

CMA2

Small Bore Cylinder

ø20, ø30, ø40

General Type

Overview

This is a medium bore (ø20 to ø40) series among general type cylinders, and it is a dismountable cylinder.



CONTENTS

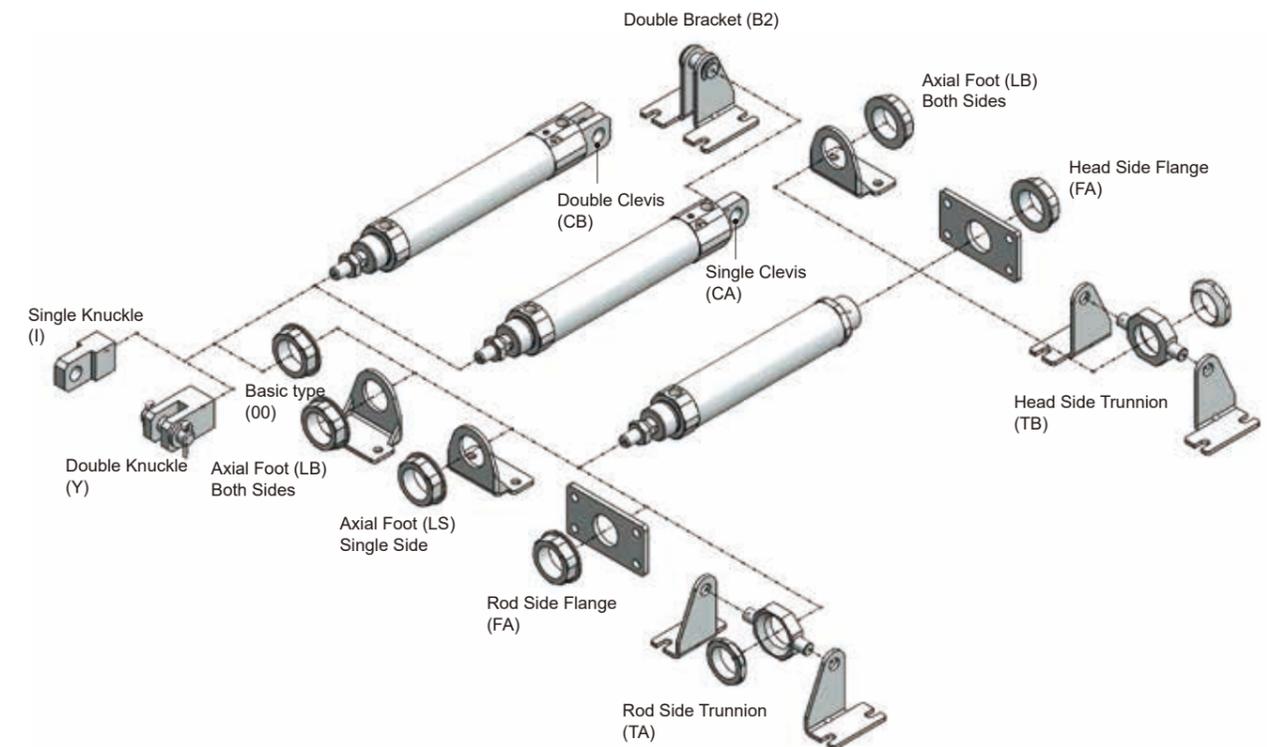
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 To use this product safely, be sure to check Intro 41 for general cylinder information and P. 1026 for cylinder switches before use.

●: Standard, ◎: Option, ○: Custom Products, ■: Not manufacturable

General Type	Variation	Model No. Circuit Diagram Symbol	Bore Size (mm)	Standard Stroke (mm)							Min. Stroke (mm)	Max. Stroke (mm)	Producible Stroke (mm)	Intermediate stroke (mm) increments	Mounting type								Option				Accessories			Switch	Page	General Type		
				25	50	75	100	150	200	250					300	Basic type	Axial Foot Type, Both Sides	Axial Foot Type, Single Side	Rod Side Flange Type	Head Side Flange Type	Single Clevis Type	Double Clevis Type	Rod Side Trunnion Type	Head Side Trunnion Type	Bellows (100 °C)	Bellows (250 °C)	Piston Rod Material (Stainless Steel)	Same Port Position	Single Knuckle				Double Knuckle	Double Yoke Bracket
				00	LB	LS	FA	FB	CA	CB					TA	TB	J	L	M	P	I	Y	B2											
SCP□3	Double Acting/ Single Rod Type	CMA2 	ø20 ø30 ø40	●	●	●	●	●	●	●	1	700	1,000 1,200 1,500	1	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	296	SCP□3
CMK2	Double Acting/ Direct Type	CMA2-E 	ø20, ø30, ø40	●	●	●	●	●	●	●	1	700	700	1	■	■	●	●	■	■	■	■	◎	■	◎	◎	◎	◎	◎	◎	◎	310	CMK2	
CMA2																																CMA2		

Combination of Mounting Brackets and Accessories





Small Bore Cylinder
Standard/Single Rod Type

CMA2 Series

● Bore size: $\phi 20$, $\phi 30$, $\phi 40$

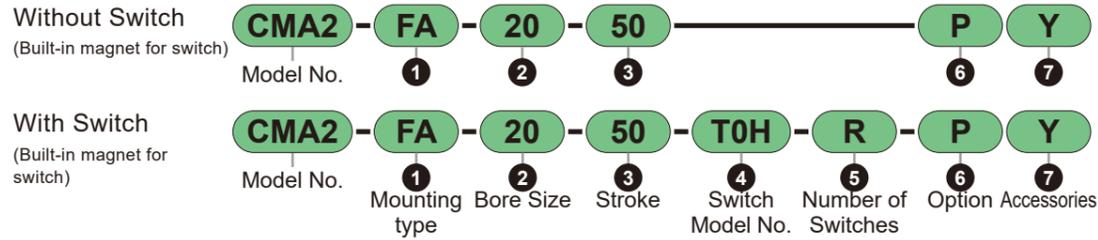
Circuit Diagram Symbol



CMA2 Series

Model No. Notation Method

Model No. Notation Method



Mounting brackets are included to the product and shipped. Shipped assembled with bellows for LB, LS, FA, TA.

1 Mounting type

Code	Content	
00	Basic type	
LB	Axial Foot Type (Double Side)	
LS	Axial Foot Type (Single Side)	
FA	Rod Side Flange Type	
FB	Head Side Flange Type	
CA	Single Clevis Type	
CB	Double Clevis Type (Pin and Washer Split Pin Attached)	
TA	Rod Side Trunnion Type	
TB	Head Side Trunnion Type	

*1: Single side foot type (LS type) has a max. stroke of 50 mm.

2 Bore size (mm)

Code	Content
20	$\phi 20$
30	$\phi 30$
40	$\phi 40$

3 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
$\phi 20$	1 to 700	Every 1 mm
$\phi 30$	1 to 700	
$\phi 40$	1 to 700	

*1: For minimum stroke with switch, refer to P. 298.

4 Switch Model No.

For switch details, please refer to P. 971. Switches are included to the product and shipped.

Contact	Indicator Lamp Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T5V□	T5V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
	2-Color	2-wire	—	24 \pm 10%	—	5 to 20	T2WH□	T2WV□	
			3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	
		2-Color Improved Water Resistance	—	24 \pm 10%	—	5 to 20	T2WLH□	T2WLV□	
1-Color Off-Delay Type	2-wire	—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□		
		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3		
Reed	1-Color No Indicator Lamp	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
			110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color	110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□		

*1: For "□" in the switch model number, enter the symbol selected from the "Lead wire length, connector specification" table.
 *2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
 *3: This does not guarantee the water resistance of the cylinder.
 *4: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 971.

5 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

7 Accessories

Code	Content	
I	Single Knuckle	
Y	Double Knuckle (Pin and Washer Split Pin Attached)	
B2	Double Yoke Bracket (Pin and retaining ring included)	

*1: "I" and "Y" cannot be selected at the same time.

6 Option

Code	Content	Max. Ambient Temperature	Instantaneous Max. Temperature	
J	Bellows	100°C	200°C	
L		250°C	400°C	
M	Piston Rod Material (Stainless Steel)			
P	Same Port Position			

*1: For bellows "J" with a stroke of less than 25 mm, please inquire each time.
 *2: Instantaneous maximum temperature is the temperature when fire, chips, etc. momentarily contact the bellows.

About Custom Product Specifications

For details, see P. 316.

Code	Content
-XJ9	Without Bellows
-T2	Fluorine Packing Type
-A2	With 2 Rod Nuts
Rod End Shape Modification	Refer to Ending P. 11.

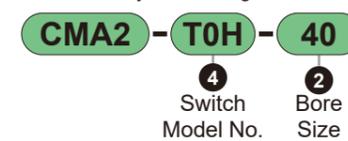
Model No. Example)

CMA2 - - XJ9

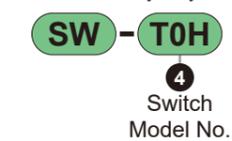
Switch Single Unit Model No. Notation Method

[T-type Switch]

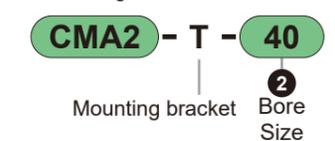
● Switch body + Mounting bracket set



● Switch body only



● Mounting bracket set



*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (-) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
 1 m T0H
 3 m T0H ③
 5 m T0H ⑤

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

Cylinder Switch

Ending

Cylinder Switch

Ending

Specifications

Item	CMA2			
	mm	ø20	ø30	ø40
Bore Size	mm	ø20	ø30	ø40
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.1		
Proof Pressure	MPa	1.05		
Ambient Temperature	°C	-10 to 60 (Provided that freezing does not occur)		
Port Size		Rc1/8		
Stroke tolerance	mm	+1.0 0 (Up to 200), +1.2 0 (Up to 1000)		
Operating Piston Speed	mm/s	50 to 500		
Cushion		None *1		
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)		
Allowable Absorbed Energy	J	0.024	0.05	0.093

*1: This product cannot absorb high energy generated by an external load. It is recommended to use an external shock absorber together.

Stroke

(Unit: mm)

Bore Size	Standard Stroke	Max. Stroke	Producible Stroke	Min. Stroke
ø20	25, 50, 75, 100, 150, 200, 250, 300	700 *2	1,000	1 *3
ø30			1200	
ø40			1500	

*1: Intermediate strokes can be produced in 1 mm increments.

*2: Single side foot type (LS type) has a maximum stroke of 50 mm.

*3: For bellows "J", production is for strokes of 25 mm or more. For strokes less than 25 mm, please inquire each time.

***4: If exceeding the max. stroke, product specifications may not be met depending on conditions, so see Intro 29.**

Min. Stroke with Switch

(Unit: mm)

Switch Model No.	With 1 pc	With 2 pcs
T0, T5, T2, T3	10	25
T2W, T3W, T2WL	10	30
T1, T8	10	25

Cylinder Weight

(Unit: kg)

Item/Mounting Style	Product Weight at Stroke (S) = 0 mm					Weight per Switch		Added Weight per S = 10 mm
	Basic type (00)	Axial Foot Type (LB)	Flange Type (FA)	Clevis Type (CA)	Trunnion Type (TA/TB)	T type	Switch Rail + Band Weight	
ø20	0.14	0.29	0.20	0.27	0.19	Please refer to the weight listed in the switch specifications on P. 971	0.005	0.01
ø30	0.29	0.55	0.44	0.50	0.39		0.005	0.014
ø40	0.47	0.73	0.62	0.69	0.67		0.009	0.02

(Example) Product Weight of CMA2-FA-30-50-T0H-D

Product weight when S = 0 mm..... 0.44 kg
 Added weight at S = 50 mm..... Added weight at S = 10 mm 0.014 × $\frac{\text{Product Stroke (50)}}{10}$ = 0.07 kg
 Weight of 2 switches..... 0.036 kg
 Product Weight..... 0.44 kg+0.07 kg+0.036 kg=0.546 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø20	Push	31.4	47.1	62.8	94.2	1.26 × 10 ²	1.57 × 10 ²	1.88 × 10 ²	2.20 × 10 ²
	Pull	23.6	35.3	47.1	70.7	94.2	1.18 × 10 ²	1.41 × 10 ²	1.65 × 10 ²
ø30	Push	70.7	1.06 × 10 ²	1.41 × 10 ²	2.12 × 10 ²	2.83 × 10 ²	3.53 × 10 ²	4.24 × 10 ²	4.95 × 10 ²
	Pull	59.4	89.1	1.19 × 10 ²	1.78 × 10 ²	2.38 × 10 ²	2.97 × 10 ²	3.56 × 10 ²	4.16 × 10 ²
ø40	Push	1.26 × 10 ²	1.88 × 10 ²	2.51 × 10 ²	3.77 × 10 ²	5.03 × 10 ²	6.28 × 10 ²	7.54 × 10 ²	8.80 × 10 ²
	Pull	1.10 × 10 ²	1.65 × 10 ²	2.21 × 10 ²	3.31 × 10 ²	4.41 × 10 ²	5.51 × 10 ²	6.62 × 10 ²	7.72 × 10 ²

Mounting Bracket Model No. Notation Method

Bore Size (mm)	ø20	ø30	ø40
Mounting bracket			
Basic Type (00)	*3 M1-00-20	M1-00-30	M1-00-30
Axial Foot Type (LB/LS)	M1-LB-20	M1-LB-30	M1-LB-30
Flange Type (FA/FB)	M1-FA-20	M1-FA-30	M1-FA-30
Single Clevis Type (CA)	M1-CA-20	M1-CA-30	M1-CA-30
Double clevis type (CB)	M1-CB-20	M1-CB-30	M1-CB-30
Trunnion Type (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-40

*1: The above mounting bracket model numbers are for a set including tightening nuts, toothed lock washers, parallel pins, etc.

*2: For axial foot type (double side), 2 sets of "MI-LB-□" are required.

*3: Only mounting nuts and toothed lock washers are included. One set is included to the basic type (00) of the product, but use it if additional sets are required.

General Type

General Type

SCP□3

SCP□3

CMK2

CMK2

CMA2

CMA2

SCM

SCM

SCG

SCG

SCA2

SCA2

SCS2

SCS2

Cylinder Switch

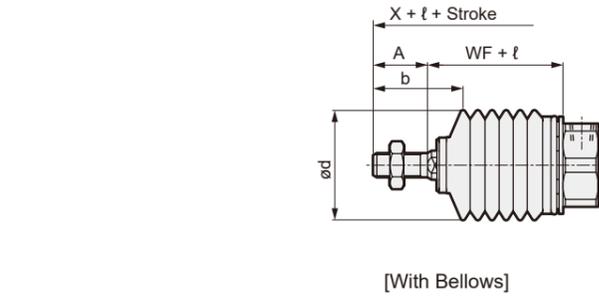
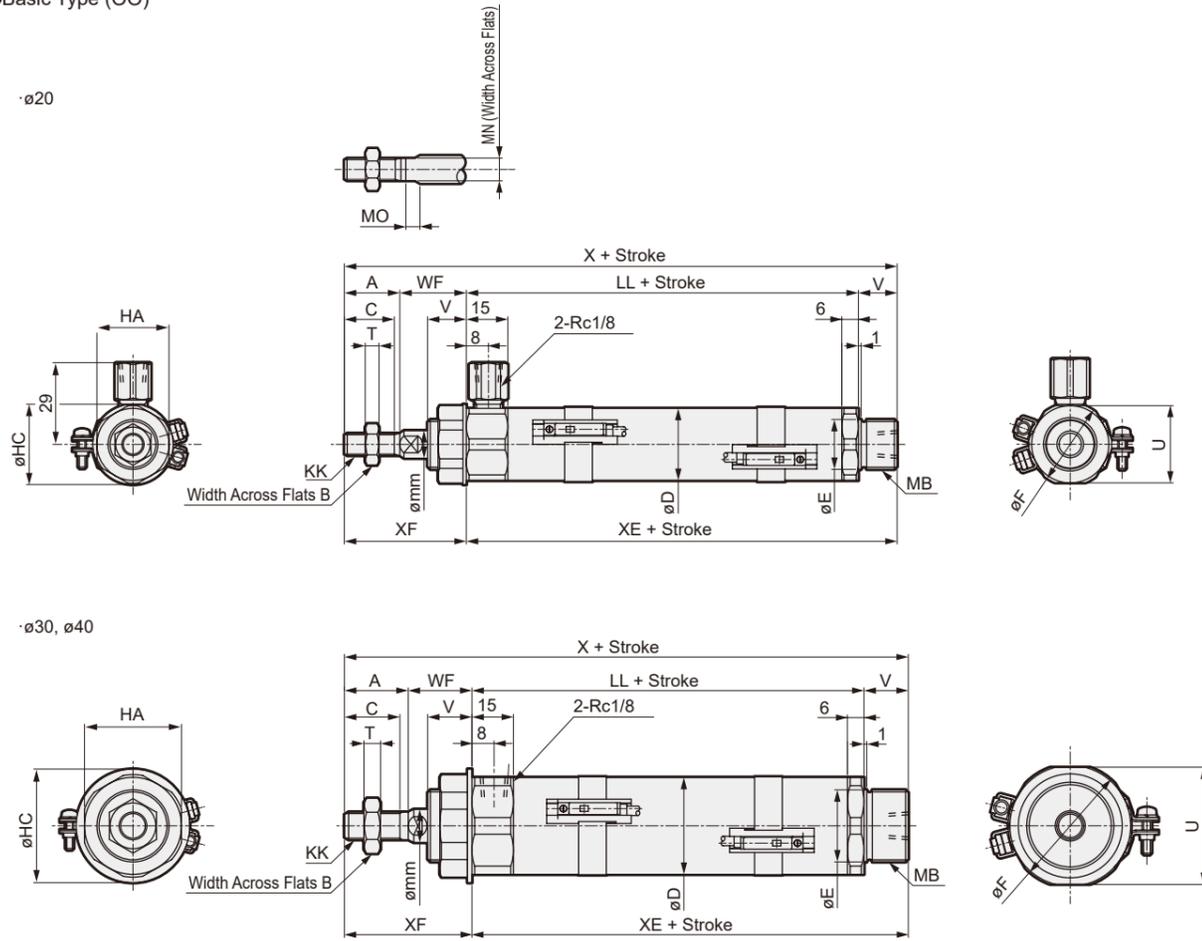
Cylinder Switch

Ending

Ending

Outline Dimension Drawing

●Basic Type (OO)



Code	Basic Type (OO) Basic Dimensions												
Bore Size (mm)	A	B	C	D	E	F	HA	HC	KK	LL	MB	MN	MO
ø20	20	13	18	25	18	28	26	29	M8 × 1	66	M18 × 1.5	8	5
ø30	23	17	20	35	26	37	35	41	M10 × 1.25	72	M26 × 1.5	10	5
ø40	25	19	22	45	26	48	35	46	M12 × 1.5	74	M26 × 1.5	12	6

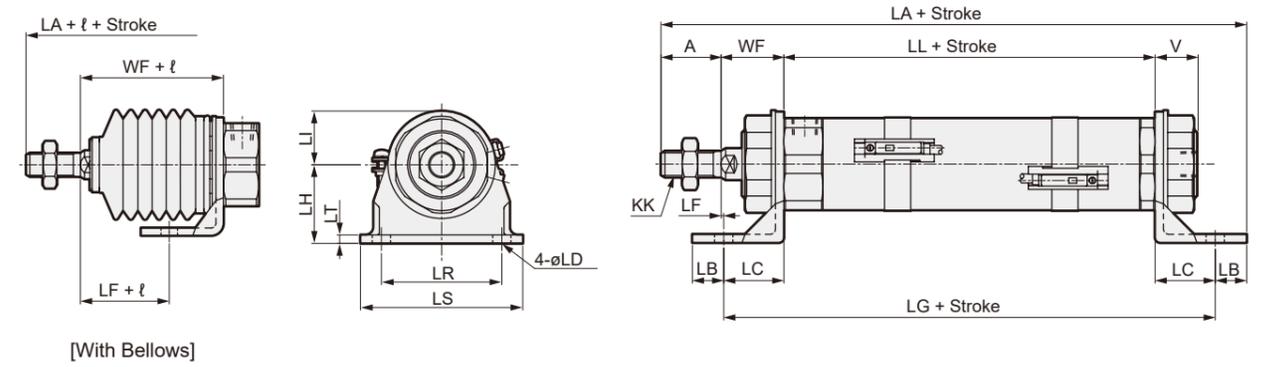
Code	With Bellows										
Bore Size (mm)	MM	T	U	V	WF	X	XE	XF	b	d	ℓ
ø20	10	5	26	14	24	124	80	44	32	30	(Stroke / 3) + 6
ø30	12	6	35	16	23	134	88	46	38	46	(Stroke / 3.25) + 7
ø40	14	7	46	16	23	138	90	48	40	46	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

Outline Dimension Drawing

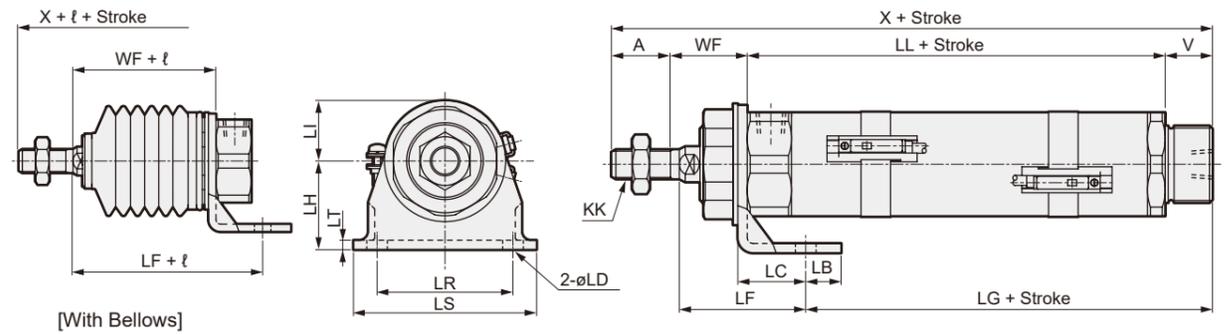
●Axial Foot Type (LB)



Code	Axial Foot Type (LB) Mounting Dimensions																With Bellows
Bore Size (mm)	A	KK	LL	V	WF	LA	LB	LC	LD	LF	LG	LH	LI	LR	LS	LT	ℓ
ø20	20	M8 × 1	66	14	24	138	10	18	6	6	102	25	15	30	44	3.2	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	16	23	153	12	23	7	0	118	30	20.5	46	62	3.2	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	16	23	157	12	23	7	0	120	30	23	46	62	3.2	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

●Single Side Axial Foot Type (LS)

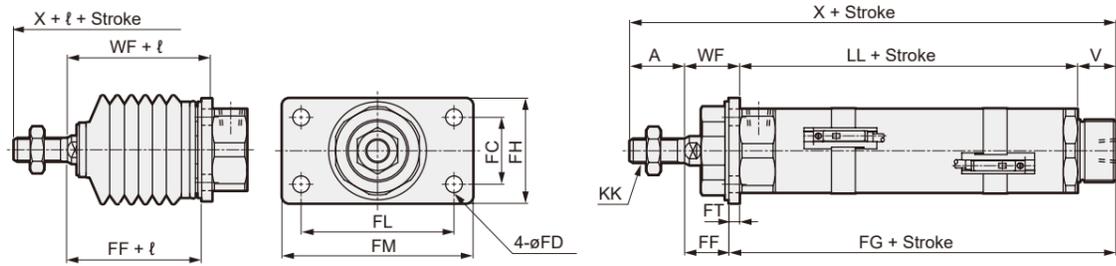


Code	Single Side Axial Foot Type (LS) Mounting Dimensions																With Bellows
Bore Size (mm)	A	KK	LL	V	WF	X	LB	LC	LD	LF	LG	LH	LI	LR	LS	LT	ℓ
ø20	20	M8 × 1	66	14	24	124	10	18	6	38.8	65.2	25	15	30	44	3.2	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	16	23	134	12	23	7	42.8	68.2	30	20.5	46	62	3.2	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	16	23	138	12	23	7	42.8	70.2	30	23	46	62	3.2	(Stroke / 3.25) + 7

*1: Max. stroke is 50 mm.
 *2: For ø20, a port nipple is included to the rod cover.
 *3: Round up ℓ dimension to the nearest whole number.
 *4: For dimensions with each switch, see P. 315.
 *5: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

●Rod Side Flange Type (FA)

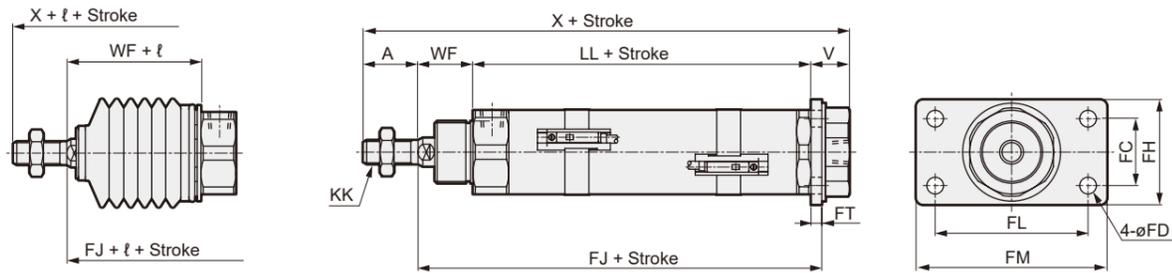


[With Bellows]

Code	Rod Side Flange Type (FA) Mounting Dimensions													With Bellows	
Bore Size (mm)	A	KK	LL	V	WF	X	FC	FD	FF	FG	FH	FL	FM	FT	ℓ
ø20	20	M8 × 1	66	14	24	124	20	6	20.8	83.2	34	40	54	3.2	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	16	23	134	28	7	18.5	92.5	44	64	80	4.5	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	16	23	138	28	7	18.5	94.5	44	64	80	4.5	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

●Head Side Flange Type (FB)



[With Bellows]

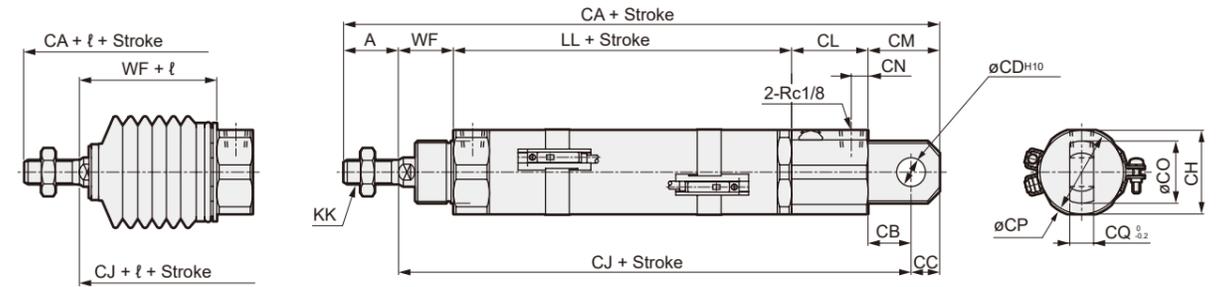
Code	Head Side Flange Type (FB) Mounting Dimensions													With Bellows
Bore Size (mm)	A	KK	LL	V	WF	X	FC	FD	FH	FJ	FL	FM	FT	ℓ
ø20	20	M8 × 1	66	14	24	124	20	6	34	93.2	40	54	3.2	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	16	23	134	28	7	44	99.5	64	80	4.5	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	16	23	138	28	7	44	101.5	64	80	4.5	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

Outline Dimension Drawing

●Single Clevis Type (CA)

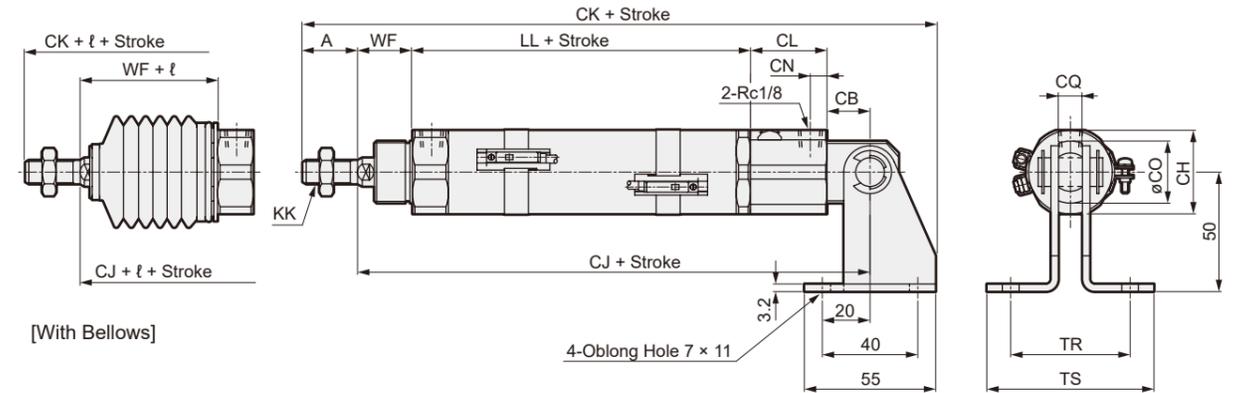


[With Bellows]

Code	Single Clevis Type (CA) Mounting Dimensions													With Bellows			
Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CH	CJ	CL	CM	CN	CO	CP	CQ	ℓ
ø20	20	M8 × 1.0	66	24	165	14	10	10	26	135	31	24	8	22	28	8	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	23	180	18	12	12	35	145	32	30	7	26	37	10	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	23	184	18	12	12	35	147	32	30	7	26	37	10	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

●Single Clevis Type (CA) with Bracket (Option Code B2)



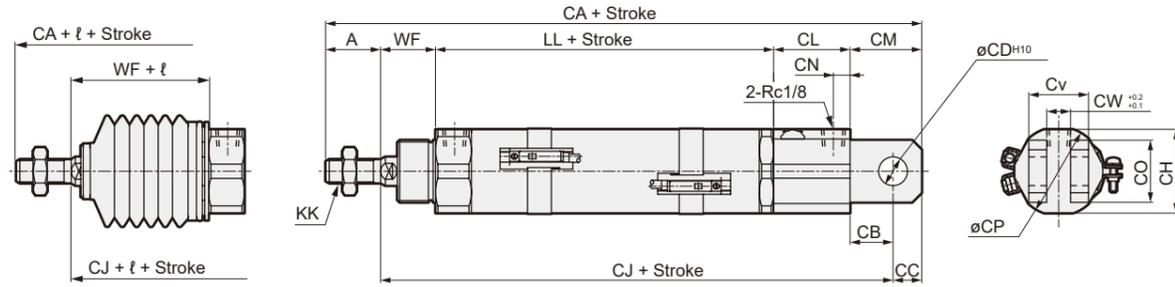
[With Bellows]

Code	Single Clevis Type (CA) With Bracket (Option Code B2) Mounting Dimensions													With Bellows	
Bore Size (mm)	A	KK	LL	WF	CB	CH	CJ	CK	CL	CN	CO	CQ	TR	TS	ℓ
ø20	20	M8 × 1.0	66	24	14	26	135	182.5	31	8	22	8	48	68	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	23	18	35	145	195.5	32	7	26	10	50	70	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	23	18	35	147	199.5	32	7	26	10	50	70	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

●Double clevis type (CB)



[With Bellows]

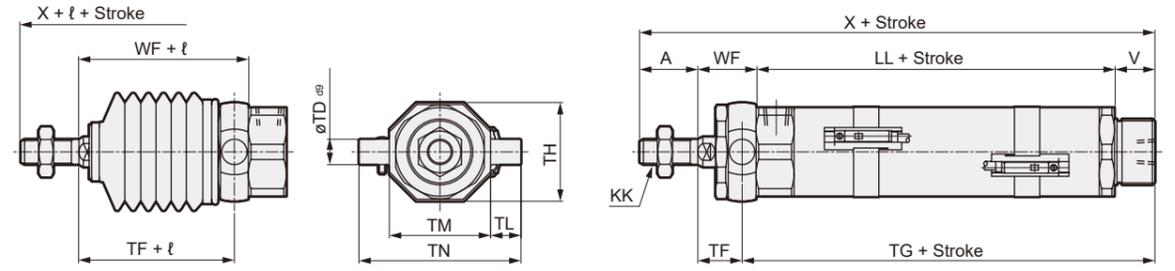
Code	Double Clevis Type (CB) Mounting Dimensions																With Bellows	
	Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CH	CJ	CL	CM	CN	CO	CP	Cv	CW
ø20	20	M8 × 1.0	66	24	165	14	10	10	26	135	31	24	8	22	28	19	8	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	23	180	18	12	12	35	145	32	30	7	26	37	25	10	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	23	184	18	12	12	35	147	32	30	7	26	37	25	10	(Stroke / 3.25) + 7

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

Outline Dimension Drawing

●Rod side trunnion type (TA)

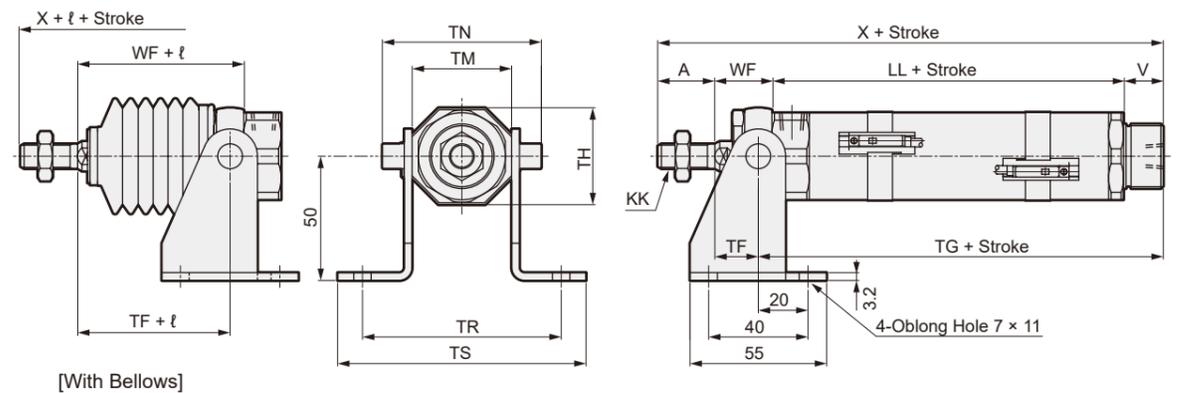


[With Bellows]

Code	Rod Side Trunnion Type (TA) Mounting Dimensions														With Bellows
	Bore Size (mm)	A	KK	LL	V	WF	X	TD	TF	TG	TH	TL	TM	TN	ℓ
ø20	20	M8 × 1.0	66	14	24	124	8	19.5	84.5	29.5	8	30	46	(Stroke / 3) + 6	
ø30	23	M10 × 1.25	72	16	23	134	10	17.5	93.5	39	12	40	64	(Stroke / 3.25) + 7	
ø40	25	M12 × 1.5	74	16	23	138	10	17.5	95.5	44	9.5	53	72	(Stroke / 3.25) + 7	

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

●Rod side trunnion type (TA) with bracket (Option code B2)



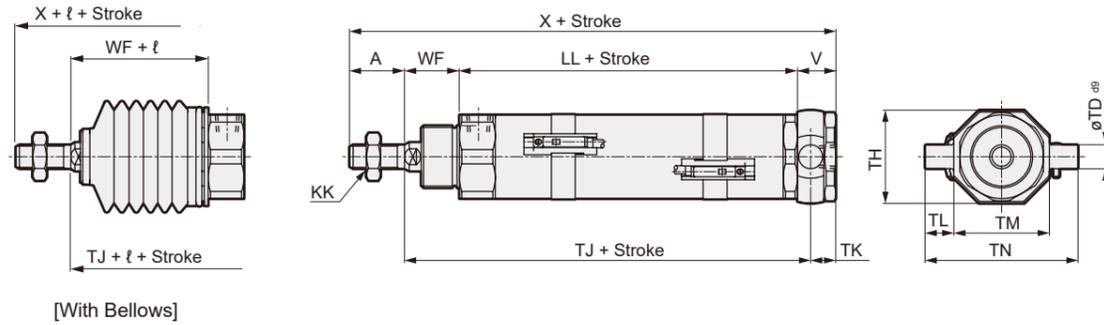
[With Bellows]

Code	Rod Side Trunnion Type (TA) with Bracket (Option Code B2) Mounting Dimensions														With Bellows
	Bore Size (mm)	A	KK	LL	V	WF	X	TF	TG	TH	TM	TN	TR	TS	ℓ
ø20	20	M8 × 1.0	66	14	24	124	19.5	84.5	29.5	30	46	70	90	(Stroke / 3) + 6	
ø30	23	M10 × 1.25	72	16	23	134	17.5	93.5	39	40	64	80	100	(Stroke / 3.25) + 7	
ø40	25	M12 × 1.5	74	16	23	138	17.5	95.5	44	53	72	93	113	(Stroke / 3.25) + 7	

*1: For ø20, a port nipple is included to the rod cover.
 *2: Round up ℓ dimension to the nearest whole number.
 *3: For dimensions with each switch, see P. 315.
 *4: For outer dimensions diagram of accessories, refer to P. 308.

Outline Dimension Drawing

●Head Side Trunnion Type (TB)

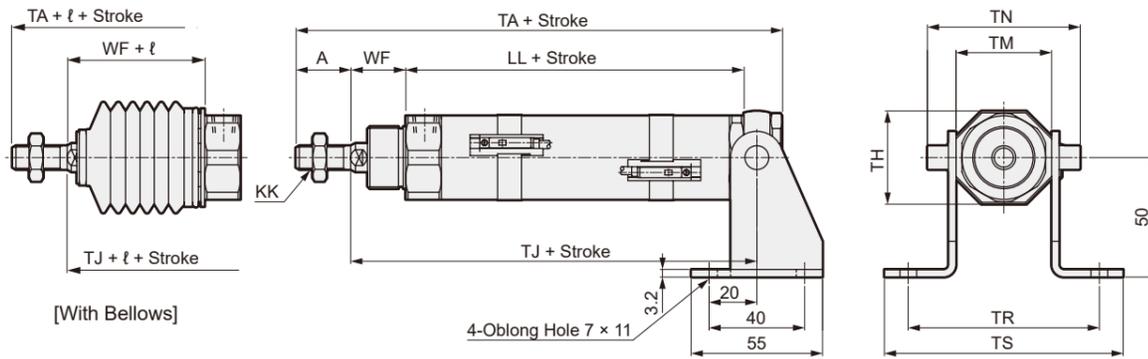


[With Bellows]

Code	Head Side Trunnion Type (TB) Mounting Dimensions													With Bellows
Bore Size (mm)	A	KK	LL	V	WF	X	TD	TH	TJ	TK	TL	TM	TN	ℓ
ø20	20	M8 × 1.0	66	14	24	124	8	29.5	94.5	9.5	8	30	46	(Stroke / 3) + 6
ø30	23	M10 × 1.25	72	16	23	134	10	39	100.5	10.5	12	40	64	(Stroke / 3.25) + 7
ø40	25	M12 × 1.5	74	16	23	138	10	44	102.5	10.5	9.5	53	72	(Stroke / 3.25) + 7

- *1: For ø20, a port nipple is included to the rod cover.
- *2: Round up ℓ dimension to the nearest whole number.
- *3: For dimensions with each switch, see P. 315.
- *4: For outer dimensions diagram of accessories, refer to P. 308.

●Head side trunnion type (TB) with bracket (Option code B2)



[With Bellows]

Code	Head Side Trunnion Type (TB) With Bracket (Option Code B2) Mounting Dimensions												With Bellows
Bore Size (mm)	A	KK	LL	WF	TA	TH	TJ	TM	TN	TR	TS	ℓ	
ø20	20	M8 × 1.0	66	24	142	29.5	94.5	30	46	70	90	(Stroke / 3) + 6	
ø30	23	M10 × 1.25	72	23	151	39	100.5	40	64	80	100	(Stroke / 3.25) + 7	
ø40	25	M12 × 1.5	74	23	155	44	102.5	53	72	93	113	(Stroke / 3.25) + 7	

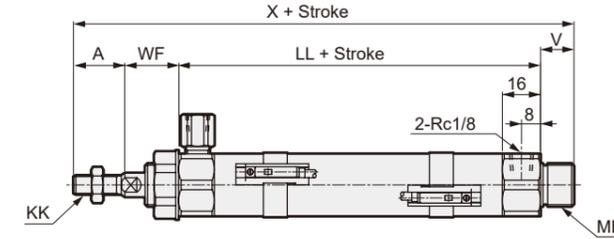
- *1: For ø20, a port nipple is included to the rod cover.
- *2: Round up ℓ dimension to the nearest whole number.
- *3: For dimensions with each switch, see P. 315.
- *4: For outer dimensions diagram of accessories, refer to P. 308.

Option Outline Dimension Drawing

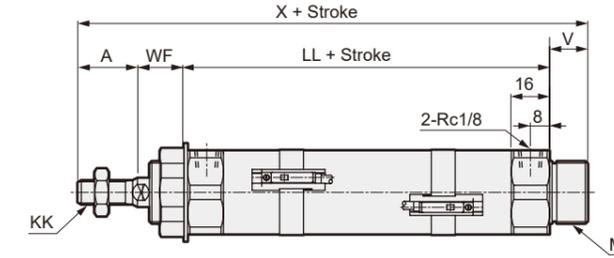
Option Outline Dimension Drawing

●Same Port Position (P)

ø20



ø30, ø40

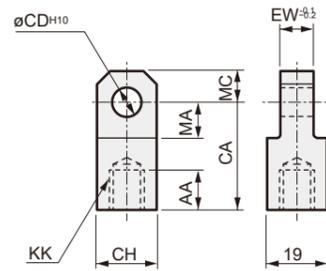


Code	Same Port Position (P) Mounting Dimensions						
Bore Size (mm)	A	KK	LL	MB	V	WF	X
ø20	20	M8 × 1.0	76	M18 × 1.5	14	24	134
ø30	23	M10 × 1.25	82	M26 × 1.5	16	23	144
ø40	25	M12 × 1.5	84	M26 × 1.5	16	23	148

- *1: For ø20, a port nipple is included to the rod cover.
- *2: For dimensions with each switch, see P. 315.
- *3: For outer dimensions diagram of accessories, refer to P. 308.

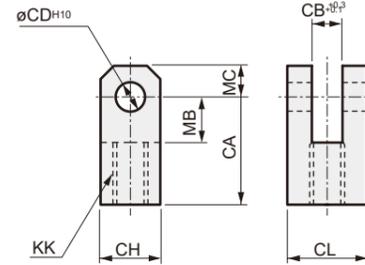
Accessories Outline Dimension Drawing

●Single Knuckle (I) Material: Steel Zinc Chromate



Model No.	Applicable Bore Size (mm)	AA	CA	CD	CH	EW	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8 × 1.0	13	10	60
M1-I-30	30	14	36	12	25	10	M10 × 1.25	16	12	106
M1-I-40	40	14	36	12	25	10	M12 × 1.5	16	12	100

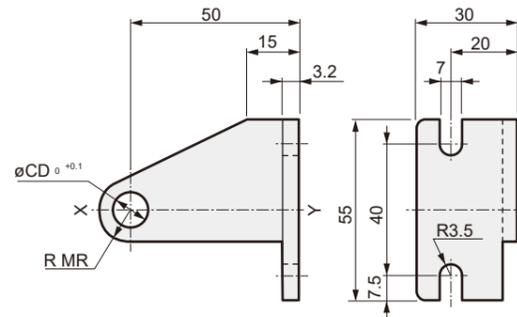
●Double Knuckle (Y) Material: Steel Zinc Chromate



Model No.	Applicable Bore Size (mm)	CA	CB	CD	CH	CL	KK	MB	MC	Weight (g)
M1-Y-20	20	30	8	10	19	19	M8 × 1.0	13	10	99
M1-Y-30	30	36	10	12	25	25	M10 × 1.25	16	12	197
M1-Y-40	40	36	10	12	25	25	M12 × 1.5	16	12	193

Note: A pin, a washer and a split pin are attached.

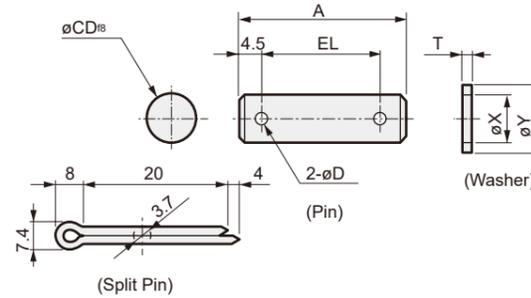
●Double Bracket (B2) Material: Steel Zinc Chromate



Model No.	Applicable Model	Applicable Bore size (mm)	CD	MR	Weight (g)
*2 M1-B2-30-CA	CMA2-CA	20	10	11	158
*2 M1-B2-40-CA	Clevis Type	30, 40	12	11	162
M1-B2-20-TA	CMA2-TA/TB	20	8	8	132
M1-B2-30-TA	Trunnion Type	30, 40	10	11	142

*1: A pair consists of two, symmetrical with respect to the XY line.
*2: Retaining ring and pin are included.

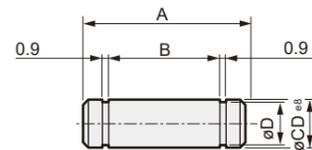
●Pin for Double Knuckle (P) Material: Steel Zinc Chromate



Model No.	Applicable Bore size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	29
M1-P-30	30, 40	46	4	12	37	2.3	12.5	22	50

Note: A pin, a washer and a split pin are included with the rod clevis.

●Pin for Double Bracket (P2) Material: Steel Zinc Chromate



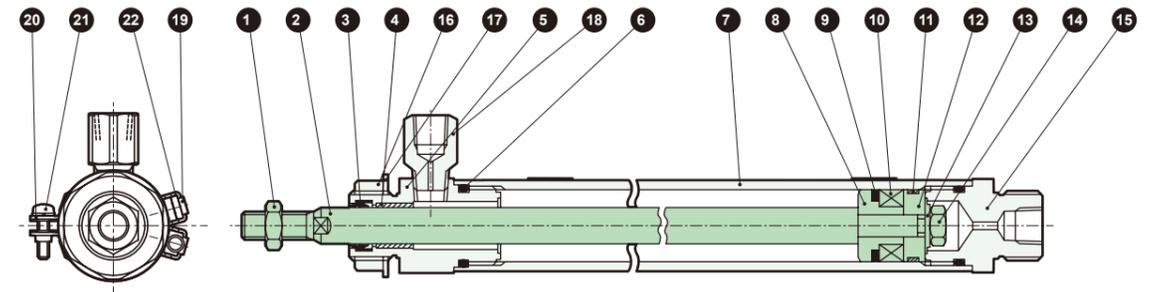
Model No.	Applicable Bore size (mm)	A	B	CD	D	Retaining Ring to Use	Weight (g)
M1-P2-20	20	25	20	10	9	E-type 9	16
M1-P2-30	30, 40	27	22	12	9	E-type 9	24

*1: Retaining ring is included.
*2: Pin and retaining ring are included to the double bracket. (However, not included for trunnion type)

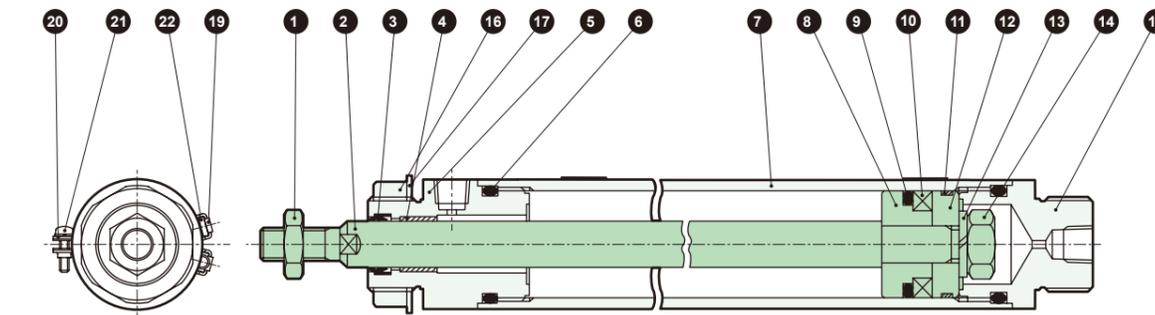
Internal Structure Diagram / Material

Internal Structure Diagram / Material

● $\phi 20$



● $\phi 30, \phi 40$



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	12	Piston B	Aluminum Alloy	
2	Piston Rod	$\phi 20, \phi 30$: Stainless Steel $\phi 40$: Carbon steel	Industrial Hard Chrome Plating	13	Spring Washer	Steel	Zinc Chromate
3	Rod Packing	Nitrile Rubber		14	Hexagon Nut	Steel	Zinc Chromate
4	Bushing	Bearing Alloy		15	Head Cover	Aluminum Alloy	Chromate
5	Rod Cover	Aluminum Alloy	Chromate	16	Nut	Steel	Zinc Chromate
6	Cylinder Gasket	Nitrile Rubber		17	Toothed Lock Washer	Steel	Zinc Chromate
7	Cylinder Tube	Aluminum Alloy	Hard Anodized	18	Port Nipple	Copper Alloy	
8	Piston A	Aluminum Alloy		With Switch			
9	Piston Packing	Nitrile Rubber		19	Switch		
10	Magnet	Plastic		20	Band	Stainless Steel	
11	Wear Ring	Polyacetal		21	Pan Head Screw	Stainless Steel	
				22	Switch Rail	Stainless Steel	

Consumable Parts List

Bore Size (mm)	Kit Number	Consumable Part Number
$\phi 20$	CMA2-20K	
$\phi 30$	CMA2-30K	3 6 9 11
$\phi 40$	CMA2-40K	

Mounting Bracket Material

Mounting type	Material
Foot (LB / LS)	Steel
Flange (FA / FB)	Steel
Trunnion (TA / TB)	Steel
Single Clevis (CA)	Steel
Double Clevis (CB)	

Note: Mounting brackets are attached to the product and shipped. However, if bellows are included and mounting brackets are LB, LS, FA, or TA, they will be shipped assembled.

General Type

General Type

SCP□3

SCP□3

CMK2

CMK2

CMA2

CMA2

SCM

SCM

SCG

SCG

SCA2

SCA2

SCS2

SCS2

Cylinder Switch

Cylinder Switch

Ending

Ending

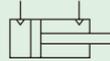


Small Bore Cylinder
Double Acting/Direct Type

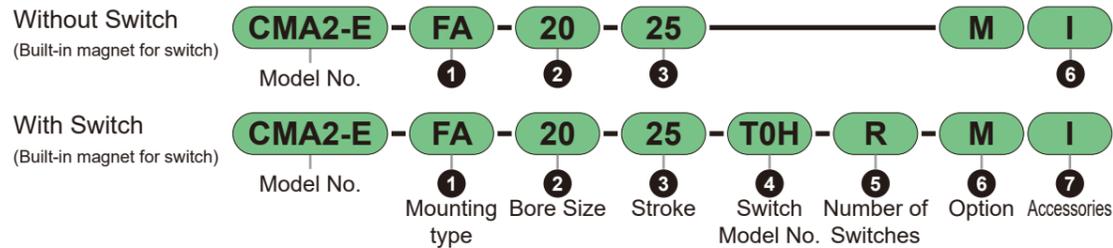
CMA2-E Series

● Bore Size: ø20, ø30, ø40

Circuit Diagram Symbol



Model No. Notation Method



1 Mounting type

Mounting brackets are included to the product and shipped.

Code	Content
LS	Side Foot Mounting
FA	Flange Mounting

2 Bore Size (mm)

Code	Content
20	ø20
30	ø30
40	ø40

3 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	1 to 700	Every 1 mm
ø30	1 to 700	
ø40	1 to 700	

Note: For minimum stroke with switch, refer to P. 312.

4 Switch Model No.

For switch details, please refer to P. 971. Switches are included with the product and shipped.

Contact	Indicator Lamp Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1	
			AC	DC	AC	DC	Straight	L-shape
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□
		3-wire (NPN)	—	—	100 or less	—	T3H□	T3V□
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□
			—	30 or less	—	50 or less	T3WH□	T3WV□
		3-wire (NPN)	—	—	—	—	T3PH□	T3PV□
Reed	1-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□
			—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□
			—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3
No Indicator Lamp	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□
			110	5/12/24	20 or less	50 or less	T5H□	T5V□
1-Color	1-Color	2-wire	110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (-) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H [3]
5 m T0H [5]

*1: For "□" in the switch model number, enter the symbol selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 971.

5 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

6 Option

Code	Content
M	Piston Rod Material (Stainless Steel)

7 Accessories

Code	Content
I	Single Knuckle
Y	Double Knuckle (Pin and washer included)

Note: I and "Y" cannot be selected simultaneously.

About Custom Product Specifications

For details, see P. 316.

Code	Content
-XJ9	Without Bellows
-T2	Fluorine Packing Type
-A2	With 2 Rod Nuts
Rod End Shape Modification	Refer to Ending P. 11.

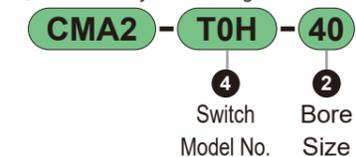
Model No. Example)

CMA2-E-.....-XJ9

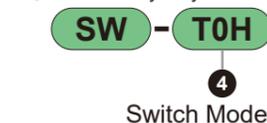
Switch Single Unit Model No. Notation Method

[T-type Switch]

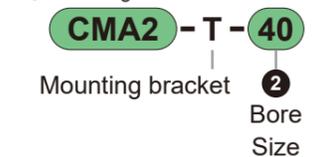
● Switch body + Mounting bracket set



● Switch body only



● Mounting bracket set



Specifications

Item	CMA2-E			
	mm	ø20	ø30	ø40
Bore Size	mm	ø20	ø30	ø40
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.1		
Proof Pressure	MPa	1.0		
Ambient Temperature	°C	-10 to 60 (Provided that freezing does not occur)		
Port Size		Rc1/8		
Stroke tolerance	mm	$^{+1.0}_0$ (Up to 200), $^{+1.2}_0$ (Up to 700)		
Operating Piston Speed	mm/s	50 to 500		
Cushion		None		
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)		
Allowable Absorbed Energy	J	0.024	0.05	0.093

*1: This product cannot absorb high energy generated by an external load. It is recommended to use an external shock absorber together.

Stroke

(Unit: mm)

Bore Size	Standard Stroke	Max. Stroke	Min. Stroke
ø20	25, 50, 75, 100, 150, 200, 250, 300	700	1
ø30			
ø40			

Note: About Intermediate Stroke: Manufacturable every 1 mm.

Min. Stroke with Switch (T-type Switch)

(Unit: mm)

Switch Model No.	With 1 pc	With 2 pcs
T0, T5, T2, T3	10	25
T2W, T3W, T2WL	10	30
T1, T8	10	25

Cylinder Weight

(Unit: kg)

Item/Mounting Style	Product Weight at Stroke (S) = 0 mm		Weight per Switch		Added Weight per S = 10 mm
	Side Foot Type (LS)	Flange Type (FA)	T type		
ø20	0.18	0.16	Please refer to the weight listed in the switch specifications on P. 971	Switch Rail + Band Weight	0.01
ø30	0.36	0.31		0.005	0.014
ø40	0.61	0.51		0.009	0.02

(Example) Product Weight of CMA2-E-FA-30-50-T0H-D

- Product Weight at S = 0 mm: 0.31 kg
- Added weight at S = 50 mm.....Added weight at S = 10 mm 0.014 × $\frac{\text{Product Stroke (50)}}{10}$ = 0.07 kg
- Weight of 2 switches.....0.036 kg
- Product Weight.....0.31 kg+0.07 kg+0.036 kg=0.416 kg

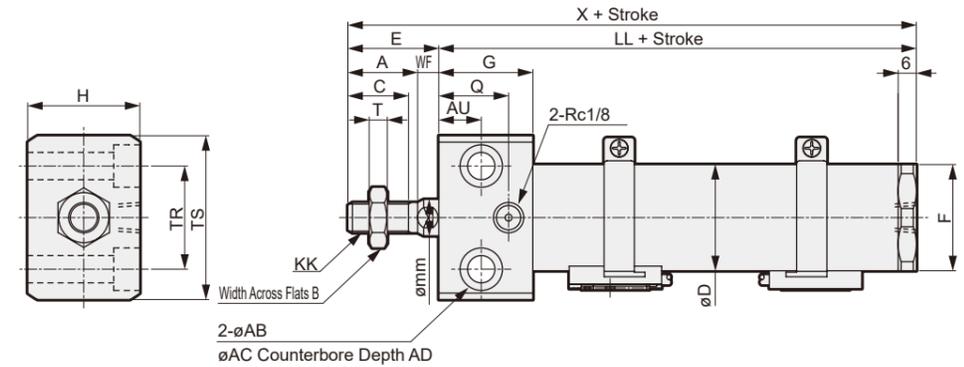
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø20	Push	31.4	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2
	Pull	23.6	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2
ø30	Push	70.7	1.06×10^2	1.41×10^2	2.12×10^2	2.83×10^2	3.53×10^2	4.24×10^2	4.95×10^2
	Pull	59.4	89.1	1.19×10^2	1.78×10^2	2.38×10^2	2.97×10^2	3.56×10^2	4.16×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2
	Pull	1.10×10^2	1.65×10^2	2.21×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2

Outline Dimension Drawing

●Side Foot Mounting Type (LS)

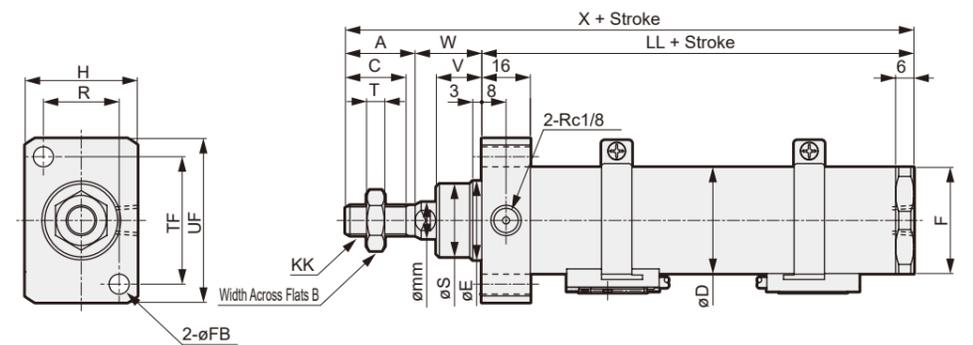


Code	Side Foot Mounting Type (LS) Mounting Dimensions																				
Bore Size (mm)	A	AB	AC	AD	AU	B	C	D	E	F	G	H	KK	LL	MM	Q	T	TR	TS	WF	X
ø20	20	6.6	11	6.5	9.5	13	18	25	31	26	28	28	M8 × 1.0	79	10	20	5	22	38	11	110
ø30	23	9	14	8.6	14	17	20	35	30	35	31	37	M10 × 1.25	88	12	23	6	34	54	7	118
ø40	25	11	17.5	10.8	15	19	22	45	31	46	32	48	M12 × 1.5	91	14	24	7	46	68	6	122

*1: For dimensions with each switch, see P. 315.

*2: For outer dimensions diagram of accessories, refer to P. 308.

●Flange Mounting Type (FA)



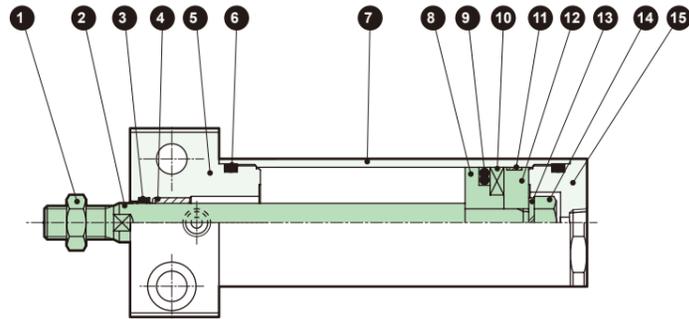
Code	Flange Mounting Type (FA) Mounting Dimensions																		
Bore Size (mm)	A	B	C	D	E	F	FB	H	KK	LL	MM	R	S	T	TF	UF	V	W	X
ø20	20	13	18	25	18	26	5.5	28	M8 × 1.0	67	10	19	17	5	29	38	12	23	110
ø30	23	17	20	35	26	35	6.6	37	M10 × 1.25	73	12	25	24	6	42	54	15	22	118
ø40	25	19	22	45	26	46	9	48	M12 × 1.5	75	14	32	24	7	52	68	16	22	122

*1: For dimensions with each switch, see P. 315.

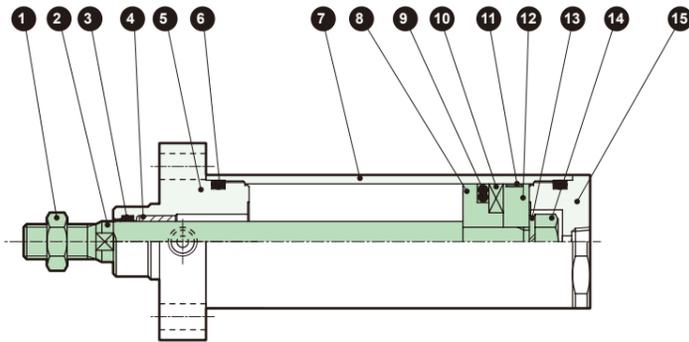
*2: For outer dimensions diagram of accessories, refer to P. 308.

Internal Structure Diagram / Material

●Side Foot Mounting Type (LS)



●Flange Mounting Type (FA)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	8	Piston A	Aluminum Alloy	
2	Piston Rod	ø20, ø30: Stainless Steel ø40: Carbon steel	Industrial Hard Chrome Plating	9	Piston Packing	Nitrile Rubber	
3	Rod Packing	Nitrile Rubber		10	Magnet	Plastic	
4	Bushing	Bearing Alloy		11	Wear Ring	Polyacetal	
5	Rod Cover	Aluminum Alloy	Chromate	12	Piston B	Aluminum Alloy	
6	Cylinder Gasket	Nitrile Rubber		13	Spring Washer	Steel	Zinc Chromate
7	Cylinder Tube	Aluminum Alloy	Hard Anodized	14	Hexagon Nut	Steel	Zinc Chromate
				15	Head Cover	Aluminum Alloy	Chromate

Consumable Parts List

Bore Size (mm)	Kit Number	Consumable Part Number
ø20	CMA2-20K	
ø30	CMA2-30K	3 6 9 11
ø40	CMA2-40K	

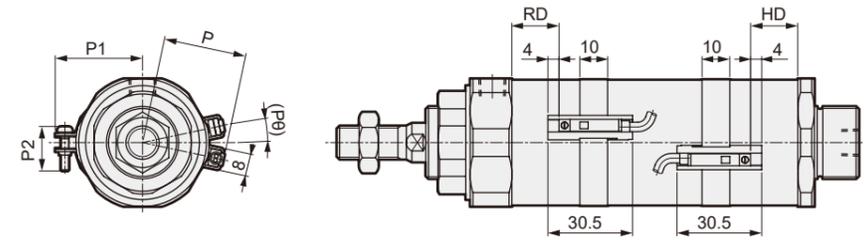
Mounting Bracket Material

Mounting type	Material
Foot (LS)	Steel
Flange (FA)	Steel

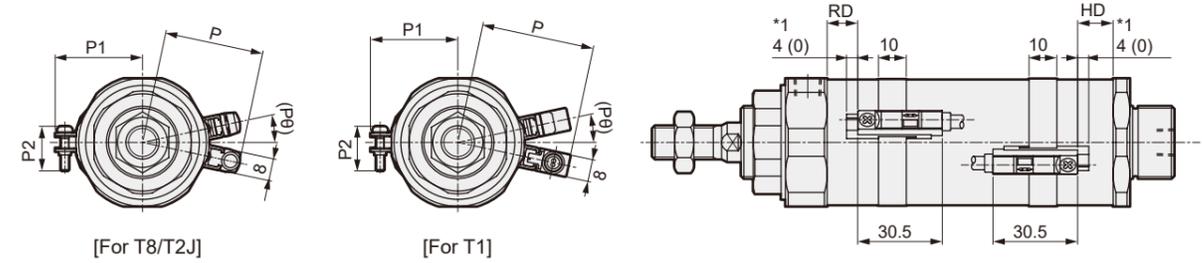
Note: Mounting brackets are included to the product upon shipment.

CMA2 Series Switch Outline Dimension Drawing

●T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V



●T1H/V, T8H/V, T2JH/V



Code	P1	P2	P0	CMA2,CMA2-E											
				T0,T5,T2,T3,T3P			T2W, T3W, T2WL			T1,T2J			T8		
Bore Size (mm)				RD	HD	P	RD	HD	P	RD	HD	P	RD	HD	P
ø20	21	14	19	13	13	19.5	15	15	19.5	12	12	30.3	7	7	25.3
ø30	26	16	15	16	16	24.5	18	18	24.5	15	15	35.3	10	10	30.3
ø40	31	14	12	17	17	29.5	19	19	29.5	16	16	40.3	11	11	35.3

*1: For T1□, T2J□ switch and stroke 33 mm or more, or for T8□ switch, dimensions in () apply.
*2: For switch mountability, refer to the model No. notation method for each variation.

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

Cylinder Switch

Ending

Cylinder Switch

Ending

CMA2 Series

Custom Products

Without Bellows (-XJ9)

Content: Piston rod with dimensions for bellows, but bellows not assembled

Model No. Notation Method

CMA2 - 00 - 40 - 100 - XJ9

Model No.

See CMA2 model No. notation method.

Outline Dimension Drawing

Same dimensions as with bellows, but bellows are not included.

Fluorine Packing Type (-T2)

Content: Change the rod packing, piston packing and O-rings to FKM. (Cushion packing is not changed)

Model No. Notation Method

CMA2 - T2 - 00 - 40 - 100

Model No.

See CMA2 model No. notation method.

Outline Dimension Drawing

Same as double acting/single rod type.

With 2 Rod Nuts (-A2)

Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation Method

CMA2 - 00 - 40 - 100 - A2

Model No.

See CMA2 model No. notation method.

Outline Dimension Drawing

Same as double acting/single rod type except that 2 rod nuts are included.

MEMO

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

Cylinder Switch

Ending

General Type

SCP□3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

Cylinder Switch

Ending