F5BA/Y7BA		With timer	
	D-F5NT/G5NT		Magnetic field resistant (2-color)	
	D-P5DW			

* With pre-wired connector is also available for solid state auto switches. For details, refer to the **WEB catalog** or Best Pneumatics No. 3.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to the **WEB catalog** or Best Pneumatics No. 3.

* Wide range detection type, solid state auto switch (D-G5NBL) is also available. For details, refer to the **WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinders
 CJ2Y-Z
 CM2Y-Z
 CG1Y-Z
 MBY-Z
 CA2Y-Z
 CS2Y
 CSY
 CQ2Y-Z
 CQ2X-Z
 CQ2X
 CUX
 Auto Switch
 Made to Order



Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 1

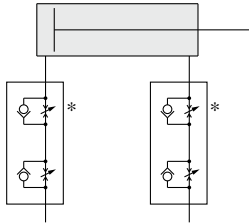
Be sure to read before handling. Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

Recommended Pneumatic Circuit

Warning

Horizontal Operation

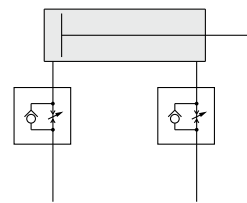
I



Dual speed controller

Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip. More stable low speed operation can be achieved than meter-in circuit alone.

II

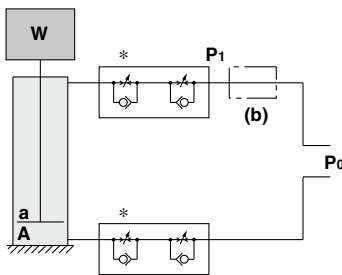


Meter-in speed controller

Meter-in speed controllers can reduce lurching while controlling the speed. The two adjustment needles facilitate adjustment.

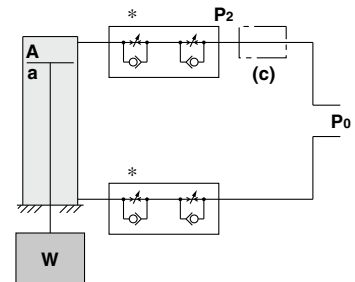
Vertical Operation

I



- (1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
- (2) Depending on the size of the load, installing a regulator with check valve at position (b) can reduce lurching during descent and operation delay during ascent.
As a guide,
when $W + P_0a > P_0A$,
adjust P_1 to make $W + P_1a = P_0A$.

II



- (1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
- (2) Installing a regulator with check valve at position (c) can reduce lurching during descent and operation delay during ascent.
As a guide,
adjust P_2 to make $W + P_2A = P_0a$.

W: Load (N) P₀: Operating pressure (MPa) P₁, P₂: Reduced pressure (MPa) a: Rod side piston area (mm²) A: Head side piston area (mm²)

Warning

Since the low speed cylinder C□UX10 is subject to internal leakage due to its construction, the speed may not be fully controlled with the meter-out controller (*) during low speed operation.



Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Design

⚠ Caution

- 1. Provide a construction that does not apply a lateral load to the cylinder.**
Applying a lateral load to the cylinder may cause a malfunction. (Only for low speed cylinders)
- 2. Design the system to prevent vibration from being applied to the cylinder.**
A malfunction may occur due to the vibration.
- 3. Avoid using a guide with obvious variations in operating resistance.**
Operation may become unstable when using a guide that manifests variations in operating resistance, or when the external load changes.
- 4. Avoid a system structure in which the mounting orientation changes.**
Operation may become unstable if the mounting orientation changes.
- 5. Avoid operation where the temperature fluctuates greatly. Also, when using at low temperatures, make sure that frost does not form inside the cylinder and on the piston rod.**
Operation may become unstable.
- 6. Do not use the product at a high frequency.**
Use it at 30 cpm or less as a guideline.
- 7. Adjust the speed in accordance with the operating environment.**
When the operating environment changes, the speed adjustment will be off unless it is reset to reflect operation in the new environment.
- 8. For cylinders with long strokes, sliding resistance will increase due to the deflection of the piston rod and other factors. Take measures such as the installation of a guide. (Only for smooth cylinders)**
- 9. Do not apply excessive lateral load to the piston rod. (Only for smooth cylinders) ^{Note 1)}**
Note 1) Easy checking method
Minimum operating pressure after the cylinder is mounted to the equipment (MPa) = Minimum operating pressure of cylinder (MPa) + {Load weight (kg) x Friction coefficient of guide/Sectional area of cylinder (mm²)}
If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

Pneumatic Circuit

⚠ Caution

- 1. The piping length between the speed controller and the cylinder port must be kept as short as possible.**
If the speed controller and the cylinder port are far apart, speed adjustment may be unstable.
- 2. Use a speed controller for low speed operation to easily adjust for low speed operation or a dual speed controller (Series ASD) to prevent cylinders from popping out.**
(When the speed controller for low speed operation is used, the maximum speed may be limited.)
Refer to “Recommended Pneumatic Circuit” on page 172.

Mounting

⚠ Caution

- 1. Do not apply a lateral load to the piston rod.**
Applying a lateral load to the piston rod may cause a malfunction. (Only for low speed cylinders)
- 2. Do not apply excessive lateral load to the piston rod. (Only for smooth cylinders) ^{Note 1)}**
Note 1) Easy checking method
Minimum operating pressure after the cylinder is mounted to the equipment (MPa) = Minimum operating pressure of cylinder (MPa) + {Load weight (kg) x Friction coefficient of guide/Sectional area of cylinder (mm²)}
If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

Lubrication

⚠ Caution

- 1. Operate without lubrication from a pneumatic system lubricator.**
A malfunction may occur when lubricated in this fashion.
- 2. Only use the grease recommended by SMC.**
The low speed cylinder and the low speed cylinder with clean room specifications use different types of grease. The use of grease other than the specified type can cause a malfunction and particulate generation.
 - Order using the following part numbers when only maintenance grease is needed.

Volume	Part no.
5 g	GR-L-005
10 g	GR-L-010
150 g	GR-L-150
- 3. Do not wipe out the grease in the sliding part of the air cylinder.**
Doing so may cause a malfunction.

Air Supply

⚠ Caution

- 1. Take measures to prevent pressure fluctuation.**
A malfunction may occur with the fluctuation of pressure.

Smooth Cylinders
CJ2Y-Z
CM2Y-Z
CG1Y-Z
MBY-Z
CA2Y-Z
CS2Y
CQSY
CQ2Y-Z
CQ2X-Z
CJ2X-Z
CM2X-Z
CQSX
CQ2X
CUX
Auto Switch
Made to Order



Please contact SMC for detailed specifications, delivery and prices.

Simple Specials

The following special specifications can be ordered as a simplified Made-to-Order. There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

Symbol	Specifications	Smooth cylinders					
		Double acting, Single rod					
		CJ2Y	CM2Y	CG1Y	MBY	CA2Y	CS2Y
-XA□	Change of rod end shape	●	●		●	●	●
-XC14	Change of trunnion bracket mounting position				●	●	●
-XC15	Change of tie-rod length					●	●

Made to Order

Symbol	Specifications	Smooth cylinders					
		Double acting, Single rod					
		CJ2Y	CM2Y	CG1Y	MBY	CA2Y	CS2Y
-XC3	Special port location	●	●				●
-XC6	Made of stainless steel		●	●			
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel				●	●	
-XC9	Adjustable stroke cylinder/Adjustable retraction type	●	●				●
-XC10	Dual stroke cylinder/Double rod type		●				●
-XC13	Auto switch rail mounting		●				
-XC20	Head cover axial port		●				
-XC25	No fixed throttle of connection port		●				
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers						●
-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				●	●	●
-XC52	Mounting nut with set screw		●				
-XC65	Made of stainless steel (Combination of XC7 and XC68)				●	●	
-XC68	Made of stainless steel (with hard chrome plated piston rod)				●	●	●
-XC86	With rod end bracket						●

Low speed cylinder
Double acting, Single rod
CM2X

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Low speed cylinder
Double acting, Single rod
CM2X

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- Smooth Cylinders
 - CJ2Y-Z
 - CM2Y-Z
 - CG1Y-Z
 - MBY-Z
 - CA2Y-Z
 - CS2Y
 - CQSY
 - CQ2Y-Z
- Low Speed Cylinders
 - CJ2X-Z
 - CM2X-Z
 - CQSX
 - CQ2X
 - CUX
- Auto Switch
- Made to Order

Series C□Y/C□X Simple Specials

These changes are dealt with Simple Specials System.

For details, refer to the Simple Specials System in the WEB catalog.
<http://www.smcworld.com>

1 Change of Rod End Shape

Symbol

-XA0 to XA30

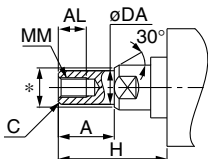
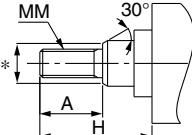
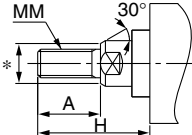
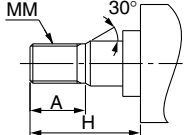
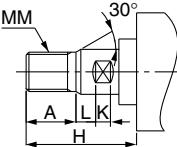
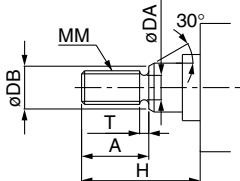
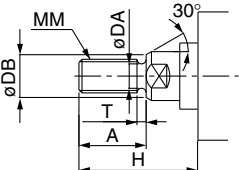
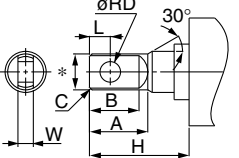
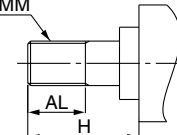
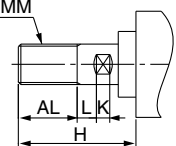
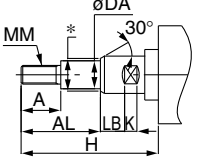
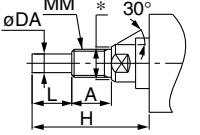
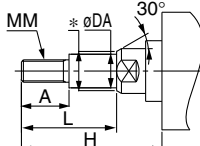
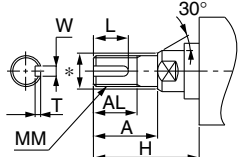
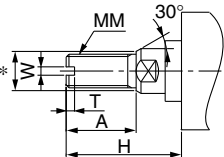
Series	Description	Model	Action	Symbol for change of rod end shape	Note
CJ2-Z	Smooth cylinder	CJ2Y	Double acting, Single rod	XA0, 1, 10, 11	Except pivot bracket and rod end bracket
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	XA0 to 30	

Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "*" will be as follows to the rod diameter (D). Enter any special dimension you desire.

- $D \leq 6 \rightarrow D-1 \text{ mm}$ $6 < D \leq 25 \rightarrow D-2 \text{ mm}$ $D > 25 \rightarrow D-4 \text{ mm}$
- In the case of double rod type and single acting retraction type, enter the dimensions when the rod is retracted.
- The XA0 of CJ2Y has no width across flats.

<p>Symbol: A0</p>	<p>Symbol: A1</p>	<p>Symbol: A2</p>	<p>Symbol: A3</p>
<p>Symbol: A4</p>	<p>Symbol: A5</p>	<p>Symbol: A6</p>	<p>Symbol: A7</p>
<p>Symbol: A8</p>	<p>Symbol: A9</p>	<p>Symbol: A10</p>	<p>Symbol: A11</p>
<p>Symbol: A12</p>	<p>Symbol: A13</p>	<p>Symbol: A14</p>	<p>Symbol: A15</p>

<p>Symbol: A16</p> 	<p>Symbol: A17</p> 	<p>Symbol: A18</p> 	<p>Symbol: A19</p> 
<p>Symbol: A20</p> 	<p>Symbol: A21</p> 	<p>Symbol: A22</p> 	<p>Symbol: A23</p> 
<p>Symbol: A24</p> 	<p>Symbol: A25</p> 	<p>Symbol: A26</p> 	<p>Symbol: A27</p> 
<p>Symbol: A28</p> 	<p>Symbol: A29</p> 	<p>Symbol: A30</p> 	

Smooth Cylinders

CJ2Y-Z

CM2Y-Z

CG1Y-Z

MBY-Z

CA2Y-Z

CS2Y

CQSY

CQ2Y-Z

Low Speed Cylinders

CJ2X-Z

CM2X-Z

CQSX

CQ2X

CUX

Auto Switch

Made to Order

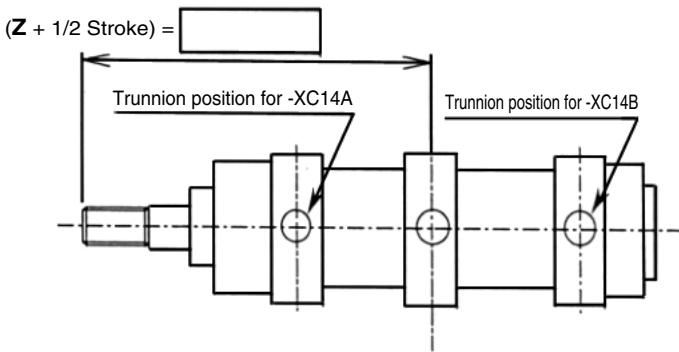
2 Change of Trunnion Bracket Mounting Position

The position for mounting the trunnion pivot bracket on the cylinder can be moved from the standard mounting position to any desired position.

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Precautions

1. Specify "Z + 1/2 Stroke" in the case the trunnion bracket position is not -XC14A, B or trunnion is not a center trunnion.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. The possible range of trunnion bracket mounting position is indicated in the table below.
4. Some trunnion mounting positions do not allow auto switch mounting. Please consult with SMC for more information.
5. The CS2 series has a greater range of trunnion bracket mounting positions than the CS1 series, so the value of "Z + 1/2 Stroke" at -XC14A and -XC14B is different.



MBY

(mm)

Bore size	Symbol		Z + 1/2 Stroke			
	For -XC14A	For -XC14B	For -XC14		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
32	82.5	95.5 + Stroke	84	94 + Stroke	89 + 1/2 Stroke	2
40	89	97 + Stroke	90	96 + Stroke	93 + 1/2 Stroke	2
50	100.5	109.5 + Stroke	102	108 + Stroke	105 + 1/2 Stroke	2
63	103.5	106.5 + Stroke	105	105 + Stroke	105 + 1/2 Stroke	2
80	127	131 + Stroke	128	130 + Stroke	129 + 1/2 Stroke	2
100	130	128 + Stroke	131	127 + Stroke	129 + 1/2 Stroke	2

CA2Y

(mm)

Bore size	Symbol		Z + 1/2 Stroke			
	For -XC14A	For -XC14B	For -XC14		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
40	89	97 + Stroke	89.5	96.5 + Stroke	93 + 1/2 Stroke	1
50	99	107 + Stroke	99.5	106.5 + Stroke	103 + 1/2 Stroke	1
63	103	111 + Stroke	103.5	110.5 + Stroke	107 + 1/2 Stroke	1
80	125	133 + Stroke	125.5	132.5 + Stroke	129 + 1/2 Stroke	1
100	132	138 + Stroke	132.5	137.5 + Stroke	135 + 1/2 Stroke	1

CS2Y

(mm)

Bore size	Symbol		Z + 1/2 Stroke			
	For -XC14A	For -XC14B	For -XC14		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
125	165.5	152.5 + Stroke	166	152 + Stroke	159 + 1/2 Stroke	25
140	168	150 + Stroke	168.5	149.5 + Stroke	159 + 1/2 Stroke	30
160	186	160 + Stroke	186.5	159.5 + Stroke	173 + 1/2 Stroke	35

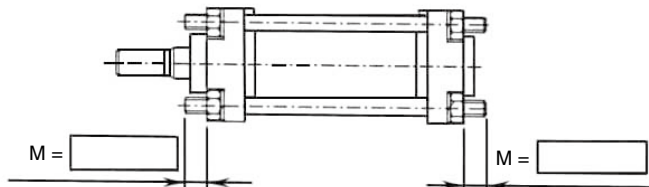
Symbol
-XC15

3 Change of Tie-rod Length

Cylinder with M dimension for tie-rod length changed from the standard length.

Series	Description	Model	Action	Note
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

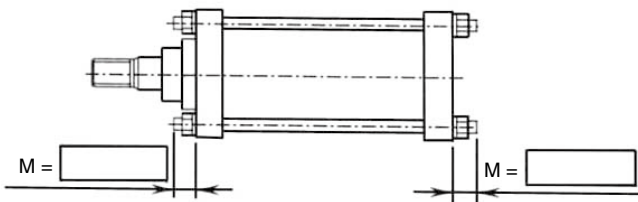
CA2Y



Tie-rod Length Changeable Range (mm)

Bore size	All bore size
M Min.	0
M Max.	300

CS2Y



Tie-rod Length Changeable Range (mm)

Bore size	125		140		160	
	L	B, F, G, C, D, T	L	B, F, G, C, D, T	L	B, F, G, C, D, T
M Min.	20	12	21	12	23	14
M Max.	270					

Precautions

1. To order, specify the M dimension as well as the part number.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. Tie-rod length changeable range is described in the below.
4. The M dimension of the bracket mounting side of Flange (F, G), Clevis (C, D) types cannot be specified.

Smooth Cylinders

CJ2Y-Z

CM2Y-Z

CG1Y-Z

MBY-Z

CA2Y-Z

CS2Y

CQSY

CQ2Y-Z

Low Speed Cylinders

CJ2X-Z

CM2X-Z

CQSX

CQ2X

CUX

Auto Switch

Made to Order

Series C□Y/C□X Made to Order

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



1 Special Port Location

Symbol
-XC3

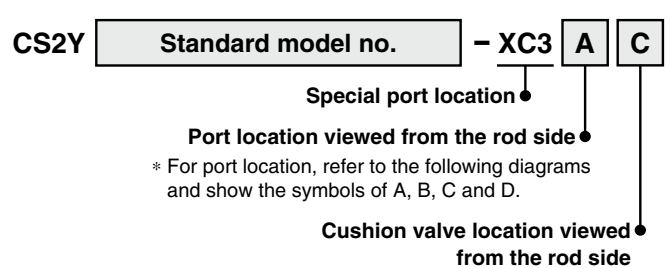
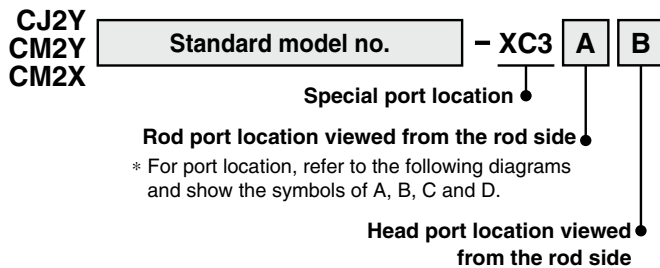
Compared with the standard type, a cylinder which changes the connection port location of rod/head cover and the location of cushion valve.

Applicable Series

Series	Description	Model	Action	Note
CJ2-Z	Smooth cylinder	CJ2Y	Double acting, Single rod	Rail mounting, Without air cushion
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Without air cushion
	Low speed cylinder	CM2X	Double acting, Single rod	Without air cushion
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Specifications: Same as standard type

How to Order



Port Location

Series	Corresponding symbol of mounting bracket (Positional relationship)	
CJ2Y CM2Y	<p>* Viewed from the rod side, the ports are rendered A, B, C, and D, in the clockwise direction.</p>	<p><Positional relationship between clevis and port> * Viewed from the rod side, with the clevis positioned as shown in the diagram, the ports are rendered A, B, C, and D, in the clockwise direction.</p>
	Positional relationship between port and cushion valve cannot be changed.	
CS2Y	<p>Basic</p>	<p>Foot</p>
	<p>Rod flange</p>	<p>Head flange</p>
	<p>Single clevis</p>	<p>Double clevis</p>
	<p>Center trunnion</p>	
	<ol style="list-style-type: none"> 1. Symbol of position for port and cushion valve has to be looked from the rod side, as figures above. (In the case of standard cylinders, port must be positioned in the upper side.) Define the upper side to be A, and then B, C, and D in a clockwise order. 2. Model of combination between port and cushion valve is applicable only when the position of a port and a cushion valve on the rod cover and the head cover will be changed to the same position against the support bracket, as a rule. 3. -XC3AA is not available in terms of the position between port and cushion valve, since it is available in the standard products. 	

2 Made of Stainless Steel

Symbol
-XC6

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

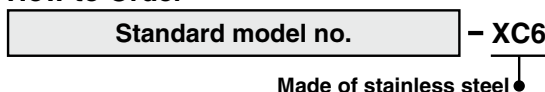
Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	
CG1-Z	Smooth cylinder	CG1Y	Double acting, Single rod	

Specifications


Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard type


How to Order




Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1, and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.