Air Cylinder

Series CA2

ø40, ø50, ø63, ø80, ø100

1 5 to 15% reduction in weight

By the adoption of die-cast cover, this model is 5 to 15% lighter than Series CA1.

2 Improved cushion capacity

Floating seal mechanism prevents shoot-out phenomenon due to cracking pressure at start-up.

3 Easy cushion valve adjustment

Use of a hexagon wrench key in cushion valve adjustment makes fine adjustment easy. The cushion valve does not protrude from the surface of the cover.

4 Able to absorb 30% more kinetic energy at the maximum.

With increased cushion volume and the adoption of a new cushion seal, this model, compared with Series CA1, is able to absorb 30% more kinetic energy at the maximum. The cushion seal has five times as long a service life.

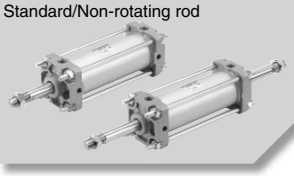
5 Piston rod deflection reduced by 5 to 10%

Piston rod deflection is reduced by the improved accuracy of bushing and piston rod, which minimizes the clearance between these components.

6 Mounting dimensions are the same as those of Series CA1.

7 NPT thread and G thread are standardized.

Series Variations

Series	Action	Type		Basic Built-in magnet	Standard variations: With rod boot	Standard variations: Clean Series	Standard variations: Copper-free	Bore size (mm)
Series CA2 Standard 	Double acting	Single rod **Series CA2**	Non-lube	●	● (For ø40 and ø63 only)	●	●	**40, 50, 63, 80, 100**
		Double rod **Series CA2W**	Non-lube	●	●	●	●	
Series CA2K Standard/Non-rotating rod 	Double acting	Single rod **Series CA2K**	Non-lube	●	●	●	●	**40, 50, 63**
		Double rod **Series CA2KW**	Non-lube	●	●	●	●	
Series CA2□Q Low friction 	Double acting	Single rod **Series CA2□Q**	Non-lube	●	●	●	●	**40, 50, 63, 80, 100**
Series CBA2 End lock 	Double acting	Single rod **Series CBA2**	Non-lube	●	●	●	●	**40, 50, 63, 80, 100**
Series CA2□H Air-hydro 	Double acting	Single rod **Series CA2□H**	Air-hydro	●	●	●	●	**40, 50, 63, 80, 100**
		Double rod **Series CA2□WH**	Air-hydro	●	●	●	●	

Air Cylinder: Standard Type
Double Acting, Single Rod
Series CA2
ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch CA2 L ☐ 50 ☐ – 100 JN

With auto switch CDA2 L 50 ☐ – 100 JN – Y7BW ☐

Number of auto switches

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

With auto switch

Mounting style

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

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Y59□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Cylinder suffix

Rod boot	Nil	Without
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	Nil	With cushion on both sides
	N	Without cushion

* When more than one symbol is to be specified, indicate them in alphabetical order.

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2L40-100

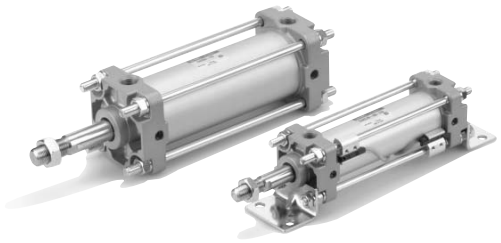
Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Tie-rod mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**Z76**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**Z73**	●	●	●	—	—	Relay, PLC
							100 V, 200 V	**A54**	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7P**	●	●	○	○		
				2-wire	—	—	100 V, 200 V	**J51**	●	●	○	—	—	
					24 V	12 V	—	**Y59B**	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**Y7NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**Y7PW**	●	●	○	○		
				2-wire		12 V		**Y7BW**	●	●	○	○	—	
	Water resistant (2-color indication)							**Y7BA**	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		**P5DW**	—	●	●	○	—	

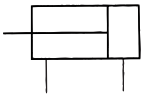
* Lead wire length symbols: 0.5 m ····· Ni (Example) A54
3 m ····· L (Example) A54L
5 m ····· Z (Example) A54Z

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

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.



JIS symbol
Double acting type



Specifications

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* With auto switch: –10 to 60°C*
Minimum operating pressure	0.05 MPa
Piston speed	50 to 500 mm/s★
Cushion	Air cushion
Thread tolerance	JIS Class 2
Stroke length tolerance	To 250st: $^{+1.0}_{0}$ 251 to 1000st: $^{+1.4}_{0}$ 1001 to 1500st: $^{+1.8}_{0}$
Lubrication	Not required (Non-lube)
Mounting	Basic style, Foot style, Rod side flange style Head side flange style, Single clevis style, Double clevis style Center trunnion style

∗ With no freezing. ★ Operate within the range of absorbing kinetic energy. (Refer to page 6-8-4.)

Standard Stroke

In case of a type with auto switch, please also refer to the table of minimum auto switch mounting strokes on page 6-8-14.

Bore size (mm)	Standard stroke (mm)*	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, 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

∗ 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.

Accessory

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

Made to Order Specifications

For details, please refer to page 6-8-63.

Symbol	Specifications
-XA□	Change of rod end shape
-XB5	Oversized rod
-XB6	Heat resistant (150°C)
-XC3	Special port positions
-XC4	With heavy duty scraper
-XC5	Heat resistant (110°C)
-XC6	Piston rod and rod end nut made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC8	Adjustable stroke/Extension
-XC9	Adjustable stroke/Retraction
-XC10	Dual stroke/Double rod
-XC11	Dual stroke/Single rod
-XC12	Tandem type
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluoro rubber seal
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC28	Compact flange made of SS400
-XC29	Double knuckle joint with spring pin
-XC30	Front trunnion
-XC35	With coil scraper
-XC58	Water resistant/Built-in hard plastic magnet
-XC59	Fluoro rubber seal/Built-in hard plastic magnet

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder. In particular, the center trunnion style needs careful attention. (For more information, refer to page 6-8-14.)

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)			40	50	63	80	100
Basic weight	Basic style	Aluminum tube	0.86	1.29	1.84	3.10	4.18
		Steel tube	0.92	1.35	1.93	3.30	4.45
	Axial foot style	Aluminum tube	1.05	1.51	2.18	3.77	5.17
		Steel tube	1.11	1.57	2.27	3.97	5.44
	Flange style	Aluminum tube	1.23	1.74	2.63	4.55	6.10
		Steel tube	1.29	1.80	2.72	4.75	6.37
	Single clevis style	Aluminum tube	1.09	1.63	2.47	4.21	5.96
		Steel tube	1.15	1.69	2.56	4.41	6.23
	Single clevis style	Aluminum tube	1.13	1.72	2.63	4.50	6.48
		Steel tube	1.19	1.78	2.72	4.70	6.75
	Trunnion style	Aluminum tube	1.22	1.77	2.64	4.65	6.46
		Steel tube	1.28	1.83	2.73	4.85	6.73
Add'l weight by each 50 mm stroke	All mounting brackets	Aluminum tube	0.20	0.25	0.31	0.46	0.58
		Steel tube	0.28	0.35	0.43	0.70	0.87
Accessory	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) CA2L40-100 (Axial foot style, ø40, 100 st)
- Basic weight····· 1.05 kg
- Additional weight····· 0.20/50 st
- Cylinder stroke····· 100 st

1.05 + 0.20 x 100 / 50 = 1.45 kg

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A5□/A6□ **D-A59W** **D-F5□/J5□** **D-F5□W/J59W** **D-F5□F/F5NTL**	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44 *** **D-G39/K39** ***	BDS-04M	BDS-05M	BMBI-063	BMBI-080	BMBI-100
D-B5□/B64 *** **D-B59W** *** **D-G5□/K59** *** **D-G5□W/K59W** *** **D-G59F** *** **D-G5NTL** ***	BH2-040	BA5-050	BAF-06	BAF-08	BAF-10
D-A3□C/A44C * **D-G39C/K39C** *	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 **D-Y59□/Y69□** **D-Y7P/Y7PV** **D-Y7□W** **D-Y7□WV** **D-Y7BAL**	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P5DWL	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080

* Mounting brackets are attached to models D-A3□C/A44C/G39C/K39C.
When placing an order, indicate one of the following part numbers according to the cylinder size.
(Example) ø40····D-A3□C-4, ø63····D-A3□C-6, ø100····D-A3□C-10
ø50····D-A3□C-5, ø80····D-A3□C-8
When other brackets are ordered separately, order by the above part numbers.

** Stainless steel mounting screw kit
The following stainless steel mounting screw kits (including set screws) are available if the operating environment requires. (The mounting bracket and band are not included and must be ordered separately.)
BBA1: D-A5/A6/F5/J5
BBA3: D-B5/B6/G5/K5
When a switch model D-F5BAL or G5BAL is mounted on the cylinder at the time of shipment, the above stainless steel screws are used. When the switch is shipped alone, BBA1 or BBA3 is attached.

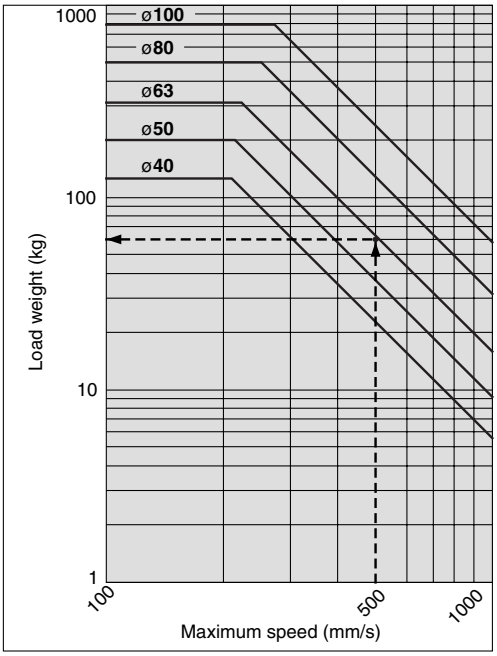
*** **Series CDA2 models vary in the thickness of the cylinder tube wall. In cases where the band mount type is used as an applicable auto switch, select the part number of the new band referring to page 6-8-71 whenever the cylinder model is changed.**

Mounting Bracket

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, two pieces should be ordered for each cylinder.
** Double clevis type is packed with clevis pin, flat washer and cotter pin.

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 weight 60 kg.

Clean Series

10 – CA2 | **Mounting** | **Bore size** | **Stroke** | **Suffix**

10: Clean Series with relief port

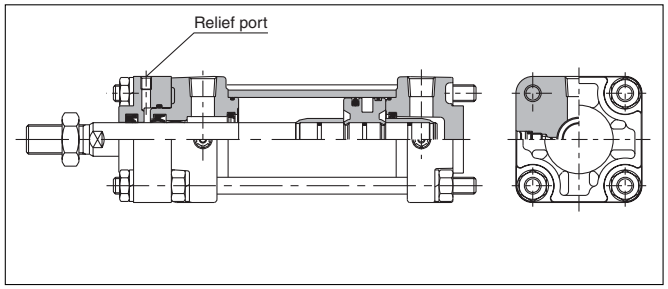
This cylinder can be operated in a class 100 clean room. The rod portion of the actuator has a double seal construction and a relief port is provided to discharge the exhaust air directly outside of the clean room.

Specifications

Action	Double acting, Single rod
Bore size (mm)	40, 50, 63
Maximum operating pressure	1 MPa
Minimum operating pressure	0.05 MPa
Cushion	Air cushion
Piping	Screw-in piping
Relief port size	M5 x 0.8
Piston speed	50 to 500 mm/s★
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style

∗ Auto switch capable
★ Operate within the range of absorbable kinetic energy. (Refer to page 6-8-4.)

Construction



Copper-free (Applicable to CRT production)

20 – CA2 | **Mounting** | **Bore size** | **Stroke** | **Suffix**

20: Copper-free

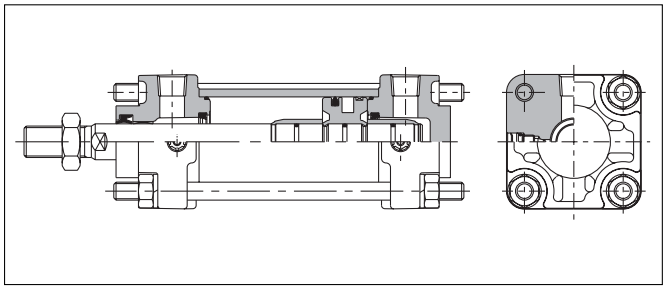
To eliminate any influences of copper ions or fluororesin on color CRTs, copper materials have been nickel plated or replaced with non-copper materials, thus preventing the generation of copperions.

Specifications

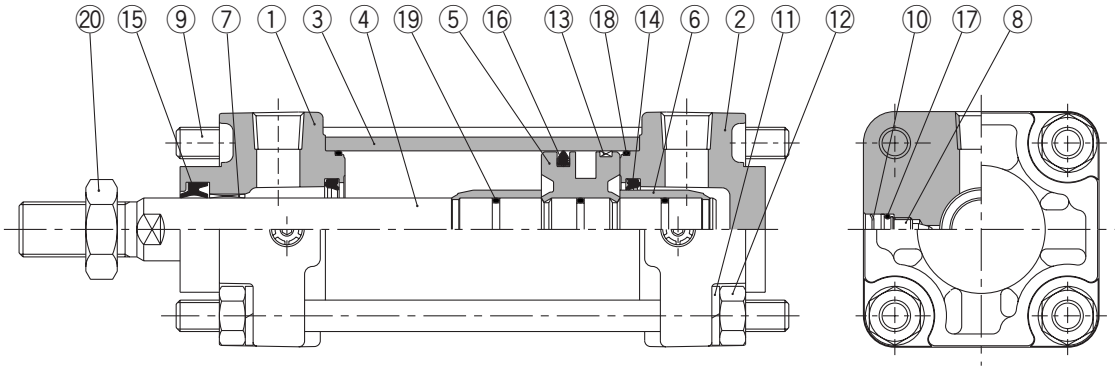
Action	Double acting, Single rod
Bore size (mm)	40, 50, 63, 80, 100
Maximum operating pressure	1 MPa
Minimum operating pressure	0.05 MPa
Cushion	Air cushion
Piping	Screw-in piping
Piston speed	50 to 500 mm/s★
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

∗ Auto switch capable
★ Operate within the range of absorbable kinetic energy. (Refer to page 6-8-4.)

Construction



Construction



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 rod	Carbon steel	Hard chromium electroplated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring	Brass	
⑦	Bushing	Lead-bronze casted	
⑧	Cushion valve	Steel wire	Nickel plated
⑨	Tie-rod	Carbon steel	Corrosion resistant chromated
⑩	Snap ring	Spring steel	
⑪	Spring washer	Steel wire	Chromated
⑫	Tie-rod nut	Rolled steel	Nickel plated
⑬	Wear ring	Resin	
⑭	Cushion seal	Urethane	
⑮	Rod seal	NBR	
⑯	Piston seal	NBR	
⑰	Cushion valve seal	NBR	
⑱	Cylinder tube gasket	NBR	
⑲	Piston gasket	NBR	O-ring
⑳	Rod end nut	Rolled steel	Nickel plated

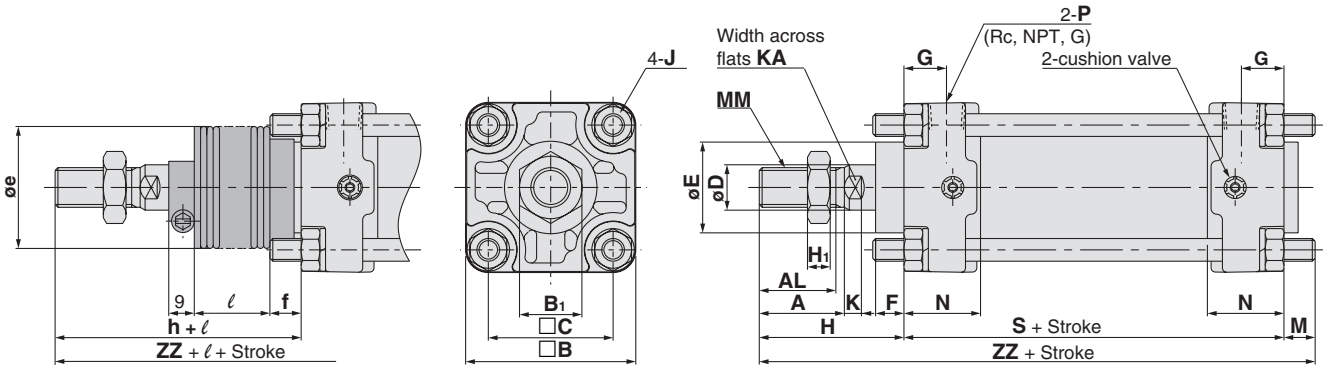
Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
	Air cylinder	
40	MB40-PS	Consists of numbers ⑭, ⑮, ⑯, and ⑱ above.
50	MB50-PS	
63	MB63-PS	
80	MB80-PS	
100	MB100-PS	

* The seal kits consist of items ⑭, ⑮, ⑯, and ⑱. Please order them by using the seal kit number corresponding to each bore size.

Basic Style: CA2B

With rod boot

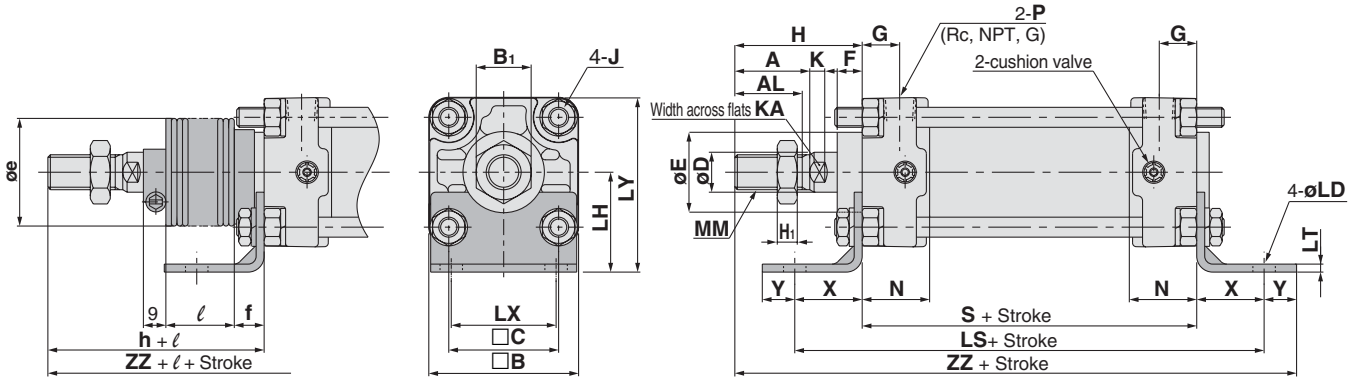


Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	D	E	F	G	H_1	J	K	KA	M	MM	N	P
	Without rod boot	With rod boot																	
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2

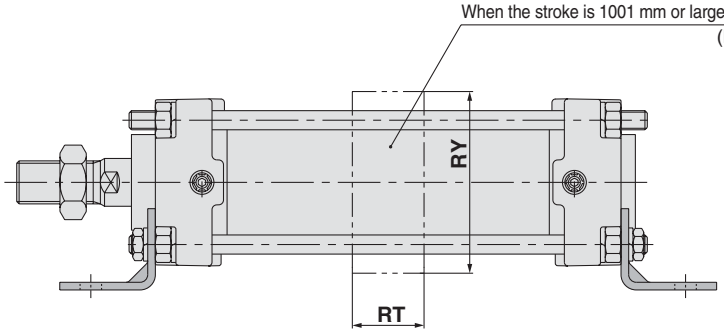
Bore size (mm)	S	Without rod boot		With rod boot				
		H	ZZ	e	f	h	ℓ	ZZ
40	84	51	146	43	11.2	59	1/4 stroke	154
50	90	58	159	52	11.2	66	1/4 stroke	167
63	98	58	170	52	11.2	66	1/4 stroke	178
80	116	71	204	65	12.5	80	1/4 stroke	213
100	126	72	215	65	14	81	1/4 stroke	224

Axial Foot Style: CA2L

With rod boot



Long stroke



For Long Stroke

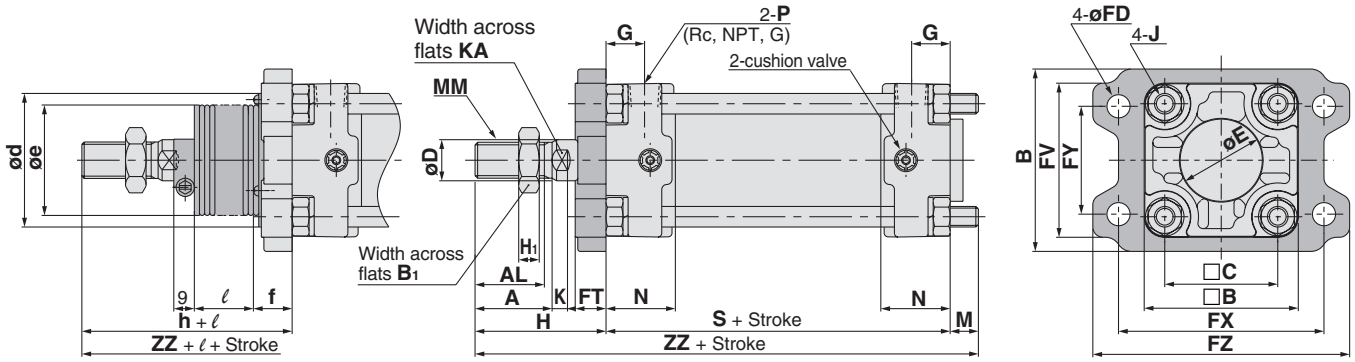
Bore size (mm)	Stroke range (mm)	RT	RY
40	501 to 800	—	—
50	601 to 1000	—	—
	1001 to 1200	30	76
63	601 to 1000	—	—
	1001 to 1200	40	92
80	751 to 1000	—	—
	1001 to 1400	45	112
100	751 to 1000	—	—
	1001 to 1500	50	136

Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	D	E	F	G	H_1	J	K	KA	LD	LH	LS	LT
	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	9.0	40	138	3.2
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9.0	45	144	3.2
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	13.5	65	204	4.5
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	13.5	75	212	6.0

Bore size (mm)	LX	LY	MM	N	P	S	X	Y	Without rod boot		With rod boot				
									H	ZZ	e	f	n	ℓ	ZZ
40	42	70	M14 x 1.5	27	1/4	84	27	13	51	175	43	11.2	59	1/4 stroke	183
50	50	80	M18 x 1.5	30	3/8	90	27	13	58	188	52	11.2	66	1/4 stroke	196
63	59	93	M18 x 1.5	31	3/8	98	34	16	58	206	52	11.2	66	1/4 stroke	214
80	76	116	M22 x 1.5	37	1/2	116	44	16	71	247	65	12.5	80	1/4 stroke	256
100	92	133	M26 x 1.5	40	1/2	126	43	17	72	258	65	14.0	81	1/4 stroke	267

Rod Side Flange Style: CA2F

With rod boot



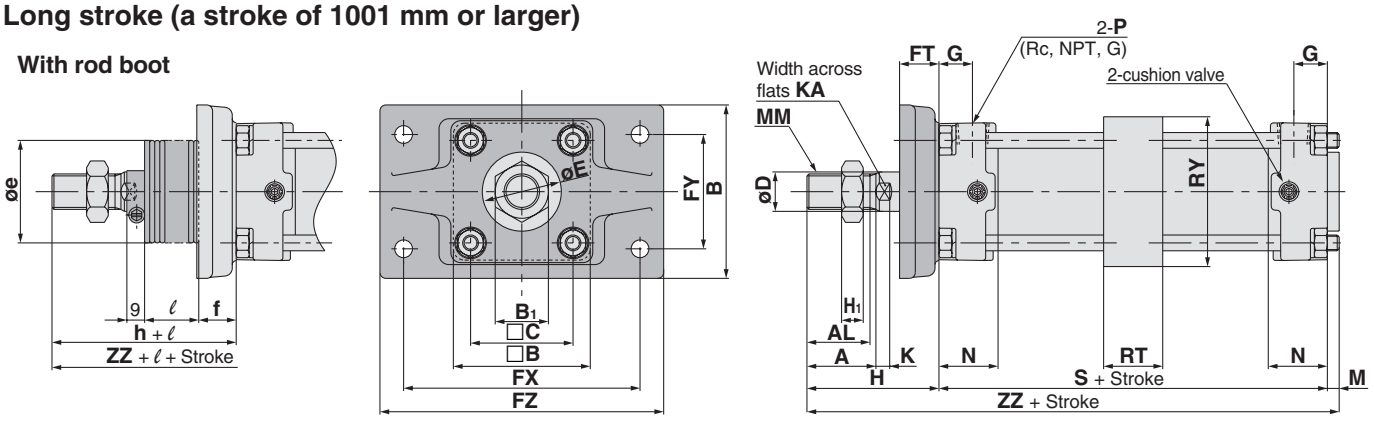
Bore size (mm)	Stroke range (mm)		Long stroke range (mm)	A	AL	B	□B	B_1	□C	D	E	FV	FD	FT	FX	FY	FZ	G	H_1	J
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	501 to 800	30	27	71	60	22	44	16	32	60	9.0	12	80	42	100	15	8	M8 x 1.25
50	up to 600	20 to 600	601 to 1000	35	32	81	70	27	52	20	40	70	9.0	12	90	50	110	17	11	M8 x 1.25
63	up to 600	20 to 600	601 to 1000	35	32	101	85	27	64	20	40	86	11.5	15	105	59	130	17	11	M10 x 1.25
80	up to 750	20 to 750	751 to 1000	40	37	119	102	32	78	25	52	102	13.5	18	130	76	160	21	13	M12 x 1.75
100	up to 750	20 to 750	751 to 1000	40	37	133	116	41	92	30	52	116	13.5	18	150	92	180	21	16	M12 x 1.75

Bore size (mm)	K	KA	M	MM	N	P	S	Without rod boot		With rod boot					
								H	ZZ	d*	e	f	h	ℓ	ZZ
40	6	14	11	M14 x 1.5	27	1/4	84	51	146	52	43	15	59	1/4 stroke	154
50	7	18	11	M18 x 1.5	30	3/8	90	58	159	58	52	15	66	1/4 stroke	167
63	7	18	14	M18 x 1.5	31	3/8	98	58	170	58	52	17.5	66	1/4 stroke	178
80	10	22	17	M22 x 1.5	37	1/2	116	71	204	80	65	21.5	80	1/4 stroke	213
100	10	26	17	M26 x 1.5	40	1/2	126	72	215	80	65	21.5	81	1/4 stroke	224

★If a hole is provided to accommodate the rod boot when the air cylinder is mounted, make the hole diameter larger than the outside diameter of the rod boot mounting bracket ød.

Long stroke (a stroke of 1001 mm or larger)

With rod boot



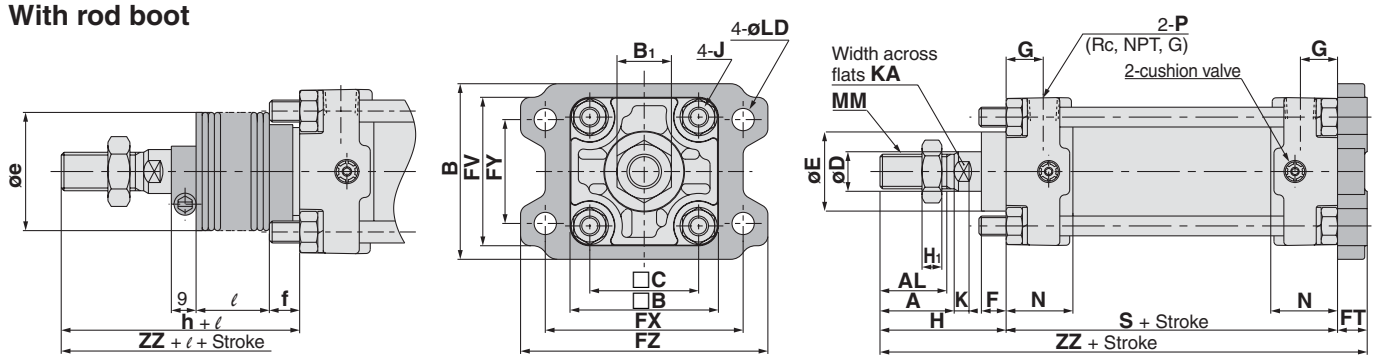
Bore size (mm)	Stroke range (mm)	A	AL	B	ℓB	B_1	ℓC	D	E	FD	FT	FX	FY	FZ	G	H_1	J	K	KA
50	1001 to 1200	35	32	88	70	27	52	20	40	9.0	20	120	58	144	17	11	M8 x 1.25	7	18
63	1001 to 1200	35	32	105	85	27	64	20	40	11.5	23	140	64	170	17	11	M10 x 1.25	7	18
80	1001 to 1400	40	37	124	102	32	78	25	52	13.5	28	164	84	198	21	13	M12 x 1.75	10	22
100	1001 to 1500	40	37	140	116	41	92	30	52	13.5	29	180	100	220	21	16	M12 x 1.75	10	26

Bore size (mm)	M	MM	N	P	RT	RY	S	Without rod boot		With rod boot				
								H	ZZ	e*	f	h	ℓ	ZZ
50	6	M18 x 1.5	30	3/8	30	76	90	67	163	52	19	66	1/4 stroke	162
63	10	M18 x 1.5	31	3/8	40	92	98	71	179	52	19	66	1/4 stroke	174
80	12	M22 x 1.5	37	1/2	45	112	116	87	215	65	21	80	1/4 stroke	208
100	12	M26 x 1.5	40	1/2	50	136	126	89	227	65	21	81	1/4 stroke	219

★If a hole is provided to accommodate the rod boot when the air cylinder is mounted, make the hole diameter larger than the outside diameter of the rod boot øe.

Head Side Flange Style: CA2G

With rod boot

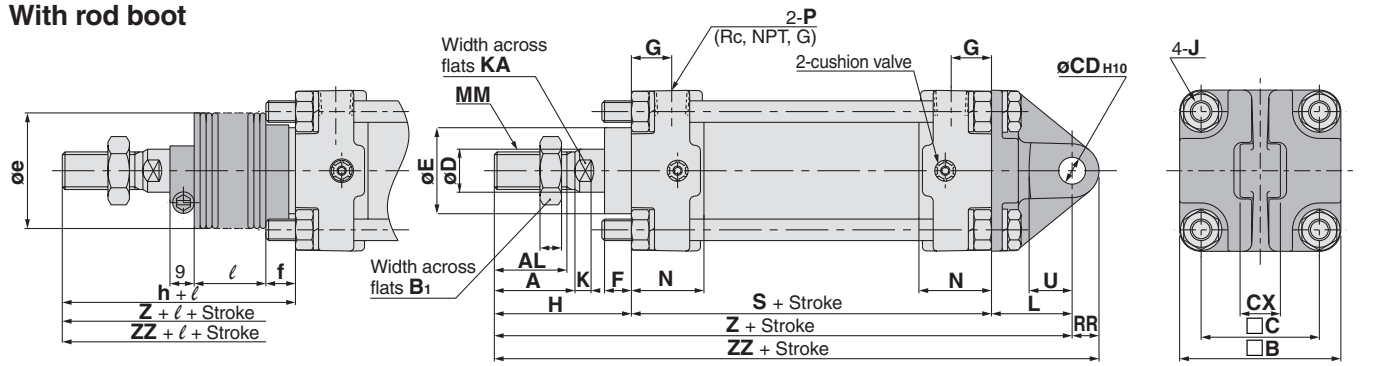


Bore size (mm)	Stroke range (mm)		A	AL	B	□B	B_1	□C	D	E	F	FV	FD	FT	FX	FY	FZ	G	H_1	J
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	30	27	71	60	22	44	16	32	10	60	9.0	12	80	42	100	15	8	M8 x 1.25
50	up to 600	20 to 600	35	32	81	70	27	52	20	40	10	70	9.0	12	90	50	110	17	11	M8 x 1.25
63	up to 600	20 to 600	35	32	101	85	27	64	20	40	10	86	11.5	15	105	59	130	17	11	M10 x 1.25
80	up to 750	20 to 750	40	37	119	102	32	78	25	52	14	102	13.5	18	130	76	160	21	13	M12 x 1.75
100	up to 750	20 to 750	40	37	133	116	41	92	30	52	14	116	13.5	18	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	e	f	h	ℓ	ZZ
40	6	14	M14 x 1.5	27	1/4	84	51	147	43	11.2	59	1/4 stroke	155
50	7	18	M18 x 1.5	30	3/8	90	58	160	52	11.2	66	1/4 stroke	168
63	7	18	M18 x 1.5	31	3/8	98	58	171	52	11.2	66	1/4 stroke	179
80	10	22	M22 x 1.5	37	1/2	116	71	205	65	12.5	80	1/4 stroke	214
100	10	26	M26 x 1.5	40	1/2	126	72	216	65	14.0	81	1/4 stroke	225

Single Clevis Style: CA2C

With rod boot

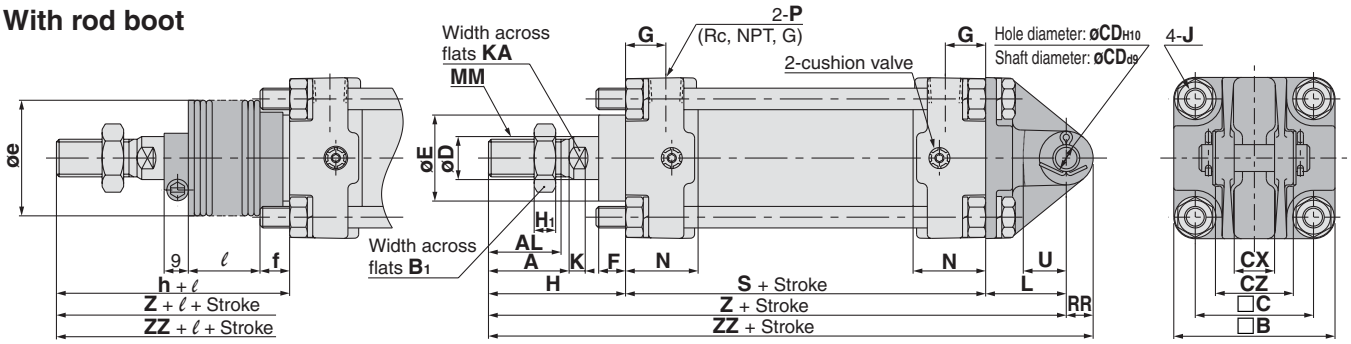


Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	CD^{H10}	CX	D	E	F	G	H_1	J	K	KA
	Without rod boot	With rod boot															
40	up to 500	20 to 500	30	27	60	22	44	$10^{+0.058}_{0}$	$15.0^{-0.1}_{-0.3}$	16	32	10	15	8	M8 x 1.25	6	14
50	up to 600	20 to 600	35	32	70	27	52	$12^{+0.070}_{0}$	$18.0^{-0.1}_{-0.3}$	20	40	10	17	11	M8 x 1.25	7	18
63	up to 600	20 to 600	35	32	85	27	64	$16^{+0.070}_{0}$	$25.0^{-0.1}_{-0.3}$	20	40	10	17	11	M10 x 1.25	7	18
80	up to 750	20 to 750	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
100	up to 750	20 to 750	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

Bore size (mm)	L	MM	N	P	RR	S	U	Without rod boot			With rod boot					
								H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	51	165	175	43	11.2	59	1/4 stroke	173	183
50	35	M18 x 1.5	30	3/8	12	90	19	58	183	195	52	11.2	66	1/4 stroke	191	203
63	40	M18 x 1.5	31	3/8	16	98	23	58	196	212	52	11.2	66	1/4 stroke	204	220
80	48	M22 x 1.5	37	1/2	20	116	28	71	235	255	65	12.5	80	1/4 stroke	244	264
100	58	M26 x 1.5	40	1/2	25	126	36	72	256	281	65	14.0	81	1/4 stroke	265	290

Double Clevis Style: CA2D

With rod boot



∗ Double clevis and double knuckle joint types are packed with pins and snap rings.

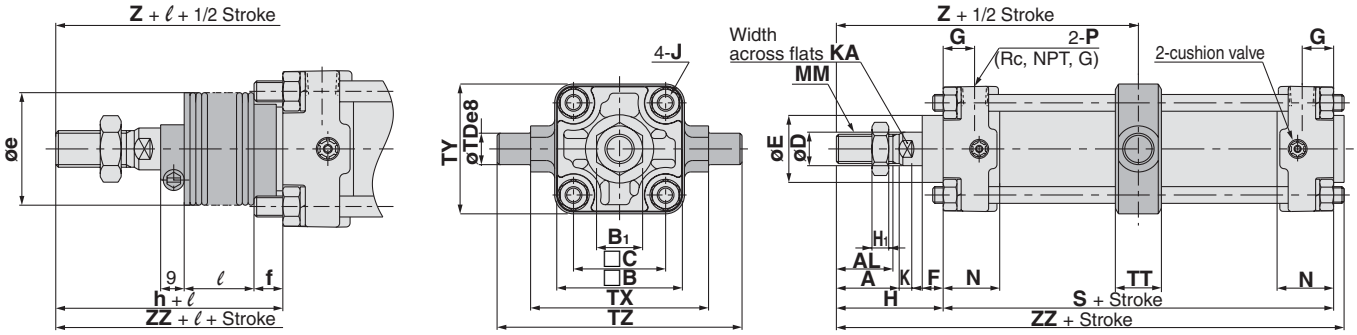
Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	CD	CX	CZ	D	E	F	G	H_1	J	K	KA
	Without rod boot	With rod boot																
40	up to 500	20 to 500	30	27	60	22	44	$10_{0}^{+0.058}$	$15.0_{+0.1}^{+0.3}$	29.5	16	32	10	15	8	M8 x 1.25	6	14
50	up to 600	20 to 600	35	32	70	27	52	$12_{0}^{+0.070}$	$18.0_{+0.1}^{+0.3}$	38	20	40	10	17	11	M8 x 1.25	7	18
63	up to 600	20 to 600	35	32	85	27	64	$16_{0}^{+0.070}$	$25.0_{+0.1}^{+0.3}$	49	20	40	10	17	11	M10 x 1.25	7	18
80	up to 750	20 to 750	40	37	102	32	78	$20_{0}^{+0.084}$	$31.5_{+0.1}^{+0.3}$	61	25	52	14	21	13	M12 x 1.75	10	22
100	up to 750	20 to 750	40	37	116	41	92	$25_{0}^{+0.084}$	$35.5_{+0.1}^{+0.3}$	64	30	52	14	21	16	M12 x 1.75	10	26

Bore size (mm)	L	MM	N	P	RR	S	U	Without rod boot			With rod boot					
								H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	51	165	175	43	11.2	59	1/4 stroke	173	183
50	35	M18 x 1.5	30	3/8	12	90	19	58	183	195	52	11.2	66	1/4 stroke	191	203
63	40	M18 x 1.5	31	3/8	16	98	23	58	196	212	52	11.2	66	1/4 stroke	204	220
80	48	M22 x 1.5	37	1/2	20	116	28	71	235	255	65	12.5	80	1/4 stroke	244	264
100	58	M26 x 1.5	40	1/2	25	126	36	72	256	281	65	14.0	81	1/4 stroke	265	290

∗ Packed with clevis pin, flat washer and cotter pin.

Center Trunnion Style: CA2T

With rod boot



Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	D	E	F	G	H_1	J	K	KA	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	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	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	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	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	M26 x 1.5	40	1/2

Bore size (mm)	S	TDe8	TT	TX	TY	TZ	Without rod boot			With rod boot					
							H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	84	$15_{-0.059}^{-0.032}$	22	85	62	117	51	93	140	43	11.2	59	1/4 stroke	101	148
50	90	$15_{-0.059}^{-0.032}$	22	95	74	127	58	103	154	52	11.2	66	1/4 stroke	111	162
63	98	$18_{-0.059}^{-0.032}$	28	110	90	148	58	107	162	52	11.2	66	1/4 stroke	115	170
80	116	$25_{-0.073}^{-0.040}$	34	140	110	192	71	129	194	65	12.5	80	1/4 stroke	138	203
100	126	$25_{-0.073}^{-0.040}$	40	162	130	214	72	135	206	65	14.0	81	1/4 stroke	144	215

Trunnion and Double Clevis Mounting Bracket

• Strength is the same as cylinder brackets.

Applicable Series

Bracket type	Applicable series
Trunnion mounting bracket	CA2, CA2W, CA2WK CA2K, CA2Q, CBA2
Double clevis bracket	CA2, CA2K, CA2Q, CBA2

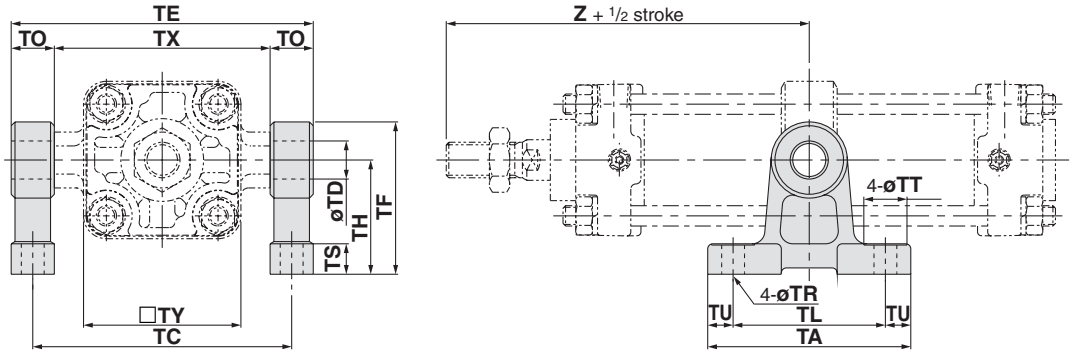
∗ Please confirm SMC at the time of mounting.

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

Note) 1. The above brackets cannot be specified in the part number of the cylinder.
2. They must be ordered separately from the cylinder.
3. When the trunnion brackets are specified, two pieces should be ordered for each cylinder.

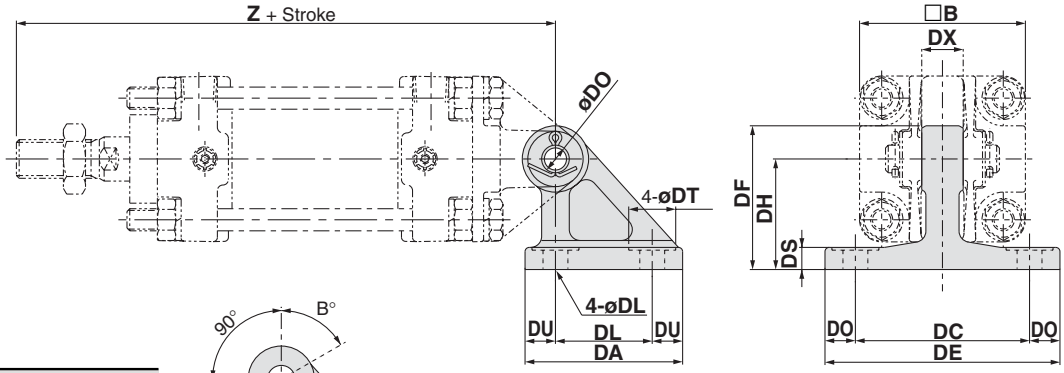
Trunnion bracket
Material: Cast iron

∗ This assembly drawing is provided as a reference. The trunnion bracket must be ordered separately.



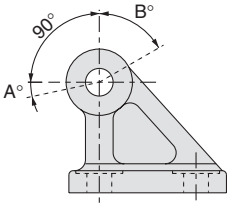
Part no.	Bore size (mm)	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	TY	Z	TD-H10 (Hole)
CA2-S04	40	80	60	10	102	85	119	17	9	17	12	45	60	62	93	$15^{+0.070}_{0}$
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	103	$15^{+0.070}_{0}$
CA2-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	107	$18^{+0.070}_{0}$
MB-S10	80	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 bracket
Material: Cast iron



Rotation

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



Note) This assembly drawing is provided as a reference. The trunnion bracket must be ordered separately.

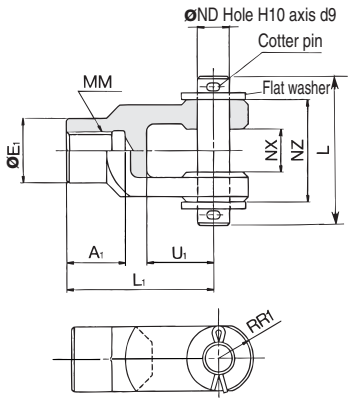
Part no.	Bore size (mm)	DA	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	DF	B	Z	DDH10 (Hole)
CA2-B04	40	57	35	11	65	15	85	10	9	17	8	40	52	60	165	$10^{+0.058}_{0}$
CA2-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	183	$12^{+0.070}_{0}$
CA2-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	196	$16^{+0.070}_{0}$
CA2-B08	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	$25^{+0.084}_{0}$

∗ Double clevis and double knuckle joint types are packed with pins and snap rings.

(Common to *Series CA2)*
Accessory Dimensions

Y Type Double Knuckle Joint

* Double clevis and double knuckle joint types are packed with pins and snap rings.

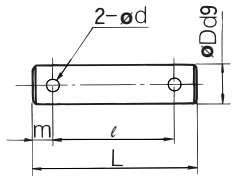


Material: Cast iron

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

* Knuckle pin, cotter pin and flat washer are included.

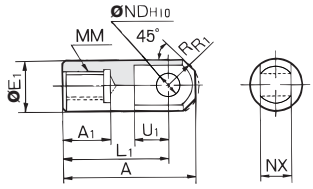
Clevis Pin/Knuckle Pin



Material: Carbon steel

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

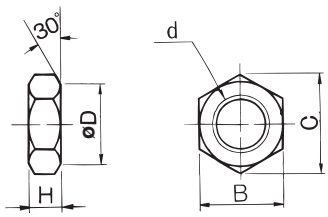
I Type Single Knuckle Joint



Material: Free cutting sulfur steel

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	R1	U1	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 option)



Material: Rolled steel

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

Minimum Auto Switch Mounting Stroke

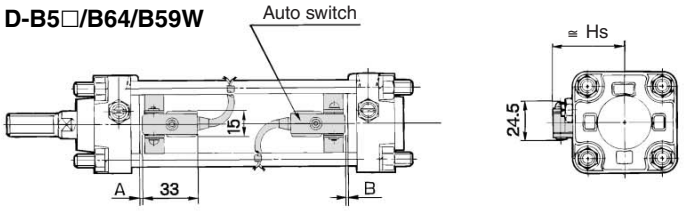
n: Number of auto switches

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

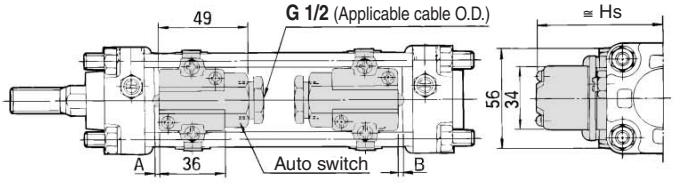
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mount type>

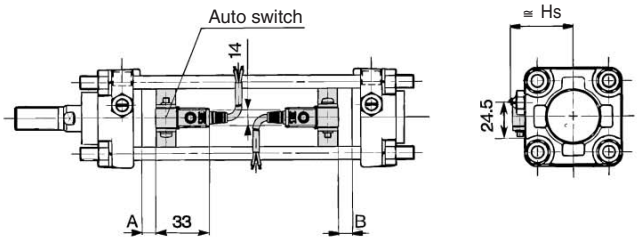
D-B5□/B64/B59W



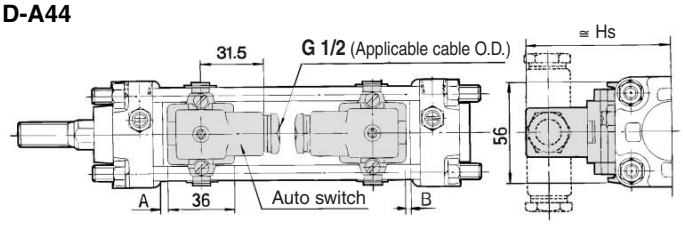
D-A3□
D-G39/K39



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

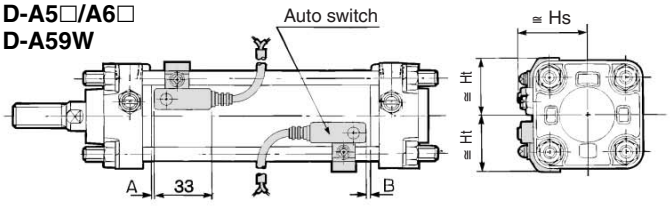


D-A44

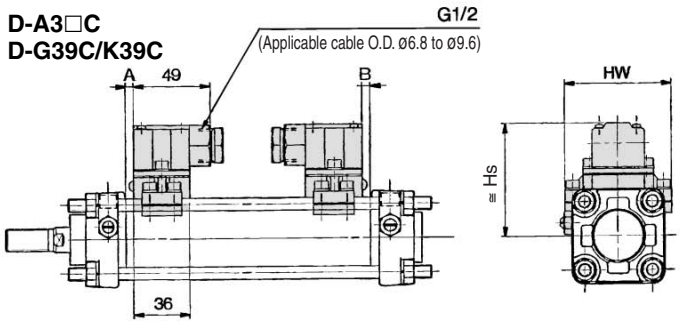


<Tie-rod mount type>

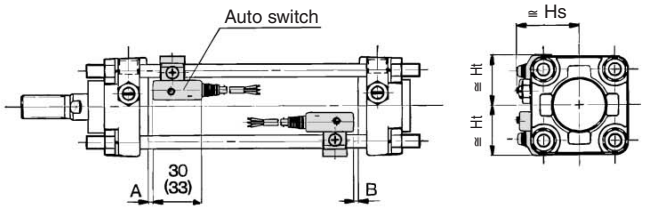
D-A5□/A6□
D-A59W



D-A3□C
D-G39C/K39C

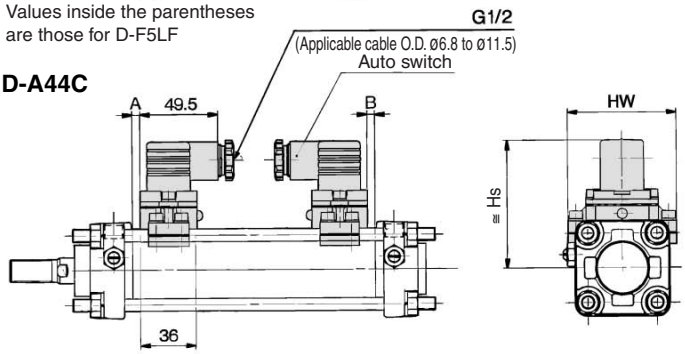


D-F5□/J5□
D-F5NTL
D-F5□W/J59W
D-F5BAL/F59F



Values inside the parentheses are those for D-F5LF

D-A44C



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-A5□/A6□ D-A3□/ A3□C D-A44/ A44C D-G39/ G39C D-K39/ K39C		D-B5□ D-B64		D-B59W		D-F5□ D-J5□ D-F59F D-F5□W D-J59W D-F5BAL		D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F		D-A59W		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	0	0	0.5	0	3.5	1.5	6.5	4.5	2	0	4	2	11.5	9.5
50	0	0	0.5	0	3.5	1.5	6.5	4.5	2	0	4	2	11.5	9.5
63	2.5	1.5	3	2	6	5	9	8	4.5	3.5	6.5	5.5	14	13
80	6	4	6.5	4.5	9.5	7.5	4.5	12.5	8	6	10	8	17.5	15.5
100	7.5	6.5	8	7	11	10	14	13	9.5	8.5	11.5	10.5	19	18

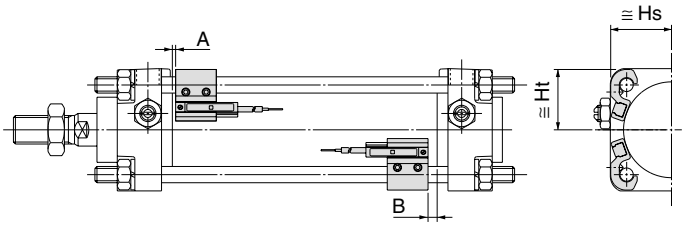
Auto Switch Mounting Height

D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F	D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C	
Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw
37	71.5	81.5	38.5	31.5	38	31.5	73	69	81	69
42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77
49	83.5	93.5	46.5	43	47	43	85.5	91	93.5	91
57.5	92	102	53.5	51	53.5	51	94	107	102	107
68	102.5	112.5	61.5	57.5	61	57.5	104	121	112	121

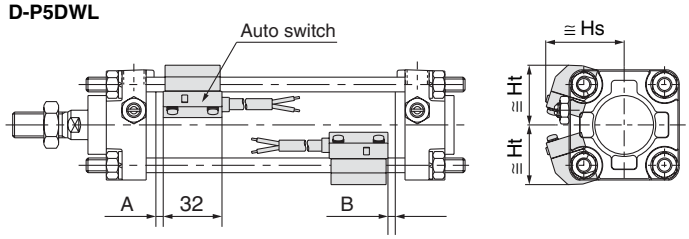
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mount type>

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



D-P5DWL



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-Z7□/Z80, D-Y59□/Y69□, D-Y7P/Y7PV, D-Y7□W, D-Y7□WV, D-Y7BAL		D-P5DWL	
	A	B	A	B
40	3.5	1.5	3	1
50	3.5	1.5	3	1
63	6	5	5.5	4
80	9.5	7.5	9	7
100	11	10	10.5	9

Auto Switch Mounting Height

Auto switch model / Bore size (mm)	D-Z7□, D-Z80, D-Y59□, D-Y7P, D-Y7BAL, D-Y7□W		D-Y69□, D-Y7PV, D-Y7□WV		D-P5DWL	
	Hs	Ht	Hs	Ht	Hs	Ht
40	30	30	30	30	42.5	33
50	34	34	34	34	46.5	37.5
63	41	41	41	41	52	43
80	49.5	49	49.5	49	58.5	51.5
100	56.5	55.5	57.5	55.5	66	58.5

Operating Range

Auto switch model	Bore size				
	40	50	63	80	100
D-Z7□/Z80	8.5	7.5	9.5	9.5	10.5
D-A3□/A44/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
D-Y59□/Y69□/Y7P/Y7□V/Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-Y7BAL	3.5	3.5	5	5	5
D-F5□/J5□/F5□W/J59W/F5BAL/F5NTL	4	4	4.5	4.5	4.5
D-F59F	5.5	5	5.5	5.5	5.5
D-G5□/K59/G5□W/K59W/G5BAL/G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39/G39C/K39C	9	9	10	10	11
D-P5DWL	4	4	4.5	4	4.5

∗ The above operating ranges are provided as guidelines including the hysteresis and are not guaranteed values (with approx. ±30% variations). They may vary significantly with the surrounding environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

Type	Mounting	Model	Electrical entry	Features
Reed switch	Tie-rod	D-A53/A56	Grommet (In-line)	—
		D-A64/A67		Without indicator light
		D-Z80		
		D-A33C/A34C	Terminal conduit	—
		D-A44C	DIN terminal	—
	Band	D-B53/B54	Grommet (In-line)	—
		D-B64		—
		D-B59W		2-color indication
		D-A33/A34	Terminal conduit	—
		D-A44	DIN terminal	—

Type	Mounting	Model	Electrical entry	Features
Solid state switch	Tie-rod	D-F59/F5P/J59	Grommet (In-line)	—
		D-F59W/F5PW/J59W		2-color indication
		D-F5BAL		Water resistant (2-color indication)
		D-F5NTL		With timer
		D-Y69A/Y7PV/Y69B		—
		D-Y7NW/Y7PW/Y7BW		2-color indication
		D-G39C/K39C	Terminal conduit	—
	Band	D-G59/G5P/K59	Grommet (In-line)	—
		D-G59W/G5PW/K59W		2-color indication
		D-G5BAL		Water resistant (2-color indication)
		D-G59F		Latch type with diagnostic output (2-color indication)
		D-G5NTL		With timer
		D-G39/K39	Terminal conduit	—

∗ Solid state switches are also available with pre-wire connector. Please contact SMC for detailed auto switch specifications.
∗ The normally closed type (NC = b contact) of solid state auto switch (D-Y7G/Y7H) are also available. Please contact SMC for detailed auto switch specifications.

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

How to Order

Without auto switch CA2W L ☐ 50 ☐ — 100 JJ

With auto switch CDA2W L ☐ 50 ☐ — 100 JJ — Y7BW ☐

With auto switch

Double rod type

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
T	Center trunnion style

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

For more information, please 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

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose at the time of shipment. (Only the switch mounting brackets for these models are mounted.)

Cylinder suffix

One end rod boot	Nil	Without rod boot
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Both ends rod boot	Nil	Without rod boot
	JJ	Nylon tarpaulin
	KK	Heat resistant tarpaulin
Cushion	Nil	With cushion on both sides
	N	Without cushion

* When more than one symbol is to be specified, indicate them in alphabetical order.

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2WL40-100

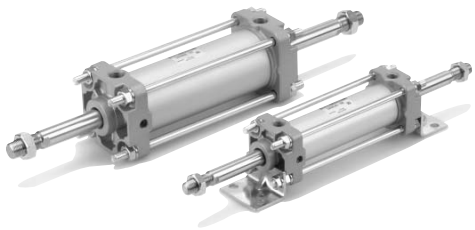
Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Tie-rod mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**Z76**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**Z73**	●	●	●	—	—	Relay, PLC
							100 V, 200 V	**A54**	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7P**	●	●	○	○		
				2-wire	—	—	100 V, 200 V	**J51**	●	●	○	—	—	
					24 V	12 V	—	**Y59B**	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**Y7NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**Y7PW**	●	●	○	○		
				2-wire		12 V		**Y7BW**	●	●	○	○	—	
	Water resistant (2-color indication)							**Y7BA**	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		**P5DW**	—	●	●	○	—	

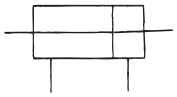
* Lead wire length symbols: 0.5 m ····· Nil (Example) A54
3 m ····· L (Example) A54L
5 m ····· Z (Example) A54Z

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

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.



JIS Symbol



Made to Order Specifications

For details, refer to page 6-8-63.

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant (150°C)
-XC3	Special port positions
-XC4	With heavy duty scraper
-XC5	Heat resistant (110°C)
-XC6	Piston rod and rod end nut made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluoro rubber seal
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC28	Compact flange made of SS400
-XC35	With coil scraper

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder.
In particular, the center trunnion style needs careful attention.
(For more information, refer to page 6-8-14.)

Specifications

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
Thread tolerance	JIS Class 2
Stroke length tolerance	to 250 st : $^{+1.0}_{0}$ 251 to 750 st : $^{+1.4}_{0}$
Lubrication	Not required (Non-lube)
Mounting	Basic style, Axial foot style, Rod side flange style, Center trunnion style

* With no freezing. ★ Operate within the range of absorbing kinetic energy. (Refer to page 6-8-4.)

Standard Stroke

In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on page 6-8-14.

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

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

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Accessory

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

* The above brackets have the same dimensions as those for the standard double acting single rod Series CA2. Please refer to page 6-8-13.

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)			40	50	63	80	100
Basic weight	Basic style	Aluminum tube	0.99	1.51	2.10	3.56	4.88
		Steel tube	1.05	1.58	2.18	3.76	5.16
	Axial foot style	Aluminum tube	1.18	1.73	2.43	4.23	5.87
		Steel tube	1.24	1.80	2.51	4.43	6.15
	Flange style	Aluminum tube	1.36	1.96	2.89	5.01	6.80
		Steel tube	1.42	2.03	2.97	5.21	7.08
	Trunnion style	Aluminum tube	1.35	1.99	2.90	5.11	7.16
		Steel tube	1.41	2.06	2.98	5.31	7.44
Additional weight per each 50 mm 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
Accessory	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 style, ø40, 100 st)
- Basic weight····· 1.18 (Axial foot, ø40)
- Additional weight····· 0.28/50 st
- Cylinder stroke····· 100 st

1.18 + 0.28 x 100/50 = 1.74 kg

The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2.

Copper-free

20-CA2W | Mounting | Bore size | — | Stroke | Suffix

• **Copper-free**

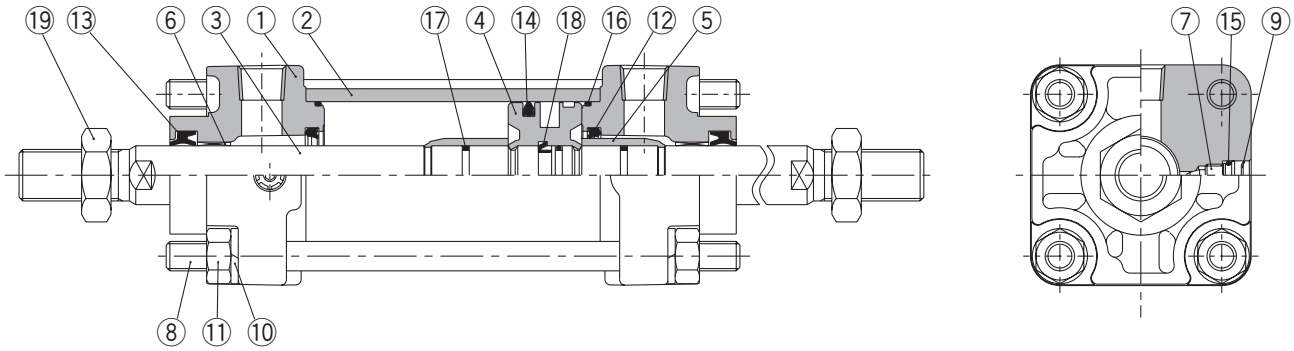
This cylinder eliminates any influences of copper ions or fluororesin on color CRTs. Copper materials have been nickel plated or replaced with non-copper materials to prevent the generation of copper ions.

Specifications

Action	Double acting, Double rod
Bore size	ø40, ø50, ø63, ø80, ø100
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.08 MPa
Cushion	Air cushion
Piping	Screw-in piping
Piston speed	50 to 500 mm/s★
Mounting	Basic style, Axial foot style Rod side flange style, Center trunnion style

∗ Auto switch capable
★ Operate within the range of absorbed energy. (Refer to page 6-8-4.)

Construction



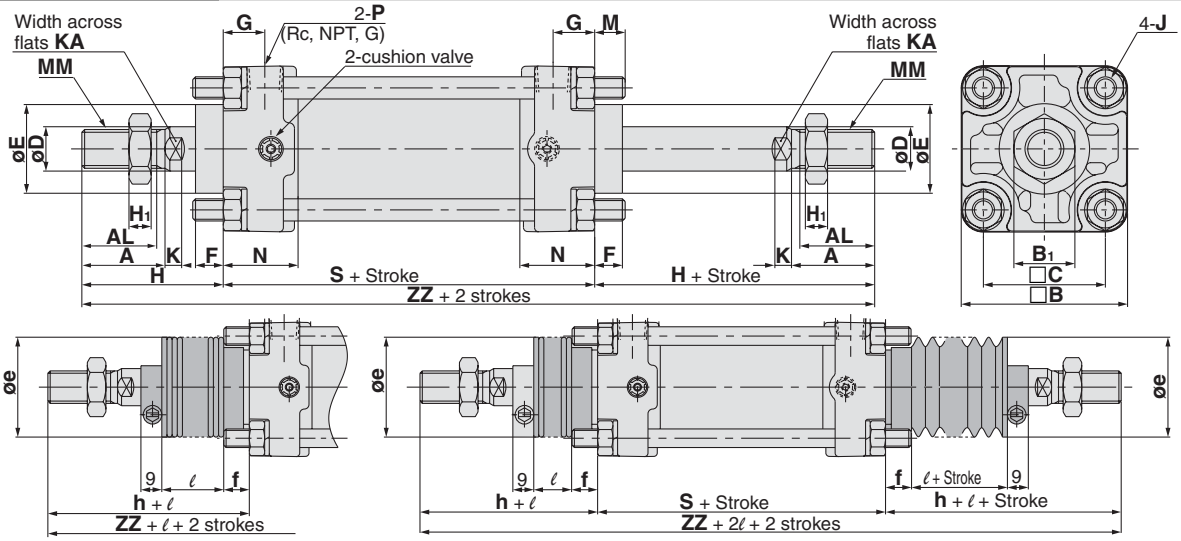
Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum die-casted	Metallic painted
②	Cylinder tube	Aluminum alloy	Hard anodized
③	Piston rod	Carbon steel	Hard chromium electroplated
④	Piston	Aluminum alloy	Chromated
⑤	Cushion ring	Brass	
⑥	Bushing	Lead-bronze cased	
⑦	Cushion valve	Steel wire	Nickel plated
⑧	Tie-rod	Carbon steel	Corrosion resistant chromated
⑨	Snap ring	Spring steel	
⑩	Spring washer	Rolled steel	Chromated
⑪	Tie-rod nut	Rolled steel	Nickel plated
⑫	Cushion seal	Urethane	
⑬	Rod seal	NBR	
⑭	Piston seal	NBR	
⑮	Cushion valve seal	NBR	O-ring
⑯	Cylinder tube gasket	NBR	
⑰	Piston gasket	NBR	
⑱	Piston holder	Urethane	
⑲	Rod end nut	Rolled steel	Nickel plated

Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
	Air cylinder	
40	MBW40-PS	Consists of numbers ⑫, ⑬, ⑭, and ⑯ above.
50	MBW50-PS	
63	MBW63-PS	
80	MBW80-PS	
100	MBW100-PS	

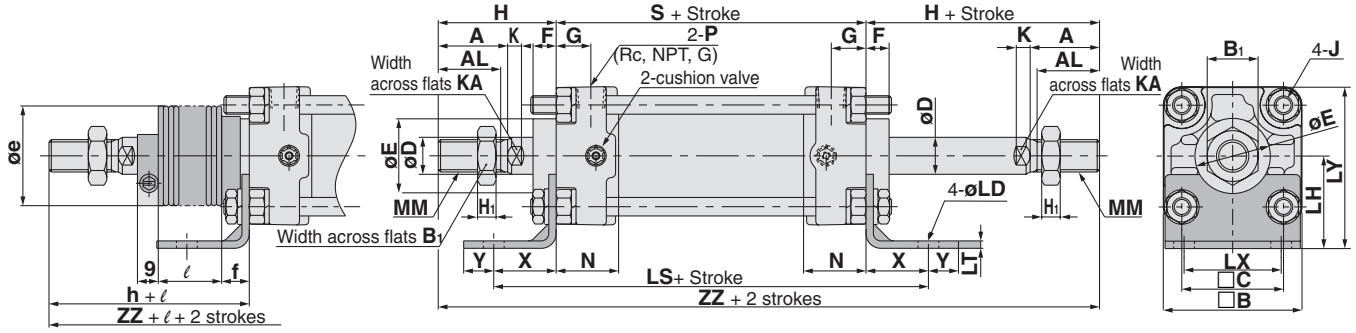
Basic Style: CA2WB



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	10	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	10	26	17	M26 x 1.5	40

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

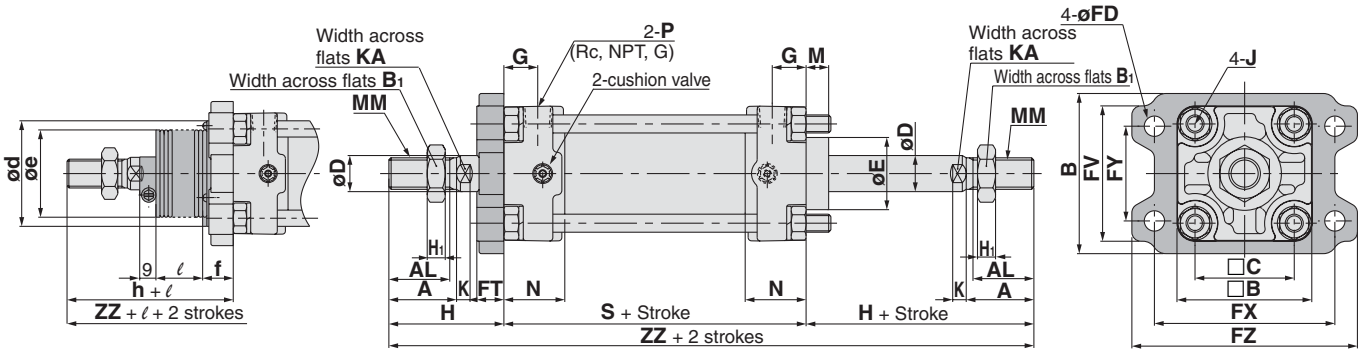
Axial Foot Style: CA2WL



Bore size (mm)	Stroke range (mm)		A	AL	□B	B1	□C	D	E	F	G	H1	J	K	KA	LD	LH	LS	LT
	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	9	40	138	3.2
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	13.5	65	204	4.5
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	13.5	75	212	6.0

Bore size (mm)	LX	LY	MM	N	P	S	X	Y	Without rod boot		With rod boot (Single side)					(Both sides)
									H	ZZ	e	f	h	ℓ	ZZ	ZZ
40	42	70	M14 x 1.5	27	1/4	84	27	13	51	186	43	11.2	59	1/4 stroke	194	202
50	50	80	M18 x 1.5	30	3/8	90	27	13	58	206	52	11.2	66	1/4 stroke	214	222
63	59	93	M18 x 1.5	31	3/8	98	34	16	58	214	52	11.2	66	1/4 stroke	222	230
80	76	116	M22 x 1.5	37	1/2	116	44	16	71	258	65	12.5	80	1/4 stroke	267	276
100	92	133	M26 x 1.5	40	1/2	126	43	17	72	270	65	14.0	81	1/4 stroke	279	288

Rod Side Flange Style: CA2WF

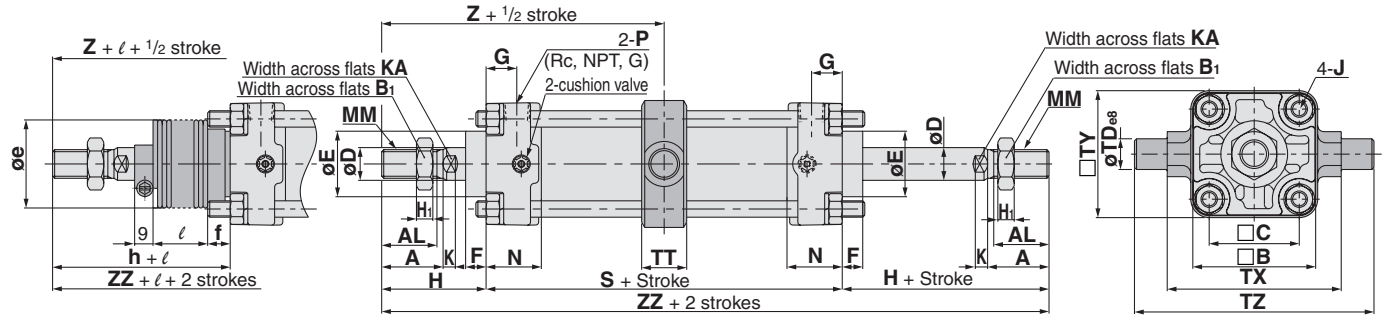


Bore size (mm)	Stroke range (mm)		A	AL	B	□B	B_1	□C	D	E	FD	FT	FX	FY	FZ	FV	G	H_1	J	K
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	30	27	71	60	22	44	16	32	9.0	12	80	42	100	60	15	8	M8 x 1.25	6
50	up to 600	20 to 600	35	32	81	70	27	52	20	40	9.0	12	90	50	110	70	17	11	M8 x 1.25	7
63	up to 600	20 to 600	35	32	101	85	27	64	20	40	11.5	15	105	59	130	86	17	11	M10 x 1.25	7
80	up to 750	20 to 750	40	37	119	102	32	78	25	52	13.5	18	130	76	160	102	21	13	M12 x 1.75	10
100	up to 750	20 to 750	40	37	133	116	41	92	30	52	13.5	18	150	92	180	116	21	16	M12 x 1.75	10

Bore size (mm)	KA	M	MM	N	P	S	Without rod boot		With rod boot (Single side)						(Both sides)
							H	ZZ	d★	e	f	h	ℓ	ZZ	ZZ
40	14	11	M14 x 1.5	27	1/4	84	51	186	52	43	15	59	1/4 stroke	194	202
50	18	11	M18 x 1.5	30	3/8	90	58	206	58	52	15	66	1/4 stroke	214	222
63	18	14	M18 x 1.5	31	3/8	98	58	214	58	52	17.5	66	1/4 stroke	222	230
80	22	17	M22 x 1.5	37	1/2	116	71	258	80	65	21.5	80	1/4 stroke	267	276
100	26	17	M26 x 1.5	40	1/2	126	72	270	80	65	21.5	81	1/4 stroke	279	288

★ If a hole is provided to accommodate the boot when the air cylinder is mounted, make the hole diameter larger than the outside diameter of the boot ød.

Center Trunnion Style: CA2WT



Bore size (mm)	Stroke range (mm)		A	AL	□B	B_1	□C	D	E	F	G	J	K	MM	N	P	S
	Without rod boot	With rod boot															
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	M8 x 1.25	6	M14 x 1.5	27	1/4	84
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	M8 x 1.25	7	M18 x 1.5	30	3/8	90
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	M10 x 1.25	7	M18 x 1.5	31	3/8	98
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	M12 x 1.75	10	M22 x 1.5	37	1/2	116
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	M12 x 1.75	10	M26 x 1.5	40	1/2	126

Bore size (mm)	TDe8	TT	TX	TY	TZ	Without rod boot			With rod boot (Single side)						(Both sides)	
						H	Z	ZZ	e	f	h	ℓ	Z	ZZ	Z	ZZ
40	$15^{-0.032}_{-0.059}$	22	85	62	117	51	93	186	43	11.2	59	1/4 stroke	101	194	101	202
50	$15^{-0.032}_{-0.059}$	22	95	74	127	58	103	206	52	11.2	66	1/4 stroke	111	214	111	222
63	$18^{-0.032}_{-0.059}$	28	110	90	148	58	107	214	52	11.2	66	1/4 stroke	115	222	115	230
80	$25^{-0.040}_{-0.073}$	34	140	110	192	71	129	258	65	12.5	80	1/4 stroke	138	267	138	276
100	$25^{-0.040}_{-0.073}$	40	162	130	214	72	135	270	65	14.0	81	1/4 stroke	144	279	144	288

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

How to Order

Without auto switch CA2K L 40 — 200

With auto switch CDA2K L 40 — 200 — Y7BW

With auto switch

Non-rotating rod

Mounting style

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

Bore size

40	40 mm
50	50 mm
63	63 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Cylinder suffix

Rod boot	Nil	Without
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	Nil	Cushion at both ends
	N	Without cushion

* When more than one symbol is to be specified, indicate them in alphabetical order.

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with built-in magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2KL40-100

Applicable Auto Switch/Refer to page 6-16-1 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 mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**Z76**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**Z73**	●	●	●	—	—	Relay, PLC
							100 V, 200 V	**A54**	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7P**	●	●	○	○		
				2-wire	—	—	100 V, 200 V	**J51**	●	●	○	—	—	
					24 V	12 V	—	**Y59B**	●	●	○	○		
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**Y7NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**Y7PW**	●	●	○	○		
				2-wire		12 V		**Y7BW**	●	●	○	○	—	
	Water resistant (2-color indication)	Grommet						**Y7BA**	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		**P5DW**	—	●	●	○	—	

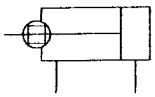
* Lead wire length symbols: 0.5 m ····· Nil (Example) A54
3 m ····· L (Example) A54L
5 m ····· Z (Example) A54Z

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

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.

Non-rotating accuracy: ±0.5°
Same mounting dimensions as those of standard cylinder

JIS Symbol



Specifications

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
Thread tolerance	JIS Class 2
Stroke length tolerance	To 250 $^{st}_{\ 0}$, 251 to 600 $^{st}_{\ 0}$
Rod non-rotating accuracy	±0.5°
Allowable rotational torque	0.44 N·m or less
Lubrication	Not required (Non-lube)
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style Double clevis style, Center trunnion style

* With no freezing. ★ Operate within the range of absorbing kinetic energy. (Refer to page 6-8-4.)

Standard Stroke

In case of a type with auto switch, please also refer to the table of minimum strokes for auto switch mounting on page 6-8-14.

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

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

Weight

(kg)

Bore size (mm)		40	50	63
Basic weight	Basic style	0.88	1.32	1.91
	Axial foot style	1.07	1.54	2.25
	Flange style	1.25	1.77	2.70
	Single clevis style	1.11	1.66	2.54
	Double clevis style	1.15	1.75	2.70
	Trunnion style	1.24	1.80	2.71
Additional weight per each 50 mm stroke		0.20	0.25	0.30
Accessory	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 style ø40)
- Additional weight ·····0.20/50 st
- Cylinder stroke·····100 st

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.

The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1.The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder. In particular, the center trunnion style needs careful attention. (For more information, please refer to page 6-8-14.)

Made to Order Specifications

For details, refer to page 6-8-63.

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC8	Adjustable stroke/Extension adjustment
-XC9	Adjustable stroke/Retraction adjustment
-XC11	Dual stroke cylinder/Single rod
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC28	Compact flange made of SS400

Copper-free

20 − CA2K | Mounting | Bore size | Stroke | Suffix

• Copper-free

This cylinder eliminates any influences of copper ions or fluororesin on color CRTs. Copper materials have been nickel plated or replaced with non-copper materials to prevent the generation of copper ions.

Specifications

Action	Double acting, Single rod
Bore size (mm)	40, 50, 63
Maximum operating pressure	1 MPa
Minimum operating pressure	0.05 MPa
Cushion	Air cushion
Piston speed	50 to 500 mm/s★
Mounting	Basic style, Axial foot style Rod side flange style, Head side flange style Single clevis style Double clevis style, Center trunnion style

★ Operate within the range of absorbing energy. (Refer to page 6-8-4.)
∗ Auto switch capable

⚠ Precautions

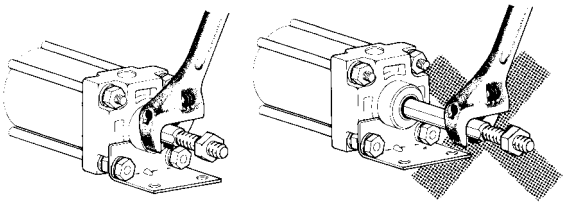
Be sure to read befor handling. Refer to pages 6-20-3 to 6 for Safety Instruction and Actuator Precautions 1 to 3 on the products mentioned in this catalog.

Operating Precautions

⚠ Caution

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

1. 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.

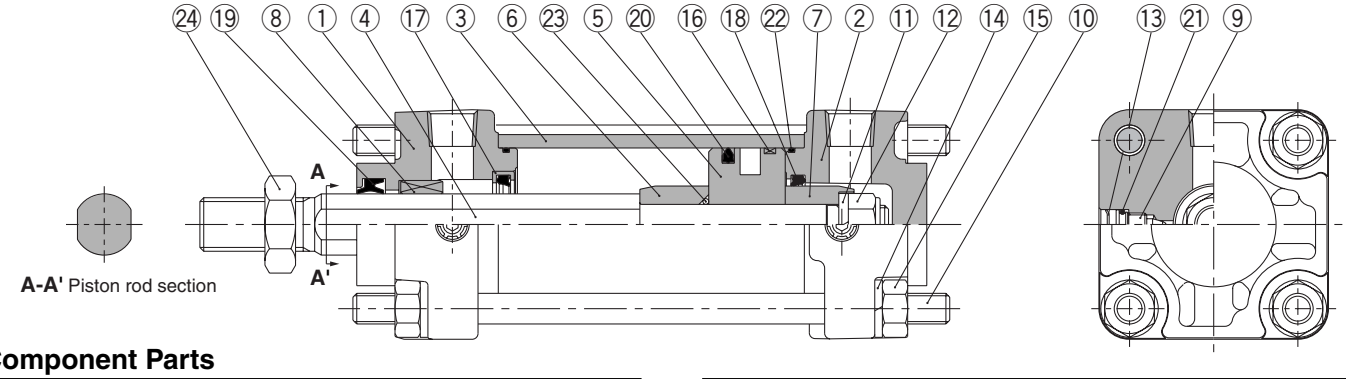


Disassembly/Replacement

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 chromium electroplated
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	Sintered alloy	
⑨	Cushion valve	Steel wire	Nickel plated
⑩	Tie-rod	Carbon steel	Corrosion resistant chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Piston nut	Rolled steel	Zinc chromated
⑬	Snap ring	Spring steel	
⑭	Spring washer	Steel wire	Chromated
⑮	Tie-rod nut	Rolled steel	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	Nickel plated

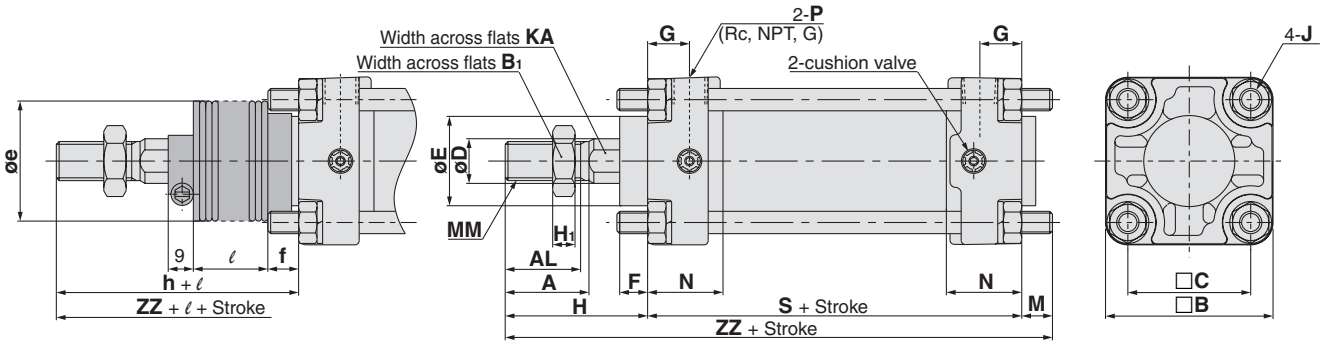
Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
40	CA2K40-PS	Consists of numbers ⑱, ⑲, ⑳, and ㉒ above.
50	CA2K50-PS	
63	CA2K63-PS	

∗ The seal kits consist of items ⑱, ⑲, ⑳, ㉒. Please order them by using the seal kit number corresponding to each bore size.

Basic Style: CA2KB

With rod boot



Bore size (mm)	Stroke range (mm)		A	AL	□B	B1	□C	D	E	F	G	H1	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	e	f	h	ℓ	ZZ
40	27	1/4	84	51	146	43	11.2	59	1/4 stroke	154
50	30	3/8	90	58	159	52	11.2	66	1/4 stroke	167
63	31	3/8	98	58	170	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 6-8-7 to 11.

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

How to Order

Without auto switch CA2KW L 40 — 200

With auto switch CDA2KW L 40 — 200 — Y7BW

With auto switch

Non-rotating rod

Double rod type

Mounting style

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

Bore size

40	40 mm
50	50 mm
63	63 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Cylinder suffix

Cushion	Nil	With cushion on both sides
	N	Without cushion

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with built-in magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2KWL40-100

Applicable Auto Switch/Refer to page 6-16-1 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 mount	Lead wire length (m)*: 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	Z73	●	●	●	—	—	Relay, PLC
							100 V, 200 V	A54	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	●	●	○	○		
				2-wire	—	—	100 V, 200 V	J51	●	●	○	—	—	
					24 V	12 V	—	Y59B	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		Y7NW	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PW	●	●	○	○		
				2-wire		12 V		Y7BW	●	●	○	○	—	
	Water resistant (2-color indication)							Y7BA	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		P5DW	—	●	●	○	—	

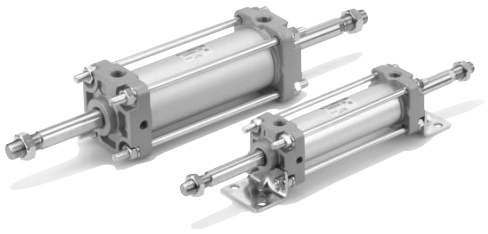
* Lead wire length symbols: 0.5 m ····· Nil (Example) A54
3 m ····· L (Example) A54L
5 m ····· Z (Example) A54Z

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

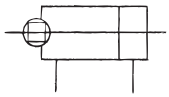
• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.

Non-rotating accuracy: ±0.5°

Same mounting dimensions as those of standard cylinder



JIS Symbol



Specifications

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
Thread tolerance	JIS Class 2
Stroke length tolerance	To 250 st : $^{+1.0}_{0}$, 251 to 600 st : $^{+1.4}_{0}$
Rod non-rotating accuracy	±0.5°
Allowable rotational torque	0.44 N·m or less
Lubrication	Not required (Non-lube)
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Center trunnion style

* With no freezing. ★ Operate within the range of absorbing kinetic energy. (Refer to page 6-8-4.)

Standard Stroke

In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on page 6-8-14.

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

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

Made to Order Specifications

For details, refer to page 6-8-63.

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

Weight/Aluminum Tube

(kg)

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

Calculation: (Example) Weight CA2KWL40-100
- Basic weight····· 1.20 (Axial foot style ø40)
- Additional weight····· 0.27/50 st
- Cylinder stroke····· 100 st

1.20 + 0.27 x 100/50 = 1.74 kg

The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod model of Series CA2.

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 mounting style of the cylinder. In particular, the center trunnion style needs careful attention. (For more information, please refer to page 6-8-14.)

Copper-free

20 – CA2KW | **Mounting** | **Bore size** | – | **Stroke** | **Suffix**

• Copper-free

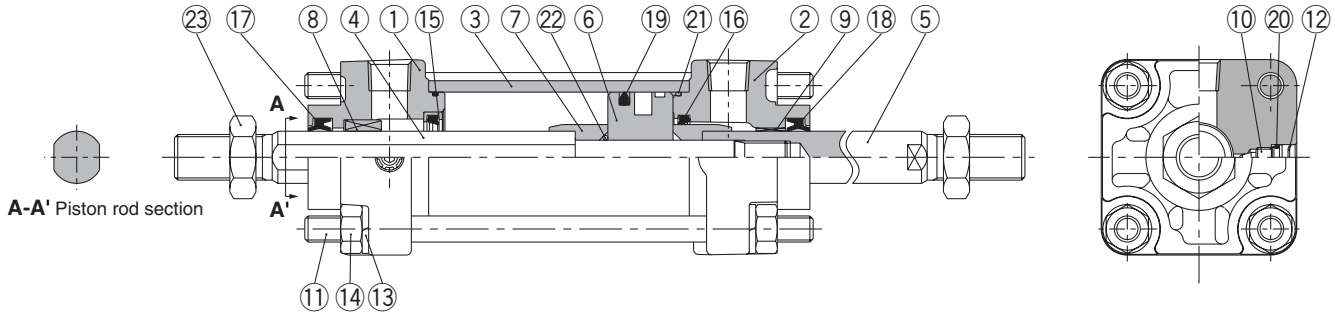
This cylinder eliminates any influences of copper ions or fluororesin on color CRTs. Copper materials have been nickel plated or replaced with non-copper materials to prevent the generation of copper ions.

Specifications

Action	Double acting, Double rod
Bore size	40, 50, 63
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.08 MPa
Cushion	Air cushion
Piston speed	50 to 500 mm/s★
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Center trunnion style

★ Operate within the range of absorbable energy. (Refer to page 6-8-4.)
∗ Auto switch capable

Construction



Component Parts

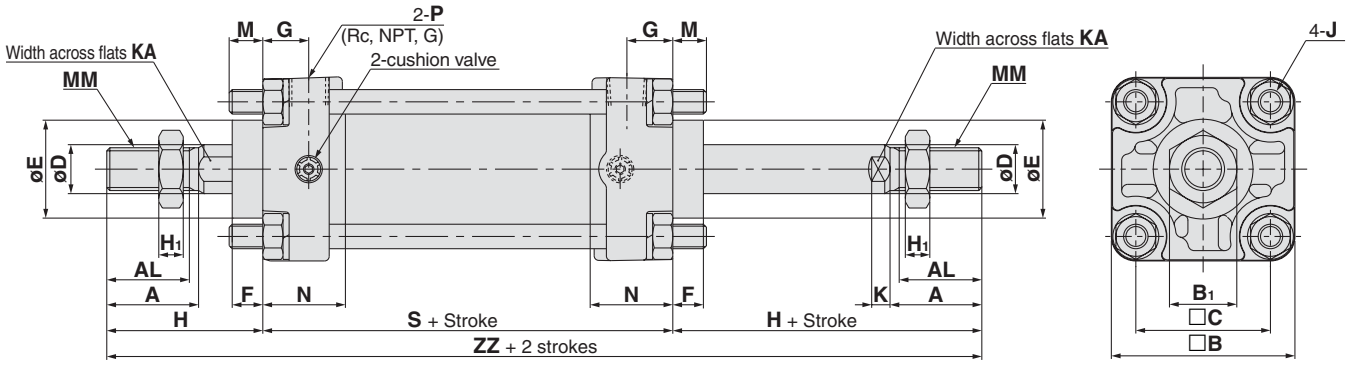
No.	Description	Material	Note
①	Rod cover A	Aluminum alloy	Metallic painted
②	Rod cover B	Aluminum die-casted	Metallic painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod A	Carbon steel	Hard chromium electroplated
⑤	Piston rod B	Carbon steel	Hard chromium electroplated
⑥	Piston	Aluminum alloy	Chromated
⑦	Cushion ring	Rolled steel	Zinc chromated
⑧	Non-rotating guide	Sintered alloy	
⑨	Bushing	Lead-bronze casted	
⑩	Cushion valve	Steel wire	Nickel plated
⑪	Tie-rod	Carbon steel	Corrosion resistant chromated
⑫	Snap ring	Spring steel	
⑬	Spring washer	Steel wire	Chromated
⑭	Tie-rod nut	Rolled steel	Nickel plated
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	Nickel plated

Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
40	CA2KW40-PS	Consists of numbers ⑯, ⑰, ⑱, ⑲, and ㉑ above.
50	CA2KW50-PS	
63	CA2KW63-PS	

∗ The seal kits consist of items ⑯, ⑰, ⑱, ⑲, and ㉑. Please order them by using the seal kit number corresponding to each bore size.

Basic Style: CA2KWB



Bore size (mm)	Stroke range (mm)	A	AL	□B	B_1	□C	D	E	F	G	H_1	J	K	KA	M	MM	N	P	S	H	ZZ
40	up to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	51	186
50	up to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	58	206
63	up to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	58	214

The dimensions for each mounting type are the same as those for the standard double acting double rod model. Refer to pages 6-8-20 to 21.

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

How to Order

Without auto switch CA2 L Q □ 40 □ — 150 F

With auto switch CDA2 L Q 40 □ — 150 F — Y7BW □

With auto switch

Mounting style

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

Low friction

Tube material

Nil	Aluminum tube
F*	Steel tube

* Types with auto switch are not available.

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Direction of low friction

F	With pressure at head side
B	With pressure at rod side

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2BQ40-100

Applicable Auto Switch/Refer to page 6-16-1 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 mount	Lead wire length (m)*: 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	Z73	●	●	●	—	—	Relay, PLC
							100 V, 200 V	A54	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	●	●	○	○		
				2-wire	—	—	100 V, 200 V	J51	●	●	○	—	—	
	Diagnostic indication (2-color indication)	Grommet			24 V	12 V	—	Y59B	●	●	○	○		
				3-wire (NPN)		5 V, 12 V		Y7NW	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PW	●	●	○	○		
				2-wire		12 V		Y7BW	●	●	○	○	—	
	Water resistant (2-color indication)	Grommet						Y7BA	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		P5DW	—	●	●	○	—	

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

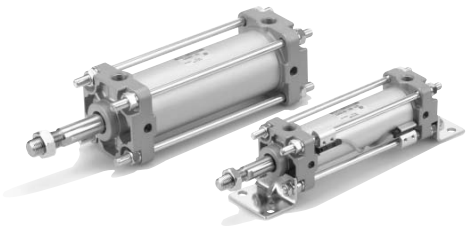
* Solid state switches marked with "○" are produced upon receipt of order.
** D-P5DW cannot be mounted on models with bore sizes ø40 and ø50 mm.

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-40.

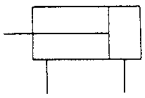
Designed with a low piston sliding resistance, this air cylinder is ideal for applications such as contact pressure control, which requires small movements at low pressures.

Low sliding resistance

Minimum operating pressure: –0.01 MPa



JIS Symbol



Made to Order Specifications

For details, refer to page 6-8-63.

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port positions
-XC14	Change of trunnion bracket mounting position

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. The minimum stroke for mounting varies with the auto switch style and mounting type of the cylinder. In particular, the center trunnion style needs careful attention.

(For more information, please refer to page 6-8-38.)

Low Friction Direction

To use the air cylinder as a balancer, pressurize it only from one of the ports as shown in the application example, and keep the other port open to the atmosphere.

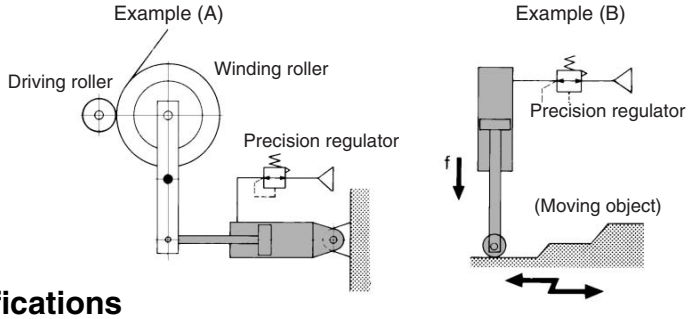
Pressurized from rod cover port ··· Low friction direction B type (Application example (A))

Pressurized from head cover port ··· Low friction direction F type (Application example (B))

In either case, if the piston rod is moved by an external force, it will effect low friction operation both in the extending and retracting directions.

Application

The low friction cylinder is used in combination with a precision regulator (such as the Series IR, etc.).



Specifications

Action	Double acting
Low friction direction	One direction (Refer to above “Low friction direction”.)
Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.01 MPa
Ambient and fluid temperature*	Without auto switch: –10 to 70°C With auto switch: –10 to 60°C*
Allowable leakage	0.5 ℓ/min (ANR)
Cushion	Without
Thread tolerance	JIS Class 2
Lubrication	Not required (Non-lube)
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

* With no freezing

Standard Stroke

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

* Intermediate strokes not listed above are also available.
Please consult with SMC for strokes exceeding the above stroke ranges.

Accessory

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

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot style	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange style	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis style	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis style	1.16 (1.21)	1.79 (1.83)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion style	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per each 50 mm 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)
Accessory	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

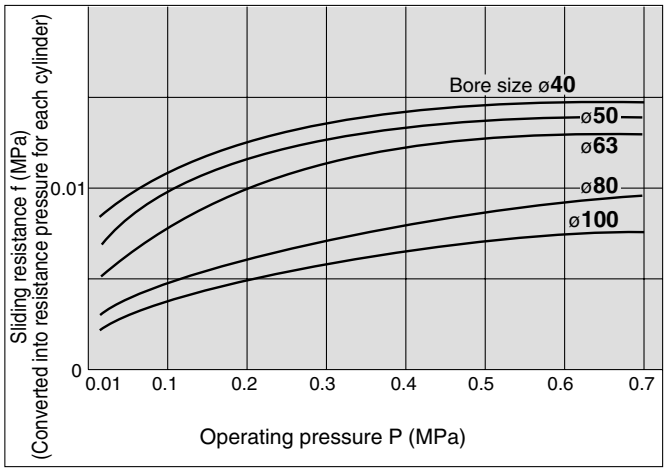
Calculation: (Example) CA2LQ40-100F (Axial foot style, ø40, 100 st)

- Basic weight 1.08kg
- Additional weight ..... 0.22/50 st
- Cylinder stroke ..... 100 st

1.08 + 0.22 x 100/50 = 1.52 kg

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

Sliding Resistance of the Low Friction Side



The actual sliding resistance F (N) can be found by the following equation from the sliding resistance f (MPa) (converted into resistance pressure of each cylinder) indicated by the ordinate of the graph.

Sliding resistance F (N) = Sliding resistance f (MPa) x Rod side piston area (mm^2)

(Example) When a low friction cylinder with a bore size 63 mm is operated at 0.2 MPa, the sliding resistance f (MPa), a converted value of the actual sliding resistance into the cylinder pressure, is found to be 0.01 MPa in the graph. Thus, the actual sliding resistance

F (N) = 0.01 (MPa) x 2800 (mm^2) = 28 (N)

Mounting Bracket

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, two pieces should be ordered for each cylinder.

∗∗ Double clevis type is packed with clevis pin, flat washer and cotter pin.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm) 40	50	63	80	100
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5NTL	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44 ∗∗∗ **D-G39/K39** ∗∗∗	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64 ∗∗∗ **D-B59W** ∗∗∗ **D-G5□/K59** ∗∗∗ **D-G5□W/K59W** ∗∗∗ **D-G59F** ∗∗∗ **D-G5NTL** ∗∗∗	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□C/A44C ∗ **D-G39C/K39C** ∗	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P5DWL	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080

∗ Mounting brackets are attached to models D-A3□C/A44C/G39C/K39C. When placing an order, indicate as described below, in accordance with the cylinder size.

(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

When other brackets are ordered separately, order by the above part numbers.

∗∗ Stainless steel mounting screw kit

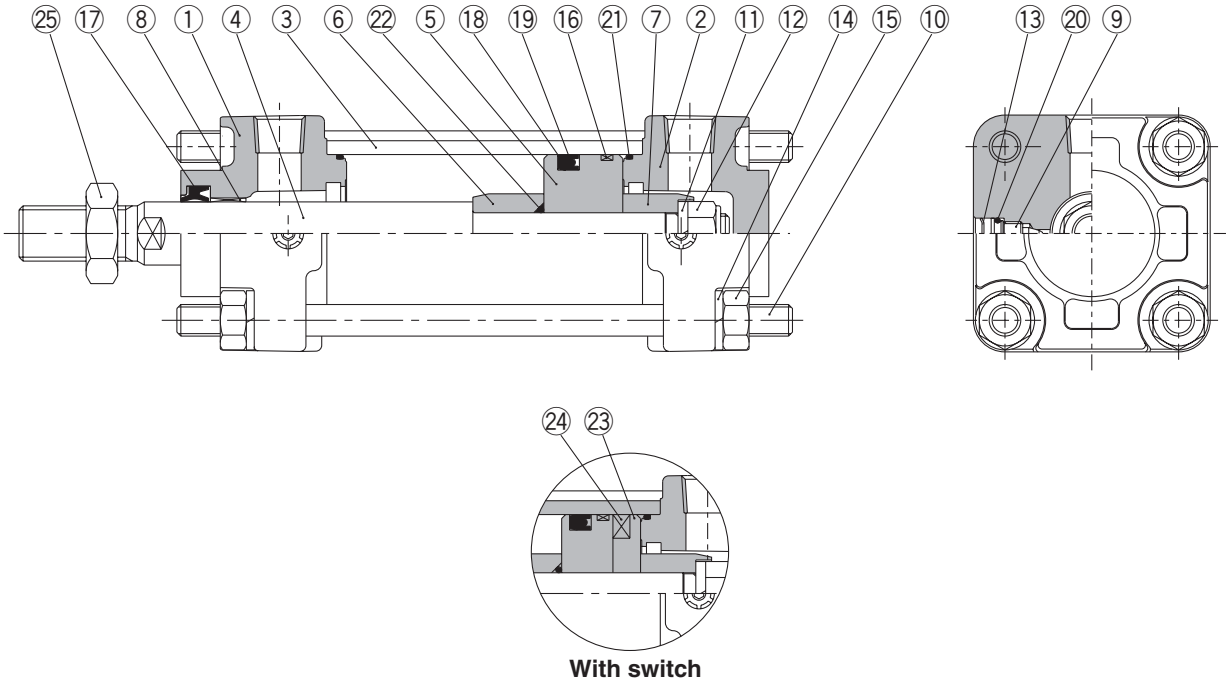
A set of stainless steel mounting screws (with set screws) described below is available and can be used as required by the operating environment. (The mounting bracket and band for auto switches must be ordered separately, as they are not included.)

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

When a switch model D-F5BAL or G5BAL is mounted on the cylinder at the time of shipment, the above stainless steel screws are used. When the switch is shipped alone, BBA1 or BBA3 is attached.

∗∗∗ **Series CDA2 models vary in the thickness of the cylinder tube wall. In cases where the band mount type is used as an applicable auto switch, select the part number of the new band referring to page 6-8-71 whenever the cylinder model is changed.**

Construction



With switch

Component Parts

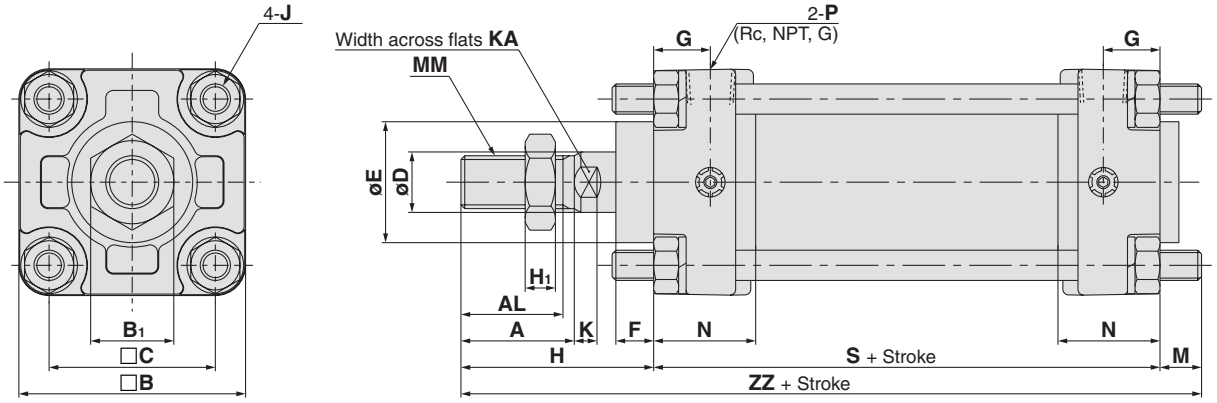
No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Metallic painted
②	Head cover	Aluminum alloy	Metallic painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chromium electroplated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring A	Rolled steel	Zinc chromated
⑦	Cushion ring B	Rolled steel	Zinc chromated
⑧	Bushing	Lead-bronze casted	
⑨	Cushion valve	Steel wire	Nickel plated
⑩	Tie-rod	Carbon steel	Corrosion resistant chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Piston nut	Rolled steel	Zinc chromated
⑬	Snap ring	Spring steel	
⑭	Spring washer	Steel wire	Nickel plated
⑮	Tie-rod nut	Rolled steel	Chromated
⑯	Wear ring	Resin	
⑰	Rod seal	NBR	
⑱	Piston seal	NBR	
⑲	Back-up O-ring	NBR	
⑳	Cushion valve seal	NBR	
㉑	Cylinder tube gasket	NBR	
㉒	Piston gasket	NBR	O-ring
㉓	Spacer	Aluminum alloy	Chromated
㉔	Magnet	—	
㉕	Rod end nut	Rolled steel	Nickel plated

Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
40	MBQ40-PS	Consists of numbers ⑰, ⑱, ⑲, and ㉑ above.
50	MBQ50-PS	
63	MBQ63-PS	
80	MBQ80-PS	
100	MBQ100-PS	

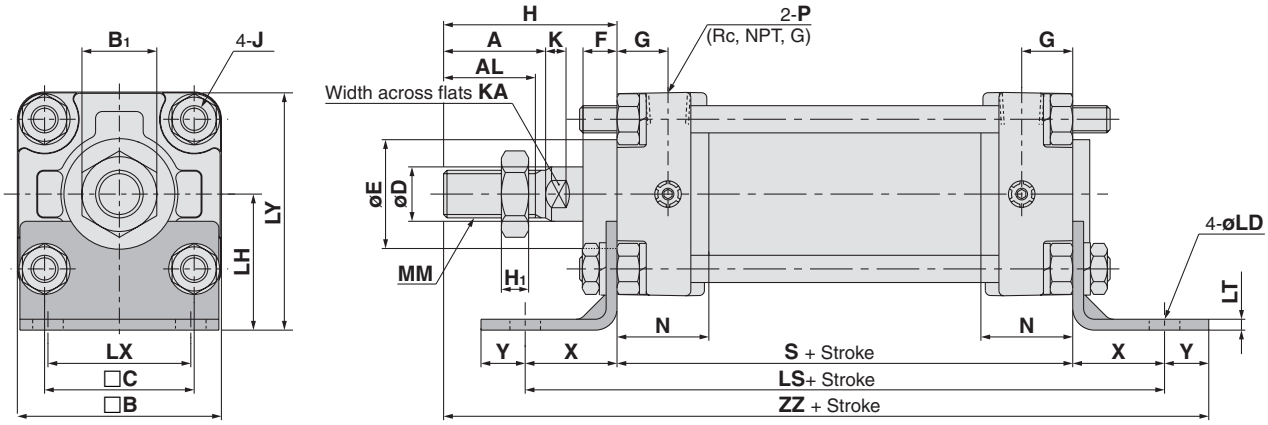
∗ The seal kits consist of items, ⑰, ⑱, ⑲, ㉑. Please order them by using the seal kit number corresponding to each bore size.

Basic Style: CA2BQ



Bore size (mm)	Stroke range	A	AL	□B	B1	□C	D	E	F	G	H	H1	J	K	KA	M	MM	N	P	Without auto switch		With auto switch	
																				S	ZZ	S	ZZ
40	up to 500	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	146	94	156
50	up to 600	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	159	100	169
63	up to 600	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	170	108	180
80	up to 750	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2	116	204	126	214
100	up to 750	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2	126	215	136	225

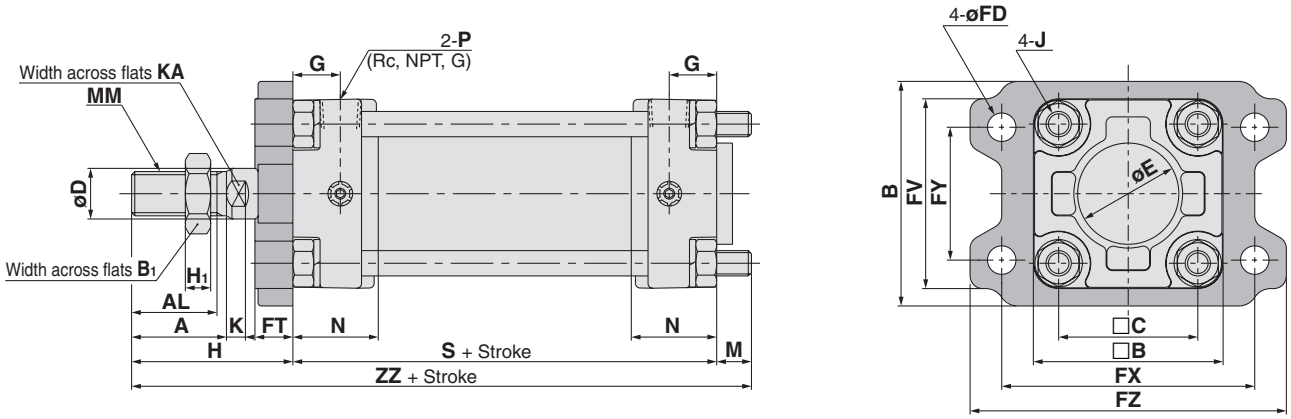
Axial Foot Style: CA2LQ



Bore size (mm)	Stroke range	A	AL	□B	B1	□C	D	E	F	G	H	H1	J	K	KA	LD	LH	LT	LX	LY	MM	N	P	X
40	up to 500	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	9	40	3.2	42	70	M14 x 1.5	27	1/4	27
50	up to 600	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	9	45	3.2	50	80	M18 x 1.5	30	3/8	27
63	up to 600	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	11.5	50	3.2	59	93	M18 x 1.5	31	3/8	34
80	up to 750	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	13.5	65	4.5	76	116	M22 x 1.5	37	1/2	44
100	up to 750	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	13.5	75	6	92	133	M26 x 1.5	40	1/2	43

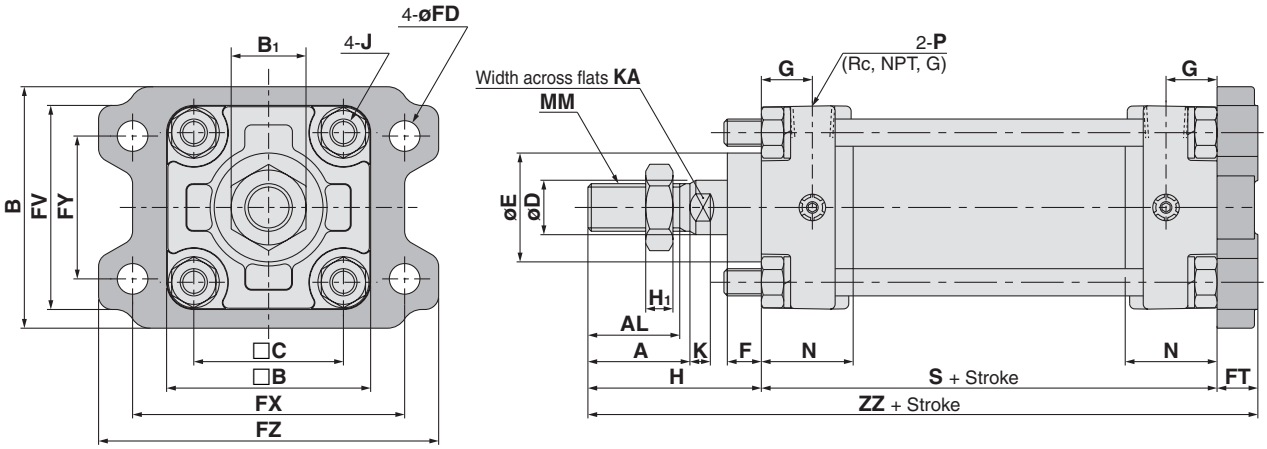
Bore size (mm)	Y	Without auto switch			With auto switch		
		S	LS	ZZ	S	LS	ZZ
40	13	84	138	175	94	148	185
50	13	90	144	188	100	154	198
63	16	98	166	206	108	176	216
80	16	116	204	247	126	214	257
100	17	126	212	258	136	222	268

Rod Side Flange Style: CA2FQ



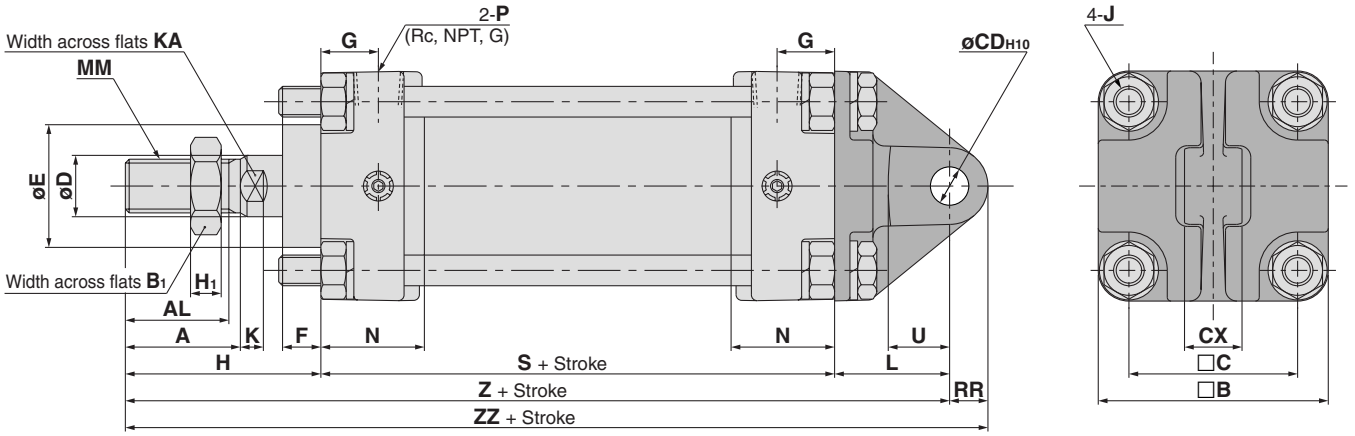
Bore size (mm)	Stroke range	A	AL	B	□B	B1	□C	D	E	FV	FD	FT	FX	FY	FZ	G	H	H1	J	K	KA	M	MM	N	P	Without auto switch		With auto switch	
																										S	ZZ	S	ZZ
40	up to 500	30	27	71	60	22	44	16	32	60	9	12	80	42	100	15	51	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	146	94	156
50	up to 600	35	32	81	70	27	52	20	40	70	9	12	90	50	110	17	58	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	159	100	169
63	up to 600	35	32	101	85	27	64	20	40	86	11.5	15	105	59	130	17	58	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	170	108	180
80	up to 750	40	37	119	102	32	78	25	52	102	13.5	18	130	76	160	21	71	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2	116	204	126	214
100	up to 750	40	37	133	116	41	92	30	52	116	13.5	18	150	92	180	21	72	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2	126	215	136	225

Head Side Flange Style: CA2GQ



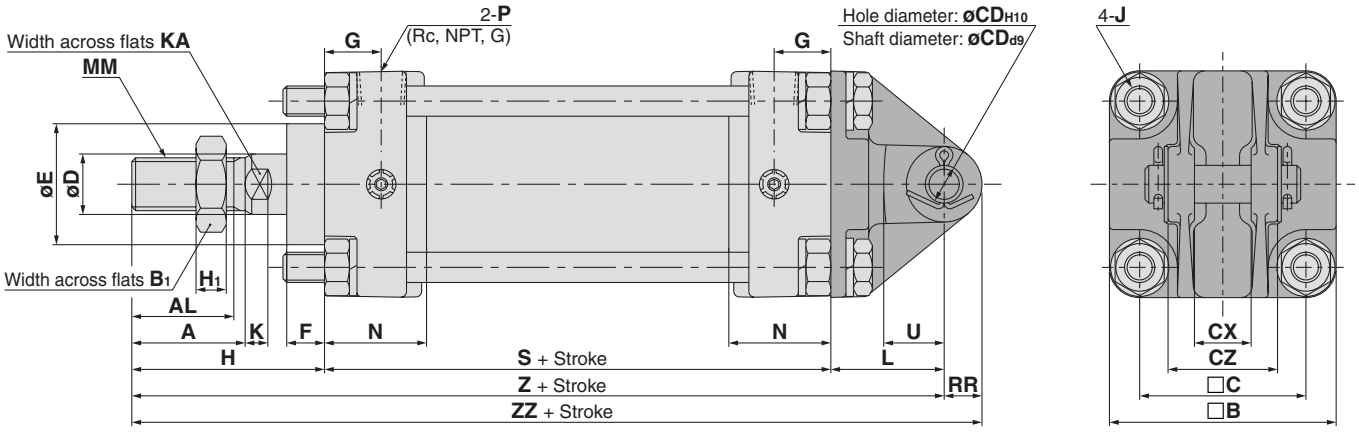
Bore size (mm)	Stroke range	A	AL	B	□B	B1	□C	D	E	FV	FD	FT	FX	FY	FZ	G	H	H1	J	K	KA	MM	N	P	Without auto switch		With auto switch	
																										S	ZZ	S	ZZ
40	up to 500	30	27	71	60	22	44	16	32	60	9	12	80	42	100	15	51	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84	147	94	157
50	up to 600	35	32	81	70	27	52	20	40	70	9	12	90	50	110	17	58	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90	160	100	170
63	up to 600	35	32	101	85	27	64	20	40	86	11.5	15	105	59	130	17	58	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98	171	108	181
80	up to 750	40	37	119	102	32	78	25	52	102	13.5	18	130	76	160	21	71	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116	205	126	215
100	up to 750	40	37	133	116	41	92	30	52	116	13.5	18	150	92	180	21	72	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126	216	136	226

Single Clevis Style: CA2CQ



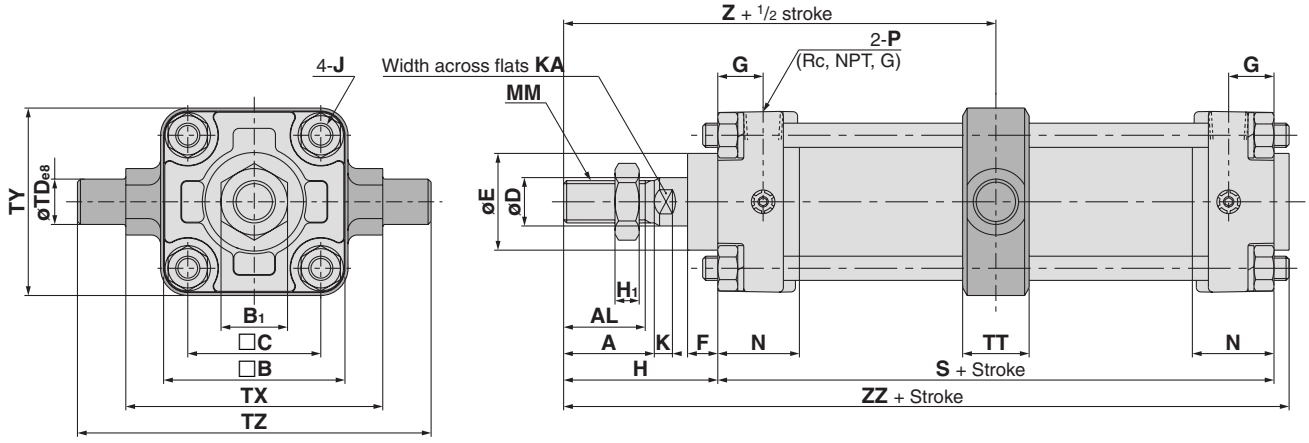
Bore size (mm)	Stroke range	A	AL	□B	B1	□C	CDH10	CX	D	E	F	G	H	H1	J	K	KA	L	MM	N	P	RR	U	Without auto switch			With auto switch		
																								S	Z	ZZ	S	Z	ZZ
40	up to 500	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{-0.1}_{-0.3}$	16	32	10	15	51	8	M8 x 1.25	6	14	30	M14 x 1.5	27	1/4	10	16	84	165	175	94	175	185
50	up to 600	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{-0.1}_{-0.3}$	20	40	10	17	58	11	M8 x 1.25	7	18	35	M18 x 1.5	30	3/8	12	19	90	183	195	100	193	205
63	up to 600	35	32	85	27	64	$16^{+0.070}_{0}$	$25^{-0.1}_{-0.3}$	20	40	10	17	58	11	M10 x 1.25	7	18	40	M18 x 1.5	31	3/8	16	23	98	196	212	108	206	222
80	up to 750	40	37	102	32	78	$20^{+0.084}_{0}$	$31.5^{-0.1}_{-0.3}$	25	52	14	21	71	13	M12 x 1.75	10	22	48	M22 x 1.5	37	1/2	20	28	116	235	255	126	245	265
100	up to 750	40	37	116	41	92	$25^{+0.084}_{0}$	$35.5^{-0.1}_{-0.3}$	30	52	14	21	72	16	M12 x 1.75	10	26	58	M26 x 1.5	40	1/2	25	36	126	256	281	136	266	291

Double Clevis Style: CA2DQ



Bore size (mm)	Stroke range	A	AL	□B	B1	□C	CDH10	CX	CZ	D	E	F	G	H	H1	J	K	KA	L	MM	N	P	RR	U	Without auto switch			With auto switch		
																									S	Z	ZZ	S	Z	ZZ
40	up to 500	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{+0.3}_{+0.1}$	29.5	16	32	10	15	51	8	M8 x 1.25	6	14	30	M14 x 1.5	27	1/4	10	16	84	165	175	94	175	185
50	up to 600	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{+0.3}_{+0.1}$	38	20	40	10	17	58	11	M8 x 1.25	7	18	35	M18 x 1.5	30	3/8	12	19	90	183	195	100	193	205
63	up to 600	35	32	85	27	64	$16^{+0.070}_{0}$	$25^{+0.3}_{+0.1}$	49	20	40	10	17	58	11	M10 x 1.25	7	18	40	M18 x 1.5	31	3/8	16	23	98	196	212	108	206	222
80	up to 750	40	37	102	32	78	$20^{+0.084}_{0}$	$31.5^{+0.3}_{+0.1}$	61	25	52	14	21	71	13	M12 x 1.75	10	22	48	M22 x 1.5	37	1/2	20	28	116	235	255	126	245	265
100	up to 750	40	37	116	41	92	$25^{+0.084}_{0}$	$35.5^{+0.3}_{+0.1}$	64	30	52	14	21	72	16	M12 x 1.75	10	26	58	M26 x 1.5	40	1/2	25	36	126	256	281	136	266	291

Center Trunnion Style: CA2TQ



Bore size (mm)	Stroke range	A	AL	□B	B_1	□C	D	E	F	G	H	H_1	J	K	KA	MM	N	P	TD_{e8}	TT	TX	TY	TZ	Without auto switch			With auto switch		
																								S	Z	ZZ	S	Z	ZZ
40	up to 500	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4	$15^{-0.032}_{-0.059}$	22	85	62	117	84	93	140	94	98	150
50	up to 600	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8	$15^{-0.032}_{-0.059}$	22	95	74	127	90	103	154	100	108	164
63	up to 600	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8	$18^{-0.032}_{-0.059}$	28	110	90	148	98	107	162	108	112	172
80	up to 750	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2	$25^{-0.040}_{-0.073}$	34	140	110	192	116	129	194	126	134	204
100	up to 750	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2	$25^{-0.040}_{-0.073}$	40	162	130	214	126	135	206	136	140	216

Minimum Auto Switch Mounting Stroke

n: Number of auto switches

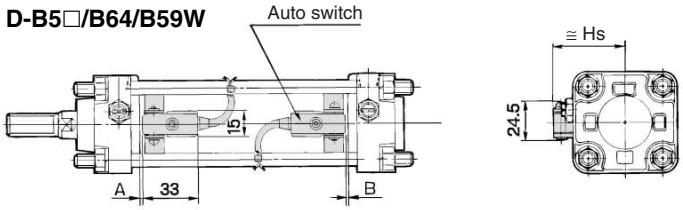
Auto switch model	Number of auto switch		Brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-A5□/A6□ D-F5□/J5□ D-F5□W/J59W D-F5BAL, D-F59F	2 (Different sides and same side) 1		15	90		100	110	120
	n (Same side)		$15 + 55\ \frac{(n-2)}{2}$ n = 2, 4, 6, 8···	$90 + 55\ \frac{(n-4)}{2}$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

* D-A3□/A3□C/A44/A44C/G39/G39C/K39/K39C/G5□W/K59W/G5BAL/G59F/P5PWL cannot be mounted on models with bore sizes ø40 and ø50 mm.

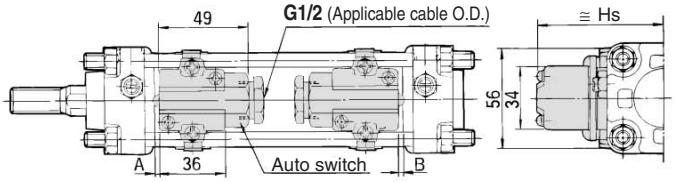
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mount type>

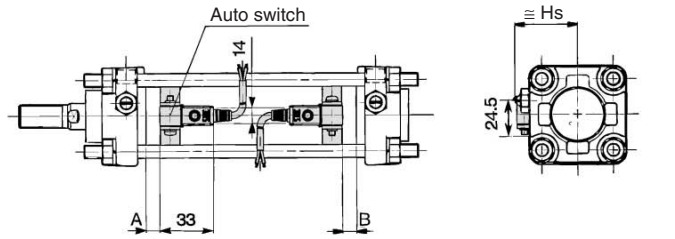
D-B5□/B64/B59W



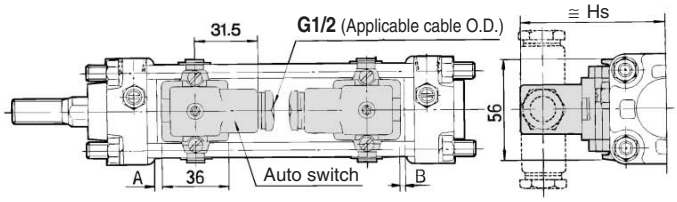
D-A3□
D-G39/K39



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

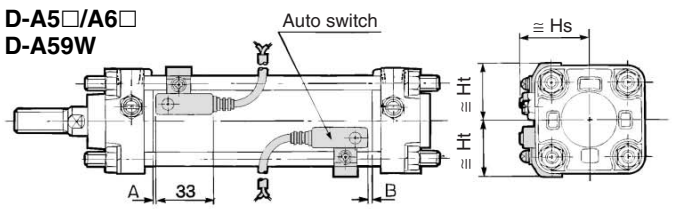


D-A44

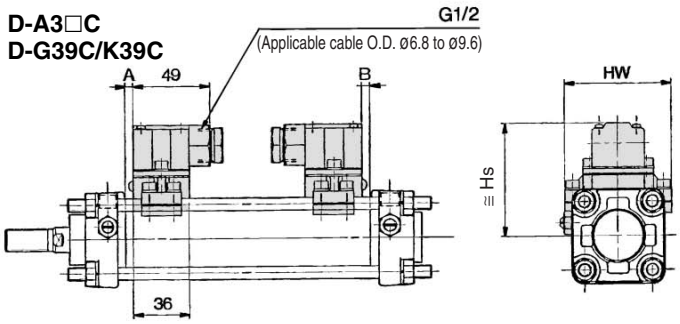


<Tie-rod mount type>

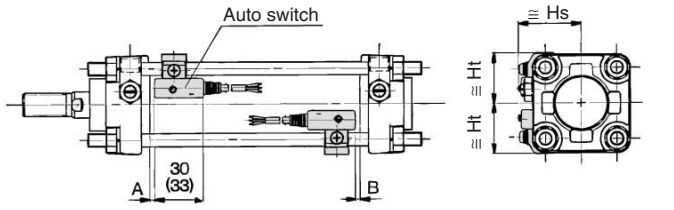
D-A5□/A6□
D-A59W



D-A3□C
D-G39C/K39C

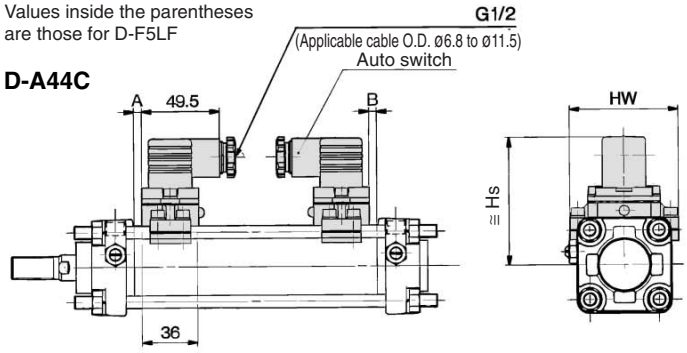


D-F5□/J5□
D-F5NTL
D-F5□W/J59W
D-F5BAL/F59F



Values inside the parentheses are those for D-F5LF

D-A44C



Proper Auto Switch Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-A5□/A6□ D-A3□/ A3□C D-A44/ A44C D-G39/ G39C D-K39/ K39C		D-B5□ D-B64		D-B59W		D-F5□ D-J5□ D-F59F D-F5□W D-J59W D-F5BAL		D-G5□ D-K59 D-G5NTL D-G5□W D-K5W D-G5BAL D-G59F		D-A59W		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	11.5	0	12	0	15	0	18	3	13.5	0	15.5	0.5	23	8
50	12	0	12.5	0	15.5	0	18.5	3	14	0	16	0.5	23.5	8
63	16.5	0	17	0	20	1	23	4	18.5	0	20.5	1.5	28	9
80	20.5	0	21	0	24	3	27	6	22.5	1.5	24.5	3.5	32	11
100	23.5	0	24	1	27	4	30	7	25.5	2.5	27.5	4.5	35	12

Auto Switch Mounting Height

(mm)

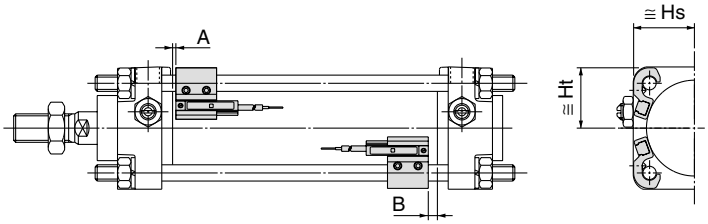
D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F	D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C	
Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw
38	—	—	40	31	38.5	31	—	—	—	—
43.5	—	—	43.5	35	42.5	35	—	—	—	—
50.5	85	93	49	42	48	42	85.5	91	93.5	91
59	93.5	101.5	55.5	50	54	50	94	107	102	107
69.5	104	112	63	57.5	62	57.5	104	121	112	121

* D-A3□/A3□C/A44/A44C/G39/G39C/K39/K39C/G5□W/K59W/G5BAL/G59F cannot be mounted on models with bore sizes ø40 and ø50 mm.

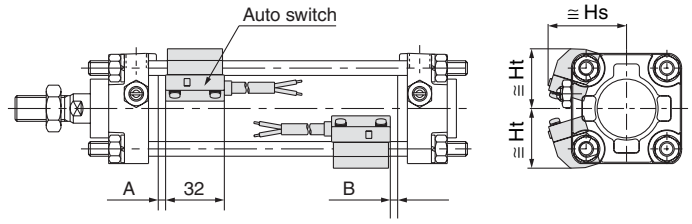
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mount type>

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



D-P5DWL



Proper Auto Switch Mounting Position (mm)

Auto switch model / Bore size (mm)	D-Z7□/Z80, D-Y59□/Y69□, D-Y7P/Y7PV, D-Y7□W, D-Y7□WV, D-Y7BAL		D-P5DWL*	
	A	B	A	B
40	15	0	—	—
50	15.5	0	—	—
63	20	1	19.5	0.5
80	24	3	23.5	2.5
100	27	4	26.5	3.5

* It cannot be mounted on models with bore sizes ø40 and ø50 mm.

Auto Switch Mounting Height (mm)

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

Operating Range

Auto switch model	Bore size				
	40	50	63	80	100
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44/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
D-Y59□/Y69□/Y7P/Y7□V/Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-Y7BAL	3.5	3.5	5	5	5
D-F5□/J5□/F5□W/J59W/F5BAL/F5NTL	4	4	4.5	4.5	4.5
D-F59F	5.5	5	5.5	5.5	5.5
D-G5□/K59/G5□W/K59W/G5BAL/G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39/G39C/K39C	—	—	10	10	11
D-P5DWL	—	—	4.5	4	4.5

* The above operating ranges are provided as guidelines including the hysteresis and are not guaranteed values (with approx. ±30% variations). They may vary significantly with the surrounding environment.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.
For detailed specifications, refer to page 6-16-1.

Type	Mounting	Model	Electrical entry	Features
Reed switch	Tie-rod	D-A53/A56	Grommet (In-line)	—
		D-64/A67		Without indicator light
		D-Z80		
		D-A33C/A34C *	Terminal conduit	—
		D-A44C *	DIN terminal	—
	Band	D-B53/B54	Grommet (In-line)	—
		D-B64		—
		D-B59W		2-color indication
		D-A33/A34 *	Terminal conduit	—
		D-A44 *	DIN terminal	—

Type	Mounting	Model	Electrical entry	Features
** Solid state switch	Tie-rod	D-F59/F5P/J59	Grommet (In-line)	—
		D-F59W/F5PW/J59W		2-color indication
		D-F5BAL		2-color indication, water resistant
		D-F5NTL		With timer
		D-Y69A/Y7PV/Y69B		—
		D-Y7NW/Y7PW/Y7BW		2-color indication
		D-G39C/K39C *	Terminal conduit	—
	Band	D-G59/G5P/K59	Grommet (In-line)	—
		D-G59W/G5PW/K59W *		2-color indication
		D-G5BAL *		2-color indication, water resistant
		D-G59F *		2-color indication, latch type with diagnostic output
		D-G5NTL		With timer
		D-G39/K39 *	Terminal conduit	—

* D-A3□/A3□C/A44/A44C/G39/G39C/K39/K39C/G5□W/K59W/G5BAL/G59F cannot be mounted on models with bore sizes ø40 and ø50 mm.
** Solid state switches are also available with pre-wired connector. Please contact SMC for further details on auto switch specifications.
** The normally closed type (NC = b contact) of solid state auto switches (D-Y7G/Y7H) are also available. Please contact SMC for further details on auto switch specifications.

Air Cylinder: With End Lock

Series CBA2

ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch CBA2 L ☐ 50 ☐ – 150 ☐ – H N

With auto switch CDBA2 L 50 ☐ – 150 ☐ – H N – Y7BW ☐

With auto switch

Mounting style

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

Tube material

Nil	Aluminum tube
F *	Steel tube

* Types with auto switch are not available.

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

For more information, please refer to the next page.

Cylinder suffix

Rod boot	Nil	Without rod boot
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	Nil	With cushion on both sides
	N	Without cushion

* When more than one symbol is to be specified, indicate them in alphabetical order.

Lock position

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

Manual release type

N	Non-lock type
L	Lock type

Auto switch

Nil	Without auto switch

* Select an applicable auto switch part number from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank. (Example) CDBA2L40-100-HN

Applicable Auto Switch

/Refer to page 6-16-1 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 mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**Z76**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**Z73**	●	●	●	—	—	Relay, PLC
							100 V, 200 V	**A54**	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7P**	●	●	○	○		
				2-wire	—	—	100 V, 200 V	**J51**	●	●	○	—	—	
					24 V	12 V	—	**Y59B**	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**Y7NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**Y7PW**	●	●	○	○		
				2-wire		12 V		**Y7BW**	●	●	○	○	—	
	Water resistant (2-color indication)							**Y7BA**	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		**P5DW**	—	●	●	○	—	

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

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

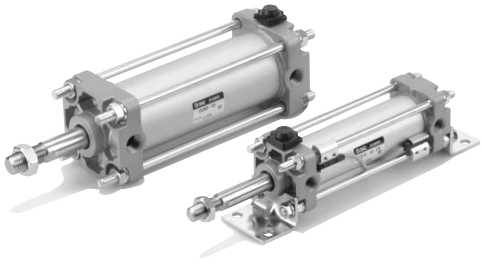
• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.

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-lock and lock types are standard for manual release.



Specifications

Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.15 MPa*
Ambient and fluid temperature	Without auto switch: –10 to 70°C (With no freezing) With auto switch: –10 to 60°C (With no freezing)
Piston speed	50 to 500 mm/s
Cushion	Interchangeable
Thread tolerance	JIS Class 2
Stroke length tolerance	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 style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

* 0.05 MPa except locking parts.

Lock Specifications

Lock position	Head side end, Rod side 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-lock type, Lock type				

Accessory /For more information, refer to page 6-8-13.

Accessory / 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 style	●	—	●	●	●	●
Axial foot style	●	—	●	●	●	●
Rod side flange style	●	—	●	●	●	●
Head side flange style	●	—	●	●	●	●
Single clevis style	●	—	●	●	●	●
Double clevis style *	●	●	●	●	●	●
Center trunnion style	●	—	●	●	●	●

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

Made to Order Specifications

(For details, refer to page 6-8-63.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB5 *1	Oversized rod
-XB6	Heat resistant (150°C)
-XC4 *1	With heavy duty scraper
-XC6 *1	Piston rod, rod end nut made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut made of stainless steel
-XC8 *1	Adjustable stroke/Extension adjustment
-XC9 *2	Adjustable stroke/Retraction adjustment
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluoro rubber seal
-XC27	Double clevis pin and double knuckle pin 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 side end lock type only
*2: For rod side end lock type only

Standard Stroke

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

* Types with auto switch have different minimum strokes. Please refer to page 6-8-14.

Rod Boot Material

Symbol	Rod boot materials	Max. ambient temperature
J	Nylon tarpaulin	70°C
K	Neoprene cross	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 mounting style of the cylinder. In particular, the center trunnion style needs careful attention. (For more information, please refer to page 6-8-14.)

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot style	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange style	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis style	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis style	1.16 (1.21)	1.79 (1.84)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion style	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per each 50 mm 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)
Accessory	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 Weight

(kg)

Bore size (mm)		40	50	63	80	100
Manual release Non-lock type (N)	Head side end lock (H)	0.02	0.03	0.03	0.10	0.12
	Rod side 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
Manual release lock type (L)	Head side end lock (H)	0.04	0.05	0.05	0.13	0.15
	Rod side 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

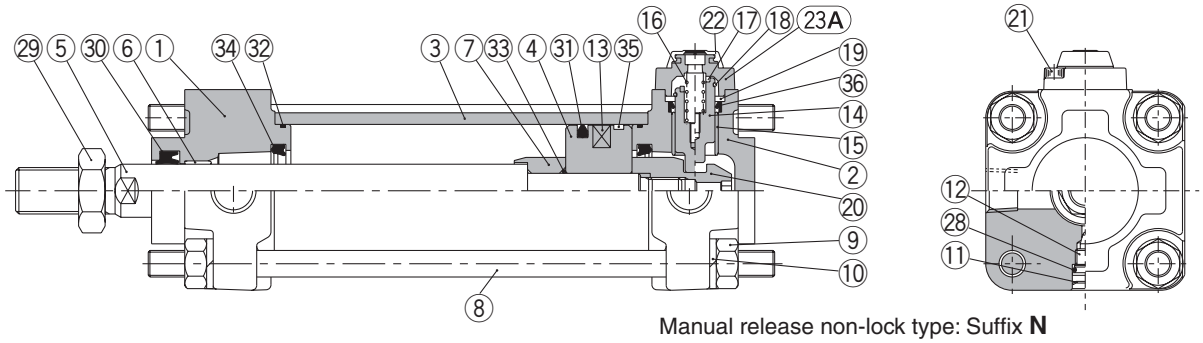
Calculation: (Example) CBA2L40-100-HN
- Basic weight····· 1.08kg (ø40 Axial foot style)
- Additional weight····· 0.22/50 st
- Cylinder stroke····· 100 st
- Lock weight····· 0.02 kg

(Head side end lock, Manual release, Non-lock)
1.08 + 0.22 x 100/50 + 0.02 = 1.54 kg

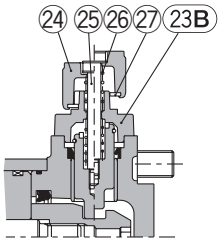
The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2.

Construction

Head side end lock



Manual release non-lock type: Suffix **N**



Manual release lock type: 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 chromium electroplated
⑥	Bushing	Lead-bronze casted	
⑦	Cushion ring A	Rolled steel	Electroless nickel plated
⑧	Tie-rod	Carbon steel	Corrosion resistant chromated
⑨	Tie-rod nut	Rolled steel	Nickel plated
⑩	Spring washer	Steel wire	Chromated
⑪	Snap ring	Spring steel	
⑫	Cushion valve	Steel wire	Nickel plated
⑬	Rubber magnet*	NBR	With auto switch*
⑭	Lock piston	Carbon steel	Quench hard chrome plated
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 hard chrome plated
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	Black coated, Tufftride

No.	Description	Material	Note
㉔	M/O knob	Zinc die-casted	Black coated
㉕	M/O bolt	Chromium molybdenum steel	Black zinc chromated
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	Nickel plated
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	

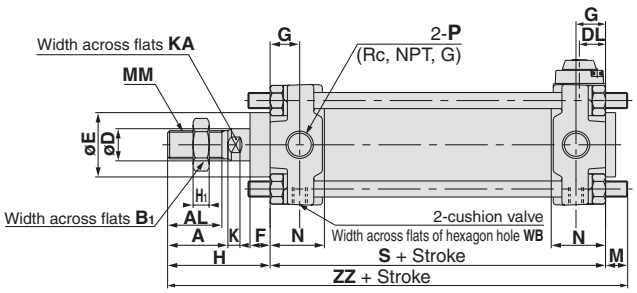
Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.		Content
	Single end lock	Double end lock	
40	MBB40-PS	MBB40-PS-W	Consists of numbers ㉚, ㉛, ㉜, ㉞, and ㊱ above.
50	MBB50-PS	MBB50-PS-W	
63	MBB63-PS	MBB63-PS-W	
80	MBB80-PS	MBB80-PS-W	
100	MBB100-PS	MBB100-PS-W	

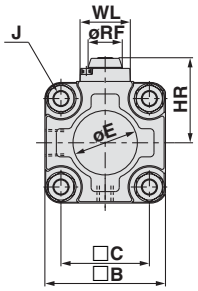
The seal kits consist of items ㉚, ㉛, ㉜, ㉞ and ㊱.
Please order them by using the seal kit number corresponding to each bore size.

Basic Style (Dimensions are common to rear end lock, front end lock and double end lock types.)

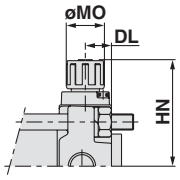
Head side end lock: CBA2B Bore size – Stroke -HN



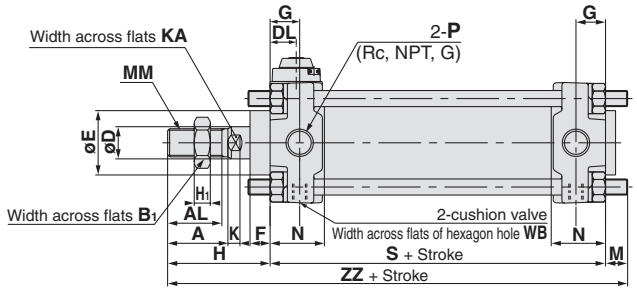
Manual release (Non-lock type): Suffix **N**



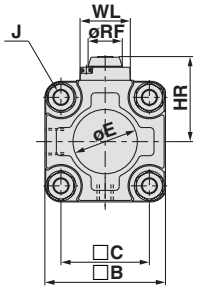
Manual release (Lock type): Suffix **L**



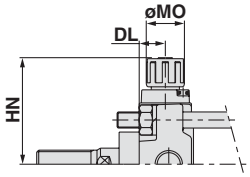
Rod side end lock: CBA2B Bore size – Stroke -RN



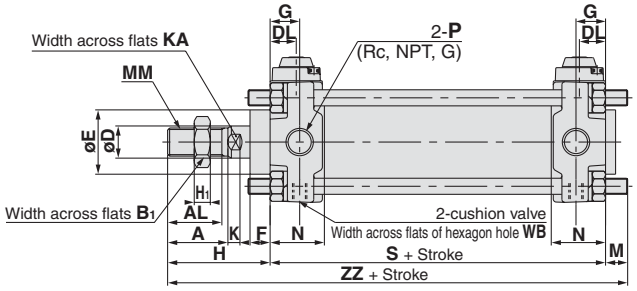
Manual release (Non-lock type): Suffix **N**



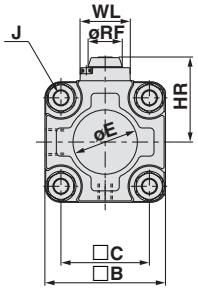
Manual release (Lock type): Suffix **L**



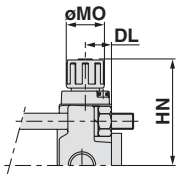
Double lock: CBA2B Bore size – Stroke -WN



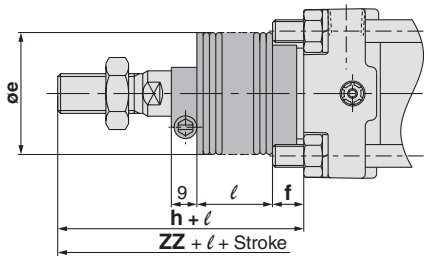
Manual release (Non-lock type): Suffix **N**



Manual release (Lock type): Suffix **L**



With rod boot



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

∗ For more information about the rod end nut and accessories, refer to page 6-8-13.

With Rod Boot

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

Dimensions of the mounting brackets are the same as those of the standard double acting single rod type. Refer to pages 6-8-8 to 11.

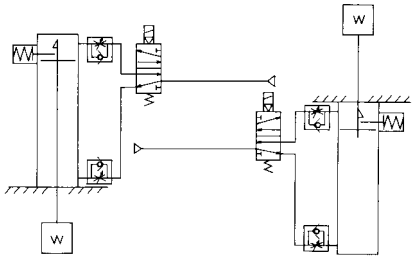
⚠Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6 for Safety Instructions and Actuator Precautions.

Use the Recommended Pneumatic Circuit.

⚠ Caution

They are required to engage and disengage the locks correctly.



Head side end lock Rod side end lock

Operation

⚠ 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 side that contains the lock mechanism, the lock will not engage. Even if the lock is engaged at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to disengage as time elapses.

2. Back pressure is required when releasing the lock.
Before starting, make sure that air is supplied to the side that is not equipped with a lock mechanism as shown in the diagram above (or the side on which the piston rod is unlocked, if both sides are equipped with a lock). Otherwise, the lock may not disengage.

3. Release the lock when mounting or adjusting the cylinder.
The lock may not disengage if the cylinder is installed with its lock engaged.

4. Operate with a load ratio of 50% or less.
The lock may not disengage or may become damaged if the load exceeds 50%.

5. Do not operate multiple synchronized cylinders.
Avoid applications in which two or more end lock cylinders are synchronized to move one work piece, as one of the cylinder locks may not be disengaged when required.

6. Use a speed controller with meter-out control.
If operated under meter-in control, the lock may not disengage.

7. Be sure to operate completely to the cylinder stroke end on the side with the lock.
The lock may not engage or disengage 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 side that has the lock mechanism, as it is necessary for disengaging the lock.

Exhaust Speed

⚠ Caution

1. When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism 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 side with the lock mechanism 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 disengaged. Therefore, the cushion valve must be adjusted properly.

Releasing the Lock

⚠ Caution

1.To disengage 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 air pressure circuit.) If the lock is disengaged, 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

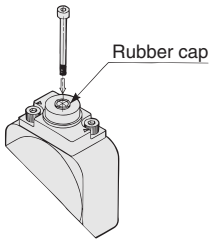
1. Non-lock type manual release

Insert the bolt, which is provided as an accessory part, 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 disengage 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 30ℓ or more	10 N	3
80, **100**	M5 x 0.8 x 40ℓ or more	24.5 N	3

* Remove the bolt for normal operation.
* It can cause lock malfunction or faulty release.

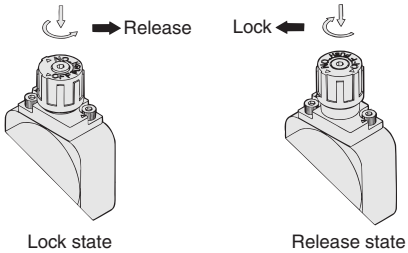


2. Manual release lock type

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

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 disengage.



Lock state Release state

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

How to Order

Without auto switch CA2 L □ H 50 □ – 100 J

With auto switch CDA2 L □ H 50 □ – 100 J – Y7BW □

With auto switch

Mounting style

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

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Hydro type

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Cylinder suffix

Rod boot	Nil	Without rod boot
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.

(Example) CDA2LH40-100

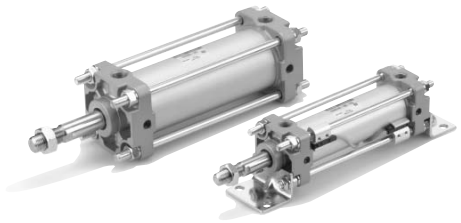
Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Tie-rod mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**Z76**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**Z73**	●	●	●	—	—	Relay, PLC
							100 V, 200 V	**A54**	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7P**	●	●	○	○		
				2-wire	—	—	100 V, 200 V	**J51**	●	●	○	—	—	
					24 V	12 V	—	**Y59B**	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**Y7NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**Y7PW**	●	●	○	○		
				2-wire		12 V		**Y7BW**	●	●	○	○	—	
	Water resistant (2-color indication)							**Y7BA**	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		**P5DW**	—	●	●	○	—	

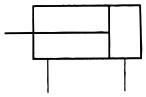
* Lead wire length symbols: 0.5 m ····· Nil (Example) A54
3 m ····· L (Example) A54L
5 m ····· Z (Example) A54Z

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

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.



JIS Symbol
Double acting type



⚠ 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.

Specifications

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	Without
Thread tolerance	JIS Class 2
Stroke length tolerance	To 250 st: $^{+1.0}_{0}$ 251 to 1.000 st: $^{+1.4}_{0}$ 1.001 to 1.500 st: $^{+1.8}_{0}$
Mounting	Basic style, Foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

Standard Stroke

In case of a type with auto switch, also refer to the table of minimum strokes for auto switch mounting on page 6-8-14.

Bore size (mm)	Standard stroke (mm)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, 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.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Accessory

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

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1. The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder. In particular, the center trunnion style needs careful attention.
(For more information, please refer to page 6-8-14.)

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot style	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange style	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis style	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis style	1.16 (1.21)	1.79 (1.83)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion style	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per each 50 mm 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)
Accessory	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 style, ø40, 100 st)
- Basic weight ..... 1.08 kg
- Additional weight ..... 0.22/50 st
- Cylinder stroke ..... 100 st

1.08 + 0.22 x 100/50 = 1.52 kg

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

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm) 40	50	63	80	100
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5NTL	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44 ∗∗∗ **D-G39/K39** ∗∗∗	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64 ∗∗∗ **D-B59W** ∗∗∗ **D-G5□/K59** ∗∗∗ **D-G5□W/K59W** ∗∗∗ **D-G59F** ∗∗∗ **D-G5NTL** ∗∗∗	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□C/A44C ∗ **D-G39C/K39C** ∗	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P5DWL	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080

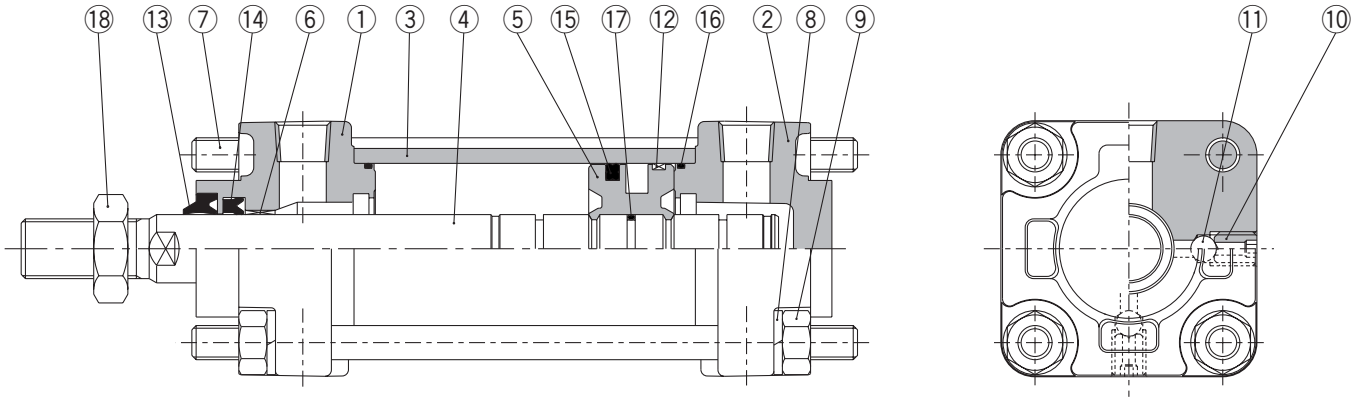
∗ Mounting brackets are attached to models D-A3□C/A44C/G39C/K39C. When placing an order, indicate one of the following part numbers according to the cylinder size.
(Example) ø40 ··· D-A3□C-4, ø80 ··· D-A3□C-8
ø50 ··· D-A3□C-5, ø100 ··· D-A3□C-10
ø63 ··· D-A3□C-6
When other brackets are ordered separately, order by the above part numbers.

∗∗ Stainless steel mounting screw kit
The following stainless steel mounting screw kits (including set screws) are available if the operating environment requires. (The mounting bracket and band are not included and must be ordered separately.)
BBA1: D-A5/A6/F5/J5
BBA3: D-B5/B6/G5/K5
When a switch model D-F5BAL or G5BAL is mounted on the cylinder at the time of shipment, the above stainless steel screws are used. When the switch is shipped alone, BBA1 or BBA3 is attached.

∗∗∗ **Series CDA2 models vary in the thickness of the cylinder tube wall. In cases where the band mount type is used as an applicable auto switch, select the part number of the new band referring to page 6-8-71 whenever the cylinder model is changed.**

The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2.

Construction



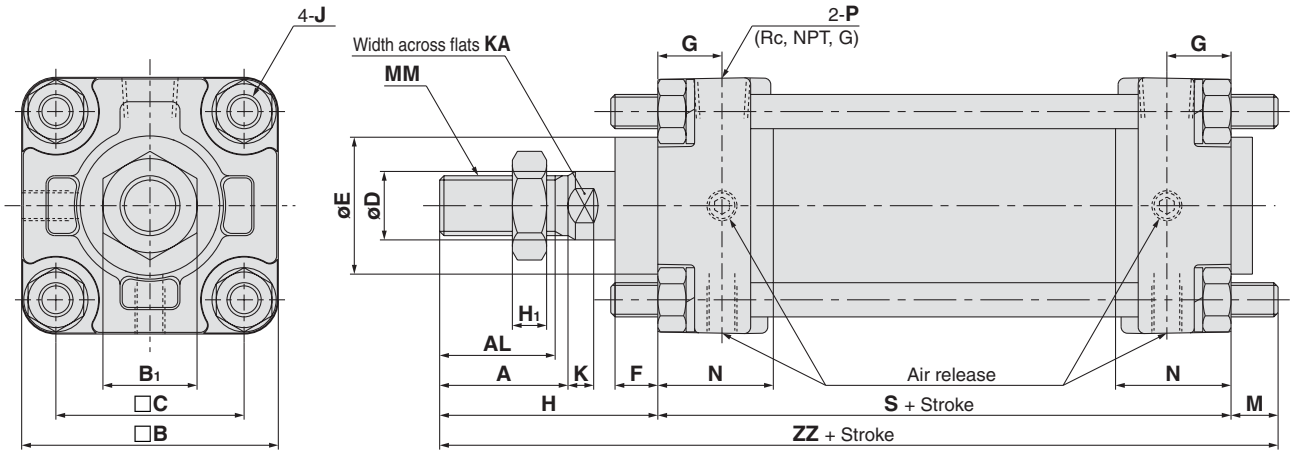
Component Parts

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 chromium electroplated
⑤	Piston	Aluminum alloy	Chromated
⑥	Bushing	Lead-bronze casted	
⑦	Tie-rod	Carbon steel	Corrosion resistant chromated
⑧	Spring washer	Rolled steel	Chromated
⑨	Tie-rod nut	Rolled steel	Nickel plated
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	Nickel plated

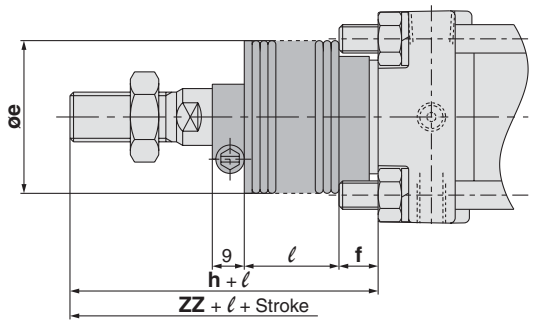
Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
	Air-hydro type	
40	CA2H40A-PS	Consists of numbers ⑭, ⑮, and ⑯ above.
50	CA2H50A-PS	
63	CA2H63A-PS	
80	CA2H80A-PS	
100	CA2H100A-PS	

Basic Style: CA2BH



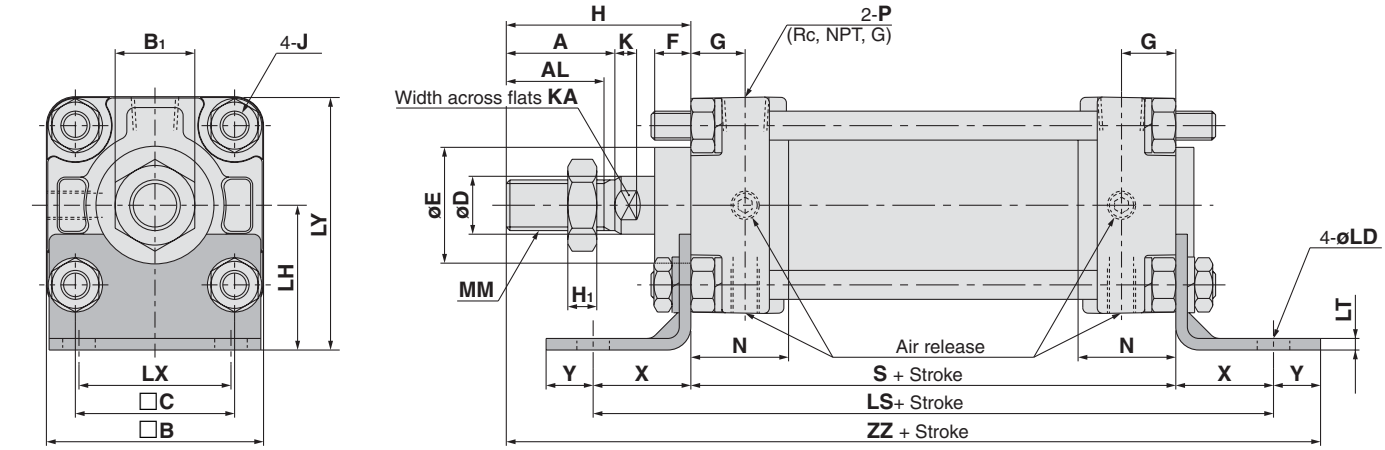
With rod boot



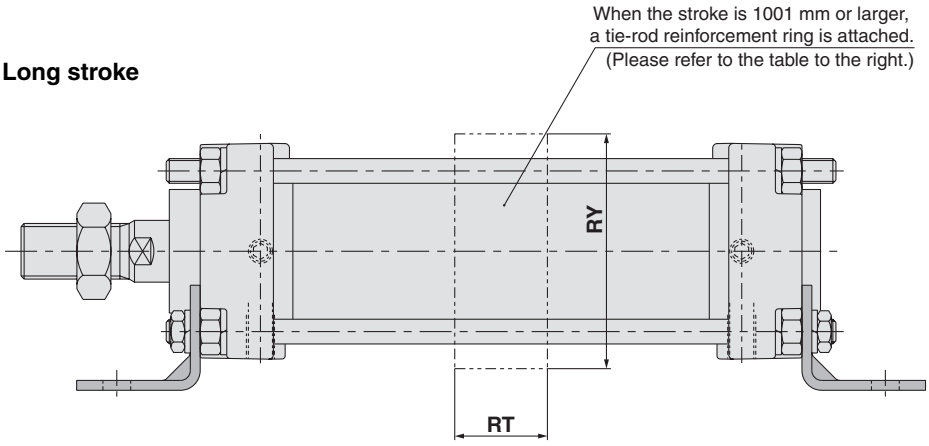
Bore size (mm)	Stroke range (mm)		A	AL	B	B1	C	D	E	F	G	H1	J	K	KA	M	MM	N	P
	Without rod boot	With rod boot																	
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8
63	up 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	e	f	h	ℓ	ZZ
40	84	51	146	43	11.2	59	1/4 stroke	154
50	90	58	159	52	11.2	66	1/4 stroke	167
63	98	58	170	52	11.2	66	1/4 stroke	178
80	116	71	204	65	12.5	80	1/4 stroke	213
100	126	72	215	65	14	81	1/4 stroke	224

Axial Foot Style: CA2LH



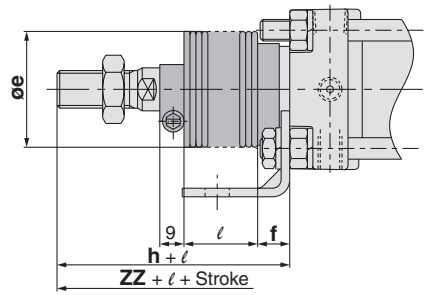
Long stroke



Long Stroke

Tube size (mm)	Stroke range (mm)	RT	RY
40	501 to 800	—	—
50	1601 to 1000	—	—
	1001 to 1200	30	76
63	601 to 1000	—	—
	1001 to 1200	40	92
80	751 to 1000	—	—
	1001 to 1400	45	112
100	751 to 1000	—	—
	1001 to 1500	50	136

With rod boot

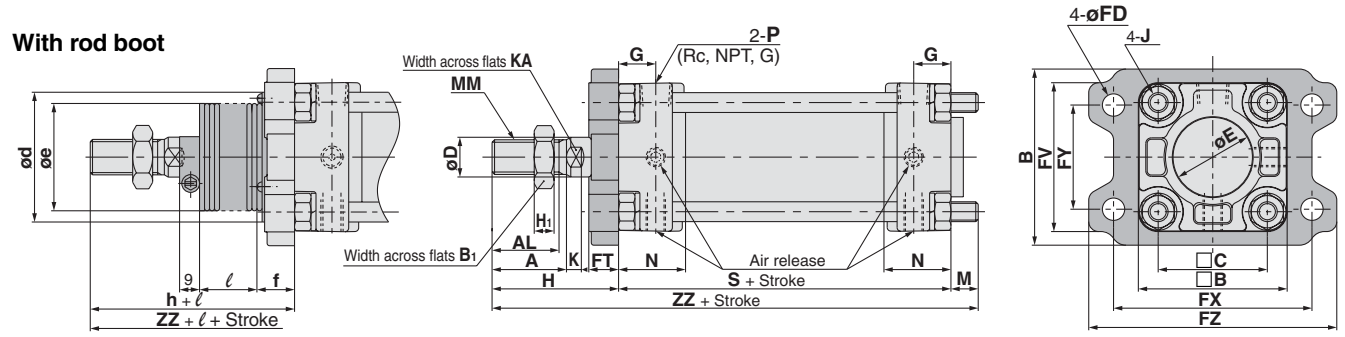


Bore size (mm)	Stroke range (mm)		A	AL	B	B1	C	D	E	F	G	H1	J	K	KA	LD	LH	LS	LT
	Without rod boot	With rod boot																	
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9	40	138	3.2
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	13.5	65	204	4.5
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	13.5	75	212	6

Bore size (mm)	LX	LY	MM	N	P	S	X	Y	Without rod boot		With rod boot				
									H	ZZ	e	f	h	ℓ	ZZ
40	42	70	M14 x 1.5	27	1/4	84	27	13	51	175	43	11.2	59	1/4 stroke	183
50	50	80	M18 x 1.5	30	3/8	90	27	13	58	188	52	11.2	66	1/4 stroke	196
63	59	93	M18 x 1.5	31	3/8	98	34	16	58	206	52	11.2	66	1/4 stroke	214
80	76	116	M22 x 1.5	37	1/2	116	44	16	71	247	65	12.5	80	1/4 stroke	256
100	92	133	M26 x 1.5	40	1/2	126	43	17	72	258	65	14.0	81	1/4 stroke	267

Front Flange Style: CA2FH

With rod boot



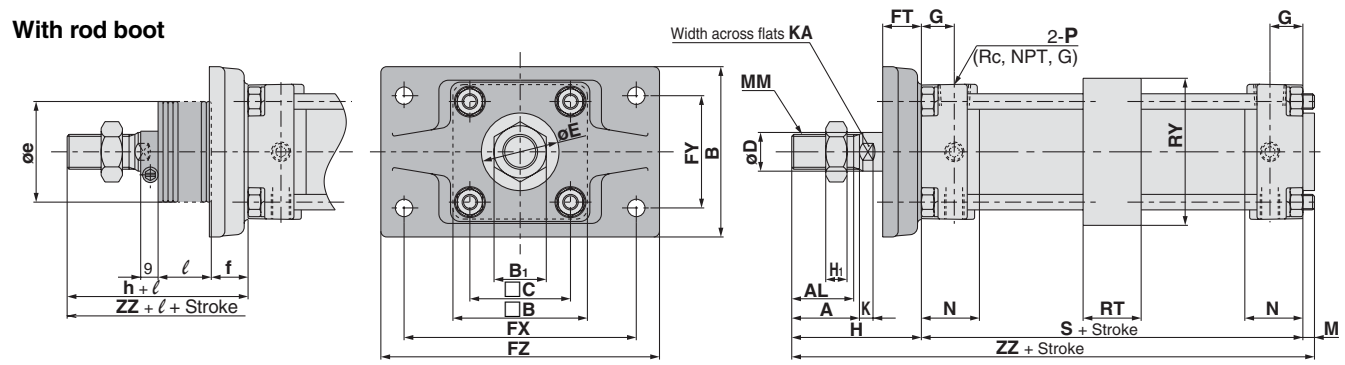
Bore size (mm)	Stroke range (mm)		Long stroke* range (mm)	A	AL	□B	B	B1	□C	D	E	FV	FD	FT	FX	FY	FZ	G	H1	J
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	501 to 800	30	27	71	60	22	44	16	32	60	9	12	80	42	100	15	8	M8 x 1.25
50	up to 600	20 to 600	601 to 1000	35	32	81	70	27	52	20	40	70	9	12	90	50	110	17	11	M8 x 1.25
63	up to 600	20 to 600	601 to 1000	35	32	101	85	27	64	20	40	86	11.5	15	105	59	130	17	11	M10 x 1.25
80	up to 750	20 to 750	751 to 1000	40	37	119	102	32	78	25	52	102	13.5	18	130	76	160	21	13	M12 x 1.75
100	up to 750	20 to 750	751 to 1000	40	37	133	116	41	92	30	52	116	13.5	18	150	92	180	21	16	M12 x 1.75

Bore size (mm)	K	KA	M	MM	N	P	S	Without rod boot		With rod boot					
								H	ZZ	d★	e	f	h	ℓ	ZZ
40	6	14	11	M14 x 1.5	27	1/4	84	51	146	52	43	15	59	1/4 stroke	154
50	7	18	11	M18 x 1.5	30	3/8	90	58	159	58	52	15	66	1/4 stroke	167
63	7	18	14	M18 x 1.5	31	3/8	98	58	170	58	52	17.5	66	1/4 stroke	178
80	10	22	17	M22 x 1.5	37	1/2	116	71	204	80	65	21.5	80	1/4 stroke	213
100	10	26	17	M26 x 1.5	40	1/2	126	72	215	80	65	21.5	81	1/4 stroke	224

★If a hole is provided to accommodate the boot when the air-hydro cylinder is mounted, make the hole diameter larger than the outside diameter of the boot mounting bracket ød.

Long stroke (When the stroke is 1001 mm or larger)

With rod boot



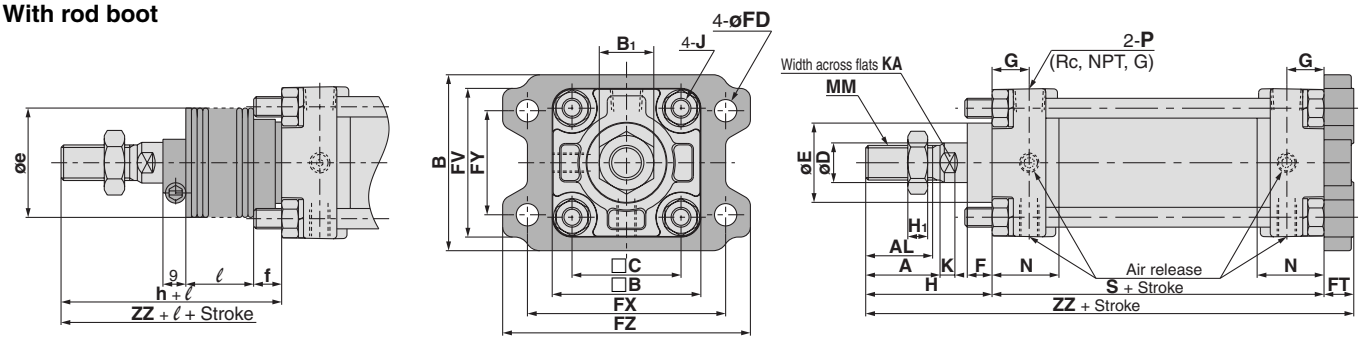
Bore size (mm)	Stroke range (mm)	A	AL	B	□B	B1	C	D	E	FD	FT	FX	FY	FZ	GA	GB	H1	J	K	KA
50	1001 to 1200	35	32	88	70	27	52	20	40	9.0	20	120	58	144	17	17	11	M8 x 1.25	7	18
63	1001 to 1200	35	32	105	85	27	64	20	40	11.5	23	140	64	170	17	17	11	M10 x 1.25	7	18
80	1001 to 1400	40	37	124	102	32	78	25	52	13.5	28	164	84	198	21	21	13	M12 x 1.75	10	22
100	1001 to 1500	40	37	140	116	41	92	30	52	13.5	29	180	100	220	21	21	16	M12 x 1.75	10	26

Bore size (mm)	M	MM	N	P	RT	RY	S	Without rod boot		With rod boot				
								H	ZZ	e★	f	h	ℓ	ZZ
50	6	M18 x 1.5	30	3/8	30	76	90	67	163	52	19	66	1/4 stroke	162
63	10	M18 x 1.5	31	3/8	40	92	98	71	179	52	19	66	1/4 stroke	174
80	12	M22 x 1.5	37	1/2	45	112	116	87	215	65	21	80	1/4 stroke	208
100	12	M26 x 1.5	40	1/2	50	136	126	89	227	65	21	81	1/4 stroke	219

★If a hole is provided to accommodate the boot when the air-hydro cylinder is mounted, make the hole diameter larger than the outside diameter of the boot mounting bracket øe.

Rear Flange Style: CA2GH

With rod boot

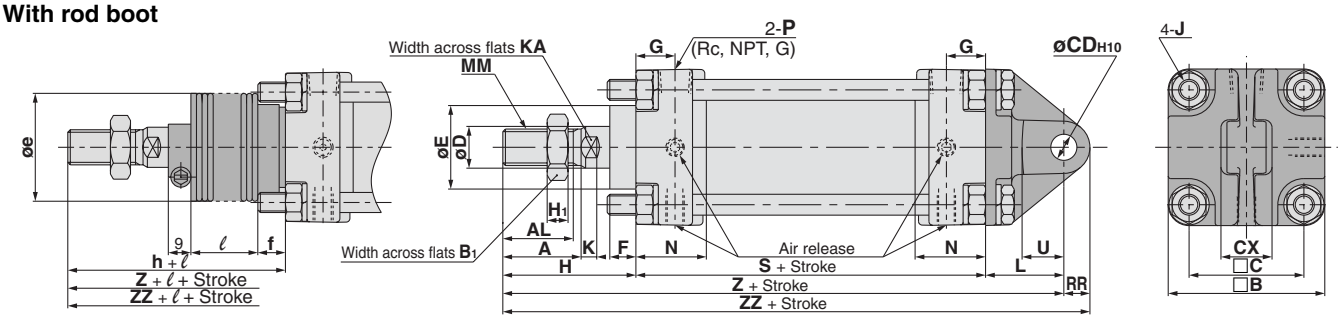


Bore size (mm)	Stroke range (mm)		A	AL	B	□B	B_1	C	D	E	F	FV	FD	FT	FX	FY	FZ	G	H_1	J
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	30	27	71	60	22	44	16	32	10	60	9	12	80	42	100	15	8	M8 x 1.25
50	up to 600	20 to 600	35	32	81	70	27	52	20	40	10	70	9	12	90	50	110	17	11	M8 x 1.25
63	up to 600	20 to 600	35	32	101	85	27	64	20	40	10	86	11.5	15	105	59	130	17	11	M10 x 1.25
80	up to 750	20 to 750	40	37	119	102	32	78	25	52	14	102	13.5	18	130	76	160	21	13	M12 x 1.75
100	up to 750	20 to 750	40	37	133	116	41	92	30	52	14	116	13.5	18	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	e	f	h	ℓ	ZZ
40	6	14	M14 x 1.5	27	1/4	84	51	147	43	11.2	59	1/4 stroke	155
50	7	18	M18 x 1.5	30	3/8	90	58	160	52	11.2	66	1/4 stroke	168
63	7	18	M18 x 1.5	31	3/8	98	58	171	52	11.2	66	1/4 stroke	179
80	10	22	M22 x 1.5	37	1/2	116	71	205	65	12.5	80	1/4 stroke	214
100	10	26	M26 x 1.5	40	1/2	126	72	216	65	14.0	81	1/4 stroke	225

Single Clevis Style: CA2CH

With rod boot

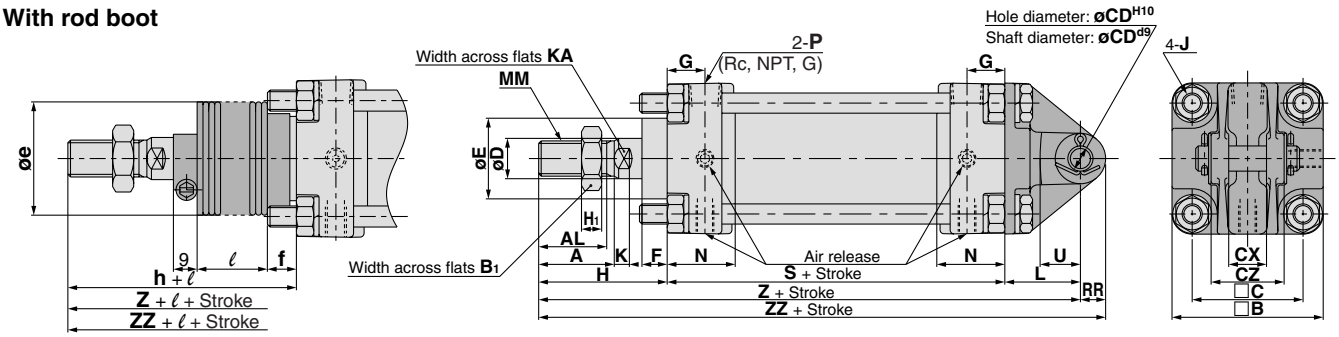


Bore size (mm)	Stroke range (mm)		A	AL	B	B_1	C	CD^{H10}	CX	D	E	F	G	H_1	J	K	KA
	Without rod boot	With rod boot															
40	up to 500	20 to 500	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{-0.1}_{-0.3}$	16	32	10	15	8	M8 x 1.25	6	14
50	up to 600	20 to 600	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{-0.1}_{-0.3}$	20	40	10	17	11	M8 x 1.25	7	18
63	up to 600	20 to 600	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
80	up to 750	20 to 750	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
100	up to 750	20 to 750	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

Bore size (mm)	L	MM	N	P	RR	S	U	Z	Without rod boot			With rod boot					
									H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	165	51	165	175	43	11.2	59	1/4 stroke	173	183
50	35	M18 x 1.5	30	3/8	12	90	19	183	58	183	195	52	11.2	66	1/4 stroke	191	203
63	40	M18 x 1.5	31	3/8	16	98	23	196	58	196	212	52	11.2	66	1/4 stroke	204	220
80	48	M22 x 1.5	37	1/2	20	116	28	235	71	235	255	65	12.5	80	1/4 stroke	244	264
100	58	M26 x 1.5	40	1/2	25	126	36	256	72	256	281	65	14.0	81	1/4 stroke	265	290

Double Clevis Style: CA2DH

With rod boot



∗ Double clevis and double knuckle joint types are packed with pins and snap rings.

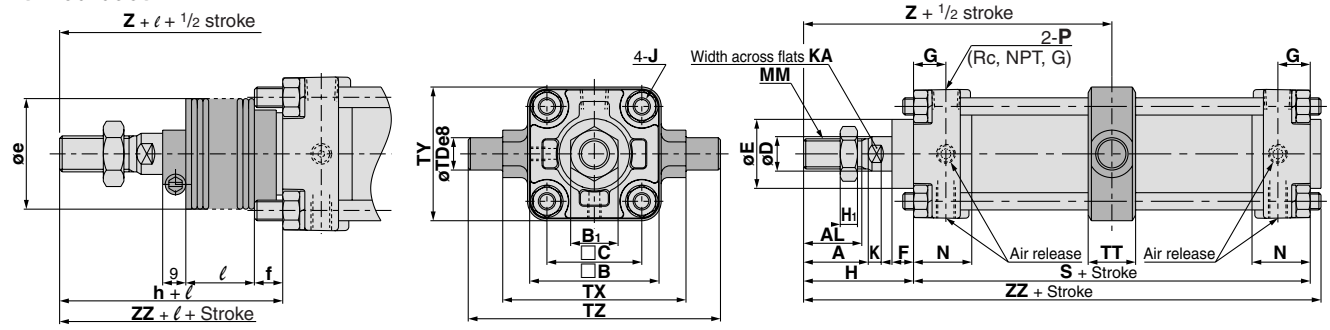
Bore size (mm)	Stroke range (mm)		A	AL	B	B_1	C	CD^{H10}	CX	CZ	D	E	F	G	H_1	J	K	KA
	Without rod boot	With rod boot																
40	up to 500	20 to 500	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{+0.3}_{+0.1}$	29.5	16	32	10	15	8	M8 x 1.25	6	14
50	up to 600	20 to 600	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{+0.3}_{+0.1}$	38	20	40	10	17	11	M8 x 1.25	7	18
63	up to 600	20 to 600	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
80	up to 750	20 to 750	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
100	up to 750	20 to 750	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

Bore size (mm)	L	MM	N	P	RR	S	U	Z	Without rod boot			With rod boot					
									H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	165	51	165	175	43	11.2	59	1/4 stroke	173	183
50	35	M18 x 1.5	30	3/8	12	90	19	183	58	183	195	52	11.2	66	1/4 stroke	191	203
63	40	M18 x 1.5	31	3/8	16	98	23	196	58	196	212	52	11.2	66	1/4 stroke	204	220
80	48	M22 x 1.5	37	1/2	20	116	28	235	71	235	255	65	12.5	80	1/4 stroke	244	264
100	58	M26 x 1.5	40	1/2	25	126	36	256	72	256	281	65	14.0	81	1/4 stroke	265	290

∗ Packed with clevis pin, flat washer and cotter pin.

Center Trunnion Style: CA2TH

With rod boot



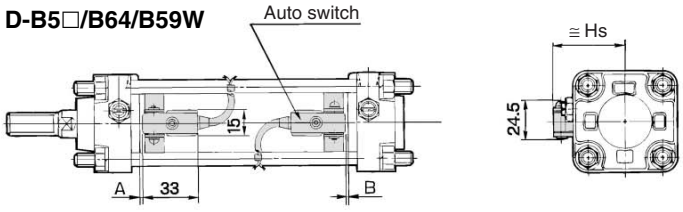
Bore size (mm)	Stroke range (mm)		A	AL	B	B_1	C	D	E	F	G	H_1	J	K	KA	MM	N	P
	Without rod boot	With rod boot																
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	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	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	M26 x 1.5	40	1/2

Bore size (mm)	S	TDe8	TT	TX	TY	TZ	Z	Without rod boot			With rod boot					
								H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	84	$15^{-0.032}_{-0.059}$	22	85	62	117	93	51	93	140	43	11.2	59	1/4 stroke	101	148
50	90	$15^{-0.032}_{-0.059}$	22	95	74	127	103	58	103	154	52	11.2	66	1/4 stroke	111	162
63	98	$18^{-0.032}_{-0.059}$	28	110	90	148	107	58	107	162	52	11.2	66	1/4 stroke	115	170
80	116	$25^{-0.040}_{-0.073}$	34	140	110	192	129	71	129	194	65	12.5	80	1/4 stroke	138	203
100	126	$25^{-0.040}_{-0.073}$	40	162	130	214	135	72	135	206	65	14.0	81	1/4 stroke	144	215

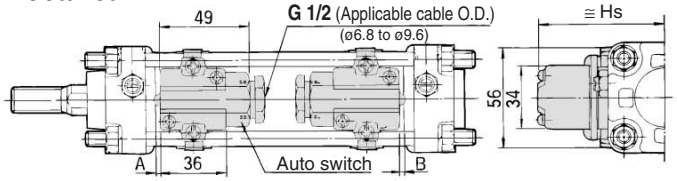
Proper Auto Switches Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mount type>

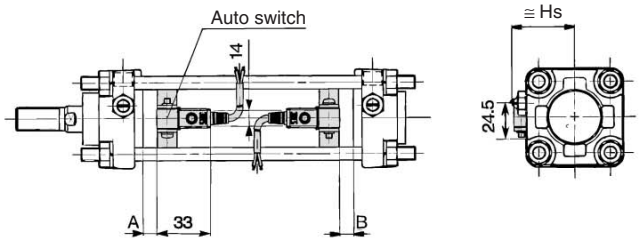
D-B5□/B64/B59W



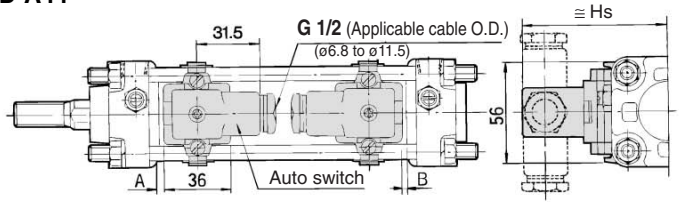
D-A3□
D-G39/K39



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

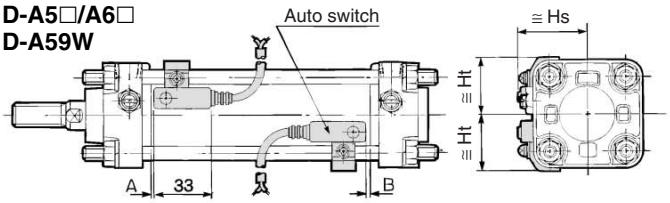


D-A44

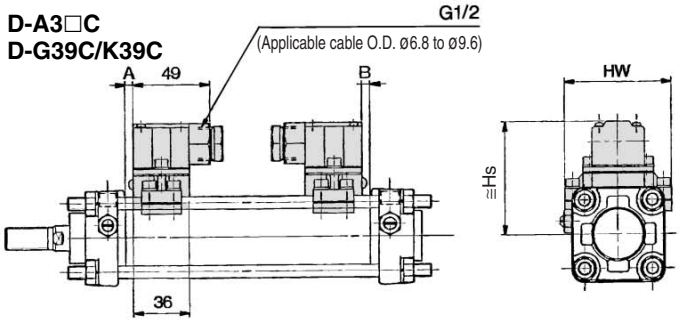


<Tie-rod mount type>

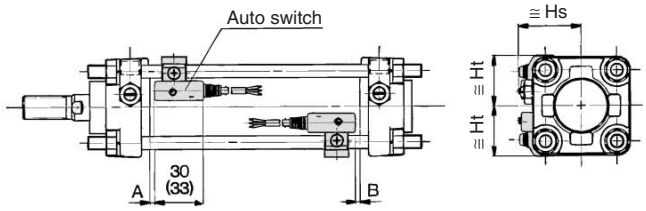
D-A5□/A6□
D-A59W



D-A3□C
D-G39C/K39C

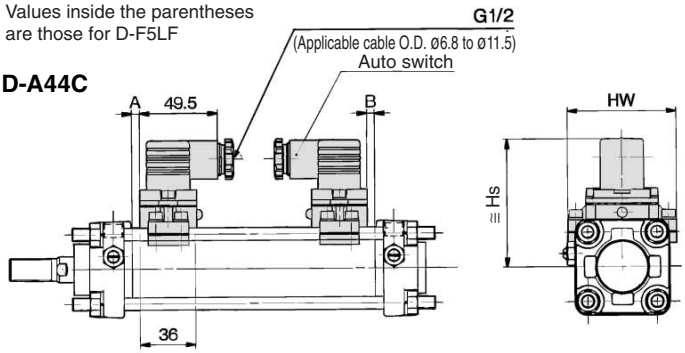


D-F5□/J5□
D-F5NTL
D-F5□W/J59W
D-F5BAL/F59F



Values inside the parentheses are those for D-F5LF

D-A44C



Proper Auto Switch Mounting Position (mm)

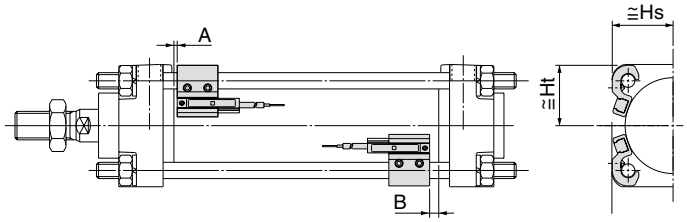
Auto switch model / Bore size (mm)	D-A5□/A6□ D-A3□/A3□C D-A44/A44C D-G39/G39C D-K39/K39C		D-B5□ D-B64		D-B59W		D-F5□ D-J5□ D-F59F D-F5□W D-J59W D-F5BAL		D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F		D-A59W		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	0	0	0.5	0	3.5	1.5	6.5	4.5	2	0	4	2	11.5	9.5
50	0	0	0.5	0	3.5	1.5	6.5	4.5	2	0	4	2	11.5	9.5
63	2.5	1.5	3	2	6	5	9	8	4.5	3.5	6.5	5.5	14	13
80	6	4	6.5	4.5	9.5	7.5	4.5	12.5	8	6	10	8	17.5	15.5
100	7.5	6.5	8	7	11	10	14	13	9.5	8.5	11.5	10.5	19	18

Auto Switch Mounting Height (mm)

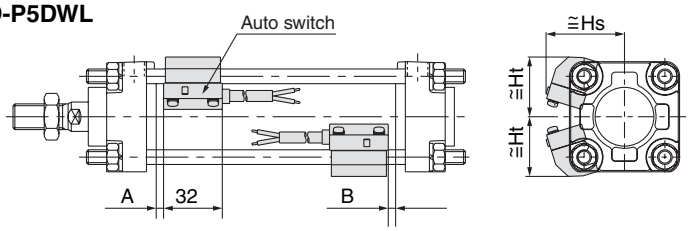
D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F	D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C	
Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw
38	72.5	80.5	40	31	38.5	31	73	69	81	69
43.5	78	86	43.5	35	42.5	35	78.5	77	86.5	77
50.5	85	93	49	42	48	42	85.5	91	93.5	91
59	93.5	101.5	55.5	50	54	50	94	107	102	107
69.5	104	112	63	57.5	62	57.5	104	121	112	121

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

<Tie-rod mount type>
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BAL



D-P5DWL



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL		D-P5DWL	
	A	B	A	B
40	3.5	1.5	3	1
50	3.5	1.5	3	1
63	6	5	5.5	4
80	9.5	7.5	9	7
100	11	10	10.5	9

Auto Switch Mounting Height

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

Operating Range

Auto switch model	Bore size (mm)				
	40	**50**	**63**	**80**	**100**
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44/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
D-Y59□/Y69□/Y7P/Y7□V/Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-Y7BAL	3.5	3.5	5	5	5
D-F5□/J5□/F5□W/J59W/F5BAL/F5NTL	4	4	4.5	4.5	4.5
D-F59F	5.5	5	5.5	5.5	5.5
D-G5□/K59/G5□W/K59W/G5BAL/G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39/G39C/K39C	9	9	10	10	11
D-P5DWL	4	4	4.5	4	4.5

∗ The above operating ranges are provided as guidelines including the hysteresis and are not guaranteed values (with approx. ±30% variations). They may vary significantly with the surrounding environment.

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

How to Order

Without auto switch CA2W L □ H 50 □ — 100 JJ

With auto switch CDA2W L H 50 □ — 100 JJ — Y7BW □

With auto switch

Double rod type

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
T	Center trunnion style

Tube material

Nil	Aluminum tube
F*	Steel tube

* Not available with auto switch.

Hydro type

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
For more information, please refer to the next page.

Cylinder suffix

Rod boot	Nil	Without rod boot
One end	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Both ends	JJ	Nylon tarpaulin
	KK	Heat resistant tarpaulin

Auto switch

Nil	Without auto switch

* Select an applicable auto switch model from the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

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

Cylinders with Built-in Magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank.
(Example) CDA2WLH40-100

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

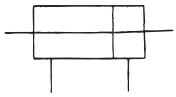
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Tie-rod mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	Z73	●	●	●	—	—	Relay, PLC
							100 V, 200 V	A54	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	●	●	○	○		
				2-wire	—	—	100 V, 200 V	J51	●	●	○	—	—	
					24 V	12 V	—	Y59B	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		Y7NW	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PW	●	●	○	○		
				2-wire		12 V		Y7BW	●	●	○	○	—	
	Water resistant (2-color indication)							Y7BA	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	●	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire		—		P5DW	—	●	●	○	—	

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

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

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-8-16.

JIS Symbol



Specifications

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°C to 60°C
Cushion	Without
Thread tolerance	JIS Class 2
Stroke length tolerance	To 250 st : $^{+1.0}_{0}$, 251 to 750 st : $^{+1.4}_{0}$
Mounting	Basic style, Axial foot style, Rod side flange style, Center trunnion style

Standard Stroke

In case of a type with auto switch, please also refer to the table of minimum strokes for auto switch mounting on page 6-8-14.

Bore size (mm)	Standard strokes (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50, **63**	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80, **100**	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700

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

Rod Boot Material

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

∗ Maximum ambient temperature for the rod boot itself.

Accessory

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

∗ The above brackets have the same dimensions as those for the standard double acting single rod Series CA2. Please refer to page 6-8-13.

Weight/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 each 50 mm 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)
Accessory	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 style, ø40, 100 st)
- Basic weight ..... 1.22 (Axial foot style, ø40)
- Additional weight ..... 0.30/50 st
- Cylinder stroke ..... 100 st

1.22 + 0.30 x 100/50 = 1.82 kg

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

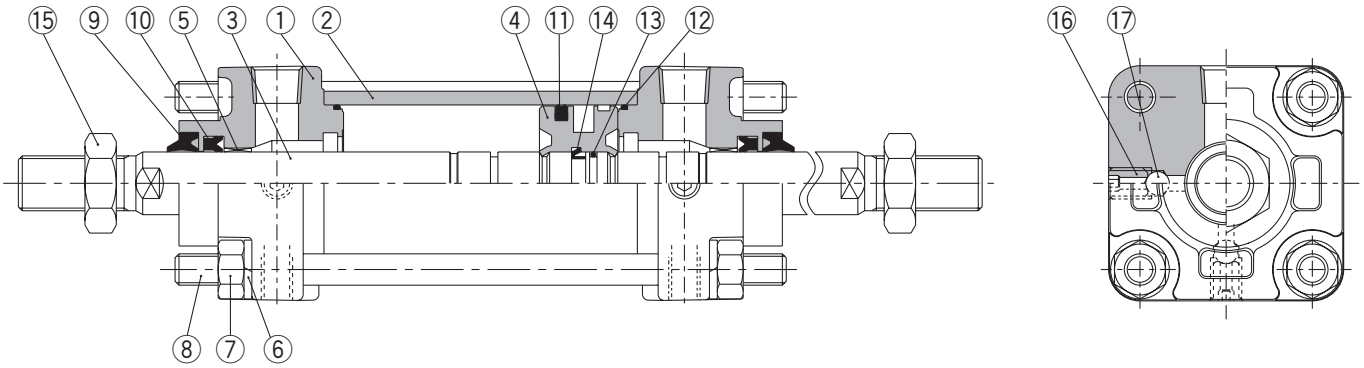
The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2□H.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

1.The minimum stroke for mounting varies with the auto switch type and mounting style of the cylinder.
In particular, the center trunnion style needs careful attention. (For more information, please refer to page 6-8-14.)

Construction



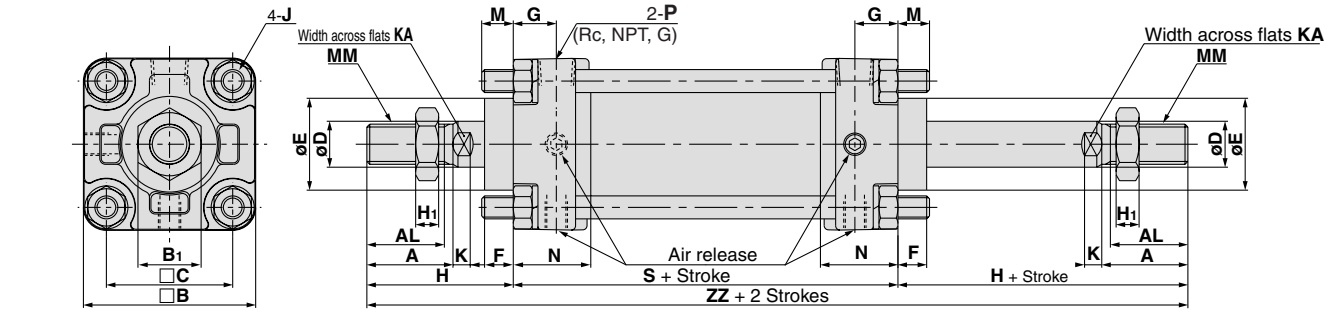
Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Metallic painted
②	Cylinder tube	Aluminum alloy	Hard anodized
③	Piston rod	Carbon steel	Hard chromium electroplated
④	Piston	Aluminum alloy	Chromated
⑤	Bushing	Lead-bronze casted	
⑥	Spring washer	Rolled steel	Chromated
⑦	Tie-rod nut	Rolled steel	Nickel plated
⑧	Tie-rod	Carbon steel	Corrosion resistant 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 plated
⑯	Air release valve	Chromium molybdenum steel	Black zinc chromated
⑰	Check ball	Bearing steel	

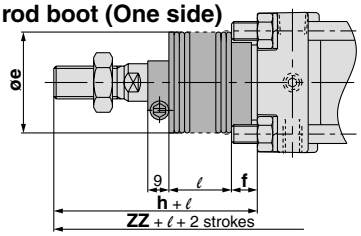
Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
	Air-hydro type	
40	CA2WH40A-PS	Consists of numbers ⑩, ⑪ and ⑫ above.
50	CA2WH50A-PS	
63	CA2WH63A-PS	
80	CA2WH80A-PS	
100	CA2WH100A-PS	

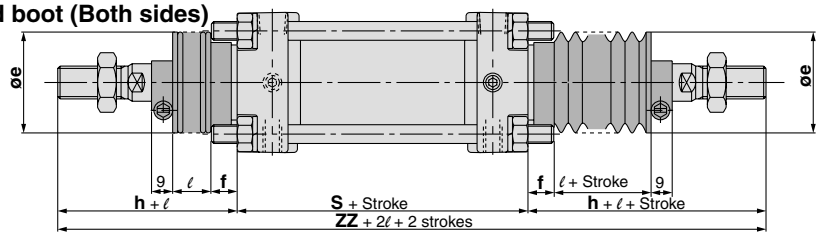
Basic Style: CA2WBH



With rod boot (One side)



With rod boot (Both sides)

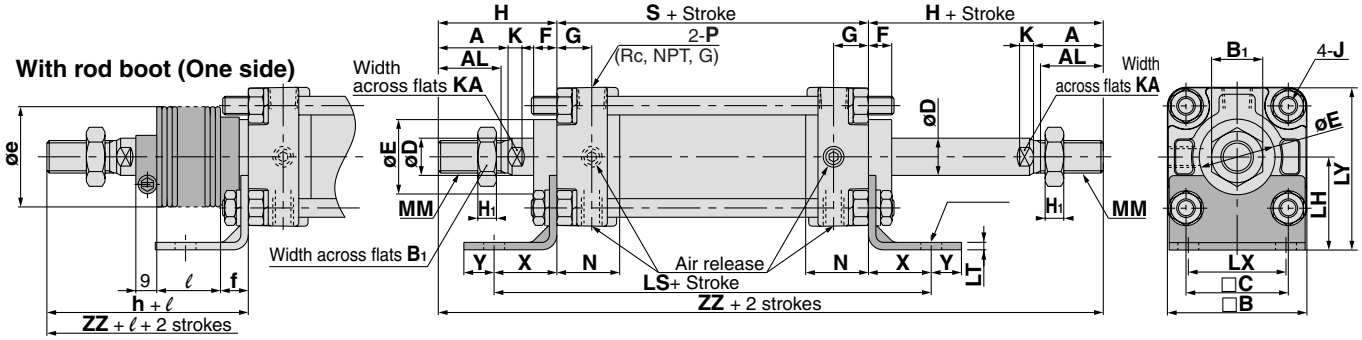


Bore size (mm)	Stroke range (mm)		A	AL	B	B_1	C	D	E	F	G	H_1	J	K	KA	M	MM	N
	Without rod boot	With rod boot																
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	11	22	17	M22 x 1.5	37
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	11	26	17	M26 x 1.5	40

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

Axial Foot Style: CA2WLH

With rod boot (One side)

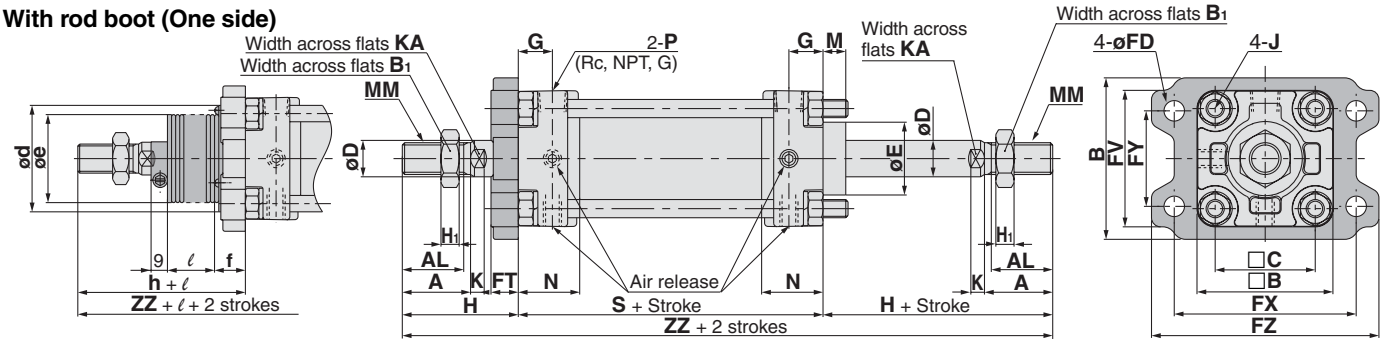


Bore size (mm)	Stroke range (mm)		A	AL	B	B_1	C	D	E	F	G	H_1	J	K	KA	LD	LH	LS	LT
	Without rod boot	With rod boot																	
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9	40	138	3.2
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9	45	144	3.2
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	11	22	13.5	65	204	4.5
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	11	26	13.5	75	212	6.0

Bore size (mm)	LX	LY	MM	N	P	S	W	X	Y	Without rod boot		With rod boot (Single side)					(Both sides)
										H	ZZ	e	f	h	ℓ	ZZ	ZZ
40	42	70	M14 x 1.5	27	1/4	84	8	27	13	51	186	43	11.2	59	1/4 stroke	194	202
50	50	80	M18 x 1.5	30	3/8	90	0	27	13	58	206	52	11.2	66	1/4 stroke	214	222
63	59	93	M18 x 1.5	31	3/8	98	0	34	16	58	214	52	11.2	66	1/4 stroke	222	230
80	76	116	M22 x 1.5	37	1/2	116	0	44	16	71	258	65	12.5	80	1/4 stroke	267	276
100	92	133	M26 x 1.5	40	1/2	126	0	43	17	72	270	65	14.0	81	1/4 stroke	279	288

Front Flange Style: CA2WFH

With rod boot (One side)



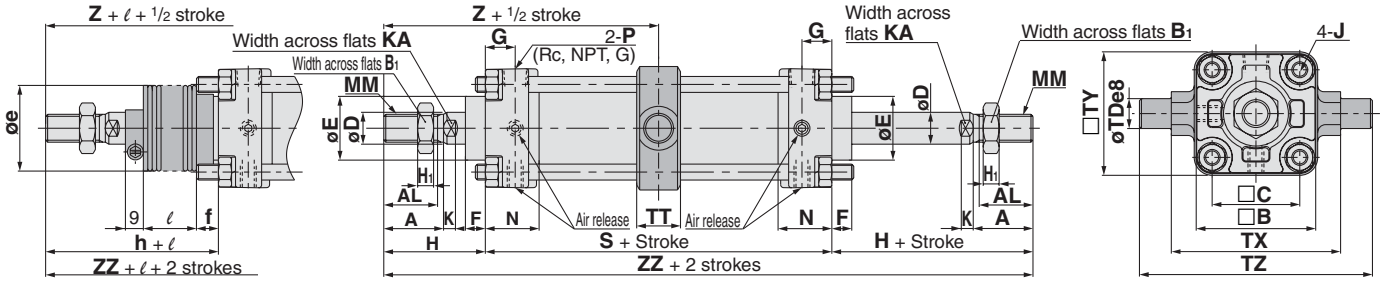
Bore size (mm)	Stroke range (mm)		A	AL	B	□B	B1	C	D	E	FD	FT	FX	FY	FZ	FV	G	H1	J	K
	Without rod boot	With rod boot																		
40	up to 500	20 to 500	30	27	71	60	22	44	16	32	9.0	12	80	42	100	60	15	8	M8 x 1.25	6
50	up to 600	20 to 600	35	32	81	70	27	52	20	40	9.0	12	90	50	110	70	17	11	M8 x 1.25	7
63	up to 600	20 to 600	35	32	101	85	27	64	20	40	11.5	15	105	59	130	86	17	11	M10 x 1.25	7
80	up to 750	20 to 750	40	37	119	102	32	78	25	52	13.5	18	130	76	160	102	21	13	M12 x 1.75	11
100	up to 750	20 to 750	40	37	133	116	41	92	30	52	13.5	18	150	92	180	116	21	16	M12 x 1.75	11

Bore size (mm)	KA	M	MM	N	P	S	Without rod boot		With rod boot (Single side)						(Both sides)
							H	ZZ	d★	e	f	h	ℓ	ZZ	ZZ
40	14	11	M14 x 1.5	27	1/4	84	51	186	52	43	15	59	1/4 stroke	194	202
50	18	11	M18 x 1.5	30	3/8	90	58	206	58	52	15	66	1/4 stroke	214	222
63	18	14	M18 x 1.5	31	3/8	98	58	214	58	52	17.5	66	1/4 stroke	222	230
80	22	17	M22 x 1.5	37	1/2	116	71	258	80	65	21.5	80	1/4 stroke	267	276
100	26	17	M26 x 1.5	40	1/2	126	72	270	80	65	21.5	81	1/4 stroke	279	288

★ If a hole is provided to accommodate the boot when the air-hydro cylinder is mounted, make the hole diameter larger than the outside diameter of the boot mounting bracket ød.

Center Trunnion Style: CA2WTH

With rod boot (One side)



Bore size (mm)	Stroke range (mm)		A	AL	B	B1	C	D	E	F	G	J	K	MM	N	P	S	TDe8
	Without rod boot	With rod boot																
40	up to 500	20 to 500	30	27	60	22	44	16	32	10	15	M8 x 1.25	6	M14 x 1.5	27	1/4	84	$15^{-0.032}_{-0.059}$
50	up to 600	20 to 600	35	32	70	27	52	20	40	10	17	M8 x 1.25	7	M18 x 1.5	30	3/8	90	$15^{-0.032}_{-0.059}$
63	up to 600	20 to 600	35	32	85	27	64	20	40	10	17	M10 x 1.25	7	M18 x 1.5	31	3/8	98	$18^{-0.032}_{-0.059}$
80	up to 750	20 to 750	40	37	102	32	78	25	52	14	21	M12 x 1.75	11	M22 x 1.5	37	1/2	116	$25^{-0.040}_{-0.073}$
100	up to 750	20 to 750	40	37	116	41	92	30	52	14	21	M12 x 1.75	11	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 (Single side)						(Both sides)	
					H	Z	ZZ	e	f	h	ℓ	Z	ZZ	Z	ZZ
40	22	85	62	117	51	93	186	43	11.2	59	1/4 stroke	101	194	101	202
50	22	95	74	127	58	103	206	52	11.2	66	1/4 stroke	111	214	111	222
63	28	110	90	148	58	107	214	52	11.2	66	1/4 stroke	115	222	115	230
80	34	140	110	192	71	129	258	65	12.5	80	1/4 stroke	138	267	138	276
100	40	162	130	214	72	135	270	65	14.0	81	1/4 stroke	144	279	144	288

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

Made to Order

Series CA2
Simple Specials
Made to Order Specifications

■ Simple Specials

Simple Special System offers the following options.
Dedicated specification sheets for Simple Specials and a CD-ROM are available. Please request of SMC sales representatives.

Symbol		Content	Single rod CA2	Double rod CA2W	Non-rotating rod CA2K	Low friction CA2□Q	End lock CBA2	Air-hydro CA2□H	Page
1	-XA0 to XA30	Change of rod end shape	●	●	●	●	●	●	6-8-64
2	-XC14	Change of trunnion bracket mounting position	●	●	●	●	●	●	6-8-65
3	-XC15	Change of tie-rod length	●	●	●	●	●	●	6-8-65

■ Made to Order Specifications

Symbol		Content	Single rod CA2	Double rod CA2W	Non-rotating rod CA2K	Low friction CA2□Q	End lock CBA2	Air-hydro CA2□H	Page
1	-XB5	Oversized rod	●				●1*		6-8-66
2	-XB6	Heat resistant (150°C)	●	●			●		
3	-XC3	Special port positions	●	●					
4	-XC4	With heavy duty scraper	●	●			●1*		
5	-XC5	Heat resistant (110°C)	●	●					6-8-67
6	-XC6	Piston rod and rod end nut made of stainless steel	●	●		●	●1*		
7	-XC7	Tie-rod, tie-rod nut, and cushion valve made of stainless steel	●	●	●	●	●		
8	-XC8	Adjustable stroke/Extension adjustment	●		●		●1*		
9	-XC9	Adjustable stroke/Retraction adjustment	●		●	●	●2*		
10	-XC10	Dual stroke/Double rod	●		●				6-8-68
11	-XC11	Dual stroke/Single rod	●						
12	-XC12	Tandem type	●						
13	-XC22	Fluoro rubber seal	●	●			●		
14	-XC27	Double clevis pin and double knuckle pin made of stainless steel	●	●	●	●	●		6-8-69
15	-XC28	Compact flange made of SS400	●	●	●	●	●		
16	-XC29	Double knuckle joint with spring pin	●			●	●		
17	-XC30	Front trunnion	●						
18	-XC35	With coil scraper	●	●			●1*		
19	-XC58	Water resistant / Built-in hard plastic magnet	●						6-8-70
20	-XC59	Fluoro rubber seals and built-in hard plastic magnet	●						

∗ 1. Only head side is locked. ∗ 2. Only rod side is locked.

Simple Specials

Change of rod end shape

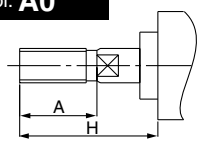
1 -XA0 to XA30

Non-rotating rod end shapes are classified into the following patterns.

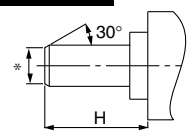
Series			Action	Symbol for change of rod end shape
CA2	Standard type	**CA2**	Double acting single rod	XA0-30
		CA2W	Double acting double rod	XA0-30
	Non-rotating rod	**CA2K**	Double acting single rod	XA0, 1, 6, 10, 11, 13, 14, 17, 19, 21
	Low friction	**CA2□Q**	Double acting single rod	XA0-30
	End Lock	**CBA2**	Double acting single rod	XA0-30
	Air-hydro type	**CA2□H**	Double acting single rod	XA1, 3, 5 to 8, 10, 11, 13 to 23, 26 to 30

1) SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
2) Dimensions marked with "∗" in relation to the rod diameter are found as follows.
   $D \leq 6 \rightarrow D - 1$ mm $6 \leq D \leq 25 \rightarrow D - 2$ mm $D \leq 25 \rightarrow D - 4$ mm
3) In case of double rod type and single acting retraction type, enter the dimensions when the rod is retracted.
4) The options are applicable to only a single side of a double rod.

Symbol: **A0**



Symbol: **A1**



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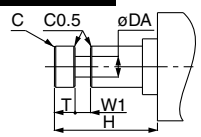

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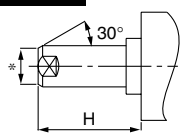

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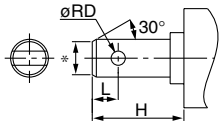

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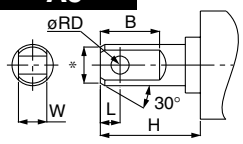

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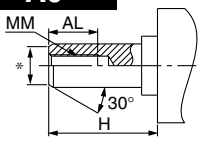

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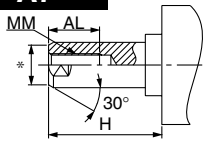

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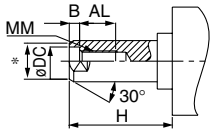

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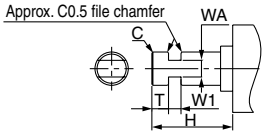

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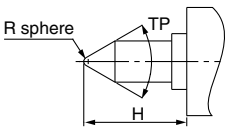

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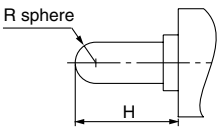

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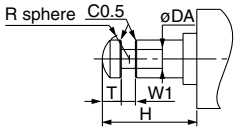

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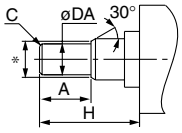

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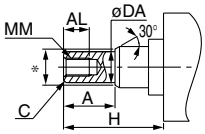

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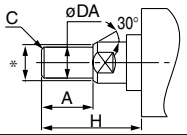

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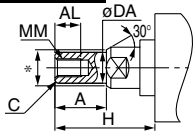

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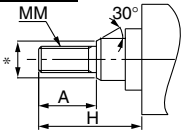

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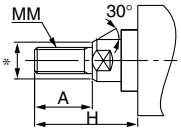

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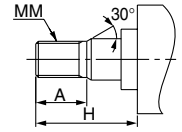

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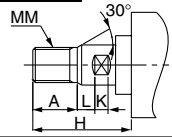

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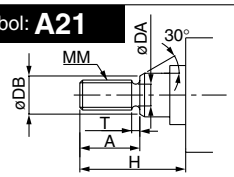

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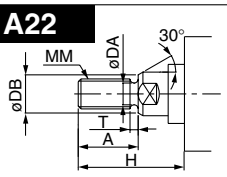

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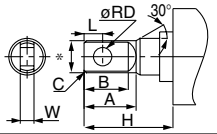

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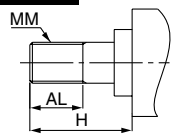

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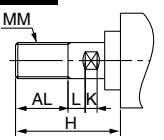

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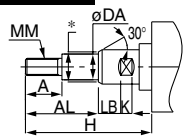
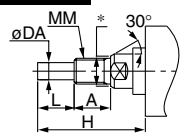


Symbol: **A27**



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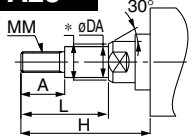

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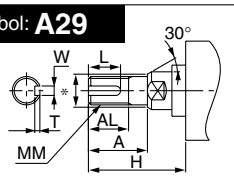
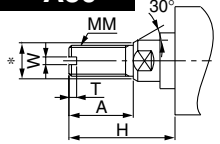


Symbol: **A30**



Change of trunnion bracket mounting position

2 -XC14

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

CA2T
CA2WT
CA2KT
CA2TQ

Standard part no. **—XC14** **A**

Change of trunnion bracket mounting position

Trunnion mounting position

Nil	Mounted at a position between covers other than at A or B below.
A	Rod side trunnion
B	Head side trunnion

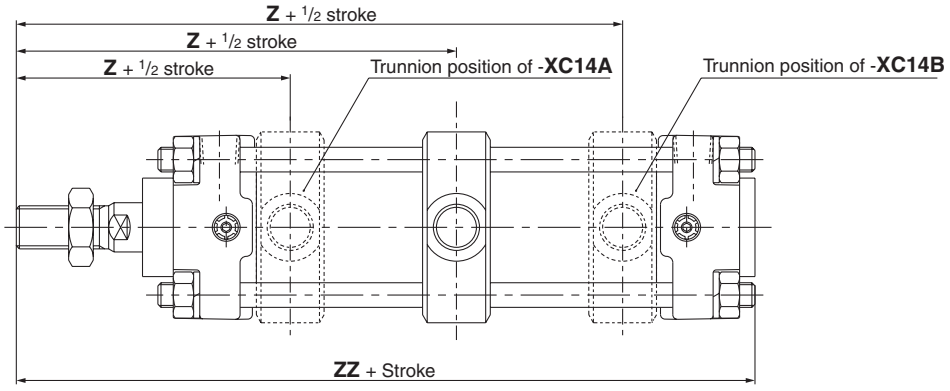
Specifications

Action	Double acting, Single rod
Mounting bracket	T-bracket only

Other specifications are the same as those of the standard type.

Precautions

1) Specify "Z + 1/2 stroke" in case the trunnion bracket position is not -XC14A, B or trunnion is not a center trunnion.
2) SMC will make appropriate arrangements if no dimensions, 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 SMC for more information.



Symbol / Bore size	Z + 1/2 stroke					
	XC14A	XC14B	XC14		Reference for standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
40	89	97 + Stroke	89.5	96.5 + Stroke	93 + 1/2 stroke	0
50	99	107 + Stroke	99.5	106.5 + Stroke	103 + 1/2 stroke	0
63	103	111 + Stroke	103.5	110.5 + Stroke	107 + 1/2 stroke	0
80	125	133 + Stroke	125.5	132.5 + Stroke	129 + 1/2 stroke	0
100	132	138 + Stroke	132.5	137.5 + Stroke	135 + 1/2 stroke	0

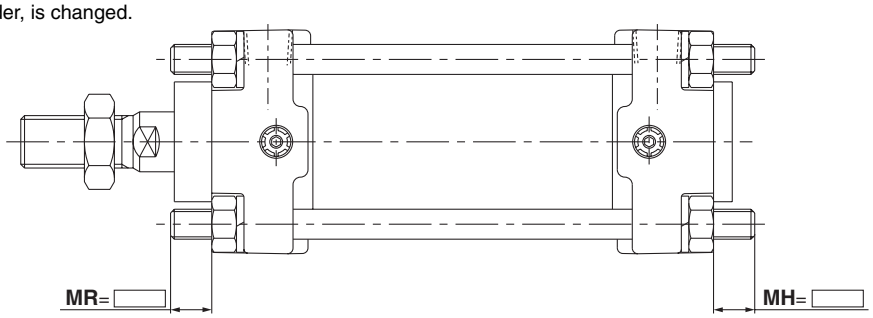
Change of tie-rod length

3 -XC15

Standard M dimension, the tie rod length of the air cylinder, is changed.

CA2
CA2W
CA2K
CA2□Q
CBA2

Standard part no. **—XC15**



Precautions

1) In ordering, specify the required M dimension with the part number.
2) SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
3) The possible range of tie-rod length is 0 to 300 mm.

Made to Order

Series CA2

Made to Order Specifications 1

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

Oversized rod

1 -XB5

The strength of the cylinder is increased by increasing the diameter of the piston rod. This cylinder is used when the stroke is long, and there is a danger of the piston rod bending or buckling, etc. (Please contact SMC in case a lateral load will be applied.)

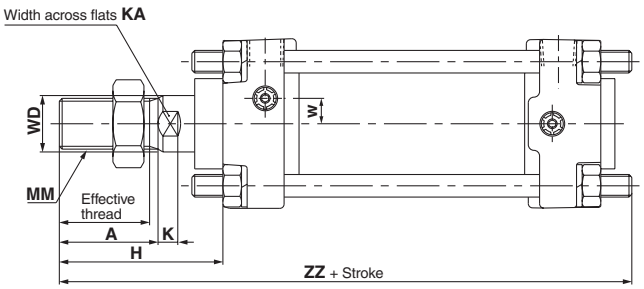
CA2 | Standard part no. | **—XB5**

• Heavy duty rod

Specifications

Operating direction	Double acting, Single rod
Bore size (mm)	40, 50, 63, 80, 100
Auto switch	Mountable

Dimensions



Bore size (mm)	Effective thread length	Width across flats	A	D	H	K	MM	W	ZZ
40	32	18	35	20	58	7	M18 x 1.5	9	153
50	37	22	40	25	71	11	M22 x 1.5	9	172
63	37	22	40	25	71	11	M22 x 1.5	9	183
80	37	26	40	30	72	11	M26 x 1.5	0	205
100	47	31	50	36	85	15	M30 x 1.5	0	228

Heat resistant (150°C)

2 -XB6

The cylinder seals are changed to a heat resistance (to 150°C) material, for use under severe conditions which exceed the standard specifications of –10°C to +70°C.

CA2
CA2W | Standard part no. | **—XB6**

• Heat resistant (150°C)

Specifications

Action	Double acting, Single/Double rod
Ambient temperature range	–10 to 150°C
Auto switch	Not mountable
Cushion	Air cushion
Seal material	Fluoro rubber
Grease	Heat resistance grease

Specifications and dimensions other than the above are the same as the standard type.

Special port positions

3 -XC3

The positions of ports and cushion valves on the rod cover and head cover are changed from those of the standard type.

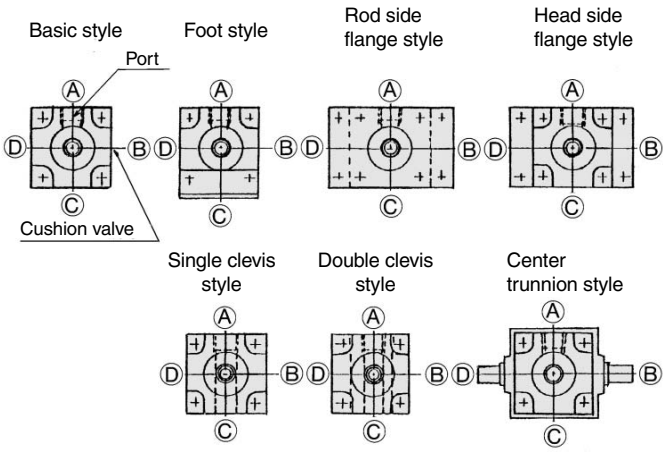
CA2 | Standard part no. | **—XC3 A C**

Special port positions •

• Cushion valve location viewed from rod side

Port location viewed from rod side •

Relation of port locations and cushion valve locations



1. The symbol A indicating the port or cushion valve position is assigned to the top position viewed from the rod side, with B, C, and D to the other positions in order when rotating clockwise.
2. The optional combination of the port and cushion valve is available only when the same positional change is applied to the rod cover and head cover.
3. The symbol -XC3 A B indicates the standard specification so an optional specification with A and B do not exist.
4. Part numbers other than the symbols for the port and cushion valve positions are the same as those of the standard type.

With heavy duty scraper

4 -XC4

Using a heavy duty scraper as a wiper ring, this series is ideal for use in severe environments where cylinders are exposed to dust, dirt and sand.
Applicable to casting machines, construction equipment and industrial vehicles, etc.

CA2
CA2W | Standard part no. | **—XC4**

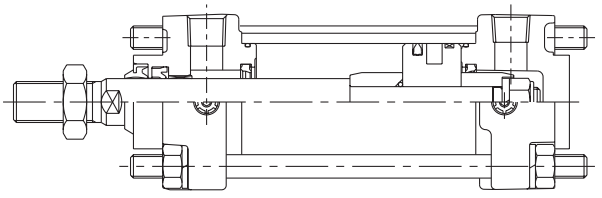
• With heavy duty scraper

Specifications

Action	Double acting, Single/Double rod
Cushion	Air cushion
Wiper ring	SCB scraper

Specifications and dimensions other than the above are the same as the standard type.

Construction



Heat resistant (110°C)

5 -XC5

The cylinder seals are changed to a heat resistant (to 110°C) material, for use under severe temperature conditions which exceed the standard specifications of –10°C to +70°C.

CA2
CA2W
Standard part no. — **XC5**
XC5: **Heat resistant (110°C)**

Specifications

Action	Double acting, Single/Double rod
Ambient temperature range	–10 to 110°C
Auto switch	Not mountable
Cushion	Air cushion
Seal material	Fluoro rubber

Specifications and dimensions other than the above are the same as the standard type.

Piston rod and rod end nut made of stainless steel

6 -XC6

Applicable in cases where there is concern about rust or corrosion, etc., such as when the piston rod end gets wet when extended.

CA2
CA2W
Standard part no. — **XC6**
XC6: **Piston rod and rod end nut made of stainless steel**

Specifications

Action	Double acting, Single/Double rod
Cushion	Air cushion

Specifications and dimensions other than the above are the same as the standard type.

Tie-rod, tie-rod nut, and cushion valve made of stainless steel

7 -XC7

Certain parts are changed from standard materials to stainless steel, when used in locations where there is a danger of rust or corrosion, etc

CA2
CA2W
CA2K
CA2Q
CBA2
Standard part no. — **XC7**
XC7: **Tie-rod, tie-rod nut, and cushion valve made of stainless steel**

Specifications

Action	Double acting, Single/Double rod
Cushion	Air cushion

Specifications and dimensions other than the above are the same as the standard type.

Adjustable stroke/Extension adjustment

8 -XC8

The extending stroke of the cylinder can be adjusted from a full stroke to (0 to 25) mm, or (0 to 50) mm. A stroke adjustment mechanism is provided on the head side to adjust the extension stroke.

CA2 | Mounting | Bore size | Stroke | Suffix | Stroke adjustment symbol | **XC8**

Stroke adjustment symbol

A	Stroke adjustment 0 to 25 mm
B	Stroke adjustment 0 to 50 mm

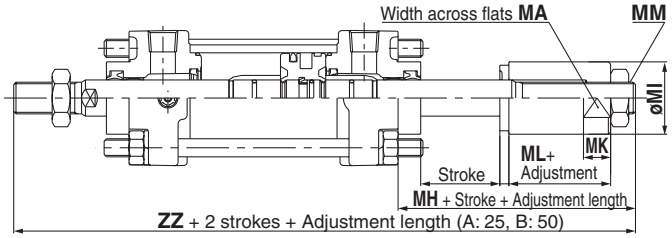
XC8: **Adjustable stroke/ Adjustable extension**

Specifications

Action	Double acting, Single rod
Mounting bracket	B, L, F, T (G, C, D not applicable)
Stroke adjustment method	Stopper adjustment
Stroke adjustment range	A: 0 to 25 mm B: 0 to 50 mm

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	MA	MK	MI	MH	ML	MM	ZZ
40	27	12	32	45	20	14	180
50	32	15	38	49	21	18	197
63	32	15	38	49	21	18	205
80	36	20	45	66	32	22	253
100	46	20	55	69	32	26	267

Adjustable stroke/Retraction adjustment

9 -XC9

The retracting stroke of the cylinder can be adjusted to (0 to 25) mm or (0 to 50) mm by an adjustment bolt which performs adjustable setting on the return stroke.

CA2 | Mounting | Bore size | Stroke | Suffix | Stroke adjustment symbol | **XC9**

Stroke adjustment symbol

A	Stroke adjustment 0 to 25 mm
B	Stroke adjustment 0 to 50 mm

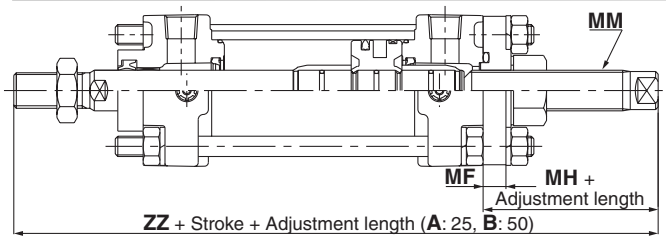
XC9: **Adjustable stroke/ Adjustable retraction**

Specifications

Action	Double acting, Single rod
Mounting bracket	B, L, F, T (G, C, D not applicable)
Stroke adjustment method	Adjustment bolt
Stroke adjustment range	A: 0 to 25 mm B: 0 to 50 mm

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	MH	MF	MM	ZZ
40	44	9	M16 x 1.5	179
50	42	11	M16 x 1.5	190
63	48	11	M20 x 1.5	204
80	55	15	M24 x 1.5	242
100	57	15	M24 x 1.5	255

Made to Order Specifications 2

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

Dual stroke/Double rod

10 -XC10

Two cylinders are combined in a back-to-back configuration, allowing the two reciprocating cylinder strokes to be controlled in three steps.

CA2 | Mounting | Bore size | Stroke A | Suffix | + | Stroke B | Suffix | XC10

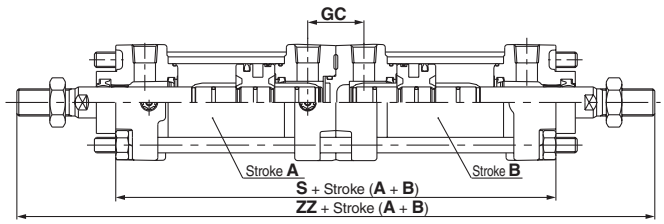
XC10: Dual stroke/Double rod

Specifications

Action	Double acting, Single rod
Cushion	Air cushion
Mounting bracket	B, L, F, G (C, D, T not applicable)
Maximum available stroke (A+B)	to 1000

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	GC	S	ZZ
40	29	167	269
50	33	179	295
63	33	195	311
80	41	231	373
100	41	251	395

Dual stroke/Single rod

11 -XC11

Two cylinders are combined in an in-line configuration, allowing the two reciprocating cylinder strokes to be controlled in two steps, or making it possible to double the cylinder output.

CA2 | Mounting | Bore size | Stroke A | Suffix | + | Stroke B-A | Suffix | XC11

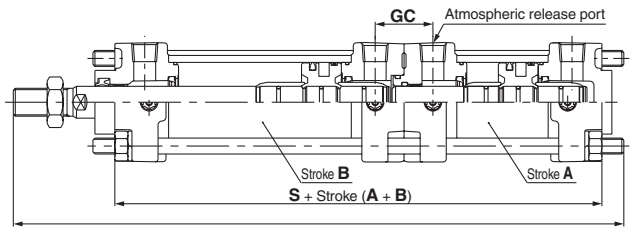
XC11: Dual stroke/Single rod

Specifications

Action	Double acting, Single rod
Cushion	Air cushion
Mounting bracket	B, L, F, G, C, D (T not applicable)

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	GC	S	ZZ
40	29	168	230
50	33	180	249
63	33	196	268
80	41	232	320
100	41	252	341

Tandem type

12 -XC12

Two cylinders are connected in-line, allowing cylinder output to be doubled.

CA2 | Standard part no. | XC12

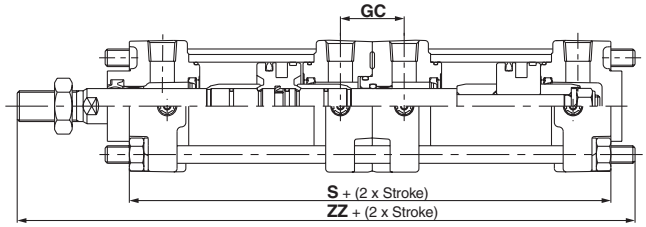
XC12: Tandem type

Specifications

Action	Double acting, Single rod
Minimum operating pressure	0.1 MPa
Cushion	Air cushion
Mounting bracket	B, L, F, G, C, D (T not applicable)

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	GC	S	ZZ
40	29	169	231
50	33	181	250
63	33	197	269
80	41	233	321
100	41	253	342

Fluoro rubber seal

13 -XC22

Seals are changed to a fluoro rubber material which has outstanding resistance to chemicals.

CA2
CA2W | Standard part no. | XC22

XC22: Fluoro rubber seal

Specifications

Action	Double acting, Single/Double rod
Seals	Fluoro rubber

Specifications and dimensions other than the above are the same as the standard type.

Double clevis pin and double knuckle pin made of stainless steel

14 -XC27

To prevent the rotating part of a double clevis, which is a bracket, or double knuckle joint, which is an accessory, from rusting, the pin and the snap ring (cotter pin) are made of stainless steel.

CA2D / CA2KD / CA2DQ / CBA2D — Standard part no. — **XC27**
- **XC27**: Double clevis pin made of stainless steel
- **D**: Double clevis

Y — 04D, 05D, 08D, 10D — **XC27**
- **Y**: Double knuckle joint
- **XC27**: Double knuckle joint pin made of stainless steel

CDP — 2A, 3A, 4A, 5A, 6A, 7A — **XC27**
- **CDP**: Clevis pin, Knuckle pin
- **XC27**: Clevis pin, Knuckle pin made of stainless steel

Specifications

Mounting	Double clevis (D) only
Pin material	Stainless steel (SUS304)

Other specifications are the same as those of the standard type.
Cotter pins, clevis pins and knuckle joint pins are packed with the mounting bracket.

Compact flange made of SS400

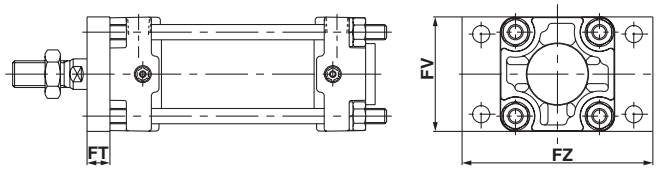
15 -XC28

Width of the front and rear flange bracket for air cylinder Series CA2 has the same dimensions as the cylinder rod cover to save the mounting space. (Flange shape and FV-dimensions are only differences from the standard type.)

CA2 / CA2W / CA2K / CA2□Q / CBA2 — **F** — Standard part no. — **XC28**
- **XC28**: Compact flange made of SS400
- **F**: Mounting style

F	Rod side flange style
G	Head side flange style

Dimensions



Bore size (mm)	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 those of the standard front flange and rear flange.
(The drawing illustrates a front flange example.)

Double knuckle joint with spring pin

16 -XC29

To prevent loosening of the double knuckle joint

CA2 / CA2□Q / CBA2 — Standard part no. — **XC29**
- **XC29**: Double knuckle joint with spring pin

Front trunnion

17 -XC30

When a standard double acting single rod cylinder supported by a front trunnion bracket has a long stroke, the trunnion bracket is mounted on the front of the cylinder's rod cover to reduce the distance from the fulcrum to the rod end.

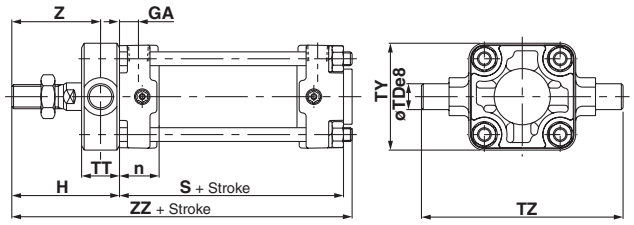
CA2T — Standard part no. — **XC30**
- **XC30**: Front trunnion

Specifications

Action	Double acting, Single/Double rod
Mounting bracket	T-bracket only

Other specifications are the same as those of the standard type.

Dimensions



Bore size (mm)	n	ØTDe8	GA	TT	TY	TZ	H	Z	ZZ	S
40	23	15 $^{-0.032}_{-0.059}$	11	22	62	117	66	55	151	80
50	26	15 $^{-0.032}_{-0.059}$	13	22	74	127	71	60	163	86
63	27	18 $^{-0.032}_{-0.059}$	13	28	90	148	79	65	179	94
80	32	25 $^{-0.040}_{-0.073}$	16	34	110	192	94.5	77.5	212.5	111
100	35	25 $^{-0.040}_{-0.073}$	16	40	130	214	100	80	229	121

With coil scraper

18 -XC35

Seals are protected by removing frost, welding spatter or cutting chips, etc. that adhere to the piston rod.

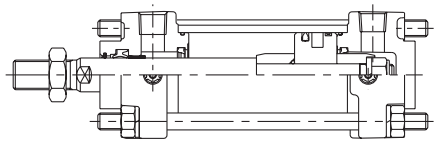
CA2 / CA2W / CBA2 — Standard part no. — **XC35**
- **XC35**: With coil scraper

Specifications

Action	Double acting, Single/Double rod
Cushion	Air cushion
Wiper ring	Coil scraper (Metal)

Specifications and dimensions other than the above are the same as the standard type.

Construction



Made to Order Specifications 3

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

Water resistant/Built-in hard plastic magnet

19 -XC58

The magnet for auto switch on a water resistant cylinder is made of hard plastic in order to prevent swelling.

CDA2 | Mounting | Bore size | **V** | Stroke | **XC58**

Water resistant cylinder

V	Fluoro rubber seal

Water resistant type
With built-in hard plastic magnet

Fluoro rubber seals and built-in hard plastic magnet

20 -XC59

The magnet for auto switch on a fluoro rubber seal cylinder is made of hard plastic in order to prevent swelling.

CDA2 | Standard part no. | **XC59**

Fluoro rubber seals
With built-in hard plastic magnet

⚠ Caution

1. **Please confirm SMC, as the type of chemical and the operating temperature may not allow the use of this product.**
2. **Although the cylinder is available with auto switch, confirm its compatibility with the operating environment with SMC before it is put to use. This is because it uses the same auto switch related parts (auto switch body and mounting bracket) as the standard type.**

Specific Product Precautions

Be sure to read before handling.

Operation

⚠ Caution

1. Do not open the cushion valve beyond the stopper.

A snap 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)	Cushion valve	Width across flats	Hexagon wrench
40, 50	MB-32-10-C1247	2.5	JIS 4648 Hexagon wrench key 2.5
63, 80, 100	MB-63-10-C1250	4	JIS 4648 Hexagon wrench key 4

2. Use the air cushion at the end of cylinder stroke.

If the cushion valve is used fully open, a type without cushion must be selected. 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 leakage.

2. Mount the rod boot so that it will not be twisted.

The boot rod may be damaged if twisted on installation.

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, please refer to the table below.

Bore size (mm)	Nut	Width across flats	Socket
40, 50	JIS B 1181 Class 3 Intermediate M8 x 1.25	13	JIS B4636 + Two-angle socket 13
63	JIS B 1181Class 3 Intermediate M10 x 1.25	17	JIS B4636 + Two-angle socket 17
80, 100	JIS B 1181 Class 3 Intermediate M12 x 1.75	19	JIS B4636 + Two-angle socket 19

2. Do not replace the bushing.

Since the bushing is press fitted, the entire cover assembly instead of a single part needs 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 mounting accuracy.

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 Cylinders

Series CA2 air cylinders with improved water tight are also available. Because they provide better coolant resistance than the standard cylinders, they are ideal for use in a machine tool environment exposed to coolant. They are also well suited for use in areas in which water splashes, such as food processing equipment or car washers. Please contact SMC for more information.

Auto Switch Mounting Band Selection

1. Series CDA2 cylinders vary in their bore sizes because of difference in the thickness of their tube walls among different models.
The part number of the auto switch mounting band thus varies depending on the cylinder type.
When an auto switch mounting band is ordered alone, please confirm the cylinder type and refer to the table below.

<Cylinder model>
Standard: CDA2/CDA2W
Non-rotating rod: CDA2K/CDA2KW
End lock: CDBA2

Auto switch model (Band mounting type)	Band part no. Cylinder bore size (mm)				
	40	**50**	**63**	**80**	**100**
D-A3□/A44 D-G39/K39	BDS-04M	BDS-05M	BMB1-063	BMB1-080	BMB1-100
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NTL	BH2-040	BA5-050	BAF-06	BAF-08	BAF-10

<Cylinder model>
Low friction: CDA2□Q
Air-hydro: CDA2□H / CDA2W□H

Auto switch model (Band mounting type)	Band part no. Cylinder bore size (mm)				
	40	**50**	**63**	**80**	**100**
D-A3□/A44 D-G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NTL	BA-04	BA-05	BA-06	BA-08	BA-10

2. Interchangeability of band with Series CDA1 (conventional model)
Take precautions since some cylinder models lack interchangeability of auto switch mounting band because they have thinner cylinder tube walls than the conventional Series CAD1.

Cylinder model	Interchangeability of auto switch mounting band
Standard: **CDA2/CDA2W** Non-rotating rod end type: **CDA2K/CDA2KW** End lock: **CDBA2**	Without
Low friction: **CDA2□Q** Air-hydro: **CDA2□H/CDA2W□H**	Interchangeable (Same part number as that of CDA1)