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

15% lighter (ø50-50 stroke)

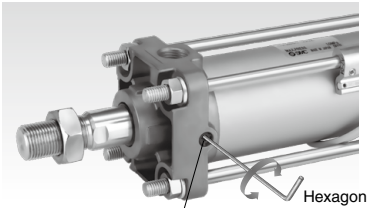
1.31 kg New CA2

(1.54 kg Existing model)

Easy air cushion control

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

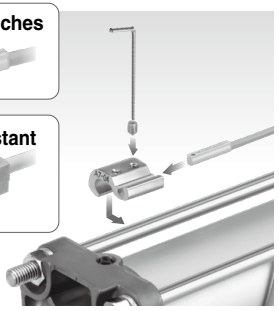
Fine adjustment becomes easy, **ensuring smooth operation at the stroke end.**



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

Compact auto switches
- D-M9□
- D-A9□

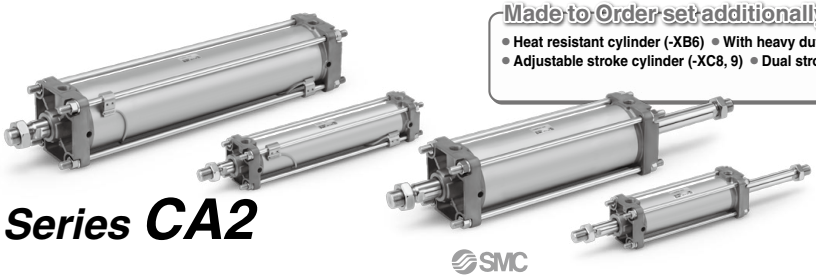
Magnetic field resistant auto switches
- D-P3DW
- D-P4DW



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

SMC

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

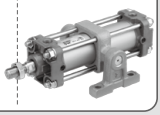
•Mounting

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

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

N: Kit of pivot bracket and double clevis

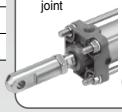
Kit of pivot bracket and trunnion



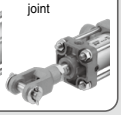
Rod end bracket	
Nil	None
V	Single knuckle joint
W	Double knuckle joint

With rod end bracket

V: Single knuckle joint

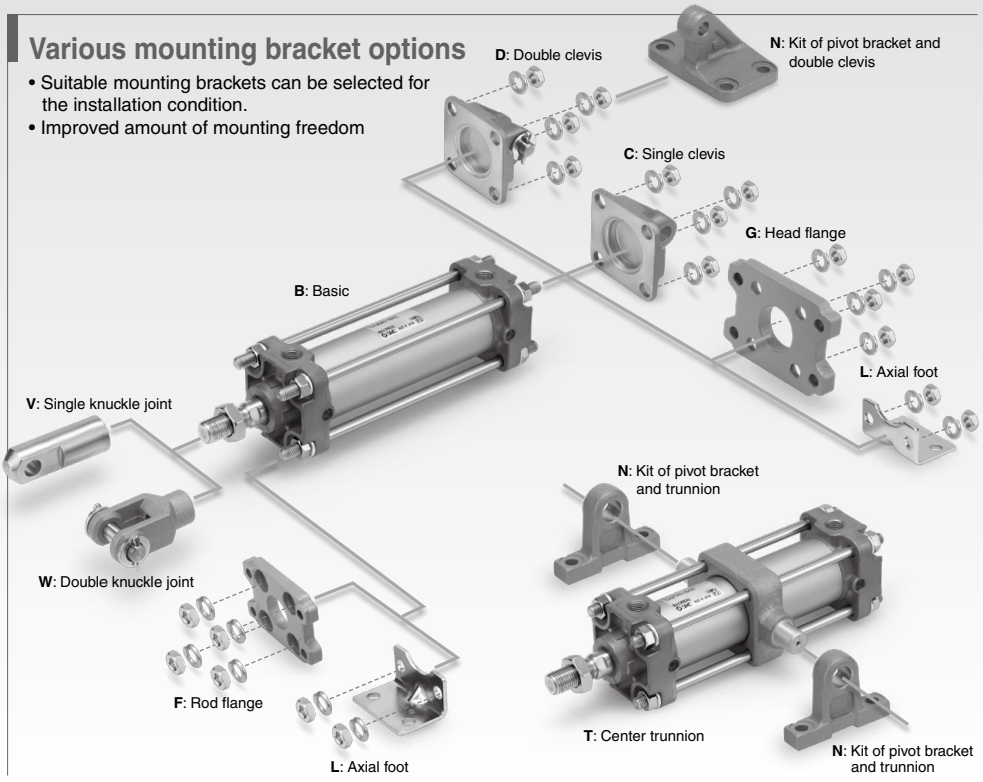


W: Double knuckle joint



Various mounting bracket options

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



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

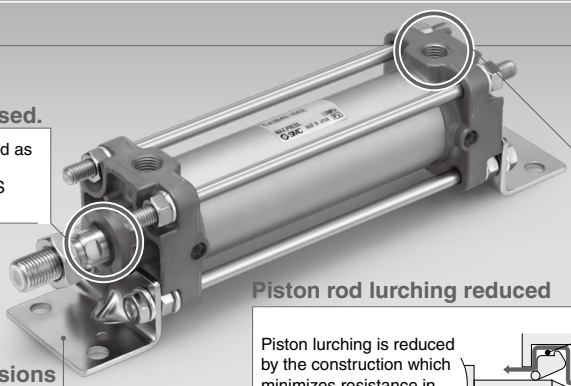
(kg)

Bore size (mm)	New CA2	Reduction rate	Existing model
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.

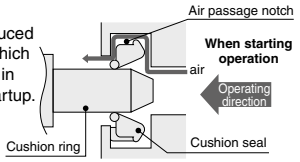
Lead free bushing is used as sliding material.
Compliant with EU RoHS directive.



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															
	20	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	CA2-Z	Single rod	●	●	●	●	●	●	●	Page 755
		Double rod	●	●	●	●	●	●	●	Page 771
Non-rotating rod	CA2K	Single rod	●	●	●	●	●	●		Page 779
		Double rod	●	●	●	●	●	●		Page 783
With end lock	CBA2	Single rod	●	●	●	●	●	●		Page 787
Air-hydro	CA2□H	Single rod	●	●	●	●	●	●		Page 793
		Double rod	●	●	●	●	●	●		Page 797
Smooth Cylinder	CA2Y-Z	Single rod	●	●	●	●	●			CAT.ES20-235
Low friction	CA2□Q	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**.

Series CA2

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

Symbol	Specifications	Applicable bore size	Series: CA2 (Standard type)		CA2K Note 4) (Non-rotating rod type)	
			Action/Type: Double acting			
			Single rod	Double rod	Single rod	Double rod
			Page 755	Page 771	Page 779	Page 783
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 787	Page 793	Page 797	—	Page 801	
			—			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.

Air Cylinder: Standard Type
Double Acting, Single Rod

Series CA2

ø40, ø50, ø63, ø80, ø100

RoHS

How to Order

CA2 **B** □ **50** □ – **100** □ □ **Z** – □ □ – □

With auto switch: CDA2 **B** **50** □ – **100** □ □ **Z** – □ □ – **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

∗ Mounting brackets other than center trunnion are shipped together.

Bore size

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

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

Suffix (Rod boot)

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Suffix (Cushion)

Nil	Air cushion
N	Rubber bumper

Bracket 1

Nil	Without bracket
N	Pivot bracket

∗ Only for D and T mounting types.
∗ Pivot bracket is shipped together with the product, but not assembled.

Auto switch

Nil	Without auto switch

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

Bracket 2

Nil	Without bracket
V	Single knuckle joint
W	Double knuckle joint

∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.

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.

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire	12 V		M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)	24 V	—	G39C	G39	—	—	—	—	—		
				2-wire	12 V		K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		M9NW	—	●	●	●	○	○	IC circuit	
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire	12 V		M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NA**	—	○	○	●	○	○		
				3-wire (PNP)			M9PA**	—	○	○	●	○	○		
				2-wire	12 V		M9BA**	—	○	○	●	○	○		
							—	G5BA**	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	100 V	A93	—	●	—	●	●	—	—	Relay, PLC
			No			100 V or less	A90	—	●	—	●	—	—	IC circuit	
			Yes			100 V, 200 V	A54	B54	●	—	●	●	—	—	
			No			200 V or less	A64	B64	●	—	●	—	—		
		Terminal conduit	Yes		12 V	—	A33C	A33	—	—	—	—	—	—	
						100 V, 200 V	A34C	A34	—	—	—	—	—		PLC
		DIN terminal					A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet			—	—	A59W	B59W	●	—	●	—	—		

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

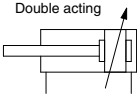
∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

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

∗ Since there are other applicable auto switches than listed above, refer to page 808 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.)

Symbol

Double acting



Air cushion

Made to Order

Made to Order
(For details, refer to pages 811 to 828.)

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 802 to 808 for cylinders with auto switches.

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

Specifications

Bore size (mm)			40	50	63	80	100
Fluid			Air				
Action			Double acting				
Proof pressure			1.5 MPa				
Maximum operating pressure			1.0 MPa				
Ambient and fluid temperature			Without auto switch: –10 to 70°C*1 With auto switch : –10 to 60°C*1				
Minimum operating pressure			0.05 MPa				
Piston speed			50 to 500 mm/s				
Cushion			Air cushion or Rubber bumper				
Stroke length tolerance			Up to 250 st: $^{+1.0}_{0}$	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

(mm)

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 806 and 807.)

Rod Boot Material

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

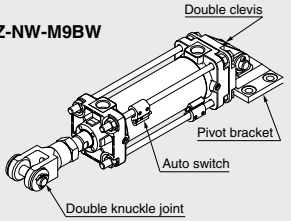
* Maximum ambient temperature for the rod boot

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	●	●	●	●	●	●	●

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)

(kg)

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

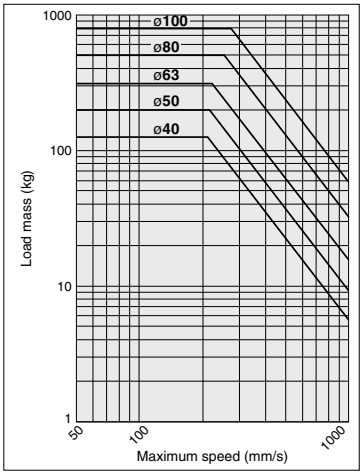
0.91 + 0.20 x 100/50 = **1.31 kg**

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

- CDA2: With auto switch (Built-in magnet)
- **R**: Water resistant air cylinder

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

- M9□A(V)L: Water resistant 2-color indication solid state auto switch
- -XC68: Made to Order

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 760 for details.**

Cylinder with Stable Lubrication Function (Lube-retainer)

CDA2 | Mounting style | Bore size | **M** | – | Stroke | Z – | Pivot bracket | Rod end bracket | – | Auto switch

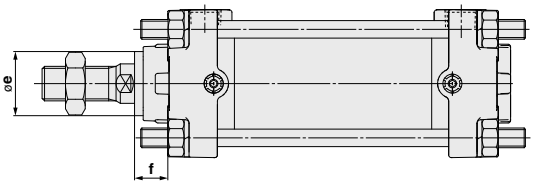
- CDA2: With auto switch (Built-in magnet)
- **M**: Cylinder with Stable Lubrication Function (Lube-retainer)
- ∗ D: Available only for with auto switch.

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.)



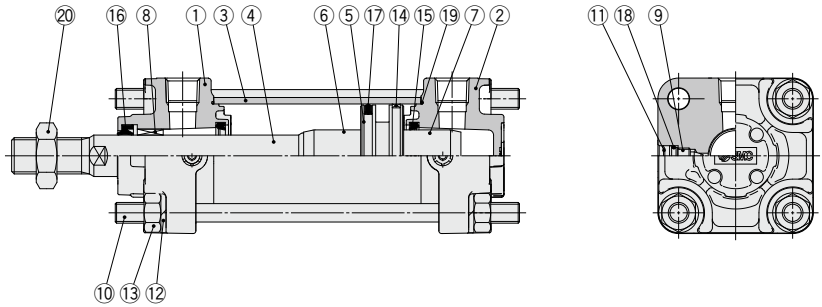
(mm)

Bore size	øe	f
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**.

Construction



Component Parts

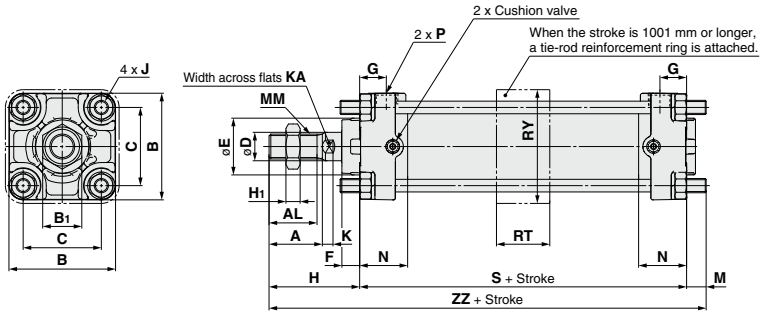
No.	Description	Material	Note
1	**Rod cover**	Aluminum die-casted	Trivalent chromated
2	**Head cover**	Aluminum die-casted	Trivalent chromated
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston rod**	Carbon steel	Hard chrome plating
5	**Piston**	Aluminum alloy	
6	**Cushion ring**	Aluminum alloy	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

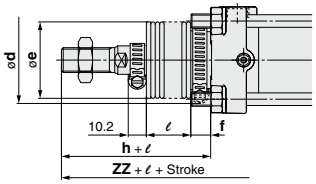
Bore size (mm)	Kit no.	Contents
40	CA2-40Z-PS	Set of the nos. ⑮, ⑯, ⑰, ⑲
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	

* Seal kit includes ⑮, ⑯, ⑰, ⑲. Order the seal kit based on each bore size.
* Do not disassemble the trunnion type. Refer to page 829.
* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed. **Grease pack part number: GR-S-010** (10 g)**, GR-S-020** (20 g)

Basic: CA2B



With rod boot



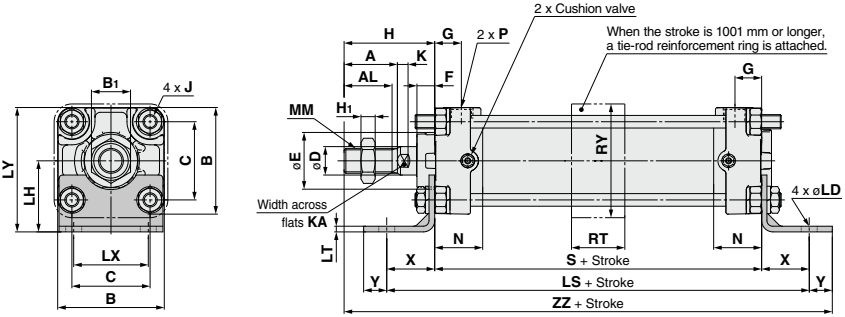
(mm)

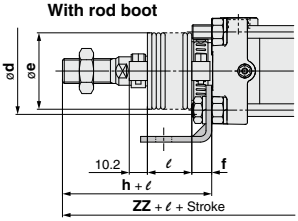
Bore size (mm)	A	AL	B	B_1	C	D	E	F	G	H_1	J	K	KA	M		MM
														Without reinforcement ring	With reinforcement ring	
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	11	M14 x 1.5
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	12	M18 x 1.5
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	15	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.

Axial Foot: CA2L





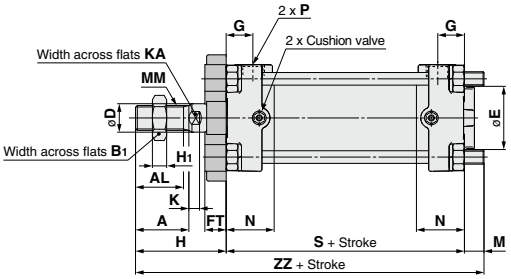
(mm)

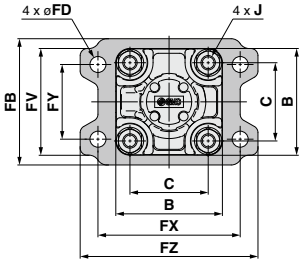
Bore size (mm)	A	AL	B	B_1	C	D	E	F	G	H_1	J	K	KA	LD	LH	LS	LT	LX	LY
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9	40	138	3.2	42	70
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2	50	80
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2	59	93
80	40	37	102	32	78	25	52	14	21	13	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	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

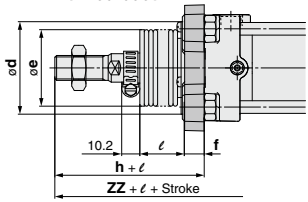
Rod Flange: CA2F

Stroke of 1000 mm or less





With rod boot



(mm)

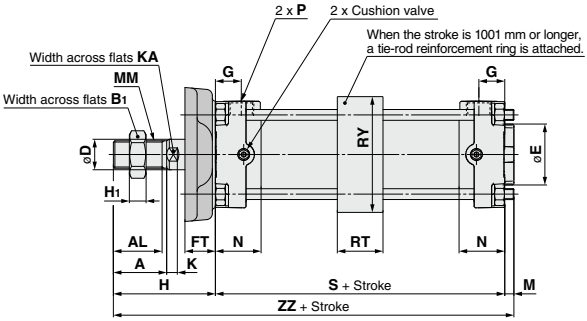
Bore size (mm)	A	AL	B	B1	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H1	J	K	KA
40	30	27	60	22	44	16	32	71	9	12	60	80	42	100	15	8	M8 x 1.25	6	14
50	35	32	70	27	52	20	40	81	9	12	70	90	50	110	17	11	M8 x 1.25	7	18
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	11	M10 x 1.25	7	18
80	40	37	102	32	78	25	52	119	13.5	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

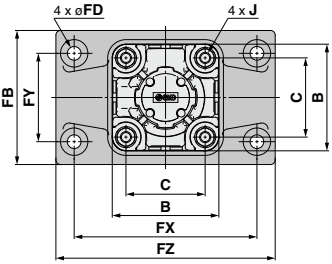
Bore size (mm)	M	MM	N	P	S	Without rod boot		With rod boot					
						H	ZZ	*d	e	f	h	ℓ	ZZ
40	11	M14 x 1.5	27	1/4	84	51	146	52	43	15	59	1/4 stroke	154
50	11	M18 x 1.5	30	3/8	90	58	159	58	52	15	66	1/4 stroke	167
63	14	M18 x 1.5	31	3/8	98	58	170	58	52	17.5	66	1/4 stroke	178
80	17	M22 x 1.5	37	1/2	116	71	204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

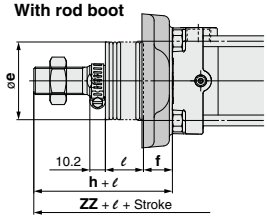
Rod Flange: CA2F

Stroke of 1001 mm or more





With rod boot



(mm)

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

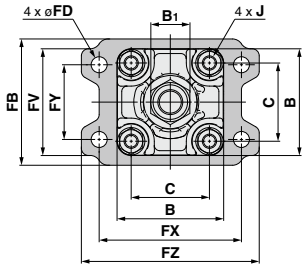
Bore size (mm)	MM	N	P	RT	RY	S	Without rod boot		With rod boot				
							H	ZZ	*e	f	h	ℓ	ZZ
40	M14 x 1.5	27	1/4	30	64	84	51	146	52	19	66	1/4 stroke	162
50	M18 x 1.5	30	3/8	30	76	90	67	163	52	19	66	1/4 stroke	162
63	M18 x 1.5	31	3/8	40	92	98	71	179	52	19	66	1/4 stroke	174
80	M22 x 1.5	37	1/2	45	112	116	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

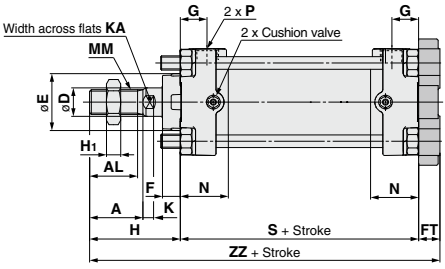
★For installing an air cylinder, when a hole must be made to accommodate the rod portion, make sure to machine a hole that is larger than the outer diameter of the boot øe.

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.

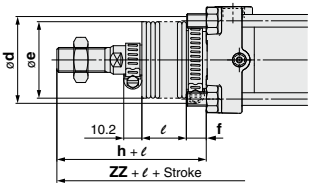
Head Flange: CA2G

Stroke of 1000 mm or less





With rod boot



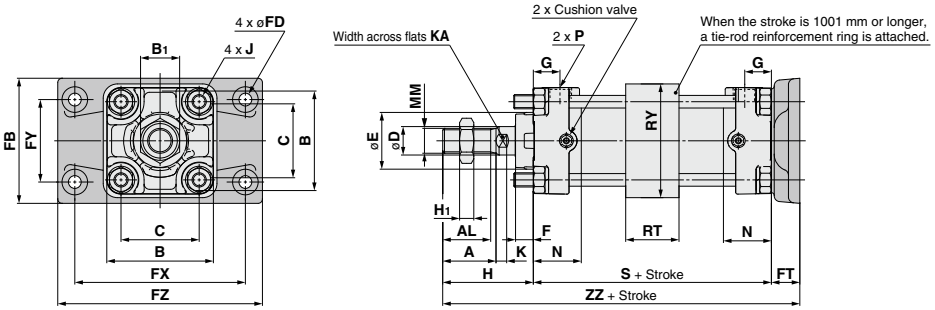
(mm)

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	M8 x 1.25
50	35	32	70	27	52	20	40	10	81	9	12	70	90	50	110	17	11	M8 x 1.25
63	35	32	85	27	64	20	40	10	101	11.5	15	86	105	59	130	17	11	M10 x 1.25
80	40	37	102	32	78	25	52	14	119	13.5	18	102	130	76	160	21	13	M12 x 1.75
100	40	37	116	41	92	30	52	14	133	13.5	18	116	150	92	180	21	16	M12 x 1.75

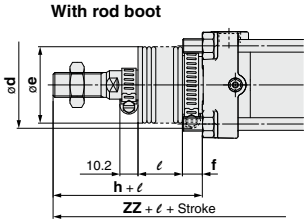
Bore size (mm)	K	KA	MM	N	P	S	Without rod boot		With rod boot					
							H	ZZ	d	e	f	h	ℓ	ZZ
40	6	14	M14 x 1.5	27	1/4	84	51	147	56	43	11.2	59	1/4 stroke	155
50	7	18	M18 x 1.5	30	3/8	90	58	160	64	52	11.2	66	1/4 stroke	168
63	7	18	M18 x 1.5	31	3/8	98	58	171	64	52	11.2	66	1/4 stroke	179
80	10	22	M22 x 1.5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

Head Flange: CA2G

Stroke of 1001 mm or more



With rod boot



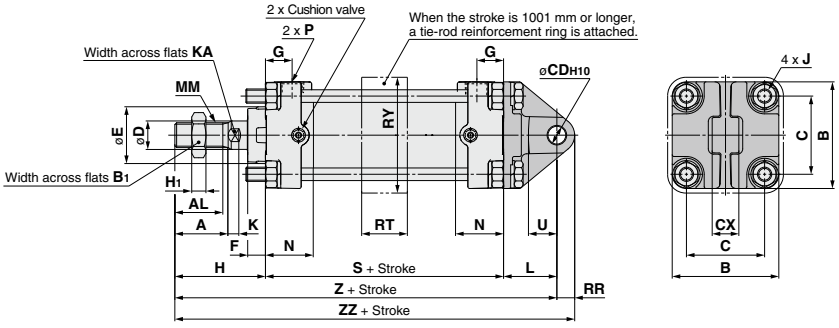
(mm)

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

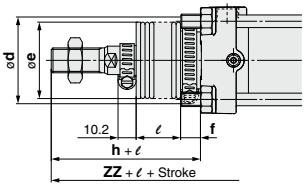
Bore size (mm)	MM	N	P	S	RT	RY	Without rod boot		With rod boot					
							H	ZZ	d	e	f	h	ℓ	ZZ
40	M14 x 1.5	27	1/4	84	30	64	51	147	56	43	11.2	59	1/4 stroke	155
50	M18 x 1.5	30	3/8	90	30	76	58	168	64	52	11.2	66	1/4 stroke	176
63	M18 x 1.5	31	3/8	98	40	92	58	179	64	52	11.2	66	1/4 stroke	187
80	M22 x 1.5	37	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 ø40, 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 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.

Single Clevis: CA2C



With rod boot

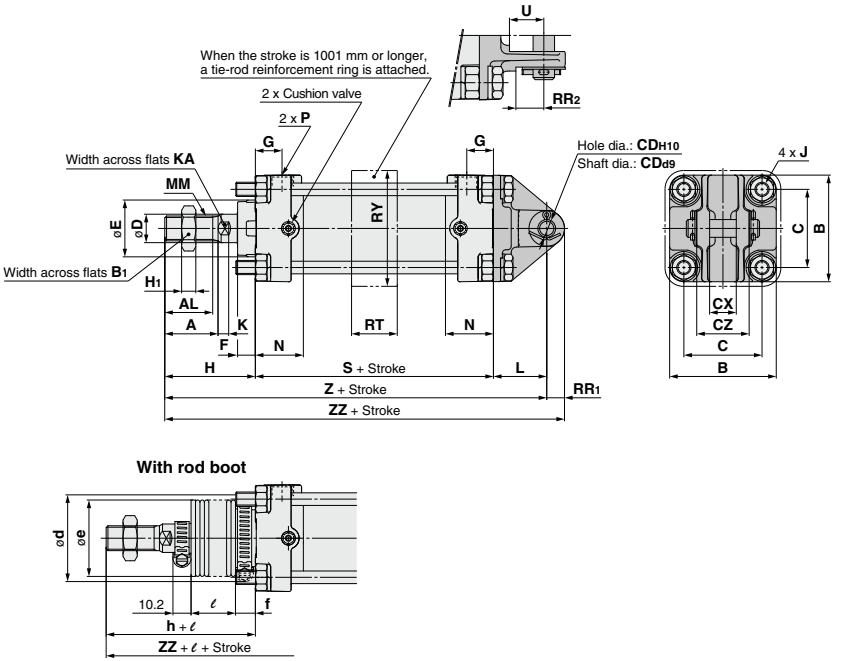


(mm)

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

Double Clevis: CA2D



With rod boot

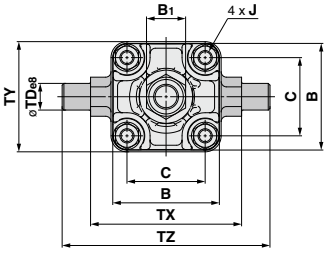
(mm)

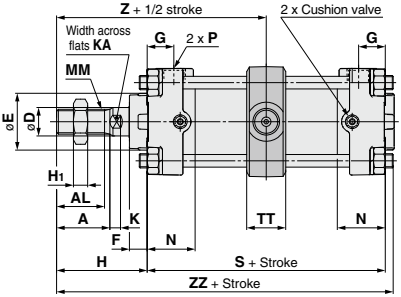
Bore size (mm)	A	AL	B	B_1	C	CD_{H10}	CX	CZ	D	E	F	G	H_1	J	K	KA	L
40	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{+0.3}_{+0.1}$	29.5	16	32	10	15	8	M8 x 1.25	6	14	30
50	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{+0.3}_{+0.1}$	38	20	40	10	17	11	M8 x 1.25	7	18	35
63	35	32	85	27	64	$16^{+0.070}_{0}$	$25^{+0.3}_{+0.1}$	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

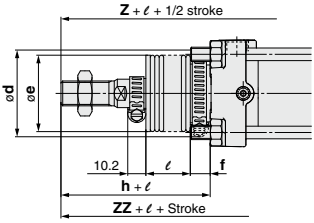
∗ A clevis pin, flat washers and split pins are included.

Center Trunnion: CA2T





With rod boot



(mm)

Bore size (mm)	A	AL	B	B1	C	D	E	F	G	H1	J	K	KA	MM	N	P	S
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126

Bore size (mm)	TDe8	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	43	11.2	59	1/4 stroke	101	148
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 829.

Trunnion and Double Clevis Pivot Bracket

• Strength is the same as cylinder brackets.

Applicable Series

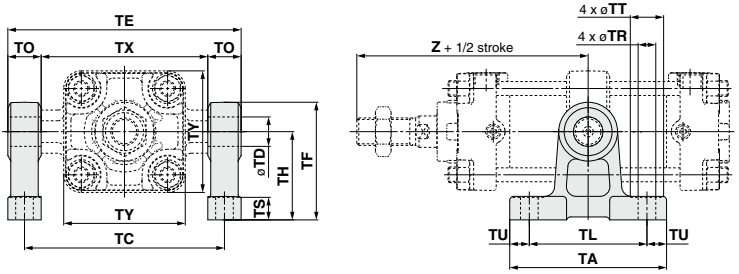
Bracket type	Applicable series
Trunnion pivot bracket	CA2
Double clevis pivot bracket	CA2

∗ Please contact SMC at the time of mounting.

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

∗ Order 2 trunnion pivot brackets per cylinder.

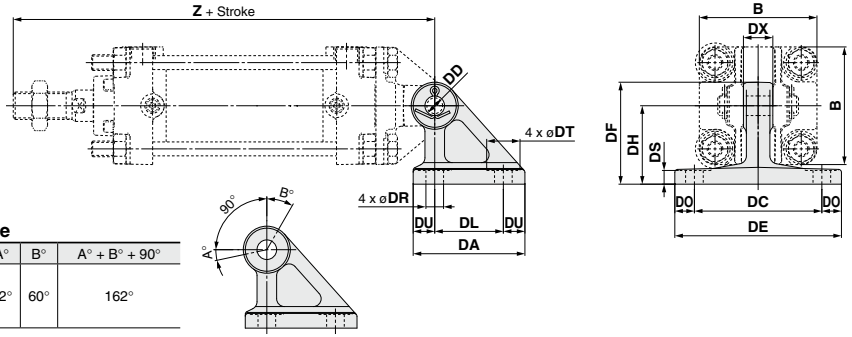
Trunnion pivot bracket
Material: Cast iron



(mm)

Part no.	Bore size (mm)	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	TY	Z	TD-H10 (Hole)
CA2-S04	40	80	60	10	102	85	119	17	9	17	12	45	60	62	93	$15^{+0.070}_{0}$
	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

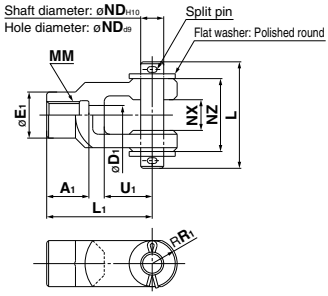
Bore size (mm)	A°	B°	A° + B° + 90°
40 to 100	12°	60°	162°

(mm)

Part no.	Bore size (mm)	DA	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	DF	B	Z	DDH10 (Hole)
CA2-B04	40	57	35	11	65	15	85	10	9	17	8	40	52	60	165	$10^{+0.058}_{0}$
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	$25^{+0.084}_{0}$

Dimensions of Accessories

Y Type Double Knuckle Joint

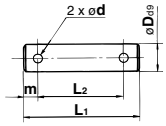


Material: Cast iron (mm)

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

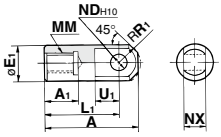


Material: Carbon steel (mm)

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.

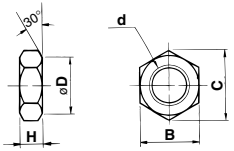
I Type Single Knuckle Joint



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

Air Cylinder: Standard Type
Double Acting, Double Rod
Series CA2W
ø40, ø50, ø63, ø80, ø100

RoHS

How to Order

CA2W L □ 50 □ – 100 □ □ Z – □

With auto switch CDA2W L 50 □ – 100 □ □ Z – M9BW □ – □

With auto switch (Built-in magnet)

Double rod

Mounting

B	Basic
L	Axial foot
F	Rod flange
T	Center trunnion

∗ Mounting brackets other than center trunnion are shipped together.

Bore size

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

Suffix (Cushion)

Nil	Air cushion
N	Rubber bumper

Suffix (Rod boot)

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

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

Number of auto switches

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

Auto switch

Nil	Without auto switch

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

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) CDA2WL40-100Z

Tube material

Nil	Aluminum tube
F∗	Steel tube

∗ Not available with auto switch.

Port thread type

Nil	Rc
TN	NPT
TF	G

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

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire		12 V	M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)	24 V	12 V	G39C	G39	—	—	—	—	—		
				2-wire			K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V	M9NW	—	●	●	●	○	○	IC circuit	
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire		12 V	M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V	M9NA**	—	○	○	●	○	○		
				3-wire (PNP)			M9PA**	—	○	○	●	○	○		
				2-wire		12 V	M9BA**	—	○	○	●	○	○		
							—	G5BA**	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	A96	—	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	100 V	A93	—	●	—	●	●	—	—	Relay, PLC
			Yes			100 V or less	A90	—	●	—	●	—	—	IC circuit	
			No			100 V, 200 V	A54	B54	●	—	●	●	—	—	
						200 V or less	A64	B64	●	—	●	—	—		
		Terminal conduit	Yes			—	A33C	A33	—	—	—	—	—		
		DIN terminal				100 V, 200 V	A34C	A34	—	—	—	—	—		PLC
							A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	A59W	B59W	●	—	●	—	—		

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

∗ Lead wire length symbols: 0.5 m·····Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

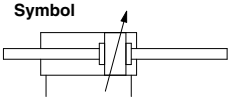
∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ Since there are other applicable auto switches than listed above, refer to page 808 for details.
∗ For details about auto switches with pre-wired connector, refer to the **WEB catalog** or the Best Pneumatics No. 2.
For 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.)

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

Symbol



Air cushion

Made to Order

Made to Order
(For details, refer to pages 811 to 828.)

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 802 to 808 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 Strokes

(mm)

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 806 and 807.)

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	●	●	●	●
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●
	With rod boot	●	●	●	●

Weights/Aluminum Tube (Steel Tube)

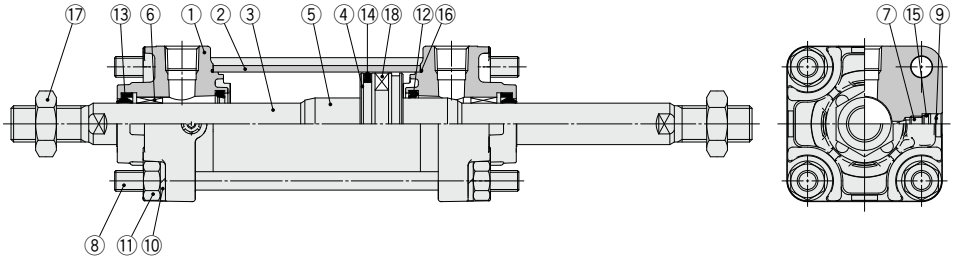
(kg)

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**

Construction



Component Parts

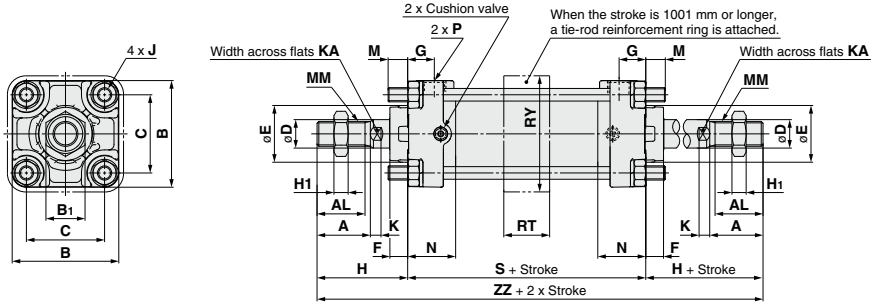
No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum die-casted	2	Trivalent chromated
2	**Cylinder tube**	Aluminum alloy	1	Hard anodized
3	**Piston rod**	Carbon steel	1	Hard chrome plating
4	**Piston**	Aluminum alloy	1	
5	**Cushion ring**	Aluminum alloy	2	Anodized
6	**Bushing**	Bearing alloy	1	
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

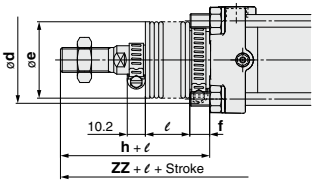
Bore size (mm)	Kit no.	Contents
	Pneumatic type	
40	CA2W40Z-PS	Set of the nos. ⑫, ⑬, ⑭, ⑯
50	CA2W50Z-PS	
63	CA2W63Z-PS	
80	CA2W80Z-PS	
100	CA2W100Z-PS	

* Do not disassemble the trunnion type. Refer to page 829.
* 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)

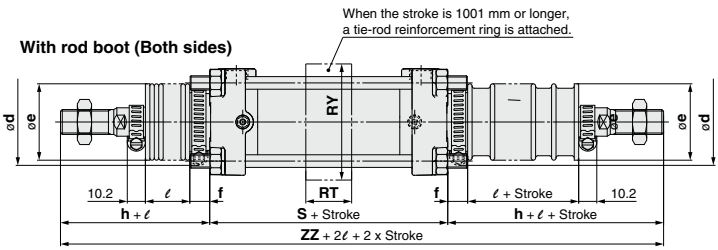
Basic: CA2WB



With rod boot (One side)



With rod boot (Both sides)

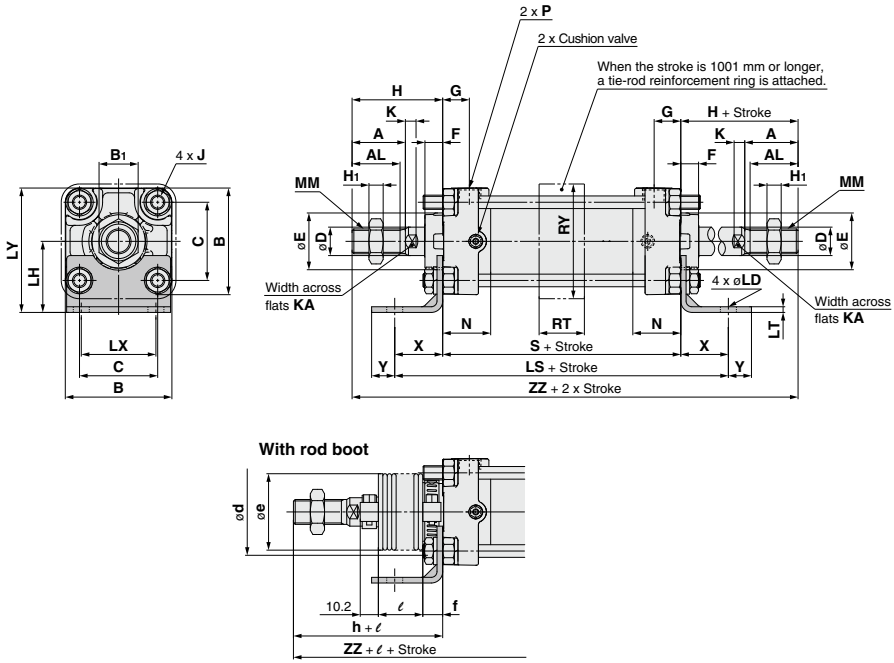


(mm)

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

Axial Foot: CA2WL



With rod boot

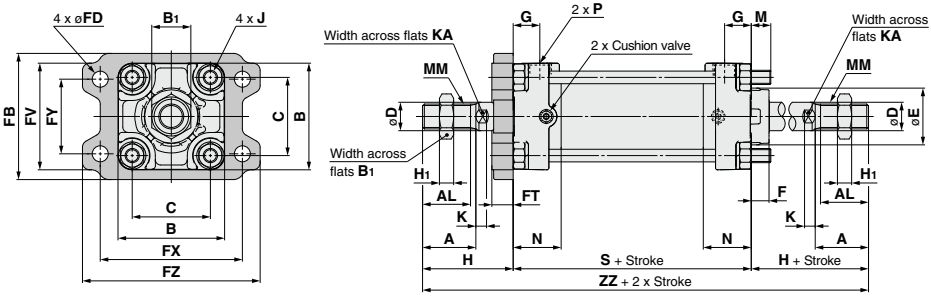
(mm)

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

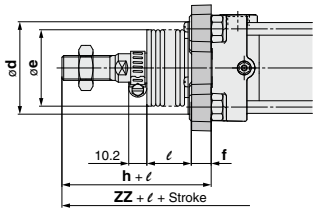
Bore size (mm)	MM	N	P	RT	RY	S	X	Y	Without rod boot		With rod boot (One side)						(Both sides)	
									H	ZZ	d	e	f	h	ℓ	ZZ	ZZ	
40	M14 x 1.5	27	1/4	30	64	84	27	13	51	186	56	43	11.2	59	1/4 stroke	194	202	
50	M18 x 1.5	30	3/8	30	76	90	27	13	58	206	64	52	11.2	66	1/4 stroke	214	222	
63	M18 x 1.5	31	3/8	40	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



With rod boot



(mm)

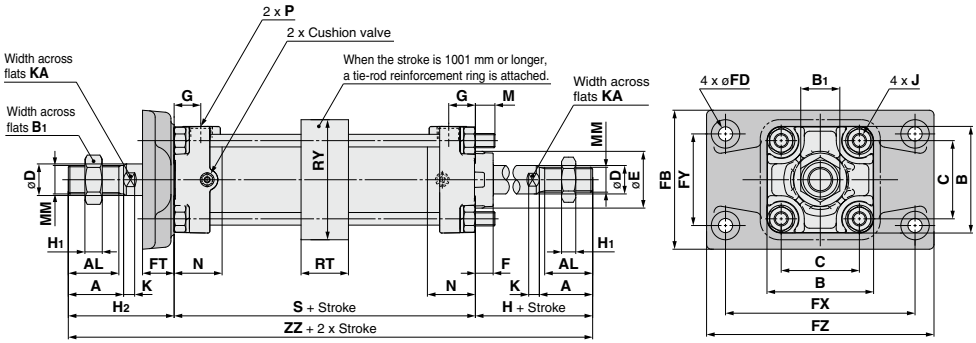
Bore size (mm)	A	AL	B	B_1	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H_1	J	K	KA	M
40	30	27	60	22	44	16	32	71	9	12	60	80	42	100	15	8	M8 x 1.25	6	14	11
50	35	32	70	27	52	20	40	81	9	12	70	90	50	110	17	11	M8 x 1.25	7	18	11
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	11	M10 x 1.25	7	18	14
80	40	37	102	32	78	25	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

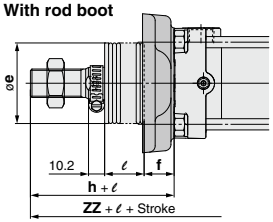
★For installing an air cylinder, when a hole must be made to accommodate the rod portion, make sure to machine a hole that is larger than the outer diameter of the boot mounting bracket ød.

Rod Flange: CA2WF

Stroke of 1001 mm or more



With rod boot



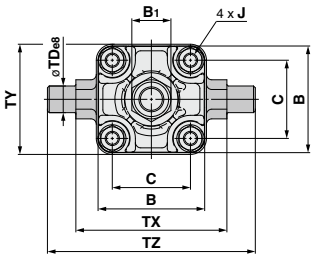
(mm)

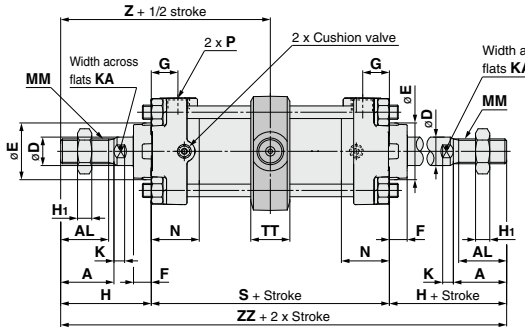
Bore size (mm)	A	AL	B	B_1	C	D	E	FB	FD	FT	FX	FY	FZ	G	H_1	J	K	KA	M
40	30	27	60	22	44	16	32	71	9	12	80	42	100	15	8	M8 x 1.25	6	14	11
50	35	32	70	27	52	20	40	88	9	20	120	58	144	17	11	M8 x 1.25	7	18	6
63	35	32	85	27	64	20	40	105	11.5	23	140	64	170	17	11	M10 x 1.25	7	18	10
80	40	37	102	32	78	25	52	124	13.5	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

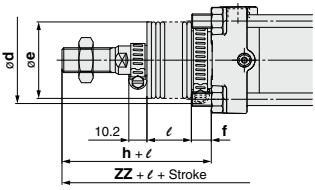
Note 1) For flange type with bore size of ø40, the same bracket is used for all strokes.
Note 2) For models with bore size of ø50 to ø100 and stroke of 1001 mm or more, do not mount a flange bracket on basic cylinders since H dimension is different from those shown above. When rod flange type is used, order with the part number with bracket.

Center Trunnion: CA2WT





With rod boot



(mm)

Bore size (mm)	A	AL	B	B1	C	D	E	F	G	H1	J	K	KA	MM	N	P	S	TDe8
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	$15^{-0.032}_{-0.059}$
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 829.

Air Cylinder: Non-rotating Rod Type
Double Acting, Single Rod
Series CA2K
ø40, ø50, ø63

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

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

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.

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire		12 V	M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)		5 V, 12 V	G39C	G39	—	—	—	—	—	IC circuit	
				2-wire		12 V	K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V	M9NW	—	●	●	●	○	○		
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire	24 V	12 V	M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V	M9NA**	—	○	○	●	○	○		
				3-wire (PNP)			M9PA**	—	○	○	●	○	○		
				2-wire		12 V	M9BA**	—	○	○	●	○	○		
							—	G5BA**	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93	—	●	—	●	●	—	—	Relay, PLC
			No				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	—	—	—	—	—	—	PLC
		DIN terminal					100 V, 200 V	A34C	A34	—	—	—	—	—		
								A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	B59W	●	—	●	—	—		

∗∗ 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.

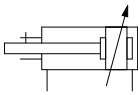
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

∗ Since there are other applicable auto switches than listed above, refer to page 808 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.)

Non-rotating accuracy: ±0.8°
Same mounting dimensions as those of standard cylinder

Symbol
Air cushion



Made to Order

Made to Order
(For details, refer to pages 811 to 828.)

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 802 to 808 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	±0.8°		
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 806 and 807.

(mm)

Bore size	Standard stroke
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

(kg)

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
	Trunnion	1.24	1.80	2.71
Additional weight per 50 mm of stroke		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, ø40)
- Additional weight···· 0.20/50 stroke
- Cylinder stroke ····· 100 stroke

1.07 + 0.20 x 100/50 = **1.47 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 806 and 807.)

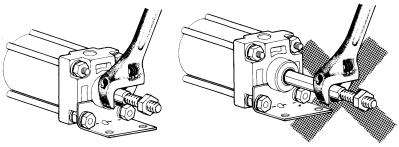
⚠ Precautions

Be sure to read this before handling. Refer to page 1574 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.



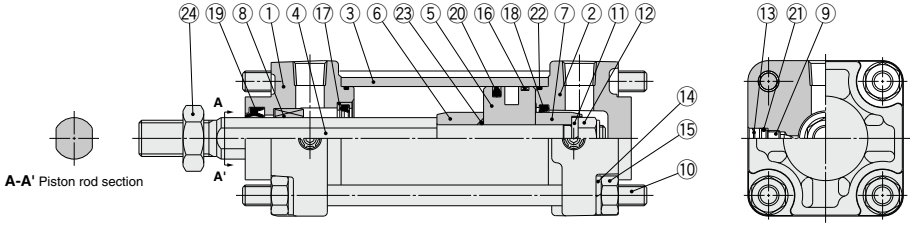
Disassembly/Replacement

⚠ 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 be replaced instead of a single part.

Construction



Component Parts

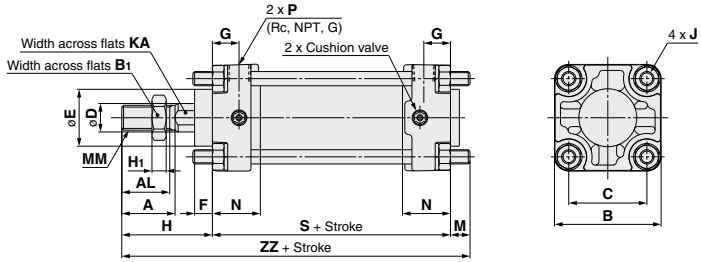
No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Metallic painted
2	**Head cover**	Aluminum die-casted	Metallic painted
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston rod**	Carbon steel	Hard chrome plating
5	**Piston**	Aluminum alloy	Chromated
6	**Cushion ring A**	Rolled steel	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	
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

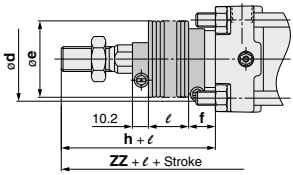
Bore size (mm)	Kit no.	Contents
40	CA2K40-PS	Set of the nos. ⑱, ⑲, ⑳, ㉒.
50	CA2K50-PS	
63	CA2K63-PS	

∗ 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 829.
∗ 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



(mm)

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 761 to 769.

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

How to Order

CA2KW **L** **40** □ – **200** □ – □

With auto switch **CDA2KW** **L** **40** □ – **200** □ – **M9BW** □ – □

With auto switch (Built-in magnet)

Non-rotating rod

Double rod type

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
T	Center trunnion

Port thread type

Nil	Rc
TN	NPT
TF	G

Bore size

40	40 mm
50	50 mm
63	63 mm

Auto switch

Nil	Without auto switch

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

Suffix (Cushion)

Nil	Air cushion
N	Without cushion

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

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

Number of auto switches

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

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire	12 V		M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
					—	—	J51	—	●	—	●	○	—		
		Terminal conduit		3-wire (NPN)	24 V	100 V, 200 V	G39C	G39	—	—	—	—	—		
				2-wire			K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V	—	M9NW	—	●	●	●	○	○	IC circuit	
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire	12 V		M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NA**	—	○	○	●	○	○		
				3-wire (PNP)			M9PA**	—	○	○	●	○	○		
				2-wire	12 V		M9BA**	—	○	○	●	○	○		
							—	G5BA**	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	100 V	12 V	A93	—	●	—	●	●	—	—	Relay, PLC
			No			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	—	—	—	—	—	—	PLC
						100 V, 200 V		A34C	A34	—	—	—	—	—		
		DIN terminal						A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	B59W	●	—	●	—	—		

∗∗ 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
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

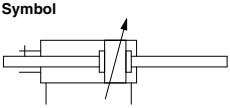
∗ Solid state auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed above, refer to page 808 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.)

Non-rotating accuracy: ±0.8°

Same mounting dimensions as those of standard cylinder

Symbol



Made to Order

Made to Order
(For details, refer to pages 811 to 828.)

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 802 to 808 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	±0.8°		
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 806 and 807.

(mm)

Bore size	Standard stroke
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

(kg)

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, ø40)
- Additional weight···· 0.27/50 stroke
- Cylinder stroke ····· 100 stroke

1.20 + 0.27 x 100/50 = **1.74 kg**

Production of Types with Rod Boot

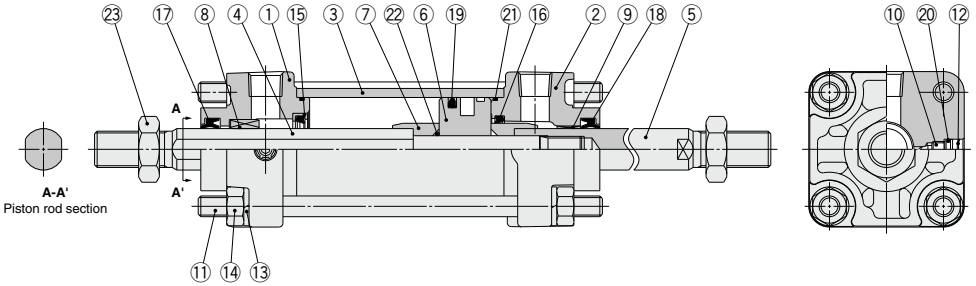
Series CA2KW is also available with rod boot. Please consult with SMC for more information.

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 806 and 807.)

Construction



Component Parts

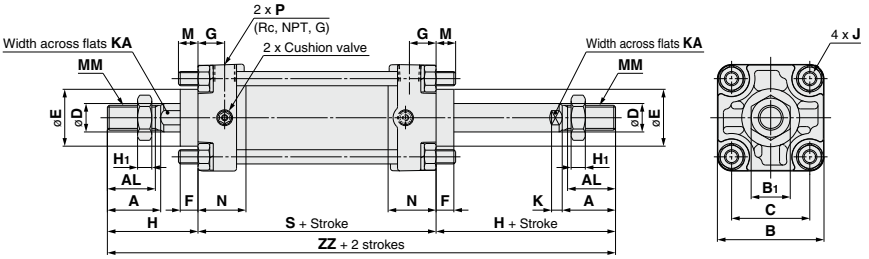
No.	Description	Material	Note
1	**Rod cover A**	Aluminum alloy	Metallic painted
2	**Rod cover B**	Aluminum die-casted	Metallic painted
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston rod A**	Carbon steel	Hard chrome plating
5	**Piston rod B**	Carbon steel	Hard chrome plating
6	**Piston**	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 829.
∗ 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



(mm)

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 775 to 778.

Air Cylinder: With End Lock

Series CBA2

ø40, ø50, ø63, ø80, ø100

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

Suffix (Cushion)

Nil	Air cushion
N	Without cushion

Suffix (Rod boot)

Nil	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Lock position

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

Manual release

N	Non-locking type
L	Locking type

Number of auto switches

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

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.

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	———	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9N**	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	**G59**	●	—	●	○	○		
				3-wire (PNP)			**M9P**	—	●	●	●	○	○		
							—	**G5P**	●	—	●	○	○		
				2-wire		12 V	**M9B**	—	●	●	●	○	○	—	
							—	**K59**	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)	24 V	12 V	**G39C**	**G39**	—	—	—	—	—	IC circuit	
				2-wire			**K39C**	**K39**	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V	**M9NW**	—	●	●	●	○	○		
							—	**G59W**	●	—	●	○	○		
				3-wire (PNP)			**M9PW**	—	●	●	●	○	○		
							—	**G5PW**	●	—	●	○	○		
				2-wire		12 V	**M9BW**	—	●	●	●	○	○	—	
							—	**K59W**	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V	**M9NA****	—	○	○	●	○	○		
				3-wire (PNP)			**M9PA****	—	○	○	●	○	○		
				2-wire		12 V	**M9BA****	—	○	○	●	○	○		
							—	**G5BA****	—	—	●	○	○		
	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**	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	———	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**A96**	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	100 V	12 V	**A93**	—	●	—	●	●	—	—	Relay, PLC
			No			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**	—	—	—	—	—	—	PLC
		DIN terminal				100 V, 200 V		**A34C**	**A34**	—	—	—	—	—		
								A44C	**A44**	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—		**A59W**	**B59W**	●	—	●	—	—		

** 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
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

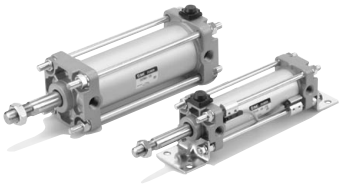
* Since there are other applicable auto switches than listed above, refer to page 808 for details.
* For details about auto switches with pre-wired connector, refer to the **WEB catalog** or the Best Pneumatics No. 2.
For the D-P3DW□, refer to the **WEB catalog** or the Best Pneumatics No. 2.
* The D-A9□/M9□□□/P3DW□ 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.

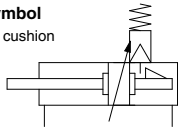
Same dimensions as those of the standard cylinder (Series CA2)

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



Symbol

Air cushion



Made to Order

Made to Order

(For details, refer to pages 811 to 828.)

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 802 to 808 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 770.

Accessories / Mounting	Standard			Option		
	Rod end nut	Clevis pin	Lock release bolt (N type only)	Single knuckle joint	Double knuckle joint (with pin)	Rod boot
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

(mm)

Bore size	Standard stroke
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 806 and 807.

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 806 and 807.)

Weights/Aluminum Tube (Steel Tube)

(kg)

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

(kg)

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

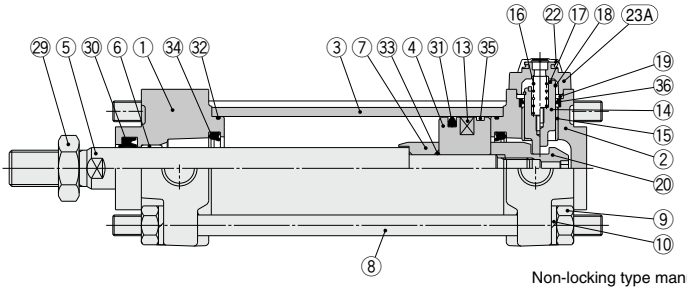
Calculation: (Example) **CBA2L40-100-HN**

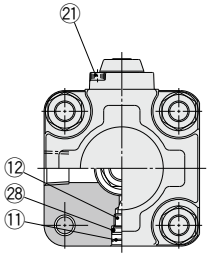
- Basic weight····· 1.08 kg (ø40, Axial foot)
- Additional weight···· 0.22/50 stroke
- Cylinder stroke ····· 100 stroke
- Lock unit weight ···· 0.02 kg
  (Head end lock, Non-locking type manual release)

1.08 + 0.22 x 100/50 + 0.02 = **1.54 kg**

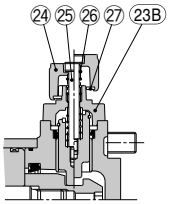
Construction

Head end lock





Non-locking type manual release: Suffix **N**



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	

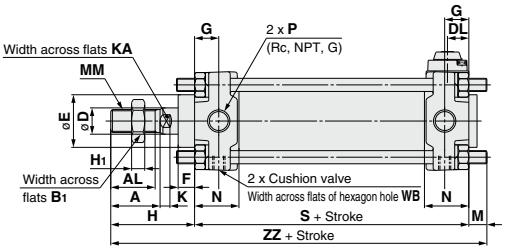
Replacement Parts: Seal Kit

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	

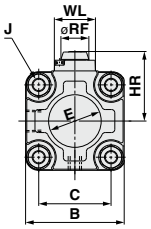
∗ Seal kit includes ㉚, ㉛, ㉜, ㉞ and ㊱. Order the seal kit based on each bore size.
∗ Do not disassemble the trunnion type. Refer to page 829.
∗ Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g), **GR-S-020** (20 g)

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

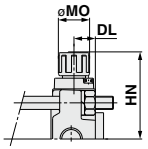
Head end lock: CBA2B Bore size – Stroke -HN



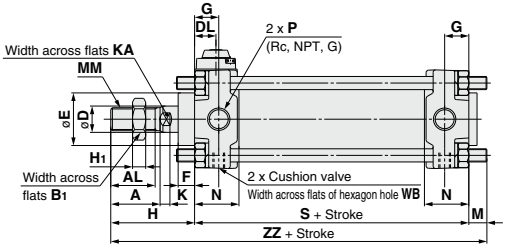
Non-locking type manual release: Suffix **N**



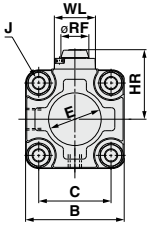
Locking type manual release: Suffix **L**



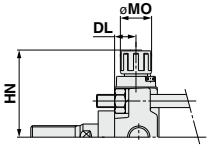
Rod end lock: CBA2B Bore size – Stroke -RN



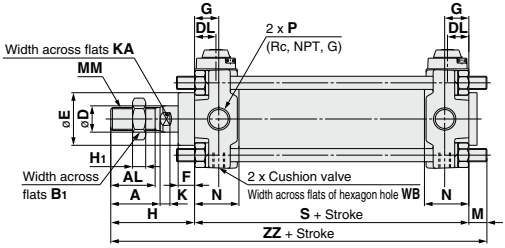
Non-locking type manual release: Suffix **N**



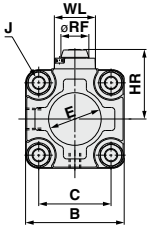
Locking type manual release: Suffix **L**



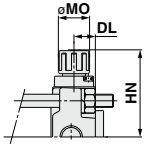
Double end lock: CBA2B Bore size – Stroke -WN



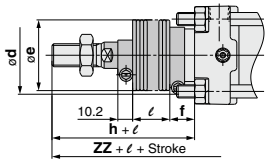
Non-locking type manual release: Suffix **N**



Locking type manual release: Suffix **L**



With rod boot



With Rod Boot (mm)

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	B1	C	D	DL	E	F	G	H	H1	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 761 to 769.

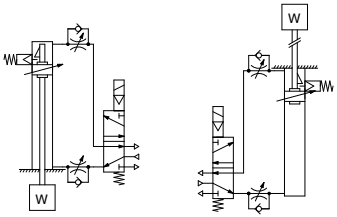
Series CBA2
Specific Product Precautions

Be sure to read this before handling. Refer to page 1574 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.



Head end lock　　Rod end lock

Handling

⚠Caution

1. **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.
2. **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".)
3. **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.
4. **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.
5. **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.
6. **Use a speed controller with meter-out control.**
   If operated under meter-in control, the lock may not be released.
7. **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

1. 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

1. 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 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

1. 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

1. 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.

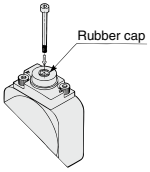
Manual Release

⚠Caution

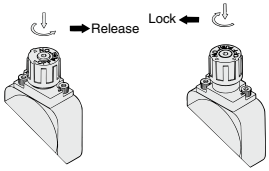
1. **Non-locking type manual release**
   Insert the bolt, which is provided as an accessory, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to release the lock. Releasing the bolt will re-engage the lock.
   The bolt size,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



Locked state　　**Release state**

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

How to Order

CA2 L □ H 50 □ – 100 □ – □ — Made to Order: For details, refer to the next page.

With auto switch CDA2 L □ H 50 □ – 100 □ – M9BW □ – □

With auto switch (Built-in magnet)

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) CDA2LH40-100

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.

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

Hydro type

Auto switch

Nil	Without auto switch

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

Suffix (Rod boot)

Nil	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Number of auto switches

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

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

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)	24 V		M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire	12 V		M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)	12 V		G39C	G39	—	—	—	—	—		
				2-wire			K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NW	—	●	●	●	○	○	IC circuit	
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire	12 V		M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NA***	—	○	○	●	○	○		
				3-wire (PNP)			M9PA***	—	○	○	●	○	○		
				2-wire	12 V		M9BA***	—	○	○	●	○	○		
							—	G5BA***	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96**	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93**	—	●	—	●	●	—	—	Relay, PLC
			No				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	—	—	—	—	—	—	PLC
		DIN terminal					100 V, 200 V	A34C	A34	—	—	—	—	—		
								A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	B59W	●	—	●	—	—		

*** 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.

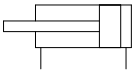
* Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.
** D-A9□ and D-A9□V types cannot be mounted on ø50. Use D-Z7□ and D-Z80 instead.

* Since there are other applicable auto switches than listed above, refer to page 808 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.)

Symbol

Double acting, without cushion



Made to Order
(For details, refer to pages 811 to 828.)

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

1. 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

1. 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

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 806 and 807.)

Refer to pages 802 to 808 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 806 and 807.

(mm)

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)

(kg)

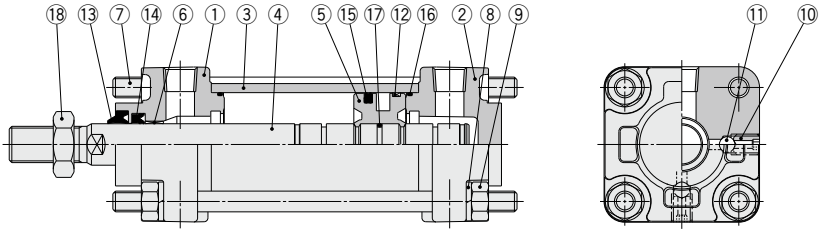
Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	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.

Construction



Component Parts

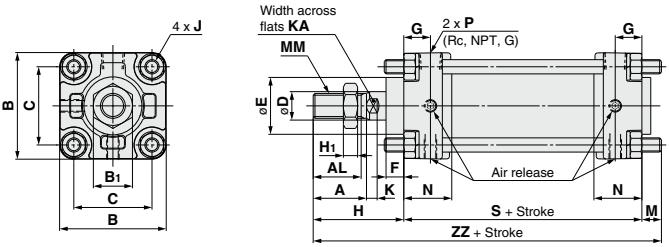
No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Metallic painted
2	**Head cover**	Aluminum alloy	Metallic painted
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston rod**	Carbon steel	Hard chrome plating
5	**Piston**	Aluminum alloy	Chromated
6	**Bushing**	Bearing alloy	
7	**Tie-rod**	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

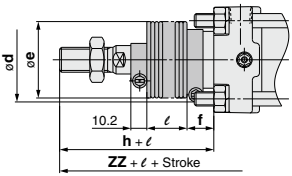
Bore size (mm)	Kit no.	Contents
	Air-hydro type	
40	CA2H40A-PS	Set of the nos. ⑭, ⑮, ⑯.
50	CA2H50A-PS	
63	CA2H63A-PS	
80	CA2H80A-PS	
100	CA2H100A-PS	

∗ Do not disassemble the trunnion type. Refer to page 829.
∗ 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)

Basic: CA2BH



With rod boot



(mm)

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 761 to 769.

Air Cylinder: Air-hydro Type
Double Acting, Double Rod
Series CA2W□H
ø40, ø50, ø63, ø80, ø100

How to Order

With auto switch: CDA2W L H 50 – 100 – M9BW –

CA2W L H 50 – 100 –

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

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

Bore size

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

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
	K	Heat resistant tarpaulin
Both sides	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.

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 DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load:	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire		12 V	M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
		Terminal conduit		3-wire (NPN)	24 V	12 V	G39C	G39	—	—	—	—	—	IC circuit	
				2-wire			K39C	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V	M9NW	—	●	●	●	○	○		
							—	G59W	●	—	●	○	○		
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
							—	G5PW	●	—	●	○	○		
				2-wire		12 V	M9BW	—	●	●	●	○	○	—	
							—	K59W	●	—	●	○	○		
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V	M9NA***	—	○	○	●	○	○		
				3-wire (PNP)			M9PA***	—	○	○	●	○	○		
				2-wire		12 V	M9BA***	—	○	○	●	○	○		
							—	G5BA***	—	—	●	○	○		
	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	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96**	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	100 V	12 V	A93**	—	●	—	●	●	—	—	Relay, PLC
			No			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	—	—	—	—	—	—	PLC
		DIN terminal				100 V, 200 V		A34C	A34	—	—	—	—	—		
								A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—		A59W	B59W	●	—	●	—	—		

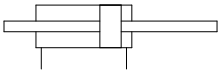
*** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
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.
** D-A9□ and D-A9□V types cannot be mounted on ø50. Use D-Z7□ and D-Z80 instead.

* Since there are other applicable auto switches than listed above, refer to page 808 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.)

Symbol
Without cushion



Made to Order

Made to Order
(For details, refer to pages 811 to 828.)

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 806 and 807.)

Refer to pages 802 to 808 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				
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 806 and 807.

(mm)

Bore size	Standard stroke
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	●	●	●	●
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●
	With rod boot	●	●	●	●

Weights/Aluminum Tube (Steel Tube)

(kg)

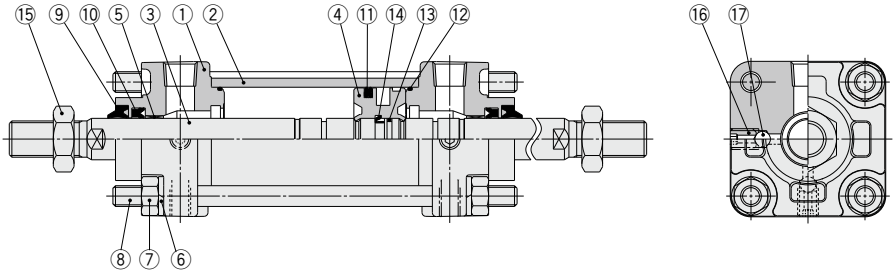
Bore size (mm)		40	50	63	80	100
Basic weight	Basic	1.03 (1.08)	1.59 (1.64)	2.26 (2.30)	3.94 (4.09)	5.57 (5.78)
	Axial foot	1.22 (1.27)	1.81 (1.86)	2.59 (2.63)	4.61 (4.76)	6.65 (6.77)
	Flange	1.40 (1.45)	2.05 (2.09)	3.05 (3.09)	5.39 (5.55)	7.49 (7.70)
	Trunnion	1.39 (1.49)	2.07 (2.18)	3.06 (3.25)	5.49 (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 x 100/50 = **1.82 kg**

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

Construction



Component Parts

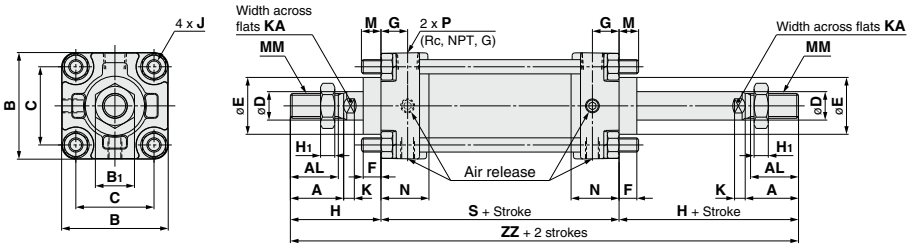
No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Metallic painted
2	**Cylinder tube**	Aluminum alloy	Hard anodized
3	**Piston rod**	Carbon steel	Hard chrome plating
4	**Piston**	Aluminum alloy	Chromated
5	**Bushing**	Bearing alloy	
6	**Spring washer**	Rolled steel	Chromated
7	**Tie-rod nut**	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

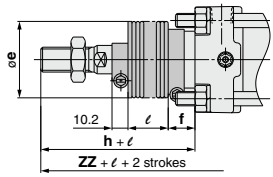
Bore size (mm)	Kit no. Air-hydro type	Contents
40	CA2WH40A-PS	Set of the nos. ⑩, ⑪, ⑫.
50	CA2WH50A-PS	
63	CA2WH63A-PS	
80	CA2WH80A-PS	
100	CA2WH100A-PS	

∗ Do not disassemble the trunnion type. Refer to page 829.
∗ 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)

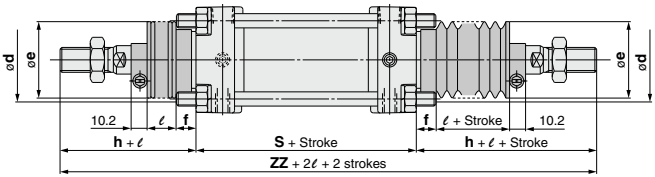
Basic: CA2WBH



With rod boot (One side)



With rod boot (Both sides)



(mm)

Bore size (mm)	Stroke range (mm)		A	AL	B	B1	C	D	E	F	G	H1	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

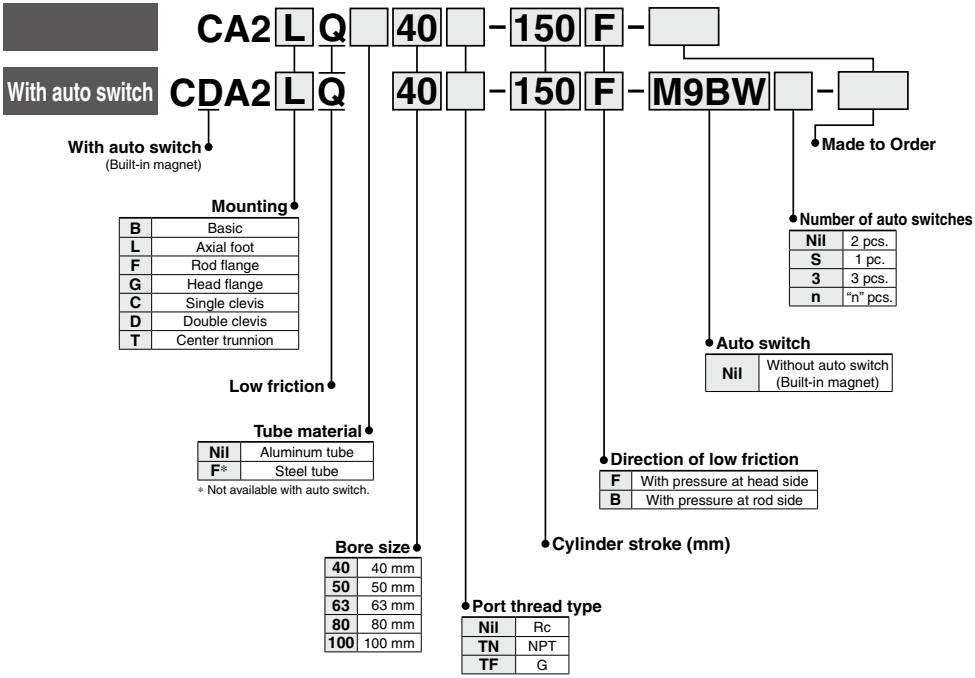
Bore size (mm)	P	S	Without rod boot		With rod boot (One side)						(Both sides)
			H	ZZ	d	e	f	h	ℓ	ZZ	ZZ
40	1/4	84	51	186	56	43	11.2	59	1/4 stroke	194	202
50	3/8	90	58	206	64	52	11.2	66	1/4 stroke	214	222
63	3/8	98	58	214	64	52	11.2	66	1/4 stroke	222	230
80	1/2	116	71	258	76	65	12.5	80	1/4 stroke	267	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 775 to 778.

Air Cylinder: Low Friction Type
Double Acting, Single Rod
Series CA2□Q
ø40, ø50, ø63, ø80, ø100

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

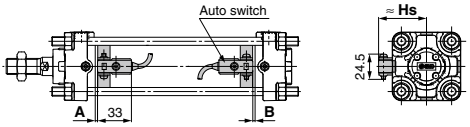
If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDA2BQ40-100

Auto Switch Mounting

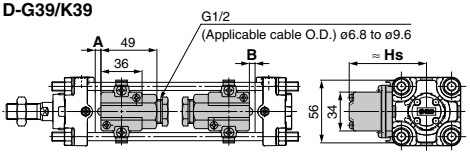
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

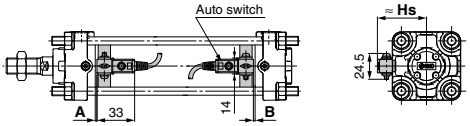
D-B5□/B64/B59W



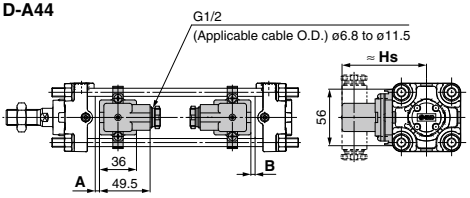
D-A3□
D-G39/K39



D-G5□/K59 **D-G5BA**
D-G5□W/K59W **D-G59F/G5NT**

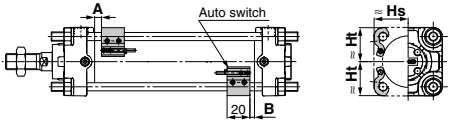


D-A44

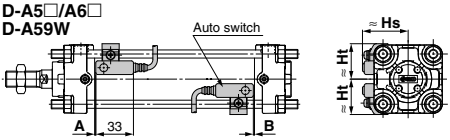


<Tie-rod mounting>

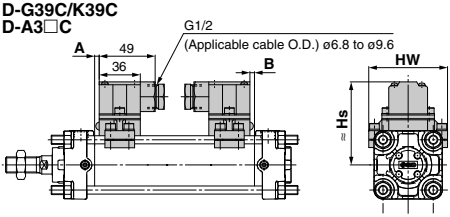
D-M9□/M9□V **D-Y59□/Y69□/Y7P/Y7PV**
D-M9□W/M9□WV **D-Y7□W/Y7□WV**
D-M9□A/M9□AV **D-Y7BA**
D-A9□/A9□V **D-Z7□/Z80**



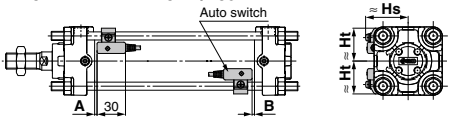
D-A5□/A6□
D-A59W



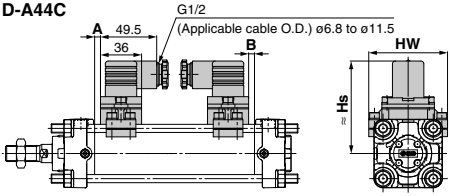
D-G39C/K39C
D-A3□C



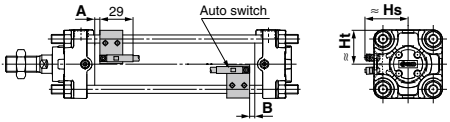
D-F5□/J59 **D-F5□W/J59W**
D-F5NT **D-F5BA/F59F**



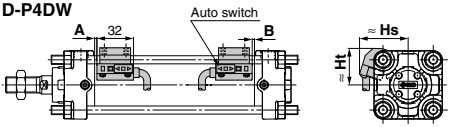
D-A44C



D-P3DW



D-P4DW



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

Auto Switch Proper Mounting Position (Standard type)

(mm)

Auto switch model / Bore size	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 / Bore size	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	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
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	93.5	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	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 / Bore size	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 / Bore size	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	Ht	Hs	Ht	Hs		Ht	
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	
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	
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	
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	
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	

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 / Bore size	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 / Bore size	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	Ht	Hs		Hs		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		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-F5□/J59 **D-F5□W/J59W** **D-F5BA/F59F** **D-A5□/A6**	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-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-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-G5□/K59 **D-G5□W** **D-K59W** **D-G5BA** **D-G59F** **D-G5NT** **D-B5□/B64**	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.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

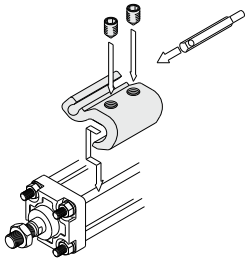
Auto switch model	Number of auto switches		Brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-G39 D-K39 D-A3□	2	Different surfaces	35	75		80	90	
		Same surface	100	100		100	100	
	n	Different surfaces	35 + 30 (n – 2) (n = 2, 3, 4···)	75 + 30 (n – 2) (n = 2, 4, 6, 8···) 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					
	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					
	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/F5NT D-A5□/A6□ D-A59W	BT-04	BT-04	BT-06	BT-08	BT-08
D-G39C/K39C D-A3□C/A44C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA D-Z7□/Z80	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-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.

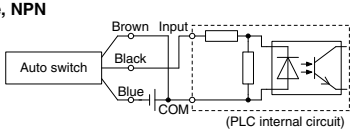
Type	Model	Electrical entry	Features
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		
	D-M9NWV/M9PWV/M9BWV		Diagnostic indication (2-color indication)
	D-Y7NWV/Y7PWV/Y7BWV		
	D-M9NAV/M9PAV/M9BAV		Water resistant (2-color indication)
	D-Y59A/Y59B/Y7P	Grommet (In-line)	—
	D-F59/F5P/J59		
	D-Y7NW/Y7PW/Y7BW		Diagnostic indication (2-color indication)
	D-F59W/F5PW/J59W		
	D-F5BA/Y7BA		Water resistant (2-color indication)
	D-F5NT/G5NT		With timer
	D-P5DW		Magnetic field resistant (2-color indication)
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

∗ 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.

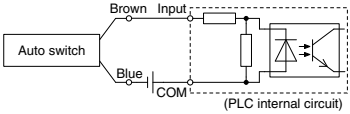
Prior to Use
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

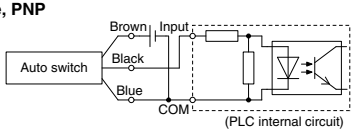


2-wire

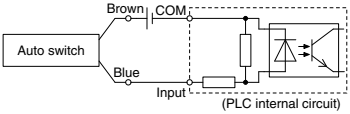


Source Input Specifications

3-wire, PNP



2-wire



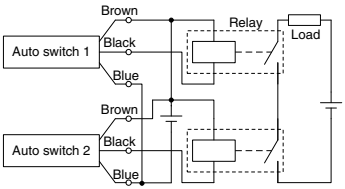
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

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

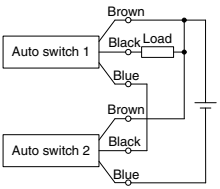
∗ When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

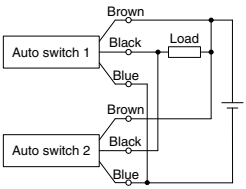
(Using relays)



(Performed with auto switches only)

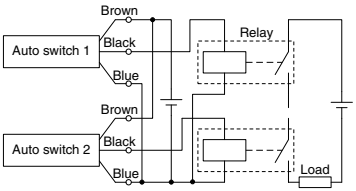


3-wire OR connection for NPN output

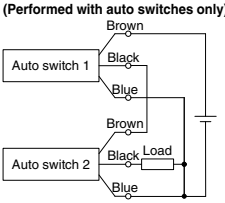


3-wire AND connection for PNP output

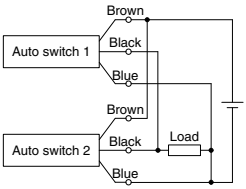
(Using relays)



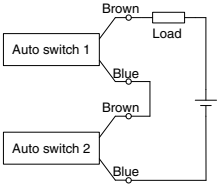
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

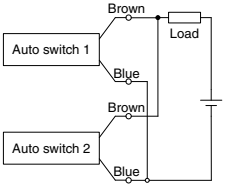


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up when both of the auto switches are in the ON state.
Auto switches with load voltage less than 20 V cannot be used.

Load voltage at ON = Power supply voltage –
Residual voltage x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

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.

Load voltage at OFF = Leakage current x 2 pcs. x
Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

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

Simple Specials/Made to Order

Please contact SMC for detailed specifications, delivery and prices.

Made to Order

■Simple Specials

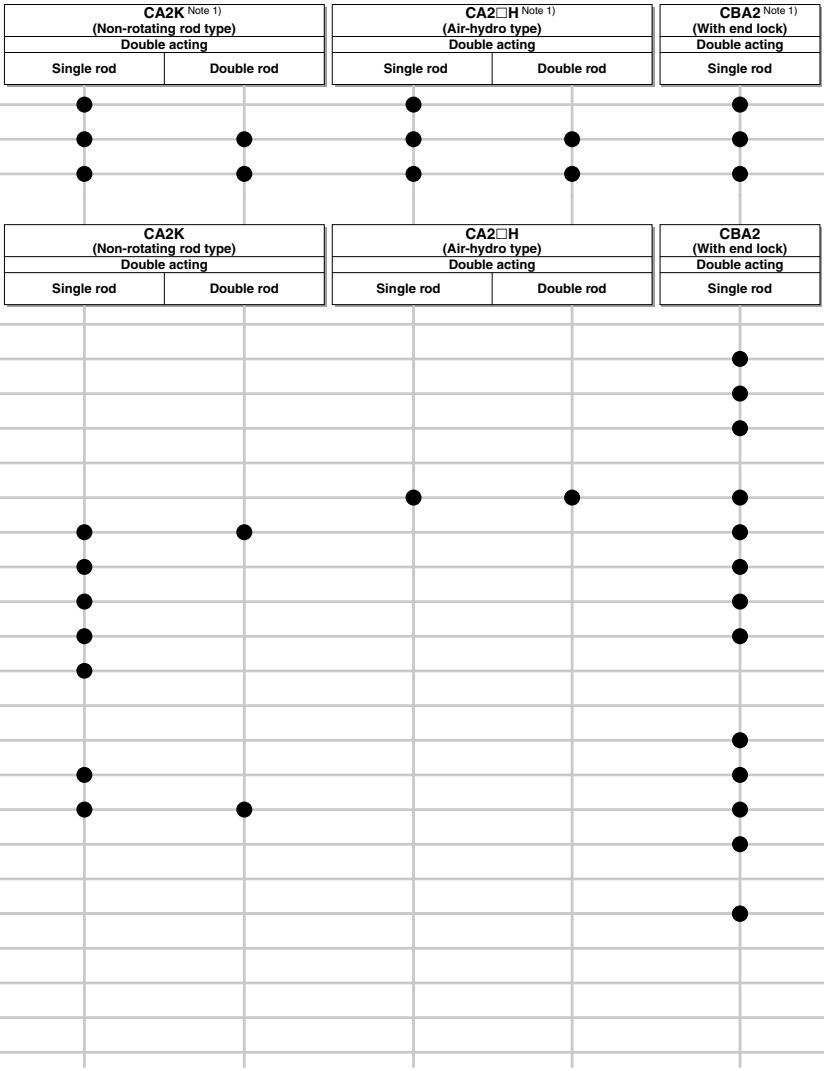
The following special specifications can be ordered as a simplified Made-to-Order.
There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

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
Single rod
Double rod
CA2□H Note 1)
(Air-hydro type)
Double acting
Single rod
Double rod
CBA2 Note 1)
(With end lock)
Double acting
Single rod
Symbol
Page
-XA0 to 30
Page 813
-XC14
Page 815
-XC15
Page 815
CA2K
(Non-rotating rod type)
Double acting
Single rod
Double rod
CA2□H
(Air-hydro type)
Double acting
Single rod
Double rod
CBA2
(With end lock)
Double acting
Single rod
Symbol
Page
-XB5
Page 816
-XB6
Page 816
-XC3
Page 817
-XC4
Page 817
-XC5
Page 818
-XC6
Page 818
-XC7
Page 818
-XC8
Page 819
-XC9
Page 820
-XC10
Page 821
-XC11
Page 822
-XC12
Page 823
-XC22
Page 823
-XC27
Page 823
-XC28
Page 824
-XC29
Page 824
-XC30
Page 825
-XC35
Page 825
-XC65
Page 826
-XC68
Page 826
-XC85
Page 827
-X1184
Page 828

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

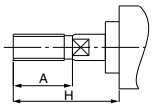
Symbol
-XA0 to XA30

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	

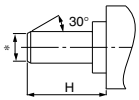
Precautions

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

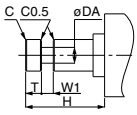
Symbol: A0



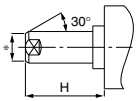
Symbol: A1



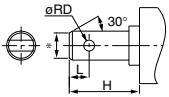
Symbol: A2



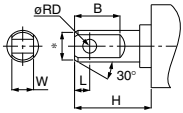
Symbol: A3



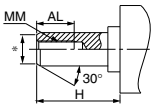
Symbol: A4



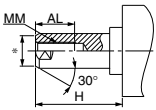
Symbol: A5



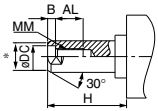
Symbol: A6



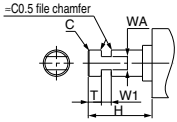
Symbol: A7



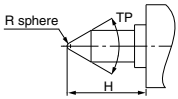
Symbol: A8



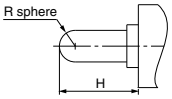
Symbol: A9



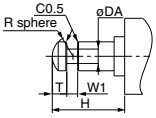
Symbol: A10



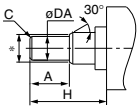
Symbol: A11



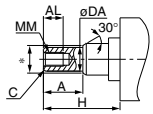
Symbol: A12



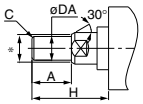
Symbol: A13



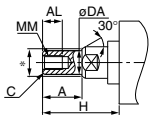
Symbol: A14



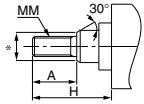
Symbol: A15



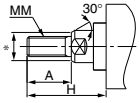
Symbol: A16



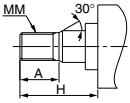
Symbol: A17



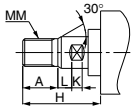
Symbol: A18



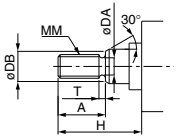
Symbol: A19



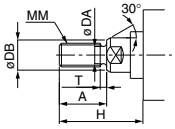
Symbol: A20



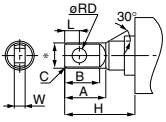
Symbol: A21



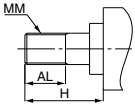
Symbol: A22



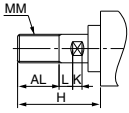
Symbol: A23



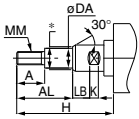
Symbol: A24



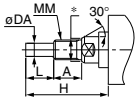
Symbol: A25



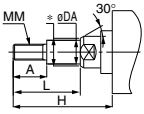
Symbol: A26



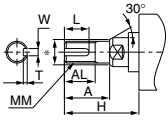
Symbol: A27



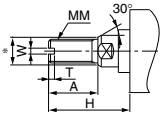
Symbol: A28



Symbol: A29



Symbol: A30

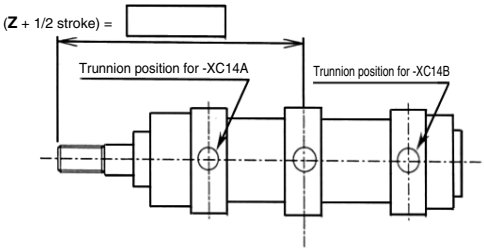


Symbol

2 Change of Trunnion Bracket Mounting Position -XC14

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.

(mm)

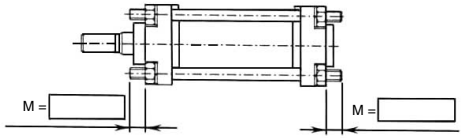
Symbol / Bore size	Z + 1/2 stroke					
	For -XC14A	For -XC14B	For -XC14		Reference	Minimum stroke
			Minimum	Maximum	Standard (Center trunnion)	
40	89	97 + Stroke	89.5	96.5 + Stroke	93 + 1/2 stroke	1
50	99	107 + Stroke	99.5	106.5 + Stroke	103 + 1/2 stroke	1
63	103	111 + Stroke	103.5	110.5 + Stroke	107 + 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

Symbol

3 Change of Tie-rod Length -XC15

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	



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.

Tie-rod Length Changeable Range (mm)

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

Series CA2
Made to Order

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

Made to Order

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	

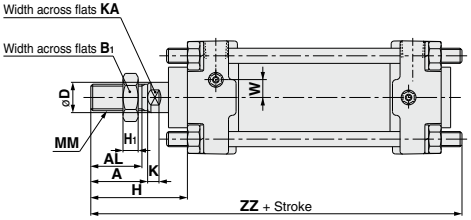
How to Order

CA2 | **Mounting style** | **Bore size** | **–** | **Stroke** | **– XB5**

Oversized rod cylinder

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

Series CA



(mm)

Bore size	A	AL	B1	øD	H	H1	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.

Symbol
-XC3

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

CA2 / CA2W: Mounting style | Bore size | – Stroke – XC3 [A] [C]

- Special port location
- Cushion valve location viewed from the rod side
- Rod port location viewed from the rod side

∗ For port location, refer to the following diagrams and show the symbols of A, B, C and D.

CBA2: Standard model no. – XC3 [A] [C]

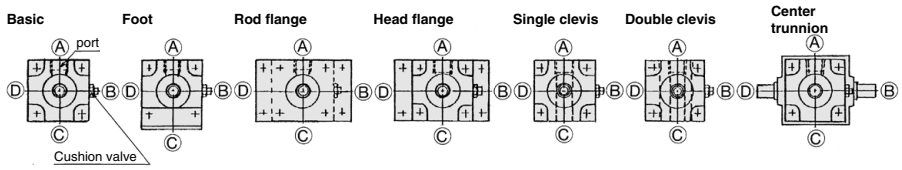
- Special port location
- Cushion valve location viewed from the rod side
- Rod port location viewed from the rod side

∗ For port location, refer to the following diagrams and show the symbols of A, B, C and D.

Specifications: Same as standard type

Relationship between Port Location and Cushion Valve Location

Corresponding symbol of mounting bracket (Positional relationships)



1. 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.
2. 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.
3. The symbol indicated as "-XC3[A][B]" is the standard specification, and there are no part numbers A or B.
4. Those shown above are the same as standard, other than the symbols that indicate the positions of the ports and the cushion valves.

Symbol
-XC4

4 With Heavy Duty Scraper

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

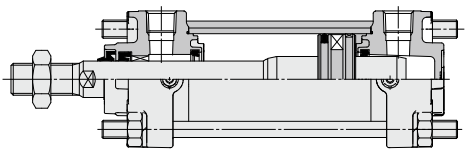
Specifications: Same as standard type

⚠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
5 Heat Resistant Cylinder (–10 to 110°C) -XC5

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.

Symbol
6 Made of Stainless Steel -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

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

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**

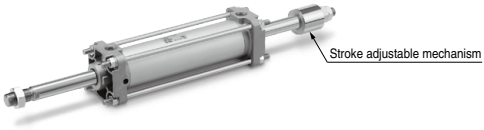
∗ Except head flange and clevis types

Adjustable stroke cylinder/Adjustable extension type

CA2K
CBA2 [Mounting style] [Bore size] – [Stroke] [Suffix] [Stroke adjustment symbol] – **XC8**

∗ Except head flange and clevis types

Adjustable stroke cylinder/Adjustable extension type

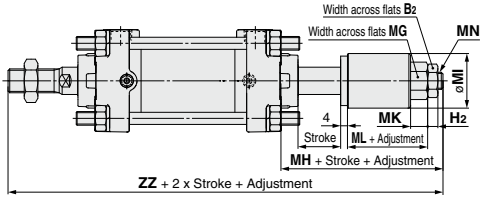


⚠Warning

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.)



(mm)

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

Symbol
-XC9

9 Adjustable Stroke Cylinder/Adjustable Retraction Type

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
CBA2 | Mounting style | Type | Bore size | – | Stroke | Suffix | Stroke adjustment symbol | – **XC9**

∗ Except head flange and clevis types

Adjustable stroke cylinder/Adjustable retraction type

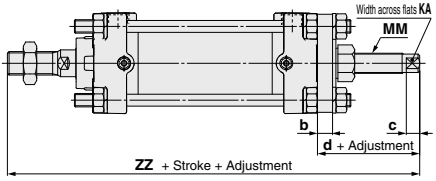
(After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)

⚠Caution

Precautions

1. 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.
2. 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	d	c	b	KA	MM	ZZ
40	44	8	9	11	M16 x 1.5	179
50	42	8	11	11	M16 x 1.5	190
63	48	8	11	14	M20 x 1.5	204
80	55	10	15	19	M24 x 1.5	242
100	57	10	15	19	M24 x 1.5	255

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

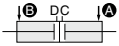
Dual stroke cylinder/Double rod type

CA2K
CBA2 | Mounting style | Type | Bore size | − | Stroke A | Suffix | + | Stroke B | Suffix | − XC10

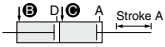
∗ Except clevis and trunnion types

Dual stroke cylinder/Double rod type

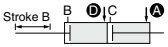
Function



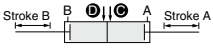
When air pressure is supplied to ports A and B, both strokes A and B retract.



When air pressure is supplied to ports B and C, A out strokes.

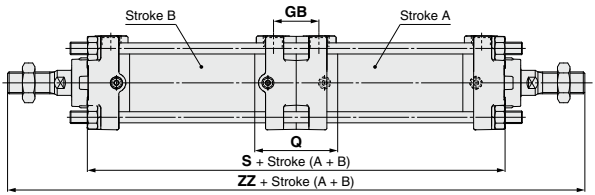


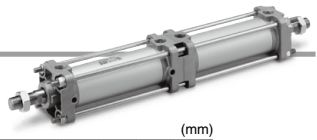
When air pressure is supplied to ports A and D, B out strokes.



When air pressure is supplied to ports C and D, both strokes A and B out strokes.

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





(mm)

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

Symbol
-XC11

11 Dual Stroke Cylinder/Single Rod Type

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

(mm)

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

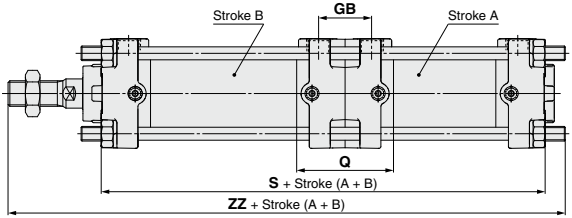
Dual stroke cylinder/Single rod type

CA2K | Mounting style | Type | Bore size | – | Stroke A | Suffix | + | Stroke B-A | Suffix | – XC11

∗ Except trunnion type

Dual stroke cylinder/Single rod type

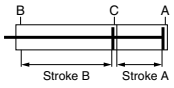
Dimensions (Dimensions other than below are the same as standard type.)



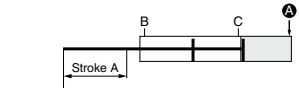
(mm)

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

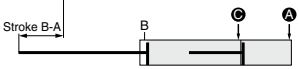
Functional description of dual stroke cylinder



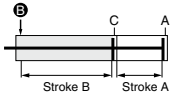
1) Initial state
(0 stroke position)



2) 1st stage
(Stroke A operation)
When the air pressure is supplied from the A port, the rod operates the stroke A.

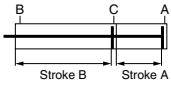


3) 2nd stage
(Stroke B-A operation)
Following the 1st stage, when the air pressure is supplied from the C port, the rod operates the stroke B-A.



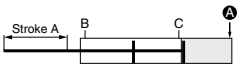
4) Cylinder retraction
When the air pressure is supplied from the B port, the rod retracts completely.

Stroke A or Stroke B operation can be made individually.

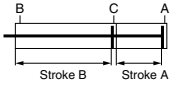


Stroke A operation

1) Initial state
(0 stroke position)

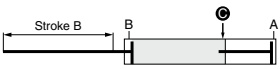


2) Operation
When the air pressure is supplied from the A port, the rod operates the stroke A.



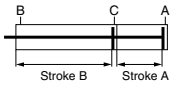
Stroke B operation

1) Initial state
(0 stroke position)

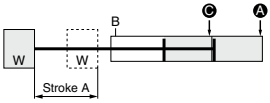


2) Operation
When the air pressure is supplied from the C port, the rod operates the stroke B.

Double output is possible.



1) Initial state
(0 stroke position)



2) Double output
When the air pressure is supplied to the A and C ports at the same time, the double output can be obtained in the stroke A range.

⚠Caution

Precautions

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

Symbol
-XC12

12 Tandem Cylinder

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

Standard model no. – XC12

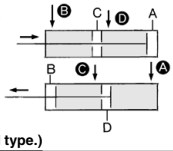
Tandem cylinder

Specifications

(mm)

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

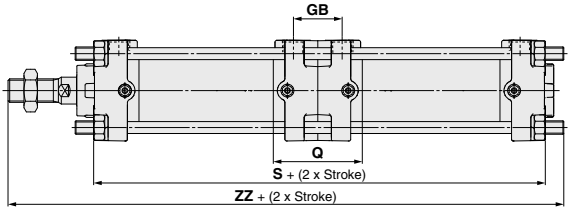
Function



When air pressure is supplied to ports B and D, the output force is doubled in the retract stroke.

When air pressure is supplied to ports A and C, the output force is doubled in the out stroke.

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



(mm)

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

Symbol
-XC22

13 Fluororubber Seal

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

Standard model no. – XC22

Fluororubber seal

Specifications

Seal material	Fluororubber
Ambient temperature range	With auto switch Note 1) : –10°C to 60°C (No freezing) Without auto switch : –10°C to 70°C
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.

Symbol
-XC27

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

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

CA2D / CA2KD / CBA2D – Standard model no. – XC27

Double clevis type

Double clevis pin made of stainless steel

Y – 04D, 05D, 08D, 10D – XC27

Double knuckle joint

Double knuckle joint pin made of stainless steel

CDP – 2A, 3A, 4A, 5A, 6A, 7A – XC27

Clevis pin / Knuckle pin

Clevis pin / Knuckle pin made of stainless steel

Symbol
-XC28

15 Compact Flange Made of SS400

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

CA2
CA2W
CA2K
CA2KW
CBA2

F | **Standard model no.** – **XC28**

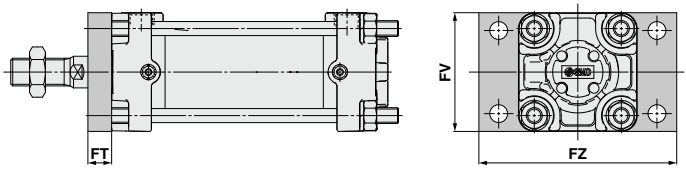
XC28: Compact flange made of SS400

Mounting

F	Rod flange
G	Head flange

Specifications: Same as standard type

Dimensions



(mm)

Bore size	FT	FV	FZ
40	12	60	100
50	12	70	110
63	15	85	130
80	18	102	160
100	18	116	180

∗ 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.)

Symbol
-XC29

16 Double Knuckle Joint with Spring Pin

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	

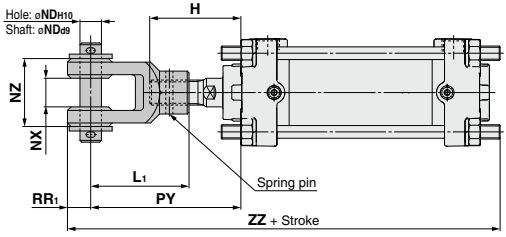
How to Order

Standard model no. – **XC29**

XC29: Double knuckle joint with spring pin

Specifications: Same as standard type

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



(mm)

Bore size	H	L1	øNDd9	øNDH10	NX	NZ	PY	RR1	ZZ
40	51	55	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	84	13	192
50	58	60	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	91	15	207
63	58	60	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	91	15	218
80	71	71	$18^{-0.050}_{-0.093}$	$18^{+0.070}_{0}$	$28^{+0.3}_{+0.1}$	55	105	19	257
100	72	83	$20^{-0.065}_{-0.117}$	$20^{+0.084}_{0}$	$30^{+0.3}_{+0.1}$	61	118	21	282

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

Symbol
17 Rod Trunnion -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	

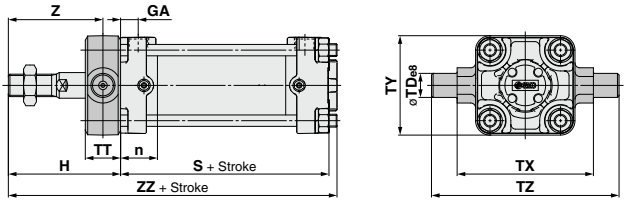
How to Order

CA2 T | Standard model no. | − XC30

T: Trunnion bracket
XC30: Rod trunnion

Specifications: Same as standard type

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



(mm)

Symbol / Bore size	Stroke range	n	GA	H	S	TDe8	TT	TX	TY	TZ	Z	ZZ
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

Symbol
18 With Coil Scraper -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.

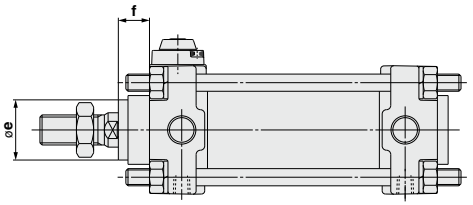
How to Order

Standard model no. | − XC35

XC35: With coil scraper

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

Series CBA2



(mm)

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.

Symbol
-XC65

19 Made of Stainless Steel (Combination of XC7 and 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. – **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

Symbol
-XC68

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

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

Symbol
-XC85

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

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

⚠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.

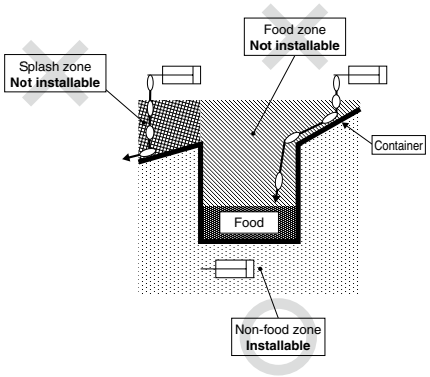
Not installable zone

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.

Symbol
-X1184

22 Cylinder with Heat Resistant Reed Auto Switch (–10 to 120°C)

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

Symbol	Description
Nil	Without switch
B30	D-B30
B30J	D-B30J
B31	D-B31
B31J	D-B31J
B35	D-B35
B35J	D-B35J

Number of switches

Symbol	Description
S	1 pc.
Nil	2 pcs.
n	n pcs.

Cylinder with heat resistant reed auto switch

∗ For details about auto switches, refer to the **WEB catalog** or the Best Pneumatics No. 2.

Specifications

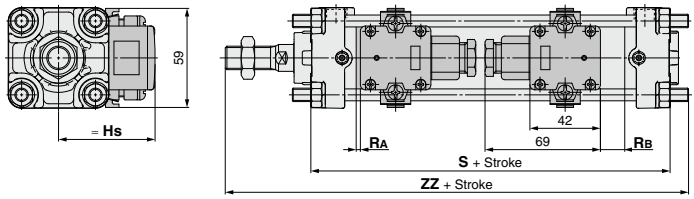
Ambient temperature range	–10°C to 120°C
Seal material	Fluororubber
Grease	Heat resistant grease

⚠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.)



(mm)

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

Series CA2
Specific Product Precautions

Be sure to read this before handling. Refer to page 1574 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. 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

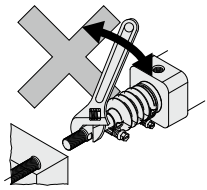
2. Use the air cushion at the end of cylinder stroke.
Otherwise, the tie-rod or piston rod assembly will be damaged.

⚠Caution

1. Do not use a pneumatic type as an air-hydro cylinder. It can cause oil leak.

2. 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.

3. 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

1. 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 (M8 x 1.25, Hexagon nut 3 types)	13	JIS B4636 + Two-angle socket 13	7.4
63	DA00010 (M10 x 1.25, Hexagon nut 3 types)	17	JIS B4636 + Two-angle socket 17	20
80, 100	DA00131 (M12 x 1.75, Hexagon nut 3 types)	19	JIS B4636 + Two-angle socket 19	29

2. Do not replace the bushing.
As the bushing is press-fit, replace the cover assembly when the bushing must be replaced.

3. 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.

4. 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.