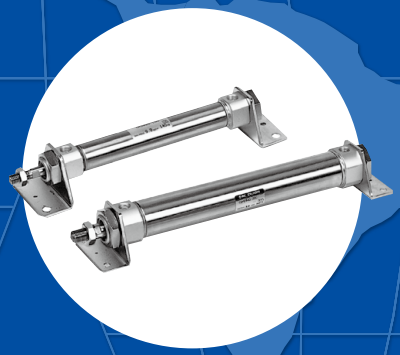
ISO Cylinder

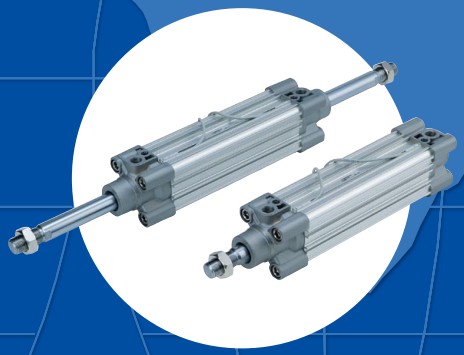
ISO cylinders are designed to meet with the international standard laid down by the International Organization for Standardization (ISO).

As long as the standard number is identical, the mounting sizes are applicable worldwide.

ISO 6432
Series C85



ISO 15552
Series CP96/C96

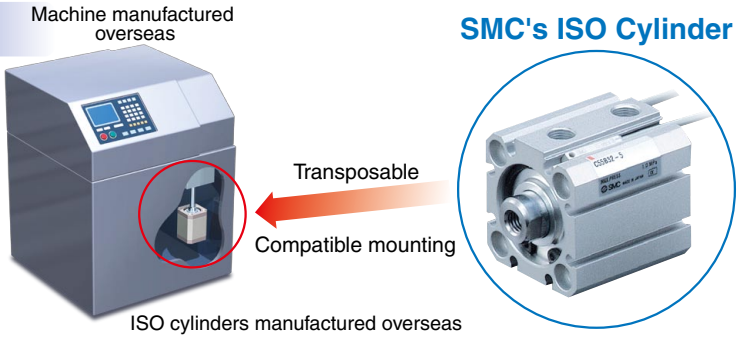


ISO 21287
Series C55

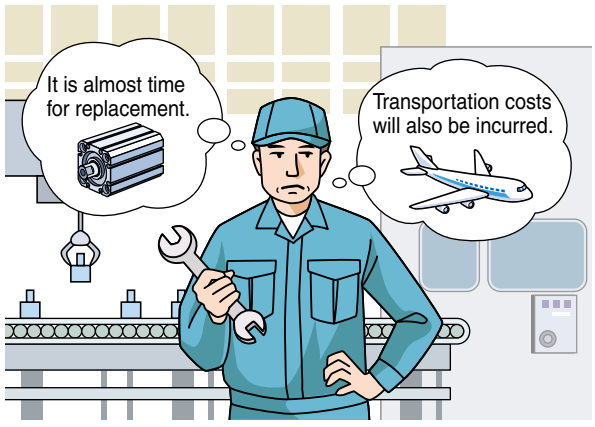
For the maintenance of equipment and machine manufactured overseas.

Mounting compatibility

Transposable with cylinders manufactured overseas.



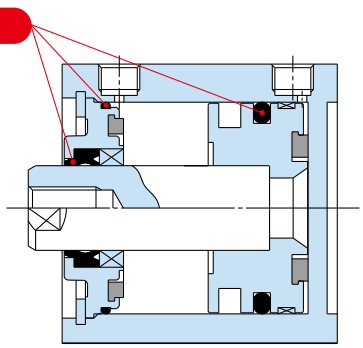
Prompt delivery



Replaceable seal

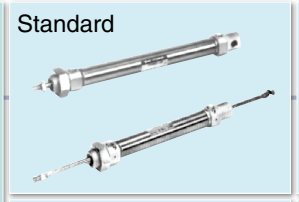
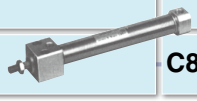
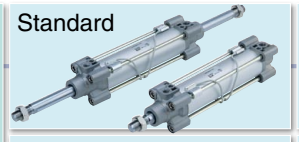
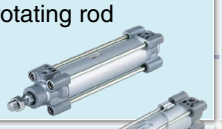
SMC's ISO cylinders have a replaceable seal.
We provide this product with a seal set.
It will be more cost efficient than a cylinder replacement.

(For details, refer to pages 1, 16, 28, 46, 52, 59, 65, 69 and 96.)



SMC

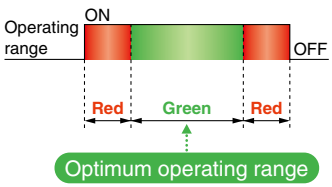
ISO Cylinder, Series Variations

Standard no.	Series		Action	Bore size (mm) 8 10 12 16 20 25 32 40 50 63 80 100 125	Page
ISO 6432	Standard 	C85	Double acting, Single rod	●●●●●●●●●●●●●	P.1
			Double acting, Double rod	●●●●●●●●●●●●●	P.16
			Single acting, Single rod	●●●●●●●●●●●●●	P.1
	Non-rotating rod 	C85K	Double acting, Single rod	●●●●●●●●●●●●●	P.16
			Single acting, Single rod	●●●●●●●●●●●●●	P.28
	Direct mount 	C85R	Double acting, Single rod	●●●●●●●●●●●●●	P.43
ISO 15552	Standard 	CP96	Double acting, Single rod	●●●●●●●●●●●●●	P.50
			Double acting, Double rod	●●●●●●●●●●●●●	P.56
	Non-rotating rod 	CP96K	Double acting, Single rod	●●●●●●●●●●●●●	P.63
			Double acting, Double rod	●●●●●●●●●●●●●	P.67
ISO 15552	Standard 	C96	Double acting, Single rod	●●●●●●●●●●●●●	P.92
			Double acting, Double rod	●●●●●●●●●●●●●	
	Non-rotating rod 	C96K	Double acting, Single rod	●●●●●●●●●●●●●	
			Double acting, Double rod	●●●●●●●●●●●●●	
	Smooth Cylinder 	C96Y	Double acting, Single rod	●●●●●●●●●●●●●	
ISO 21287	Standard 	C55	Double acting, Single rod	●●●●●●●●●●●●●	

Small auto switch mountable on all types

2-color indication solid state auto switch

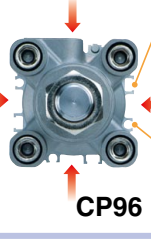
◎ Appropriate setting of the mounting position can be performed without mistakes.



A green light lights up at the optimum operating range.

Water resistant auto switches are available in environments with exposure to water or coolants.

Mountable on all four sides



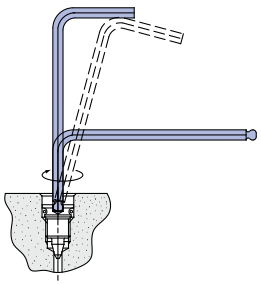
CNOMO grooves
Mount a switch from the head end for attaching to the CNOMO groove on the port surfaces.

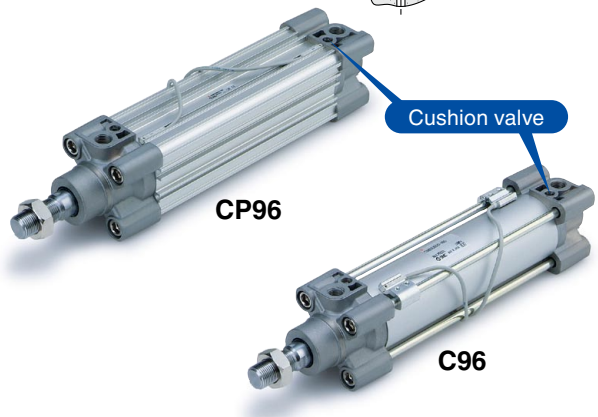
Groove for the D-M9□, A9□ type*

* The D-M9□V, A9□V series are not mountable.

Simple end of stroke cushion valve adjustment

Since the adjustment of the cushion valve is performed with ahex wrench key, even finite control can be easily accomplished. Furthermore, the cushion valve has been recessed so that it does not protrude from the cover.





ISO Standards

Air Cylinder: Standard/Non-rotating Type
Double Acting, Single/Double Rod
Series C85
ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Double acting, Single rod C D 85 K N 16 – 40 C J – A

Double acting, Double rod C D 85W E 16 – 40 C JJ – B

Built-in magnet

Nil	None
D	Built-in magnet

Type

Nil	Standard
K	Non-rotating rod (Rubber bumper only)

Mounting

N*	Basic (Integral clevis)
E**	Double end boss-cut
F	Boss-cut/Basic
Y	Head cover axial port

* Air cushion type is applicable only for the N type.
** Double rod is applicable only for the E type.

Auto switch mounting

A	Rail mounting
B	Band mounting

Applicable auto switches are shown on page 32. Order auto switches and bands separately.
(Auto switches and bands cannot be indicated here.)

Rod boot (Only ø20, ø25)

Nil	Without rod boot
J	Nylon tarpaulin (one side)
K	Heat resistant tarpaulin (one side)
JJ*	Nylon tarpaulin (both sides)
KK*	Heat resistant tarpaulin (both sides)

* In the case of double acting/double rod.

Cushion

Nil	Rubber bumper (Standard)
C	Air cushion (Only "N" mounting, ø10 to 25)

Bore size / **Cylinder stroke**

Bore size (mm)	Standard stroke (mm)**	Max. stroke (mm)***		
		Standard	Non-rotating	Double rod
8*	10, 25, 40, 50, 80, 100	200	100	100
10		400		
12	10, 25, 40, 50, 80, 100 125, 160, 200		200	200
16				
20	10, 25, 40, 50, 80, 100 125, 160, 200, 250, 300	1000	1000	500
25				

* Not available with air cushion.
** Other strokes available on request.
*** For exceeding the standard stroke range, it will be available as a special order (-X2018).

Mounting Bracket Part No.

Mounting bracket \ Bore size (mm)		8	10	12	16	20	25
Mounting bracket	Foot (1 pc.)	C85L10A		C85L16A		C85L25A	
	Foot (2 pcs. with mounting nut 1 pc.)	C85L10B		C85L16B		C85L25B	
	Flange	C85F10		C85F16		C85F25	
	Trunnion	C85T10		C85T16		C85T25	
	Clevis	C85C10		C85C16		C85C25	
Accessories	Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
	Double knuckle joint	GKM4-8		GKM6-10		GKM8-16	GKM10-20
	Floating joint	JA10-4-070		JA15-6-100		JA20-8-125	JA30-10-125

Replacement Parts/Standard Cylinders

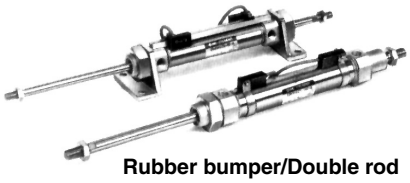
Bore size (mm)	Part no.	Note
20	C85-20PS	Every set includes: 1 rod seal 1 flat washer 1 retaining ring
25	C85-25PS	

Replacement Parts/Non-rotating Cylinders ("K")

Bore size (mm)	Part no.	Note
20	C85K-20PS	Every set includes: 1 rod seal 1 flat washer 1 retaining ring
25	C85K-25PS	

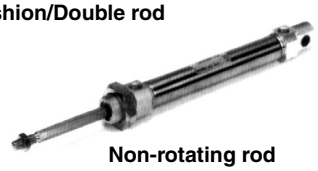
Rubber bumper/Single rod

Air cushion/Single rod



Rubber bumper/Double rod

Air cushion/Double rod



Non-rotating rod

Specifications

Bore size (mm)		8	10	12	16	20	25
Piston rod dia. (mm)		4	4	6	6	8	10
Piston rod thread		M4 x 0.7	M4 x 0.7	M6 x 1	M6 x 1	M8 x 1.25	M10 x 1.25
Port size		M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	G 1/8	G 1/8
Action		Double acting, Single/Double rod					
Fluid		Air					
Proof pressure		1.5 MPa					
Max. operating pressure		1.0 MPa					
Min. operating pressure		0.1 MPa	0.08 MPa		0.05 MPa		
Ambient and fluid temperature		–20 to 80°C (Built-in magnet: –10 to 60°C)					
Cushion		Rubber bumper (Non-rotating: Rubber bumper only), Air cushion (Except ø8)					
Lubrication		Not required. Use turbine oil Class 1 ISO VG32, if lubricated.					
Rod boot	**Nylon tarpaulin**	—				Max. ambient temperature 60°C	
	Heat resistant tarpaulin	—				Max. ambient temperature 110°C*	
Piston speed		50 to 1500 mm/s					
Allowable kinetic energy	**Rubber bumper**	0.02 J	0.03 J	0.04 J	0.09 J	0.27 J	0.4 J
	Air cushion	—	0.17 J	0.19 J	0.4 J	0.66 J	0.97 J
Non-rotating accuracy		±1.5°	±1.5°	±1°	±1°	±0.7°	±0.7°
Stroke length tolerance		$^{+1.0}_{0}$ mm				$^{+1.4}_{0}$ mm	

* Maximum ambient temperature of rod boots only

Weights

(g)

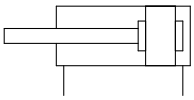
Bore size (mm)			8	10	12	16	20	25
Double acting	Basic weight		45	49	96	109	183 (203)	258 (286)
Double rod	Additional weight per 10 mm of stroke		3	3.2	6.2	7.2	11.8	18.4
Mounting bracket		C85L□A	20		40		95	
		C85L□B	55		105		210	
		C85F□	12		25		90	
		C85T□	20		50		75	
		C85C□	20		40		85	
Accessories	Single knuckle joint	KJ□D	17		25		45	70
	Double knuckle joint	GKM□-□	10		20		50	100
	Floating joint	JA□-□-□	10		20		50	70

Calculation: Example) **C85N10-50, C85F10** ( ): In the case of air cushion

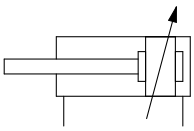
- Basic weight ····· 49 (ø10) g
- Additional weight ····· 3.2/10 mm stroke
- Cylinder stroke ····· 50 mm stroke
- Mounting bracket ····· 12 g

49 + 3.2 x 50/10 = 65 g 65 + 12 = 77 g

Double acting, Single rod

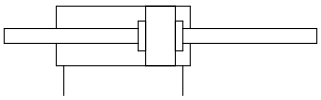


Rubber bumper

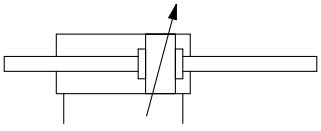


Air cushion

Double acting, Double rod

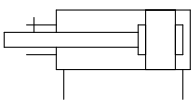


Rubber bumper



Air cushion

Non-rotating rod: Double acting, Single rod



⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuator and Auto Switch Precautions.

Stroke Selection

Relationship between cylinder size and maximum stroke

The below table shows the applicable maximum stroke (in cm units), found by calculation assuming the case where the force generated by the cylinder itself acts as buckling force on the piston rod, or piston rod and cylinder tube. Therefore, it is possible to find the applicable maximum stroke for each cylinder size using the relationship between the size of the operating pressure and the cylinder support type, regardless of the load ratio.

[Reference] If it is stopped with the external stopper on the cylinder extension side, even with a light load, the maximum generated force of the cylinder will act on the cylinder itself.

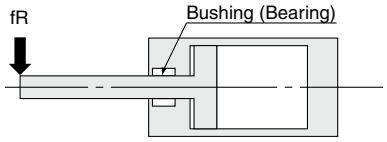
(cm)

Mounting	Nominal symbol	Operating pressure (MPa)	Applicable maximum stroke according to buckling strength C85					
Support bracket nominal symbol and schematic diagram			8	10	12	16	20	25
Foot: L / Rod flange:F / Head flange: G	L F	0.3	24	18	36	26	38	48
		0.5	18	14	27	19	29	36
		0.7	14	11	22	16	23	30
	G	0.3	9	6	15	10	15	20
		0.5	6	4	10	6	10	14
		0.7	4	3	8	4	8	11
Clevis: C, D / Rod trunnion: U	C D	0.3	22	17	35	24	36	46
		0.5	16	12	26	18	27	34
		0.7	13	10	21	14	22	28
Head trunnion: U / Center trunnion: O	U	0.3	(40) *	(40) *	(40) *	(40) *	80	(100) *
		0.5	38	30	(40) *	(40) *	61	77
		0.7	32	25	(40) *	35	51	64
Series CS1 only	T	0.3	22	17	35	24	37	47
		0.5	16	12	26	18	27	35
		0.7	13	10	21	14	22	28
Foot: L / Rod flange:F / Head flange: G	L F	0.3	(40) *	(40) *	(40) *	(40) *	(100) *	(100) *
		0.5	(40) *	(40) *	(40) *	(40) *	89	(100) *
		0.7	(40) *	36	(40) *	(40) *	74	93
	G	0.3	33	26	(40) *	37	54	69
		0.5	25	19	39	27	41	52
		0.7	20	15	32	22	33	43
Foot: L / Rod flange:F / Head flange: G	L F	0.3	(40) *	(40) *	(40) *	(40) *	(100) *	(100) *
		0.5	(40) *	(40) *	(40) *	(40) *	(100) *	(100) *
		0.7	(40) *	(40) *	(40) *	(40) *	(100) *	(100) *
	G	0.3	(40) *	38	(40) *	(40) *	79	(100) *
		0.5	37	29	(40) *	(40) *	60	76
		0.7	30	23	(40) *	34	50	63

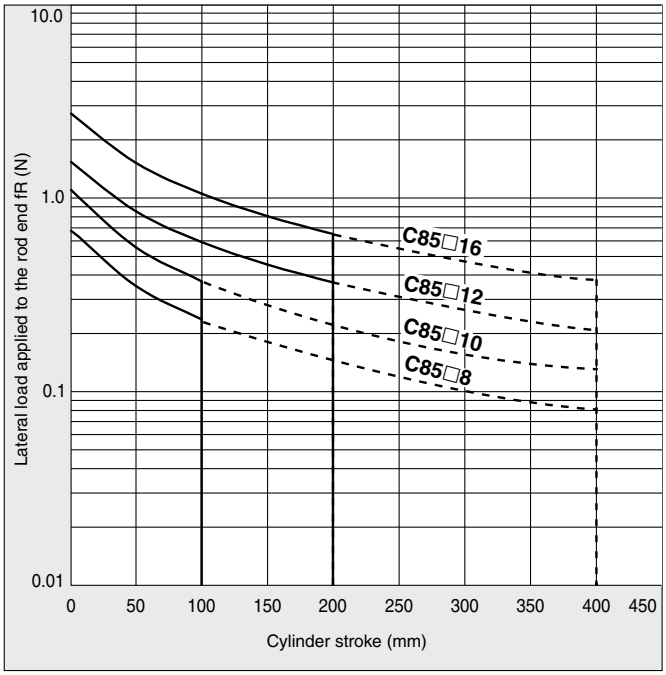
* The data in ( ) are limited by max. stroke length.

The maximum stroke at which the cylinder can be operated under a lateral load

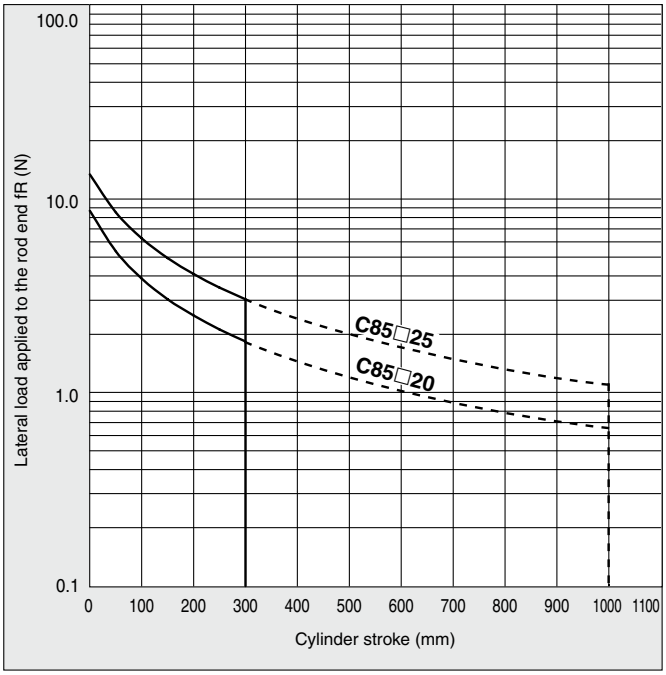
The region that does not exceed the bold solid line represents the allowable lateral load in relation to the cylinder of a given stroke length. In the graph, the range of the broken line shows that the long stroke limit has been exceeded. In this region, as a rule, operate the cylinder by providing a guide along the direction of movement.



Series C85: ø8, ø10, ø12, ø16

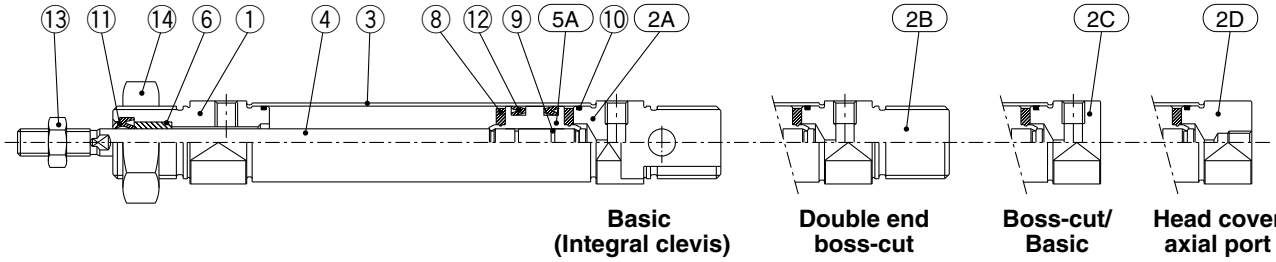


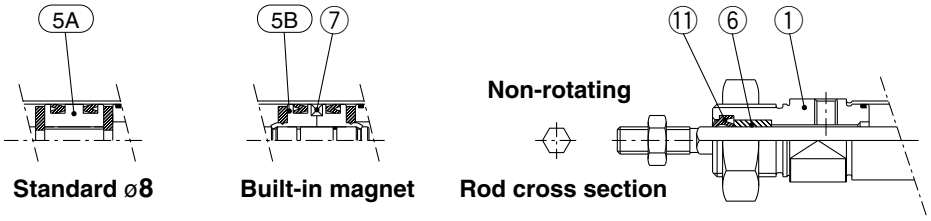
Series C85: ø20, ø25



Construction

Double acting, Single rod
Rubber bumper: C□85□8 to 16 (Disassembly is not possible.)



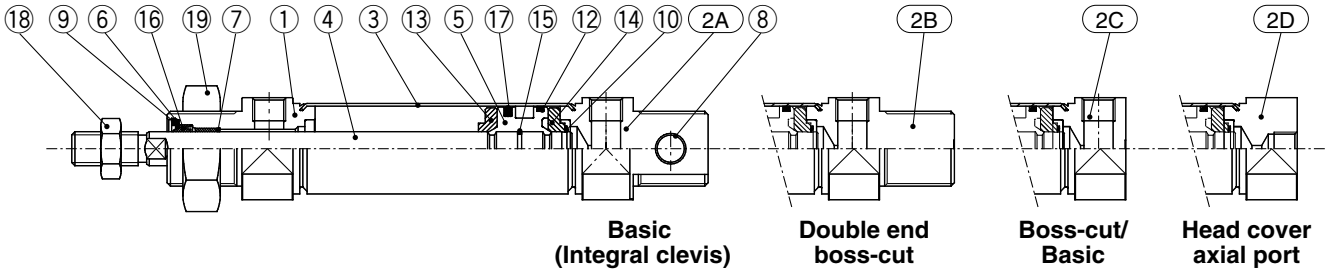


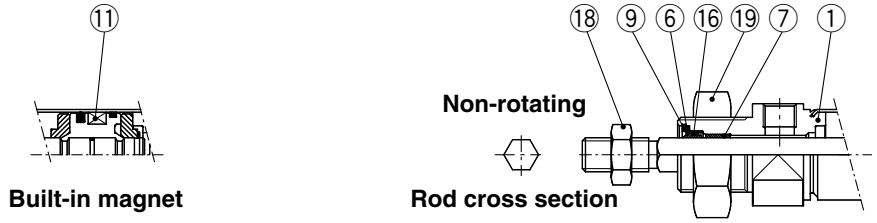
Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2A	**Head cover N**	Aluminum alloy	1	Clear anodized
2B	**Head cover E**	Aluminum alloy	1	Clear anodized
2C	**Head cover F**	Aluminum alloy	1	Clear anodized
2D	**Head cover Y**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Stainless steel	1	
5A	**Piston A**	Brass (ø8 only), Aluminum alloy (ø10 to ø16)	1	
5B	**Piston B**	Brass (ø8 only), Aluminum alloy (ø10 to ø16)	2	(Switch type piston)

No.	Description	Material	Q'ty	Note
6	**Bushing**	Bearing alloy	1	
7	**Magnet**	Magnet	1	(Switch type only)
8	**Bumper**	Urethane	2	
9	**Piston gasket**	NBR	1	(2 for switch type)
10	**Tube gasket**	NBR	2	
11	**Rod seal**	NBR	1	
12	**Piston seal**	NBR	2	
13	**Rod end nut**	Carbon steel	1	Nickel plating
14	**Mounting nut**	Carbon steel	1	Nickel plating

Rubber bumper: C□85□20/25





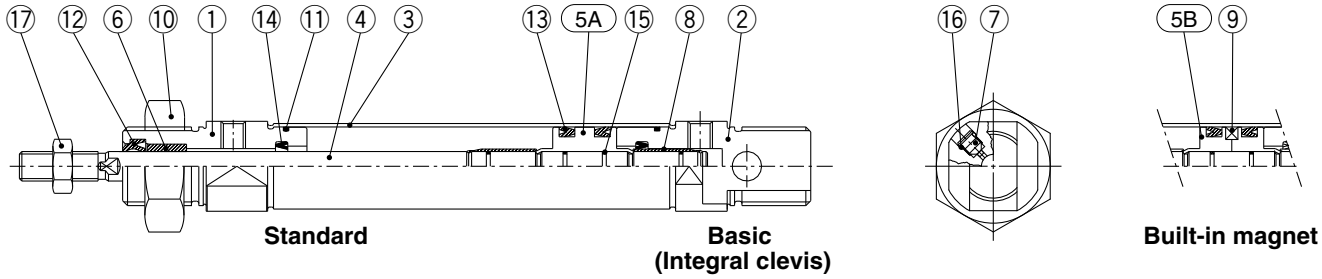
Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2A	**Head cover N**	Aluminum alloy	1	Clear anodized
2B	**Head cover E**	Aluminum alloy	1	Clear anodized
2C	**Head cover F**	Aluminum alloy	1	Clear anodized
2D	**Head cover Y**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Carbon steel	1	Hard chrome plating
5	**Piston**	Aluminum alloy	1	Chromated
6	**Flat washer**	Stainless steel	1	
7	**Bushing**	Bearing alloy	1	
8	**Bushing**	Bearing alloy	2	

No.	Description	Material	Q'ty	Note
9	**Retaining ring**	Carbon steel	1	Phosphate coating
10	**Retaining ring**	Stainless steel	1	
11	**Magnet**	Magnet	1	(Switch type only)
12	**Wear ring**	Resin	1	
13	**Bumper A**	Urethane	1	
14	**Bumper A**	Urethane	1	
15	**Piston gasket**	NBR	1	
16	**Rod seal**	NBR	1	
17	**Piston seal**	NBR	1	
18	**Rod end nut**	Carbon steel	1	Nickel plating
19	**Mounting nut**	Carbon steel	1	Nickel plating

Construction

Double acting, Single rod
Air cushion: C□85□10 to 16 (Disassembly is not possible.)



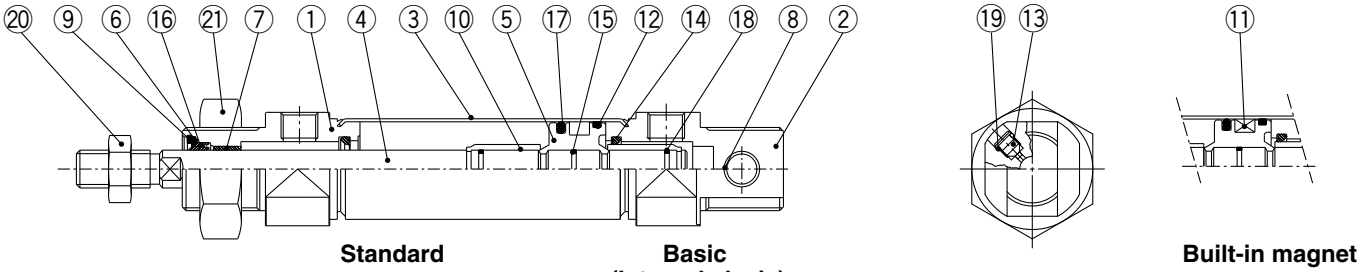
Standard **Basic (Integral clevis)** **Built-in magnet**

Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2	**Head cover N**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Stainless steel	1	
5A	**Piston A**	Aluminum alloy	1	
5B	**Piston B**	Aluminum alloy	2	(Switch type piston)
6	**Bushing**	Bearing alloy	1	
7	**Cushion needle**	Carbon steel	2	Electroless nickel plating
8	**Cushion ring**	Brass	2	
9	**Magnet**	Magnet	1	(Switch type only)

No.	Description	Material	Q'ty	Note
10	**Mounting nut**	Carbon steel	1	Nickel plating
11	**Tube gasket**	NBR	2	
12	**Rod seal**	NBR	1	
13	**Piston seal**	NBR	2	
14	**Check seal**	NBR	2	
15	**Piston gasket and cushion ring gasket**	NBR	3	(4 for switch type)
16	**Needle seal**	NBR	2	
17	**Rod end nut**	Carbon steel	1	Nickel plating

Air cushion : C□85□20/25



Standard **Basic (Integral clevis)** **Built-in magnet**

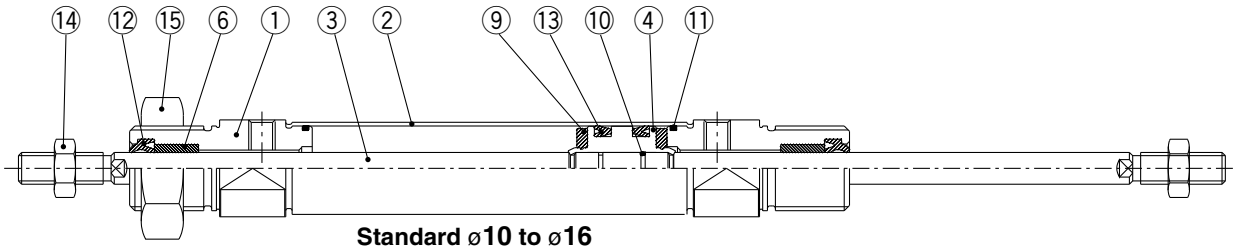
Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2	**Head cover N**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Carbon steel	1	Hard chrome plating
5	**Piston**	Aluminum alloy	1	Chromated
6	**Flat washer**	Stainless steel	1	
7	**Bushing**	Bearing alloy	1	
8	**Bushing**	Bearing alloy	1	
9	**Retaining ring**	Carbon steel	1	Phosphate coating
10	**Cushion ring**	Aluminum alloy	2	
11	**Magnet**	Magnet	1	(Switch type only)

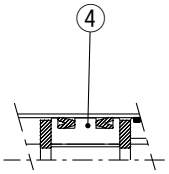
No.	Description	Material	Q'ty	Note
12	**Wear ring**	Resin	1	
13	**Cushion needle**	Carbon steel	2	Electroless nickel plating
14	**Cushion seal**	Urethane	2	
15	**Piston gasket**	NBR	1	
16	**Rod seal**	NBR	1	
17	**Piston seal**	NBR	1	
18	**Cushion ring gasket**	NBR	2	
19	**Cushion needle seal**	NBR	2	
20	**Rod end nut**	Carbon steel	1	Nickel plating
21	**Mounting nut**	Carbon steel	1	Nickel plating

Construction

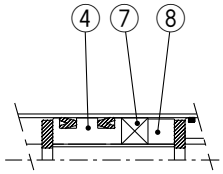
Double acting, Double rod
Rubber bumper: C□85WE8 to 16 (Disassembly is not possible.)



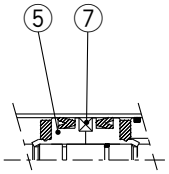
Standard ø10 to ø16



Standard ø8



Built-in magnet ø8



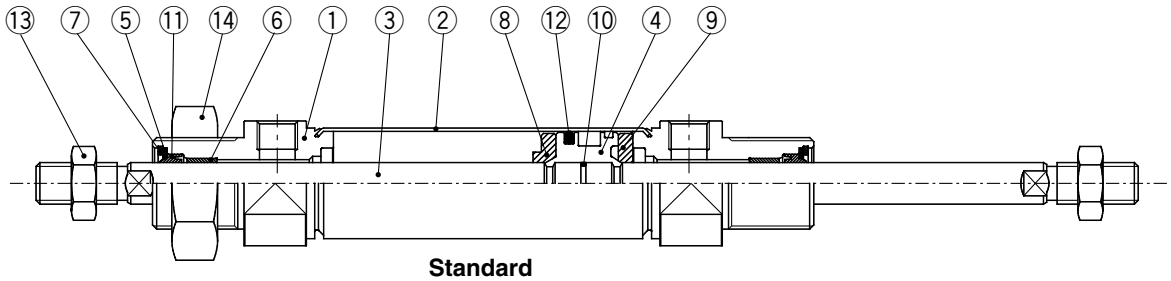
Built-in magnet ø10 to ø16

Component Parts

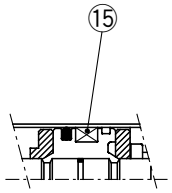
No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	2	Clear anodized
2	**Cylinder tube**	Stainless steel	1	
3	**Piston rod**	Stainless steel	1	2 for ø8
4	**Piston A**	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	
5	**Piston B**	Brass (ø8), Aluminum alloy (ø10 to ø16)	2	(Switch type piston)
6	**Bushing**	Bearing alloy	2	
7	**Magnet**	Magnet	1	(Switch type only)
8	**Spacer**	Brass	1	

No.	Description	Material	Q'ty	Note
9	**Bumper**	Urethane	2	
10	**Piston gasket**	NBR	1	(2 for switch type)
11	**Tube gasket**	NBR	2	
12	**Rod seal**	NBR	2	
13	**Piston seal**	NBR	2	
14	**Rod end nut**	Carbon steel	2	Nickel plating
15	**Mounting nut**	Carbon steel	1	Nickel plating

Rubber bumper: C□85WE20/25



Standard



Built-in magnet

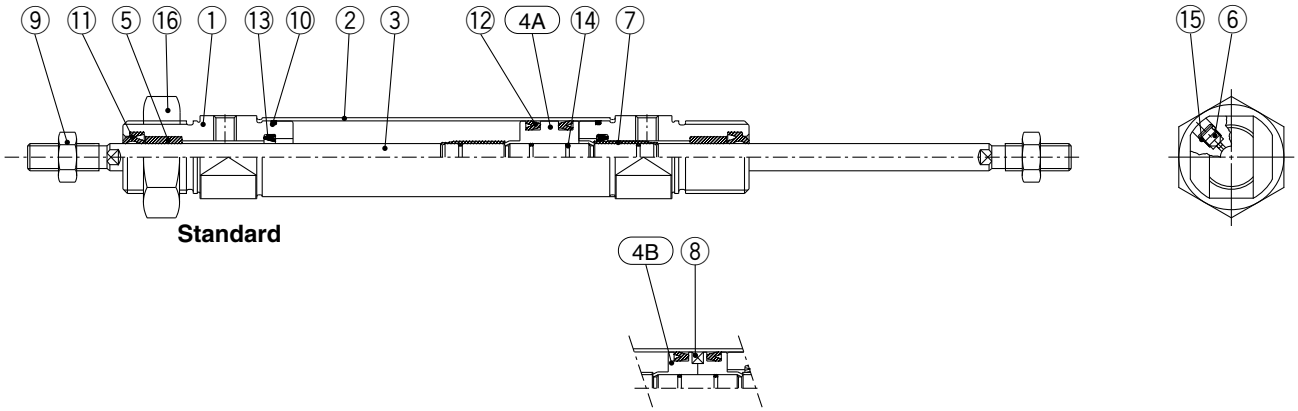
Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	2	Clear anodized
2	**Cylinder tube**	Stainless steel	1	
3	**Piston rod**	Carbon steel	1	Hard chrome plating
4	**Piston**	Aluminum alloy	1	Chromated
5	**Flat washer**	Stainless steel	2	
6	**Bushing**	Bearing alloy	2	
7	**Retaining ring**	Carbon steel	2	Phosphate coating
8	**Bumper A**	Urethane	1	

No.	Description	Material	Q'ty	Note
9	**Bumper B**	Urethane	1	
10	**Piston gasket**	NBR	1	
11	**Rod seal**	NBR	2	
12	**Piston seal**	NBR	1	
13	**Rod end nut**	Carbon steel	2	Nickel plating
14	**Mounting nut**	Carbon steel	1	Nickel plating
15	**Magnet**	Magnet	1	(Switch type only)

Construction

Double acting, Double rod
Air cushion: C□85WE10 to 16 (Disassembly is not possible.)

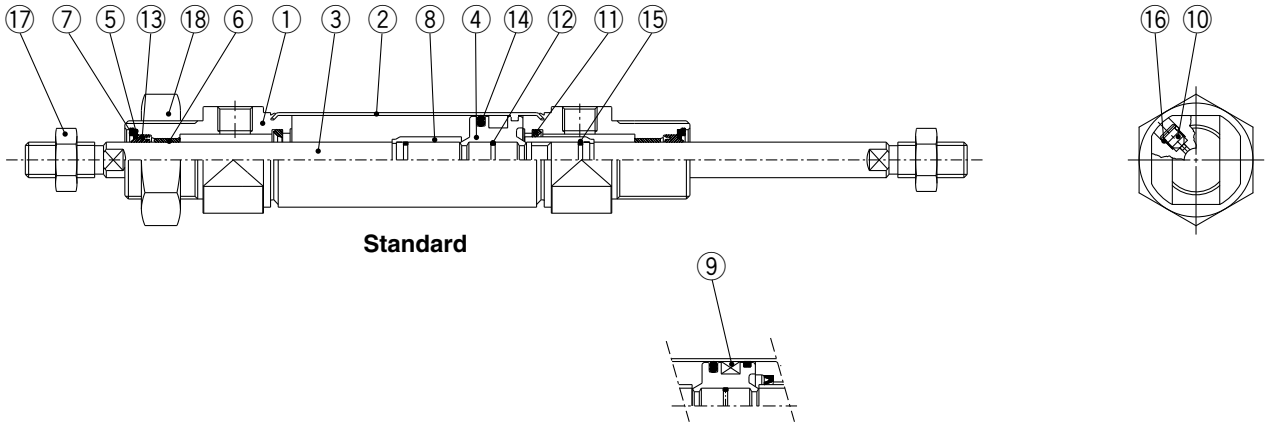


Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	2	Clear anodized
2	**Cylinder tube**	Stainless steel	1	
3	**Piston rod**	Stainless steel	1	
4A	**Piston A**	Aluminum alloy	1	
4B	**Piston B**	Aluminum alloy	2	(Switch type piston)
5	**Bushing**	Bearing alloy	2	
6	**Cushion needle**	Carbon steel	2	Electroless nickel plating
7	**Cushion ring**	Brass	2	
8	**Magnet**	Magnet	1	(Switch type only)

No.	Description	Material	Q'ty	Note
9	**Rod end nut**	Carbon steel	2	Nickel plating
10	**Tube gasket**	NBR	2	
11	**Rod seal**	NBR	2	
12	**Piston seal**	NBR	2	
13	**Check seal**	NBR	2	
14	**Piston gasket and cushion ring gasket**	NBR	3	(4 for switch type)
15	**Needle seal**	NBR	2	
16	**Mounting nut**	Carbon steel	2	Nickel plating

Air cushion: C□85WE 20/25



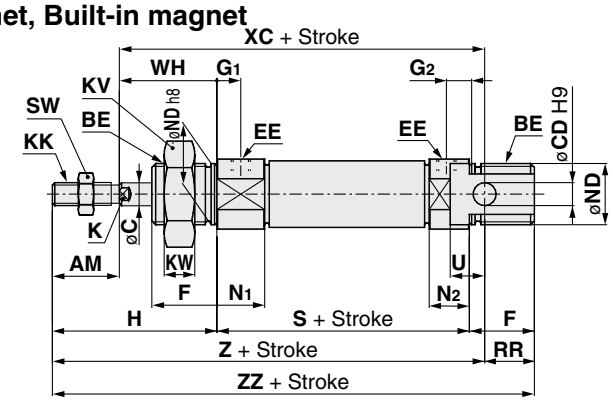
Component Parts

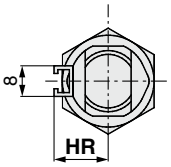
No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	2	Clear anodized
2	**Cylinder tube**	Stainless steel	1	
3	**Piston rod**	Carbon steel	1	Hard chrome plating
4	**Piston**	Aluminum alloy	1	Chromated
5	**Flat washer**	Stainless steel	2	
6	**Bushing**	Bearing alloy	2	
7	**Retaining ring**	Carbon steel	2	Phosphate coating
8	**Cushion ring**	Aluminum alloy	2	
9	**Magnet**	Magnet	1	(Switch type only)

No.	Description	Material	Q'ty	Note
10	**Cushion needle**	Carbon steel	2	Electroless nickel plating
11	**Cushion seal**	Urethane	2	
12	**Piston gasket**	NBR	1	
13	**Rod seal**	NBR	2	
14	**Piston seal**	NBR	1	
15	**Cushion ring gasket**	NBR	2	
16	**Needle seal**	NBR	2	
17	**Rod end nut**	Carbon steel	2	Nickel plating
18	**Mounting nut**	Carbon steel	1	Nickel plating

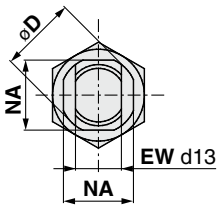
Dimensions

Double acting, Single rod
Rubber bumper: C□85N Bore size – Stroke – □
Without magnet, Built-in magnet



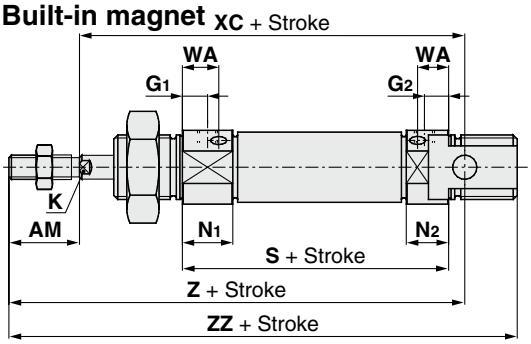


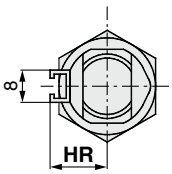
Rail mounting type (A)



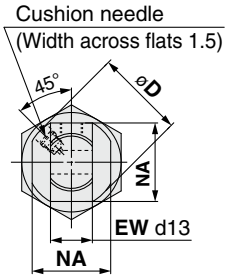
Band mounting type (B) or non-magnet

Air cushion: C□85N Bore size – Stroke C – □
Without magnet, Built-in magnet



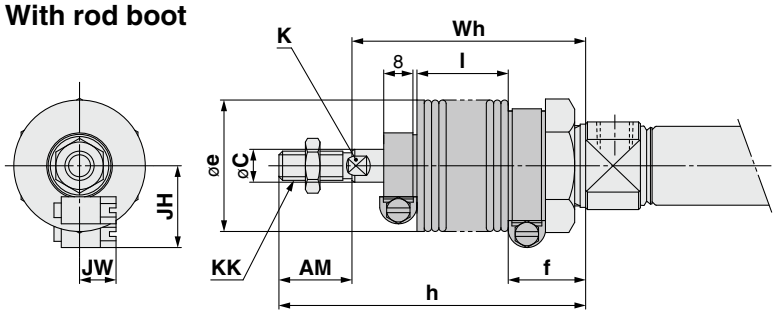


Rail mounting type (A)

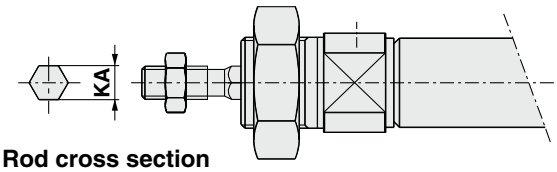


Band mounting type (B) or non-magnet

With rod boot



C□85KN
Non-rotating, Piston rod (Rubber bumper only)



Rod cross section

(mm)

Bore size	AM	BE	C	CD	D	EE	EW	F	G1	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	RR	S	SW	U	WA	WH	XC	Z	ZZ
8	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	7	5	28	10	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	10	46	7	6	—	16	64	76	86
10	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	7 (5.5)	5 (5.5)	28	10.5	—	4.2	M4 x 0.7	19	6	11.5 (13.5)	9.5 (13.5)	15	12	10	46 (53)	7	6	10.5	16	64 (71)	76 (83)	86 (93)
12	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	8 (5.5)	6 (5.5)	38	14	5	6.2	M6 x 1	24	8	12.5 (12.5)	10.5 (12.5)	18.3	16	14	50 (54)	10	9	9.5	22	75 (79)	91 (95)	105 (109)
16	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	8 (5.5)	6 (5.5)	38	14	5	6.2	M6 x 1	24	8	12.5 (12.5)	10.5 (12.5)	18.3	16	13	56 (56)	10	9	9.5	22	82 (82)	98 (98)	111 (111)
20	20	M22 x 1.5	8	8	28	G 1/8	16	20	8	8	44	17	6	8.2	M8 x 1.25	32	11	15 (17)	15 (17)	24	22	11	62	13	12	13	24	95	115	126
25	22	M22 x 1.5	10	8	33.5	G 1/8	16	22	8	8	50	20	8	10.2	M10 x 1.25	32	11	15 (17)	15 (17)	30	22	11	65	17	12	13	28	104	126	137

( ): In the case of air cushion.

With Rod Boot

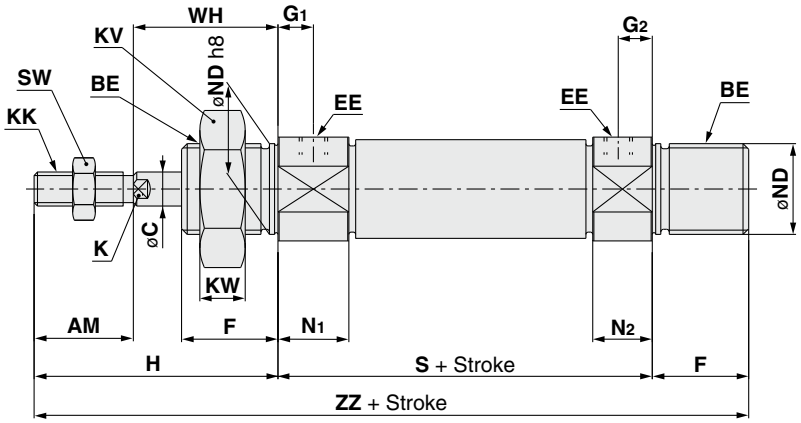
(mm)

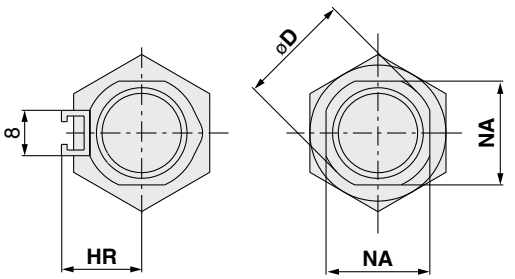
Item / Bore size / Stroke	AM	C	e	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	36	20	6	M8 x 1.25	71	84	96	109	134	159	—
25	22	10	36	20	8	M10 x 1.25	74	87	99	112	137	162	187

Item / Bore size / Stroke	l							JH	JW	Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	23.5	10.5	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	23.5	10.5	52	65	77	90	115	140	165

Dimensions

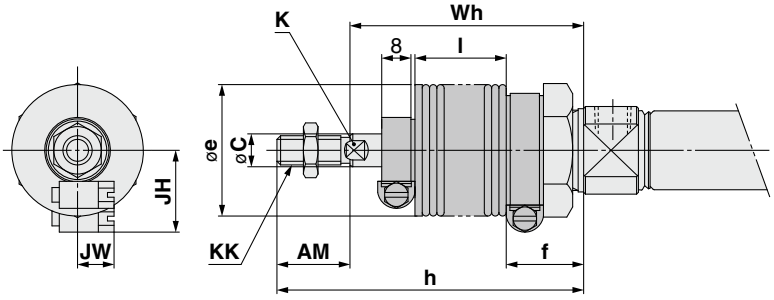
Double acting, Single rod
Rubber bumper: C□85E Bore size – Stroke – □
Without magnet, Built-in magnet



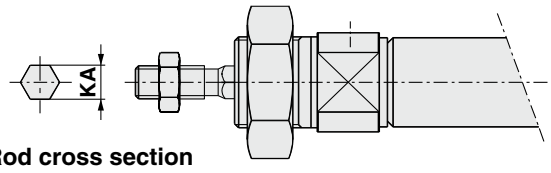


Rail mounting type (A) Band mounting type (B) or non-magnet

With rod boot



C□85KE
Non-rotating, Piston rod (Rubber bumper only)



Rod cross section

(mm)

Bore size	AM	BE	C	D	EE	F	G1	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	S	SW	WH	ZZ
8	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	5	28	10	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	46	7	16	86
10	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	5	28	10.5	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	46	7	16	86
12	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	6	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	50	10	22	105
16	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	6	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	56	10	22	111
20	20	M22 x 1.5	8	28	G 1/8	20	8	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	22	62	13	24	126
25	22	M22 x 1.5	10	33.5	G 1/8	22	8	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	22	65	17	28	137

With Rod Boot

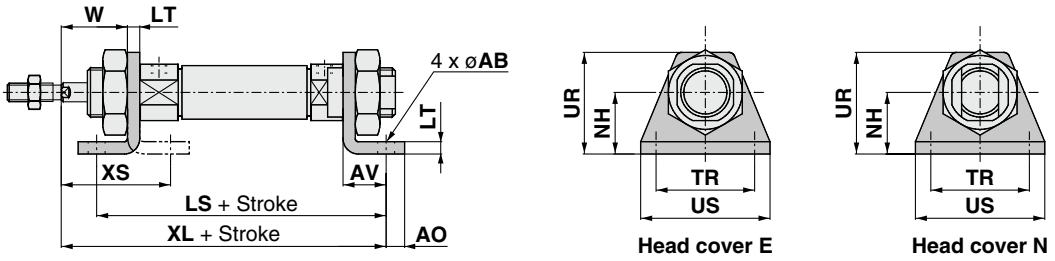
(mm)

Item / Bore size / Stroke	AM	C	e	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	36	20	6	M8 x 1.25	71	84	96	109	134	159	—
25	22	10	36	20	8	M10 x 1.25	74	87	99	112	137	162	187

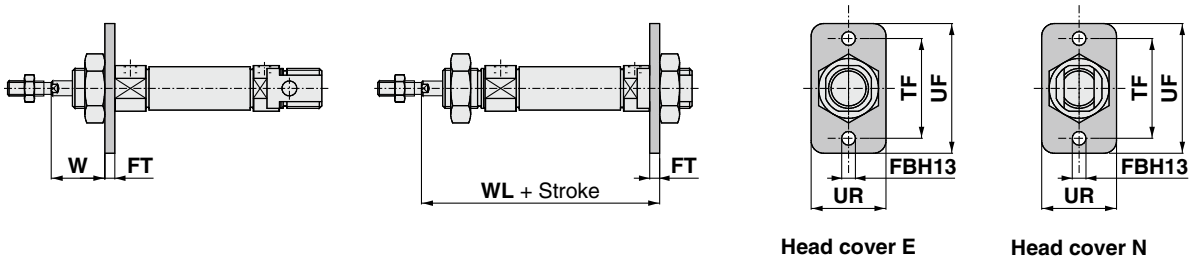
Item / Bore size / Stroke	l							JH	JW	Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	23.5	10.5	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	23.5	10.5	52	65	77	90	115	140	165

Dimensions

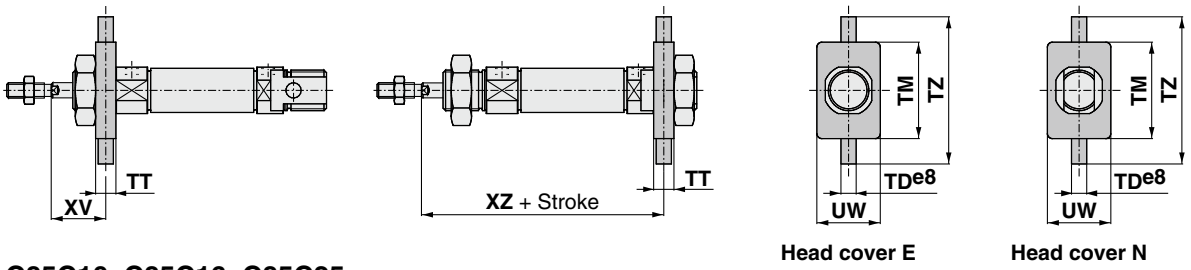
Double acting, Single rod
Rod foot, Head foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



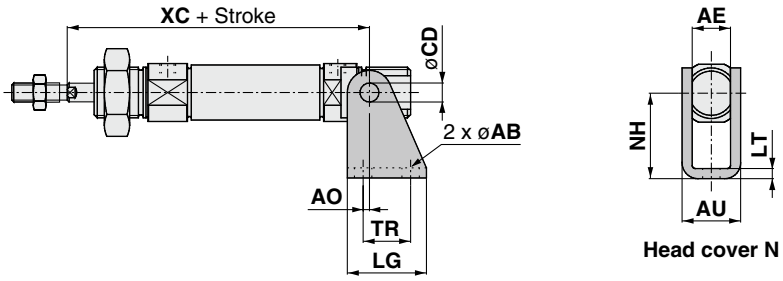
Rod flange, Head flange: C85F10, C85F16, C85F25



Rod trunnion, Head trunnion: C85T10, C85T16, C85T25



Clevis: C85C10, C85C16, C85C25



(mm)

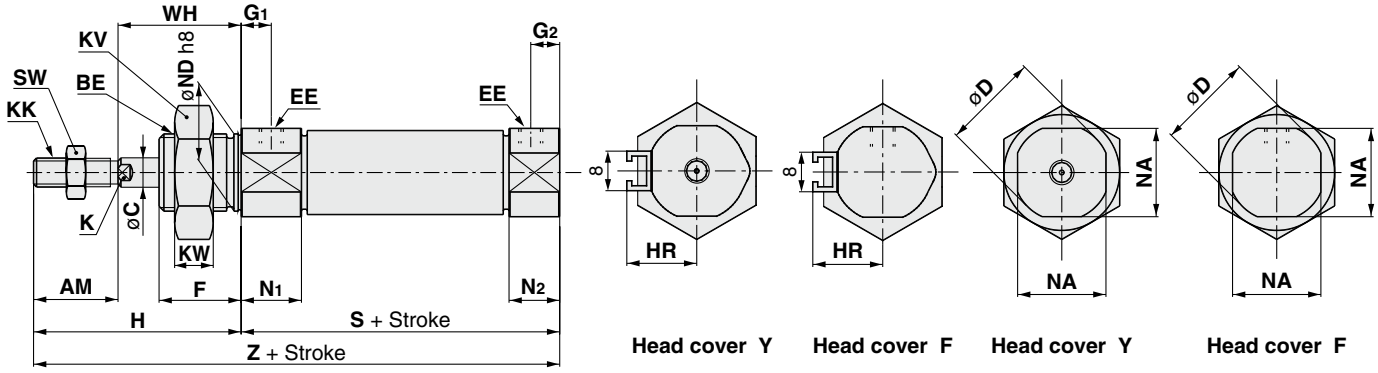
Bore size	Rod foot, Head foot												Rod flange, Head flange						
	AB	AO	AV	LS	LT	NH	TR JS14	UR	US	W	XL	XS	FBH13	FT	TF	UF	UR	W	WL
8	4.5	5	11	68	3.2	16	25	26	35	12.8	73	23.8	4.5	3.2	30	40	22	12.8	65.2
10	4.5	5	11	68 (75)	3.2	16	25	26	35	12.8	73 (80)	23.8	4.5	3.2	30	40	22	12.8	65.2 (72.2)
12	5.5	6	14	78 (82)	4	20	32	33	42	18	86 (90)	32	5.5	4	40	52	30	18	76 (80)
16	5.5	6	14	84 (84)	4	20	32	33	42	18	92 (92)	32	5.5	4	40	52	30	18	82 (82)
20	6.6	8	17	96	5	25	40	42	54	19	103	36	6.6	5	50	66	40	19	91
25	6.6	8	17	99	5	25	40	42	54	23	110	40	6.6	5	50	66	40	23	98

Bore size	Rod trunnion, Head trunnion							Clevis									
	TD e8	TM	TT	TZ	UW	XV	XZ	AB	AE	AO	AU	CD H9	LG	LT	NH	TR	XC
8	4	26	6	38	20	13	65	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	64
10	4	26	6	38	20	13	65 (72)	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	64 (71)
12	6	38	8	58	25	18	76 (80)	5.5	12.1	2	18.5	6	25	3.2	27	15	75 (79)
16	6	38	8	58	25	18	82 (82)	5.5	12.1	2	18.5	6	25	3.2	27	15	82 (82)
20	6	46	8	66	32	20	90	6.6	16.1	4	24.1	8	32	4	30	20	95
25	6	46	8	66	32	24	97	6.6	16.1	4	24.1	8	32	4	30	20	104

( ): In the case of air cushion.

Dimensions

Double acting, Single rod
Rubber bumper: C□85F/Y Bore size – Stroke – □
Without magnet, Built-in magnet



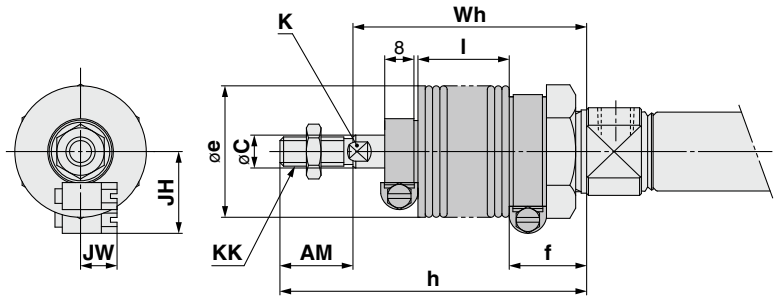
Head cover Y | Head cover F | Head cover Y | Head cover F

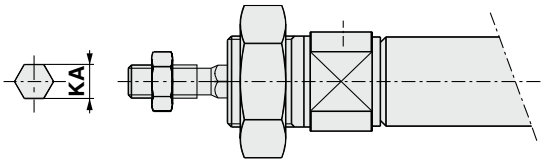
Rail mounting type (A)

Band mounting type (B) or non-magnet

With rod boot

C□85KF/Y Bore size – Stroke – □
Non-rotating, Piston rod (Rubber bumper only)





Rod cross section

(mm)

Bore size	AM	BE	C	D	EE	F	G1	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	S	SW	WH	Z
8	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	5	28	10	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	46	7	16	74
10	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	5	28	10.5	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	46	7	16	74
12	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	6	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	50	10	22	88
16	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	6	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	50	10	22	88
20	20	M22 x 1.5	8	28	G 1/8	20	8	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	22	62	13	24	106
25	22	M22 x 1.5	10	33.5	G 1/8	22	8	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	22	65	17	28	115

With Rod Boot

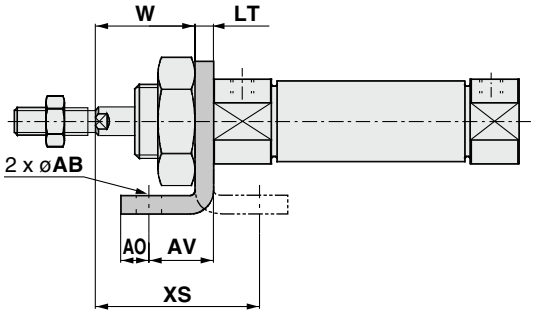
(mm)

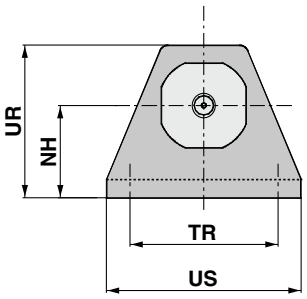
Bore size \ Item / Stroke	AM	C	e	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	36	20	6	M8 x 1.25	71	84	96	109	134	159	—
25	22	10	36	20	8	M10 x 1.25	74	87	99	112	137	162	187

Bore size \ Item / Stroke	l							JH	JW	Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	23.5	10.5	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	23.5	10.5	52	65	77	90	115	140	165

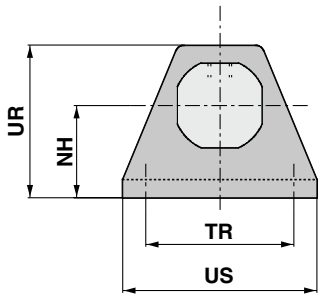
Dimensions

Double acting, Single rod
Rod foot: C85L10A, C85L16A, C85L25A



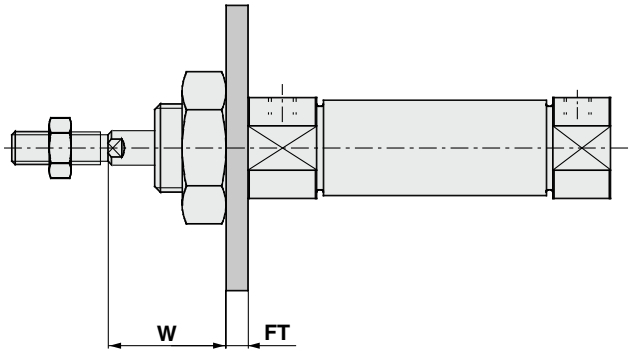


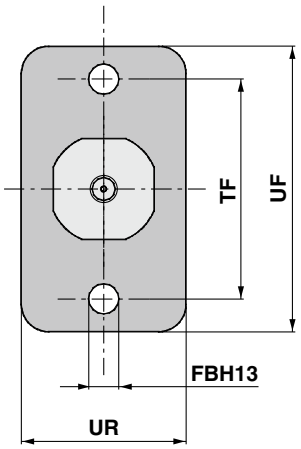
Head cover Y



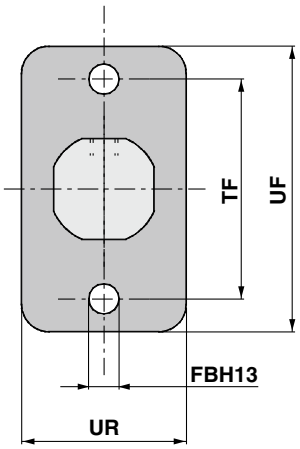
Head cover F

Rod flange: C85F10, C85F16, C85F25



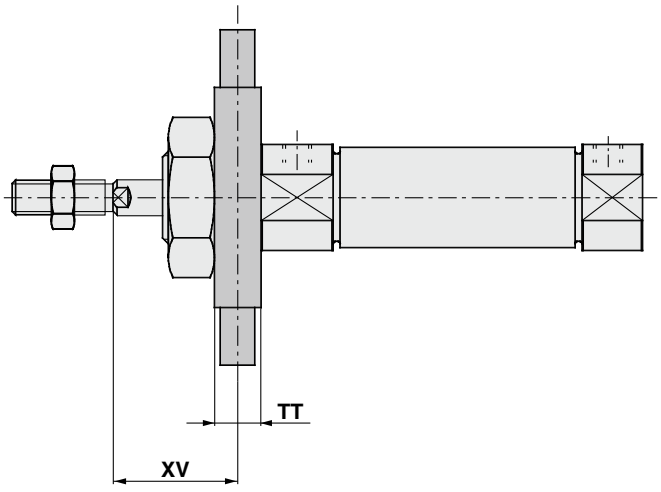


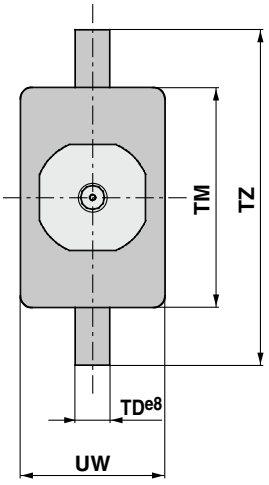
Head cover Y



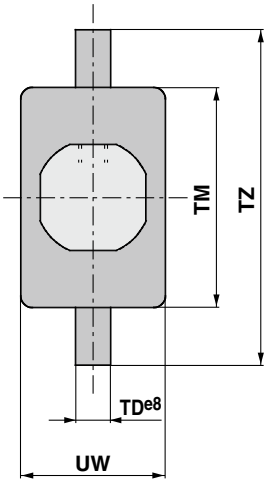
Head cover F

Rod trunnion: C85T10, C85T16, C85T25





Head cover Y



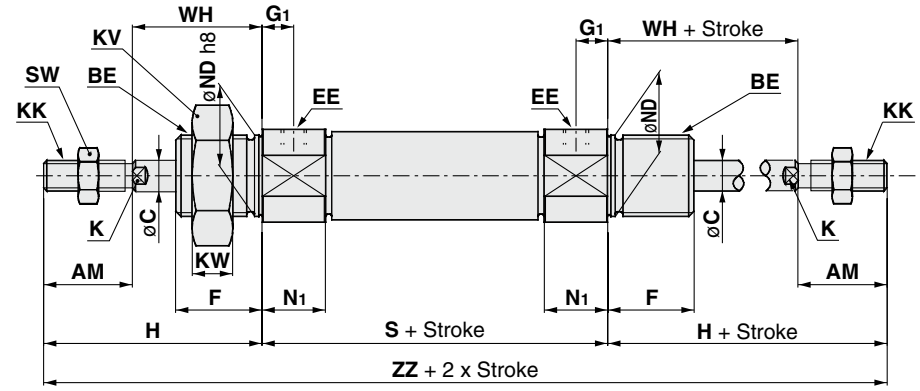
Head cover F

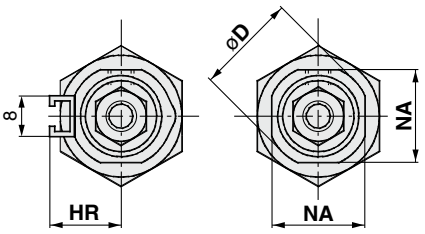
(mm)

Bore size	Rod foot										Rod flange						Rod trunnion					
	AB	AO	AV	LT	NH	TR JS14	UR	US	W	XS	FBH13	FT	TF	UF	UR	W	TD e8	TM	TT	TZ	UW	XV
8	4.5	5	11	3.2	16	25	26	35	12.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
10	4.5	5	11	3.2	16	25	26	35	12.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
12	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
16	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
20	6.6	8	17	5	25	40	42	54	19	36	6.6	5	50	66	40	19	6	46	8	66	32	20
25	6.6	8	17	5	25	40	42	54	23	40	6.6	5	50	66	40	23	6	46	8	66	32	24

Dimensions

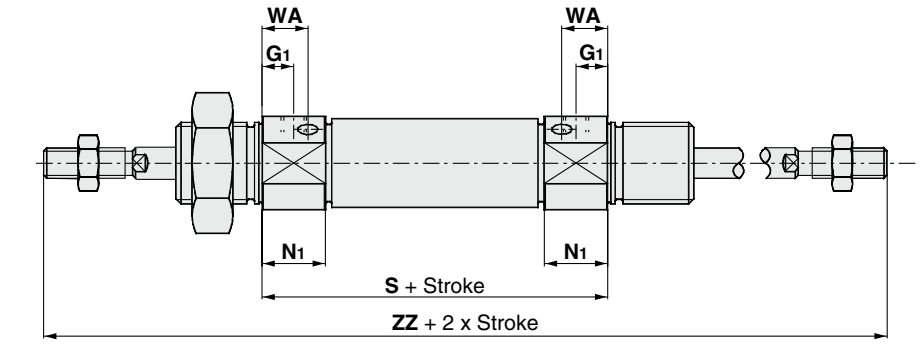
Double acting, Double rod
Rubber bumper: C□85WE Bore size – Stroke –□
Without magnet, Built-in magnet

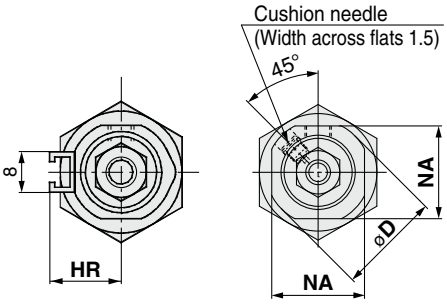




Rail mounting type (A) Band mounting type (B) or non-magnet

Air cushion: C□85WE Bore size – Stroke C –□
Without magnet, Built-in magnet

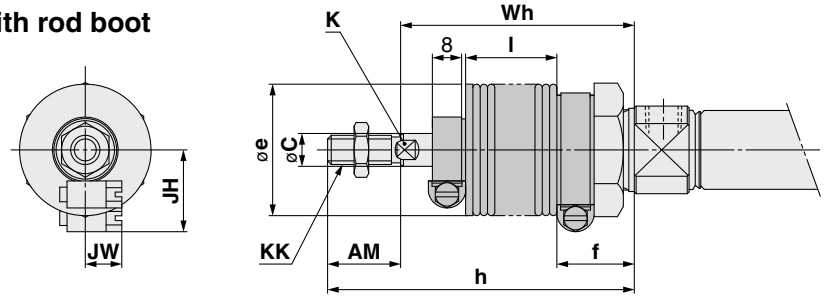




ø8 to ø25

Rail mounting type (A) Band mounting type (B) or non-magnet

With rod boot



(mm)

Bore size	AM	BE	C	D	EE	F	G1	H	HR	K	KK	KV	KW	N6	NA	ND	S	SW	WA	WH	ZZ
8	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	28	10	—	M4 x 0.7	19	6	11.5	15	12	48 {54}	7	—	16	104 {110}
10	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7 (5.5)	28	10.5	—	M4 x 0.7	19	6	11.5 (13.5)	15	12	48 (53)	7	10.5	16	104 (109)
12	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8 (5.5)	38	14	5	M6 x 1	24	8	12.5 (12.5)	18.3	16	52 (54)	10	9.5	22	128 (130)
16	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8 (5.5)	38	14	5	M6 x 1	24	8	12.5 (12.5)	18.3	16	52 (54)	10	9.5	22	128 (130)
20	20	M22 x 1.5	8	28	G 1/8	20	8	44	17	6	M8 x 1.25	32	11	15 (17)	24	22	62	13	13	24	150
25	22	M22 x 1.5	10	33.5	G 1/8	22	8	50	20	8	M10 x 1.25	32	11	15 (17)	30	22	65	17	13	28	165

( ): In the case of air cushion. { }: In the case of built-in magnet.

With Rod Boot

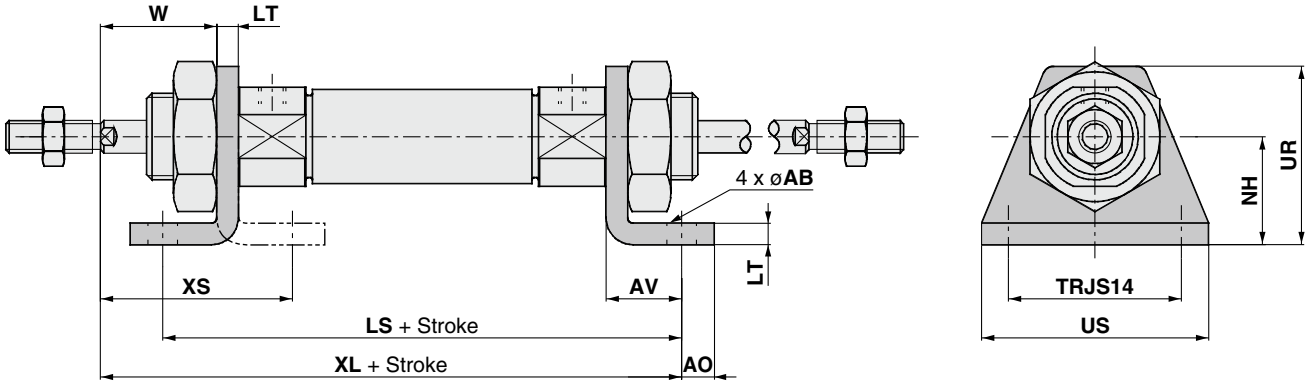
(mm)

Item / Bore size / Stroke	AM	C	e	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	36	20	6	M8 x 1.25	71	84	96	109	134	159	—
25	22	10	36	20	8	M10 x 1.25	74	87	99	112	137	162	187

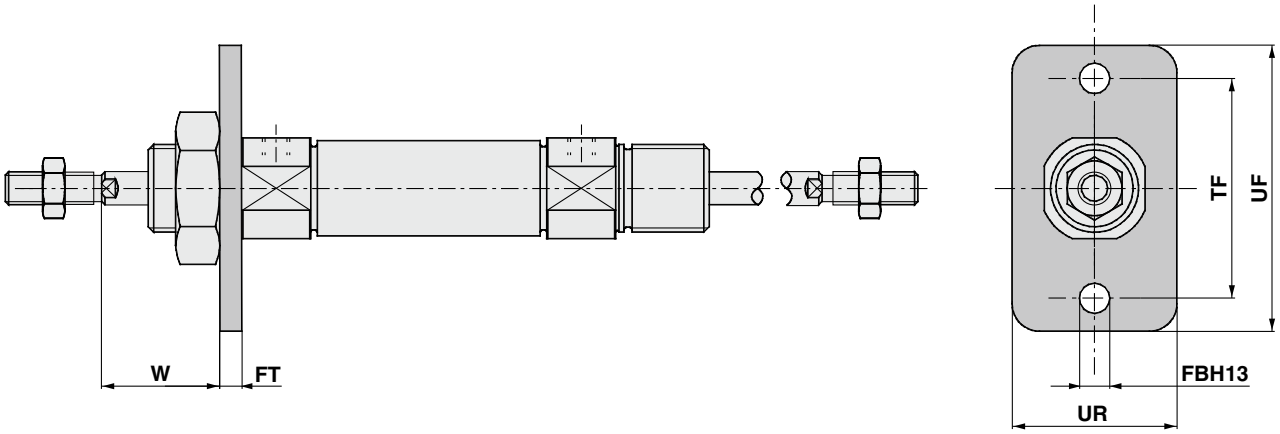
Item / Bore size / Stroke	l							JH	JW	Wh						
	1 to 50	50 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	23.5	10.5	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	23.5	10.5	52	65	77	90	115	140	165

Dimensions

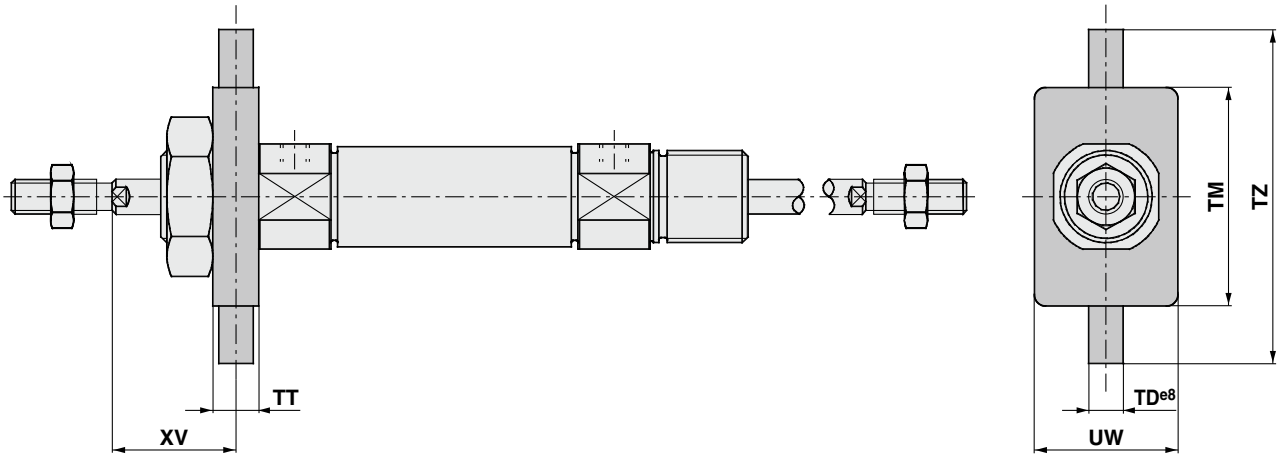
Double acting, Double rod
Rod foot, Head foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



Rod flange: C85F10, C85F16, C85F25



Rod trunnion: C85T10, C85T16, C85T25



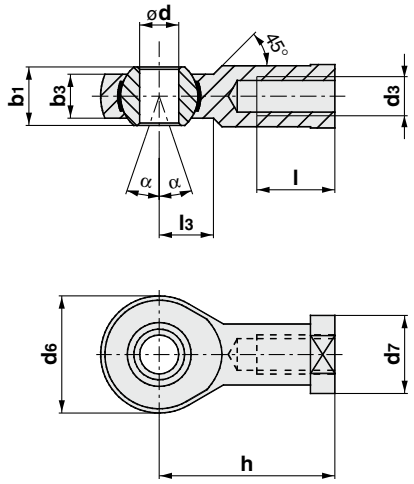
(mm)

Bore size	Rod foot, Head foot												Rod flange						Rod trunnion					
	AB	AO	AV	LS	LT	NH	TR JS14	UR	US	W	XL	XS	FBH13	FT	TF	UF	UR	W	TD e8	TM	TT	TZ	UW	XV
8	4.5	5	11	70 {76}	3.2	16	25	26	35	12.8	75 {81}	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
10	4.5	5	11	70 (75)	3.2	16	25	26	35	12.8	75 (80)	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
12	5.5	6	14	80 (82)	4	20	32	33	42	18	88 (90)	32	5.5	4	40	52	30	18	6	38	8	58	25	18
16	5.5	6	14	80 (82)	4	20	32	33	42	18	88 (90)	32	5.5	4	40	52	30	18	6	38	8	58	25	18
20	6.6	8	17	96	5	25	40	42	54	19	103	36	6.6	5	50	66	40	19	6	46	8	66	32	20
25	6.6	8	17	99	5	25	40	42	54	23	110	40	6.6	5	50	66	40	23	6	46	8	66	32	24

( ): In the case of air cushion. { }: In the case of built-in magnet.

Series C85
Accessory Dimensions

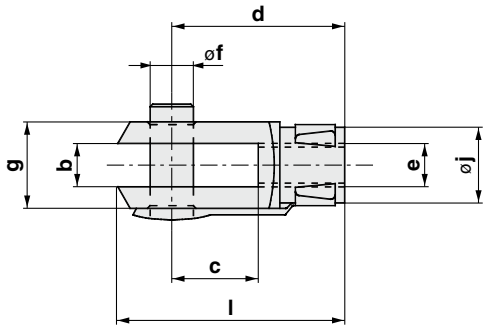
Single Knuckle Joint



(mm)

Bore size	Model	b1	b3	dh7	d6	d7	h	l	l3	d3	α°
8	**KJ4D**	8	6.0	5	18	11	27	10	10	M4 x 0.7	7.5
10	**KJ4D**	8	6.0	5	18	11	27	10	10	M4 x 0.7	7.5
12	**KJ6D**	9	6.75	6	20	13	30	12	10	M6 x 1	6.5
16	**KJ6D**	9	6.75	6	20	13	30	12	10	M6 x 1	6.5
20	**KJ8D**	12	9	8	24	16	36	16	12	M8 x 1.25	13
25	**KJ10D**	14	10.5	10	28	19	43	20	14	M10 x 1.25	13

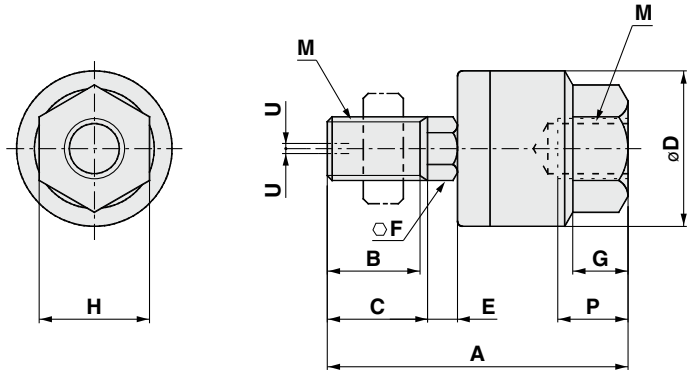
Double Knuckle Joint



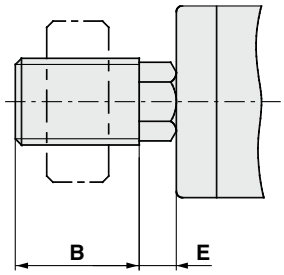
(mm)

Bore size	Model	b	c	d	f	g	j	e	l
8	**GKM4-8**	4	8	16	4	8	6	M4 x 0.7	21
10	**GKM4-8**	4	8	16	4	8	6	M4 x 0.7	21
12	**GKM6-12**	6	12	24	6	10	8	M6 x 1	31
16	**GKM6-12**	6	12	24	6	10	8	M6 x 1	31
20	**GKM8-16**	8	16	32	8	12	10	M8 x 1.25	42
25	**GKM10-20**	10	20	40	10	18	12	M10 x 1.25	52

Floating Joint: Series JA



In the case of dimension without C



(mm)

Bore size	Model	M		A	B	C	D	E	F	G	H	Maximum screw-in depth **P**	Allowable eccentricity **U**	Max. operating tension and compression power (kN)
		Nominal thread dia.	Pitch											
8, 10	**JA10-4-070**	4	0.7	26	9	10	12	1.5	4	4	7	5.5	0.5	0.054
12, 16	**JA15-6-100**	6	1	34.5	12.5	14	16	2	6	5	10	7	0.5	0.123
20	**JA20-8-125**	8	1.25	44	17.5	—	21	4.5	7	7	13	8	0.5	1.1
25	**JA30-10-125**	10	1.25	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5

Air Cylinder: Standard/Non-rotating Type
Single Acting, Spring Return/Extended
Series C85
ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Single acting, Spring return/ Spring extended

C D 85 K N 16 – 40 S – B

Built-in magnet

Nil	None
D	Built-in magnet

Type

Nil	Standard
K	Non-rotating rod (Rubber bumper only)

Mounting

N	Basic (Integral clevis)
E	Double end boss-cut
F	Boss-cut/Basic
Y*	Head cover axial port

* Except single acting/spring extended type.

Auto switch mounting

A	Rail mounting
B	Band mounting

Applicable auto switches are shown on page 32.
Order auto switches and bands separately.
(Auto switches and bands cannot be indicated here.)

Action

S	Single acting, Spring return
T	Single acting, Spring extended

Bore size / **Cylinder stroke**

Bore size (mm)	Standard stroke (mm)*	Max. stroke (mm)
8	10, 25, 40, 50	50
10		
12		
16	10, 25, 40, 50, 80, 100 125, 150	150
20		
25		

* Other strokes available on request.

Mounting Bracket Part No.

Mounting bracket \ Bore size (mm)		8	10	12	16	20	25
Mounting bracket	Foot (1 pc.)	C85L10A		C85L16A		C85L25A	
	Foot (2 pcs. with mounting nut 1 pc.)	C85L10B		C85L16B		C85L25B	
	Flange	C85F10		C85F16		C85F25	
	Trunnion	C85T10		C85T16		C85T25	
	Clevis	C85C10		C85C16		C85C25	
Accessories	Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
	Double knuckle joint	GKM4-8		GKM6-10		GKM8 -16	GKM10 -20
	Floating joint	JA10-4-070		JA15-6-100		JA20 -8-125	JA30 -10-125

Replacement Parts/Standard Cylinders

Bore size (mm)	Part no.	Note
20	C85-20PS	Every set includes: 1 rod seal 1 flat washer 1 retaining ring
25	C85-25PS	

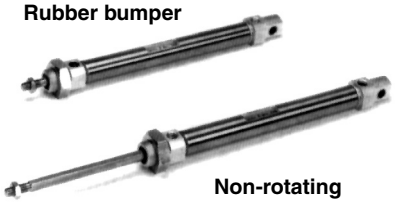
Replacement Parts/Non-rotating Cylinders (“K”)

Bore size (mm)	Part no.	Note
20	C85K-20PS	Every set includes: 1 rod seal 1 flat washer 1 retaining ring
25	C85K-25PS	

Spring return

Spring extended

Rubber bumper



Non-rotating

Specifications

Bore size (mm)		8	10	12	16	20	25
Piston rod dia. (mm)		4	4	6	6	8	10
Piston rod thread		M4 x 0.7	M4 x 0.7	M6 x 1	M6 x 1	M8 x 1.25	M10 x 1.25
Port size		M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	G 1/8	G 1/8
Action		Single acting, Single rod, Spring return/extend					
Fluid		Air					
Proof pressure		1.5 MPa					
Max. operating pressure		1.0 MPa					
Min. operating pressure	Spring return	0.22 MPa	0.18 MPa		0.13 MPa	0.18 MPa	
	Spring extended					0.23 MPa	
Ambient and fluid temperature		–20 to 80°C (Built-in magnet type: –10 to 60°C)					
Cushion		Rubber bumper (Standard)					
Lubrication		Not required. Use turbine oil Class 1 ISO VG32, if lubricated.					
Piston speed		50 to 1500 mm/s					
Allowable kinetic energy		0.02 J	0.03 J	0.04 J	0.09 J	0.27 J	0.4 J
Non-rotating accuracy		±1.5°	±1.5°	±1°	±1°	±0.7°	±0.7°
Stroke length tolerance		$^{+1.0}_{0}$ mm				$^{+1.4}_{0}$ mm	

Spring Retracting Force

Spring Return

(N)

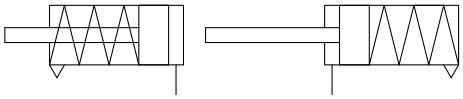
Bore size (mm)	Standard stroke (mm)	Spring force									
		10		25		50		100		150	
		Retract	Extended	Retract	Extended	Retract	Extended	Retract	Extended	Retract	Extended
8	10, 25, 50	4.4	4.0	4.4	3.4	4.4	2.5	—	—	—	—
10		6.3	5.7	6.3	4.9	6.3	3.5	—	—	—	—
12		7.2	6.6	7.2	5.8	7.2	4.4	—	—	—	—
16	10, 25, 50, 100, 150	13.2	12.1	13.2	10.3	13.2	7.5	13.2	7.5	13.2	7.5
20		21.6	18.6	21.6	16.7	21.6	11.8	39.2	9.8	39.2	9.8
25		27.5	25.3	27.5	22.1	27.5	16.7	47.1	13.7	47.1	15.7

Spring Extended

(N)

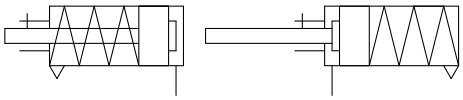
Bore size (mm)	Standard stroke (mm)	Spring force									
		10		25		50		100		150	
		Retract	Extended	Retract	Extended	Retract	Extended	Retract	Extended	Retract	Extended
8	10, 25, 50	5.3	3.9	5.3	3.1	5.3	2.7	—	—	—	—
10		6.0	4.8	6.0	4.0	6.0	3.5	—	—	—	—
12		6.6	5.6	6.6	4.9	6.6	4.5	—	—	—	—
16	10, 25, 50, 100, 150	14.7	11.3	14.7	9.2	14.7	7.9	14.7	7.9	14.7	7.9
20		39.2	33.0	39.2	23.5	39.2	9.8	39.2	9.8	39.2	9.8
25		47.1	40.4	47.1	30.4	47.1	13.7	47.1	13.7	47.1	15.7

Standard



Spring return　　Spring extended

Non-rotating



Spring return　　Spring extended

Operating Precautions

⚠Caution

1. Be sure to read this before handling the products.

Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.

2. Do not turn the piston rod of the standard type, single acting, spring return/extend cylinder.

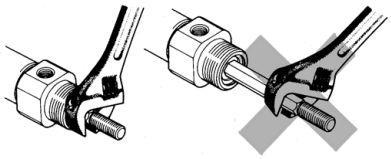
When screwing a bracket or nut into the thread part at the piston rod end, tighten it so that the piston rod does not turn. If the piston rod turns, the built-in spring is entangled, causing malfunction.

3. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.

If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

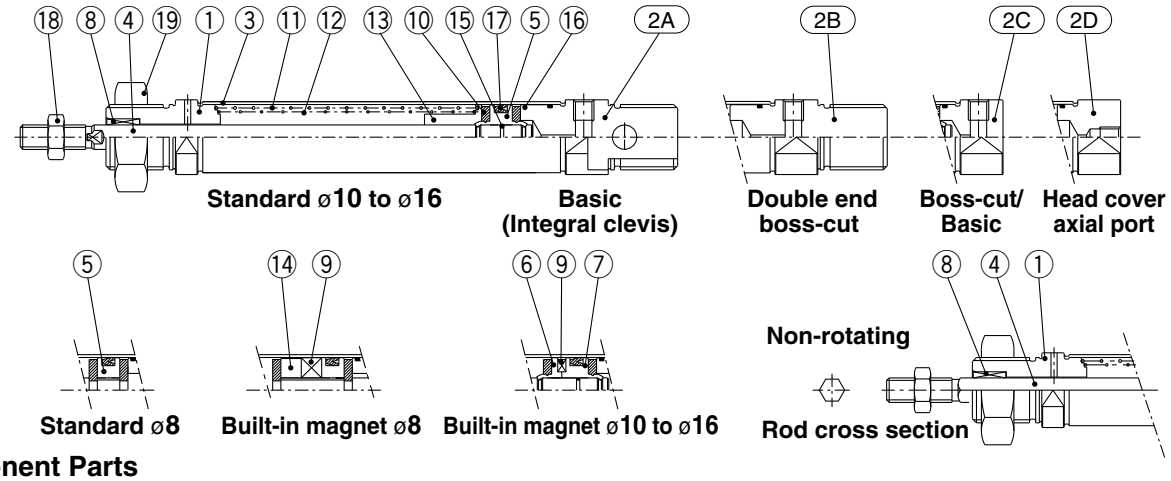
Allowable rotational torque (N·m or less)	ø8	ø10	ø12	ø16	ø20	ø25
	0.02		0.04		0.2	0.25

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.
Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



Construction

Single acting, Single rod
Spring return: C□85□8 to 16-□S (Disassembly is not possible.)

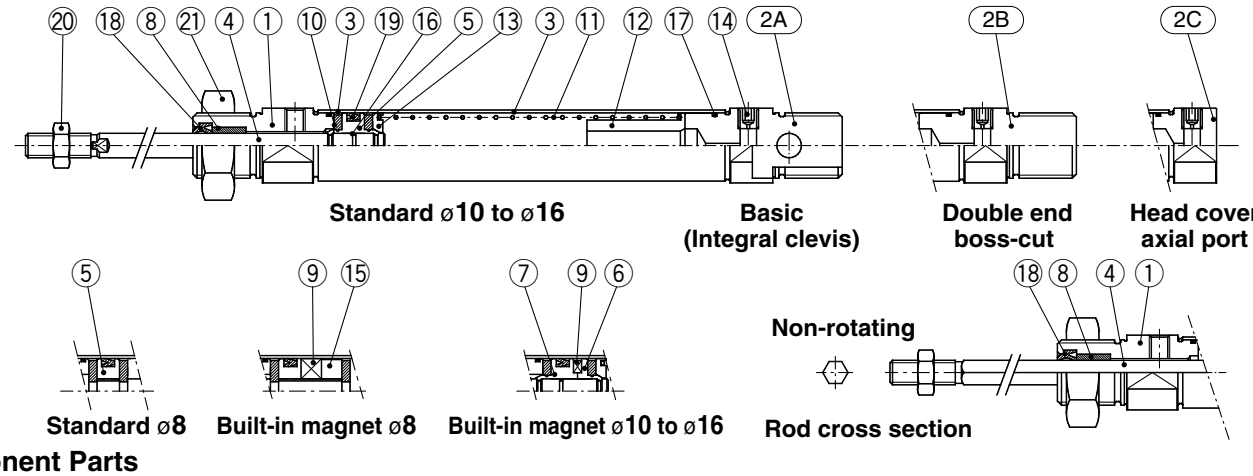


Component Parts

No.	Description	Material	Q'ty	Note
1	Rod cover	Aluminum alloy	1	Clear anodized
2A	Head cover N	Aluminum alloy	1	Clear anodized
2B	Head cover E	Aluminum alloy	1	Clear anodized
2C	Head cover F	Aluminum alloy	1	Clear anodized
2D	Head cover Y	Aluminum alloy	1	Clear anodized
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Stainless steel	1	
5	Piston	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	
6	Piston A	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	(Switch type only)
7	Piston B	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	(Switch type only)
8	Bushing	Bearing alloy	1	

No.	Description	Material	Q'ty	Note
9	Magnet	Magnet	1	(Switch type only)
10	Bumper	Urethane	2	
11	Return spring A	Piano wire	1	
12	Return spring B	Piano wire	1	
13	Spring guide	Brass	1	
14	Spacer	Brass	1	
15	Piston gasket	NBR	1	(2 for switch type)
16	Tube gasket	NBR	1	
17	Piston seal	NBR	1	
18	Rod end nut	Carbon steel	1	Nickel plating
19	Mounting nut	Carbon steel	1	Nickel plating

Spring extended: C□85□8 to 16-□T (Disassembly is not possible.)



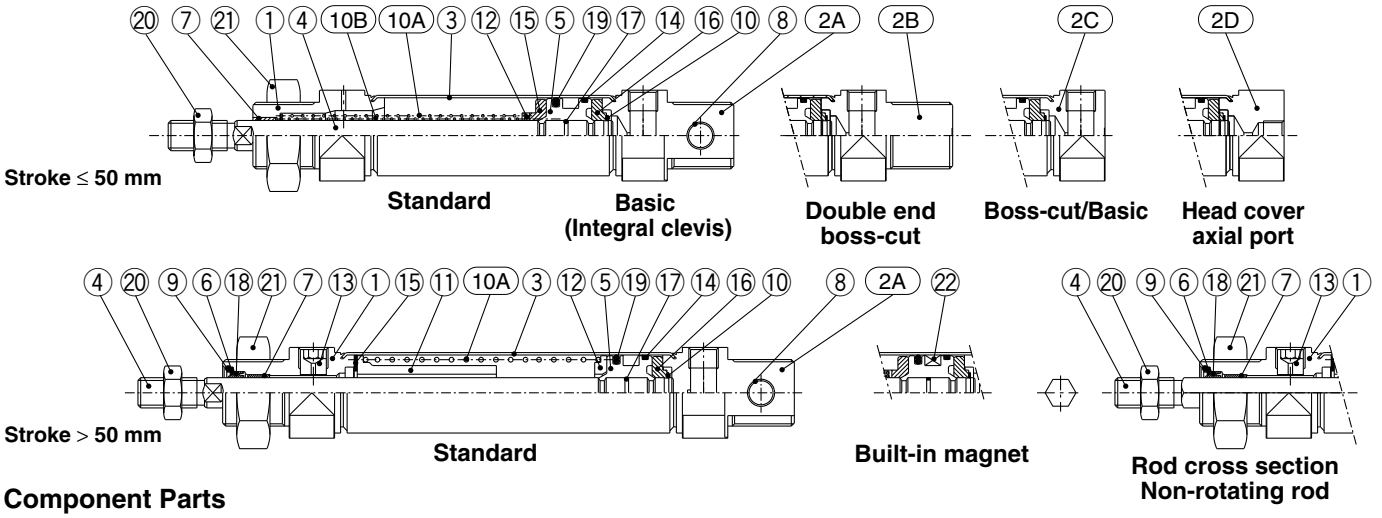
Component Parts

No.	Description	Material	Q'ty	Note
1	Rod cover	Aluminum alloy	1	Clear anodized
2A	Head cover N	Aluminum alloy	1	Clear anodized
2B	Head cover E	Aluminum alloy	1	Clear anodized
2C	Head cover F	Aluminum alloy	1	Clear anodized
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Stainless steel	1	
5	Piston	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	
6	Piston A	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	(Switch type only)
7	Piston B	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	(Switch type only)
8	Bushing	Bearing alloy	1	
9	Magnet	Magnet	1	(Switch type only)
10	Bumper	Urethane	2	

No.	Description	Material	Q'ty	Note
11	Return spring C	Piano wire	1	
12	Spring guide	Brass	1	
13	Spring seat	Brass	1	
14	Plug	Steel	1	
15	Spacer	Brass	1	
16	Piston gasket	NBR	1	(2 for switch type)
17	Tube gasket	NBR	1	
18	Rod seal	NBR	1	
19	Piston seal	NBR	1	
20	Rod end nut	Carbon steel	1	Nickel plating
21	Mounting nut	Carbon steel	1	Nickel plating

Construction

Single acting, Single rod
Spring return: C□85□20/25-□S

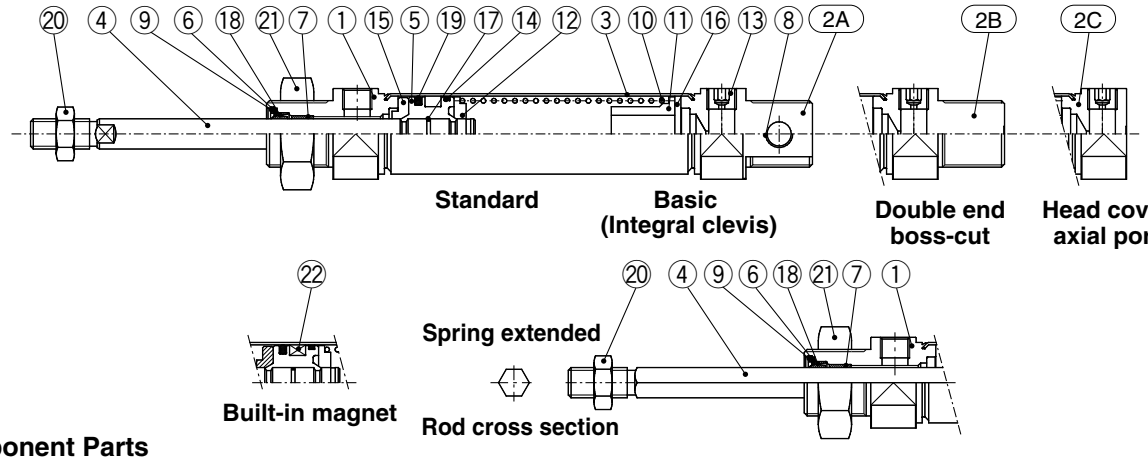


Component Parts

No.	Description	Material	Q'ty	Note
1	Rod cover	Aluminum alloy	1	Clear anodized
2A	Head cover N	Aluminum alloy	1	Clear anodized
2B	Head cover E	Aluminum alloy	1	Clear anodized
2C	Head cover F	Aluminum alloy	1	Clear anodized
2D	Head cover Y	Aluminum alloy	1	Clear anodized
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plating
5	Piston	Aluminum alloy	1	Chromated
6	Flat washer	Stainless steel	1	
7	Bushing	Sintered alloy	1	
8	Bushing	Sintered alloy	1	
9	Retaining ring	Carbon steel	1	Nickel plating
10	Retaining ring	Stainless steel	1	
10A	Return spring A	Piano wire	1	Zinc chromated

No.	Description	Material	Q'ty	Note
10B	Return spring B	Piano wire	1	Zinc chromated
11	Spring guide	Aluminum alloy	1	
12	Spring holder	Aluminum alloy	1	
13	Plug with fixed orifice	Copper alloy	1	
14	Wear ring	Resin	1	
15	Bumper A	Urethane	1	
16	Bumper B	Urethane	1	
17	Piston gasket	NBR	1	
18	Rod seal	NBR	1	
19	Piston seal	NBR	1	
20	Rod end nut	Carbon steel	1	Nickel plating
21	Mounting nut	Carbon steel	1	Nickel plating
22	Magnet	Magnet	1	(Switch type only)

Spring extended: C□85□20/25-□T



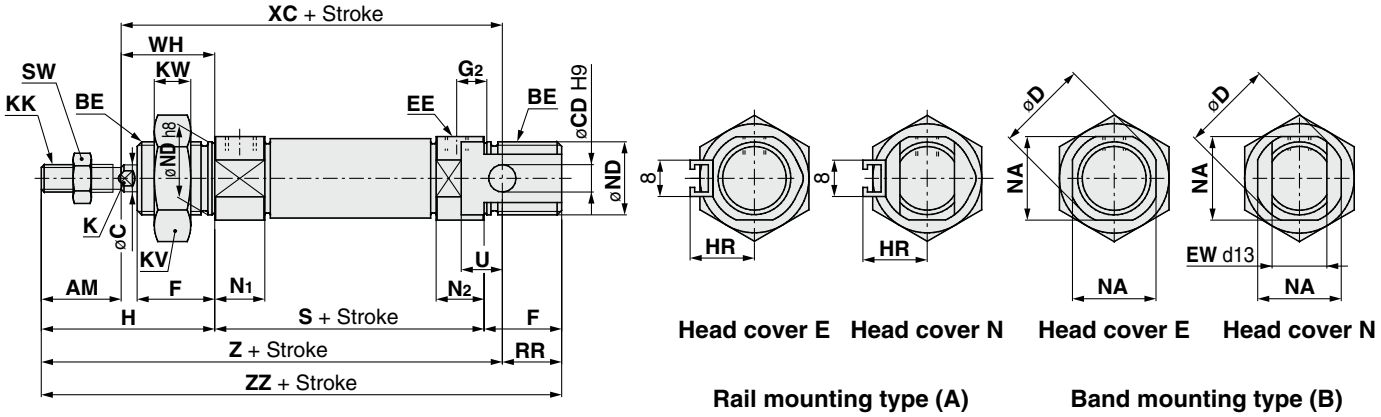
Component Parts

No.	Description	Material	Q'ty	Note
1	Rod cover	Aluminum alloy	1	Clear anodized
2A	Head cover N	Aluminum alloy	1	Clear anodized
2B	Head cover E	Aluminum alloy	1	Clear anodized
2C	Head cover F	Aluminum alloy	1	Clear anodized
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plating
5	Piston	Aluminum alloy	1	Chromated
6	Flat washer	Stainless steel	1	
7	Bushing	Bearing alloy	1	
8	Bushing	Bearing alloy	1	
9	Retaining ring	Carbon steel	1	Phosphate coating
10	Return spring	Piano wire	1	Zinc chromated

No.	Description	Material	Q'ty	Note
11	Spring guide	Aluminum alloy	1	
12	Spring guide	Aluminum alloy	1	
13	Plug with fixed orifice	Copper alloy	1	
14	Wear ring	Resin	1	
15	Bumper A	Urethane	1	
16	Bumper B	Urethane	1	
17	Piston gasket	NBR	1	
18	Rod seal	NBR	1	
19	Piston seal	NBR	1	
20	Rod end nut	Carbon steel	1	Nickel plating
21	Mounting nut	Carbon steel	1	Nickel plating
22	Magnet	Magnet	1	(Switch type only)

Dimensions

Single acting, Spring return
C□85$^{N}_{E}$ Bore size − Stroke S − □
Without magnet, Built-in magnet

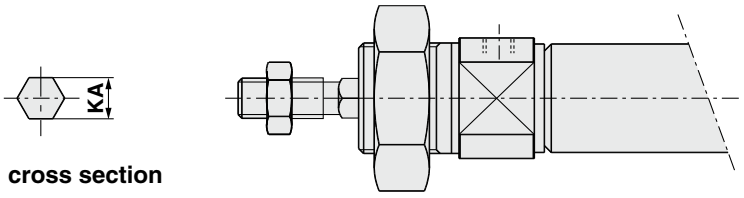


Head cover E **Head cover N** **Head cover E** **Head cover N**

Rail mounting type (A)

Band mounting type (B) or non-magnet

C□85KN, C□85KE
Non-rotating (Piston rod)



Rod cross section

(mm)

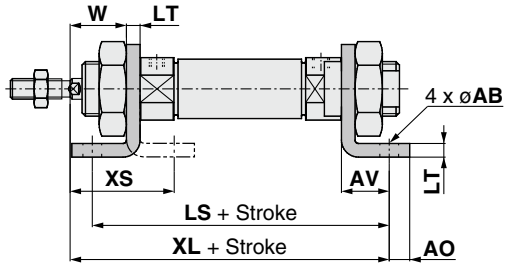
Bore size	AM	BE	C	CD	D	EE	EW	F	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	RR	SW	U	WH
8	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	5	28	10	—	4.2	M4 x 0.7	19	6	5.5	9.5	15	12	10	7	6	16
10	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	5	28	10.5	—	4.2	M4 x 0.7	19	6	5.5	9.5	15	12	10	7	6	16
12	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	6	38	14	5	6.2	M6 x 1	24	8	5.5	10.5	18.3	16	14	10	9	22
16	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	6	38	14	5	6.2	M6 x 1	24	8	5.5	10.5	18.3	16	13	10	9	22
20	20	M22 x 1.5	8	8	28	G 1/8	16	20	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	22	11	13	12	24
25	22	M22 x 1.5	10	8	33.5	G 1/8	16	22	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	22	11	17	12	28

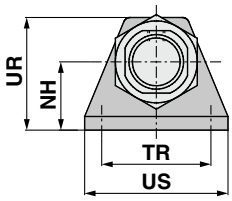
Bore size	S			XC			Z			ZZ		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
8	46 (52) {56(62)}	—	—	64 (70) {74(80)}	—	—	76 (82) {86(92)}	—	—	86 (92) {96(102)}	—	—
10	46 (50) {56(60)}	—	—	64 (68) {74(78)}	—	—	76 (80) {86(90)}	—	—	86 (90) {96(100)}	—	—
12	50 (53.5) {60(63.5)}	—	—	75 (78.5) {85(88.5)}	—	—	91 (94.5) {101(104.5)}	—	—	105 (108.5) {115(118.5)}	—	—
16	56 (59.5) {66(69.5)}	71.5 (75) {92(95.5)}	87 (90.5) {118(121.5)}	82 (85.5) {92(95.5)}	97.5 (101) {118(121.5)}	113 (116.5) {144(147.5)}	98 (101.5) {108(111.5)}	113.5 (117) {134(137.5)}	129 (132.5) {160(163.5)}	111 (114.5) {121(124.5)}	126.5 (130) {147(150.5)}	142 (145.5) {173(176.5)}
20	62 {87}	112	137	95 {120}	145	170	115 {140}	165	190	126 {151}	176	201
25	65 {88.5}	113.5	138.5	104 {127.5}	152.5	177.5	126 {149.5}	174.5	199.5	137 {160.5}	185.5	210.5

( ): In the case of auto switch style. { }: In the case of non-rotating rod.

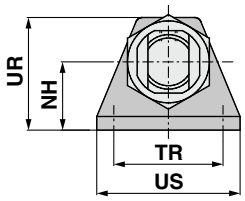
Dimensions

Single acting, Spring return
Rod foot, Head foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



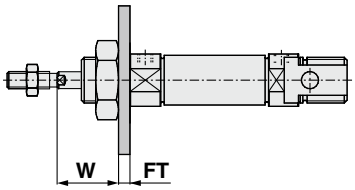


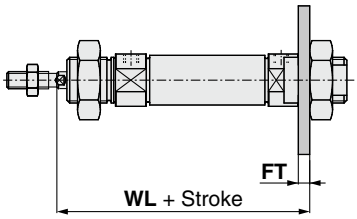
Head cover E

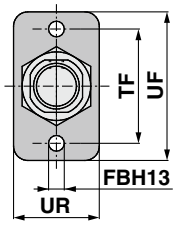


Head cover N

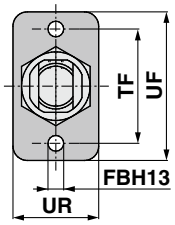
Rod flange, Head flange: C85F10, C85F16, C85F25





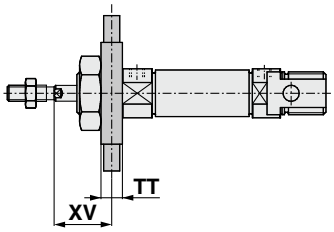


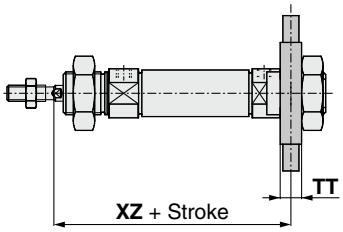
Head cover E

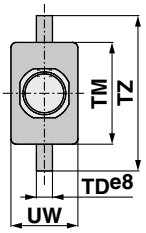


Head cover N

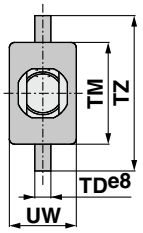
Rod trunnion, Head trunnion: C85T10, C85T16, C85T25





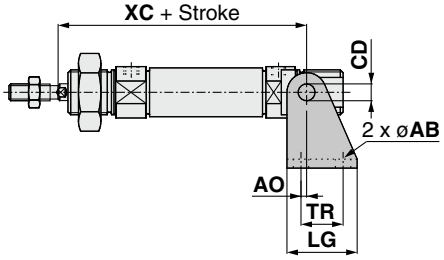


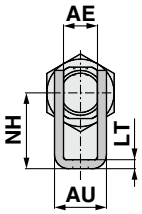
Head cover E



Head cover N

Clevis: C85C10, C85C16, C85C25





Head cover N

(mm)

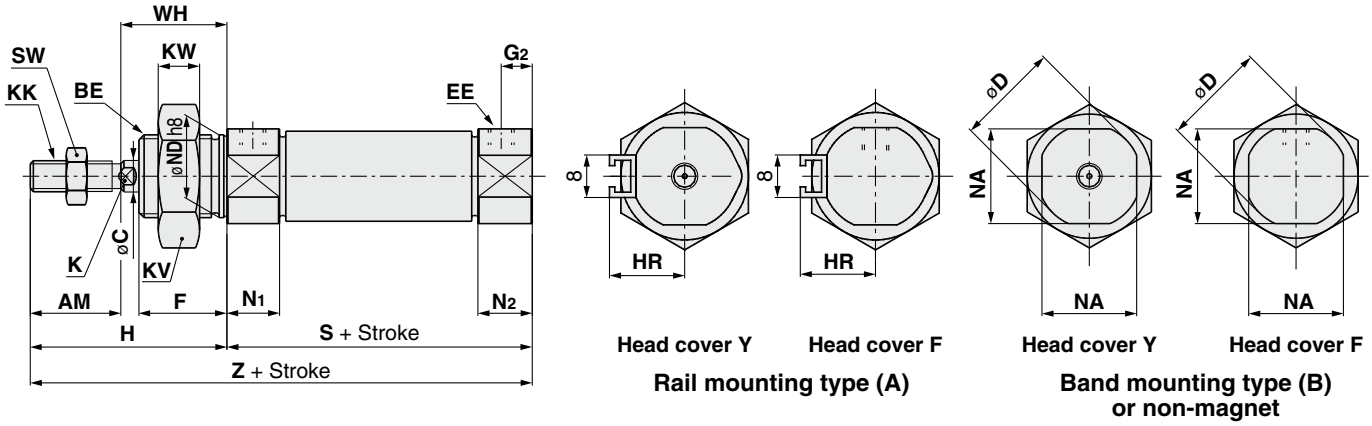
Bore size	Rod foot, Head foot																Rod flange, Head flange								
	AB	AO	AV	LS			LT	NH	TR JS14	UR	US	W	XL			XS	FBH13	FT	TF	UF	UR	W	WL		
				1 to 50	51 to 100	101 to 150							1 to 50	51 to 100	101 to 150								1 to 50	51 to 100	101 to 150
8	4.5	5	11	68 (74) {78(84)}	—	—	3.2	16	25	26	35	12.8	73 (79) {83(89)}	—	—	23.8	4.5	3.2	30	40	22	12.8	65.2 (71.2) {75.2(81.2)}	—	—
10	4.5	5	11	68 (72) {78(82)}	—	—	3.2	16	25	26	35	12.8	73 (77) {83(87)}	—	—	23.8	4.5	3.2	30	40	22	12.8	65.2 (69.2) {75.2(79.2)}	—	—
12	5.5	6	14	78 (81.5) {88(91.5)}	—	—	4	20	32	33	42	18	86 (89.5) {96(99.5)}	—	—	32	5.5	4	40	52	30	18	76 (79.5) {86(89.5)}	—	—
16	5.5	6	14	84 (87.5) {94(97.5)}	99.5 (103) {120(123.5)}	115 (118.5) {146(149.5)}	4	20	32	33	42	18	92 (95.5) {102(105.5)}	107.5 (111) {128(131.5)}	123 (126.5) {154(157.5)}	32	5.5	4	40	52	30	18	82 (85.5) {92(95.5)}	97.5 (101) {118(121.5)}	113 (116.5) {144(147.5)}
20	6.6	8	17	96 {121}	146	171	5	25	40	42	54	19	103 {128}	153	178	36	6.6	5	50	66	40	19	91 {116}	141	166
25	6.6	8	17	96 {122.5}	147.5	172.5	5	25	40	42	54	23	110 {133.5}	158.5	183.5	40	6.6	5	50	66	40	23	98 {121.5}	146.5	171.5

Bore size	Rod trunnion, Head trunnion								Clevis										
	TD e8	TM	TT	TZ	UW	XV	XZ			AB	AE	AO	AU	CD H9	LG	LT	NH	TR	XC		
							1 to 50	51 to 100	101 to 150										1 to 50	51 to 100	101 to 150
8	4	26	6	38	20	13	65 (71) {75(81)}	—	—	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	64 (70) {74(80)}	—	—
10	4	26	6	38	20	13	65 (69) {75(79)}	—	—	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	64 (68) {74(78)}	—	—
12	6	38	8	58	25	18	76 (79.5) {86(89.5)}	—	—	5.5	12.1	2	18.5	6	25	3.2	27	15	75 (78.5) {85(88.5)}	—	—
16	6	38	8	58	25	18	82 (85.5) {92(95.5)}	97.5 (101) {118(121.5)}	113 (116.5) {144(147.5)}	5.5	12.1	2	18.5	6	25	3.2	27	15	82 (88.5) {92(95.5)}	97.5 (101) {118(121.5)}	113 (116.5) {144(147.5)}
20	6	46	8	66	32	20	90 {115}	140	165	6.6	16.1	4	24.1	8	32	4	30	20	95 {120}	145	170
25	6	46	8	66	32	24	97 {120.5}	145.5	170.5	6.6	16.1	4	24.1	8	32	4	30	20	104 {127.5}	152.5	177.5

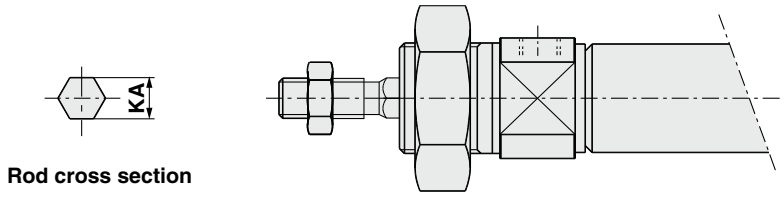
( ): In the case of auto switch style. { }: In the case of non-rotating rod.

Dimensions

Single acting, Spring return
C□85 F/Y Bore size − Stroke S − □
Without magnet, Built-in magnet



C□85KF, C□85KY
Non-rotating (Piston rod)



(mm)

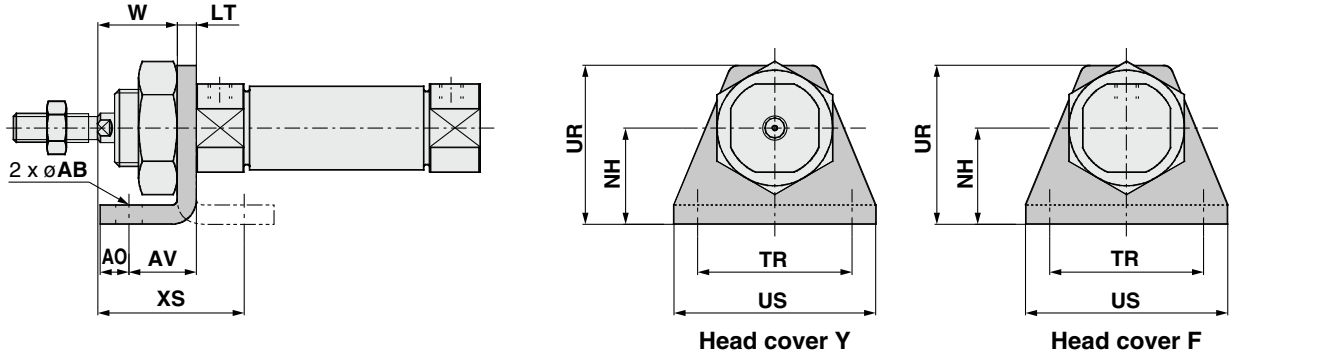
Bore size	AM	BE	C	D	EE	F	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	SW	WH
8	12	M12 x 1.25	4	16.7	M5 x 0.8	12	5	28	10	—	4.2	M4 x 0.7	19	6	5.5	9.5	15	12	7	16
10	12	M12 x 1.25	4	16.7	M5 x 0.8	12	5	28	10.5	—	4.2	M4 x 0.7	19	6	5.5	9.5	15	12	7	16
12	16	M16 x 1.5	6	19.7	M5 x 0.8	17	6	38	14	5	6.2	M6 x 1	24	8	5.5	10.5	18.3	16	10	22
16	16	M16 x 1.5	6	19.7	M5 x 0.8	17	6	38	14	5	6.2	M6 x 1	24	8	5.5	10.5	18.3	16	10	22
20	20	M22 x 1.5	8	28	G 1/8	20	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	22	13	24
25	22	M22 x 1.5	10	33.5	G 1/8	22	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	22	17	28

Bore size	S			Z		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
8	46 (52) {56(62)}	—	—	74 (80) {84(90)}	—	—
10	46 (50) {56(60)}	—	—	74 (78) {84(88)}	—	—
12	50 (53.5) {60(63.5)}	—	—	88 (91.5) {98(101.5)}	—	—
16	50 (53.5) {60(63.5)}	65.5 (69) {86(89.5)}	81 (84.5) {112(115.5)}	88 (91.5) {98(101.5)}	103.5 (107) {124(127.5)}	119 (122.5) {150(153.5)}
20	62 {87}	112	137	106 {131}	156	181
25	65 {88.5}	113.5	138.5	115 {138.5}	163.5	188.5

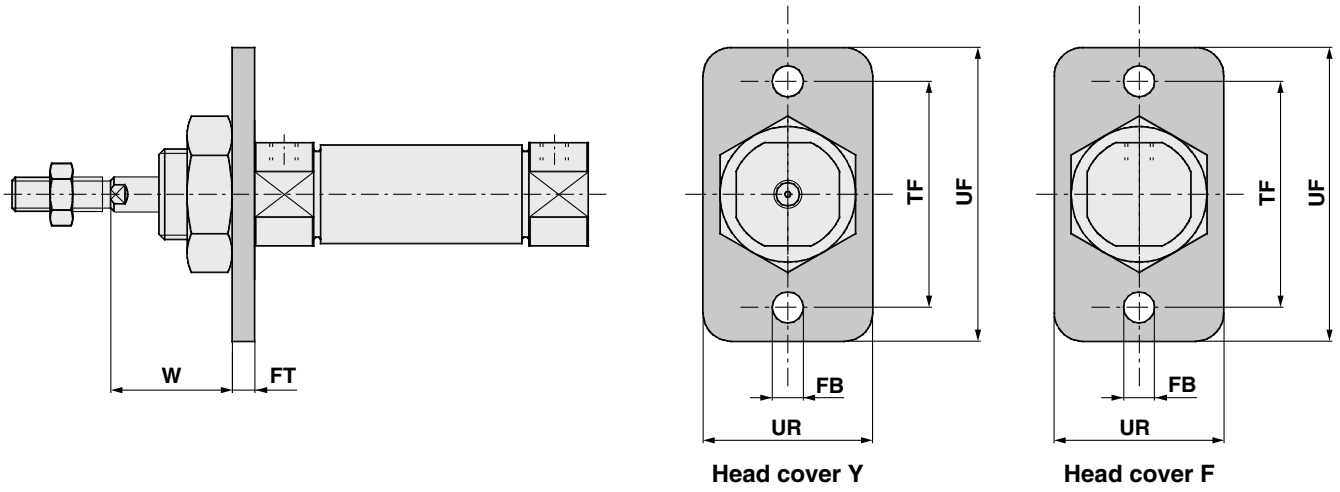
( ): In the case of auto switch style. { }: In the case of non-rotating rod.

Dimensions

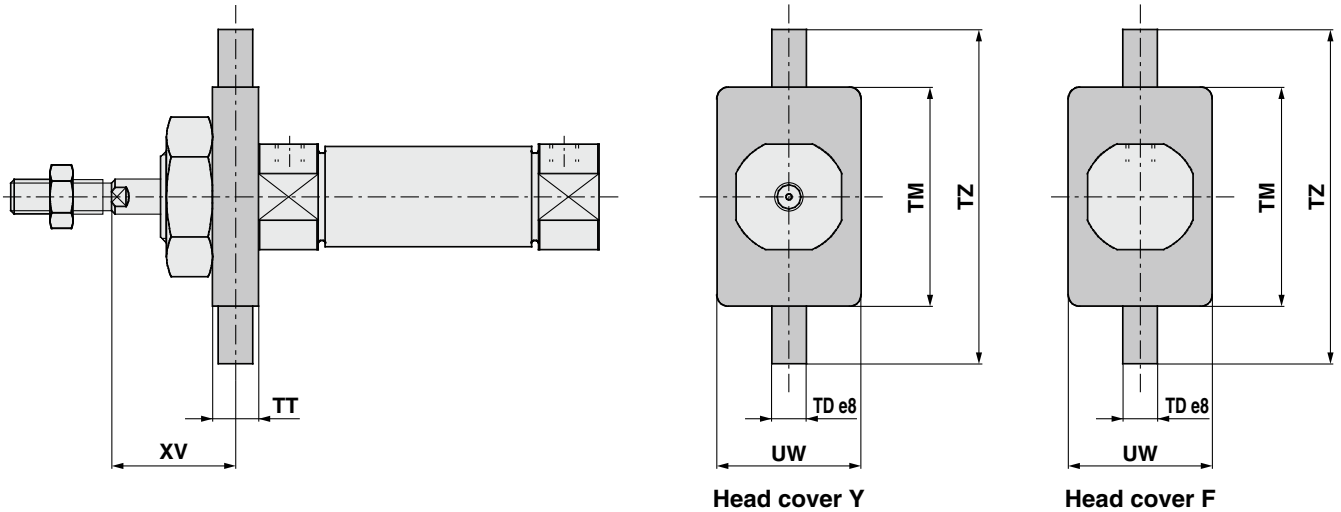
Single acting, Spring return
Rod foot: C85L10A, C85L16A, C85L25A



Rod flange: C85F10, C85F16, C85F25



Rod trunnion: C85T10, C85T16, C85T25

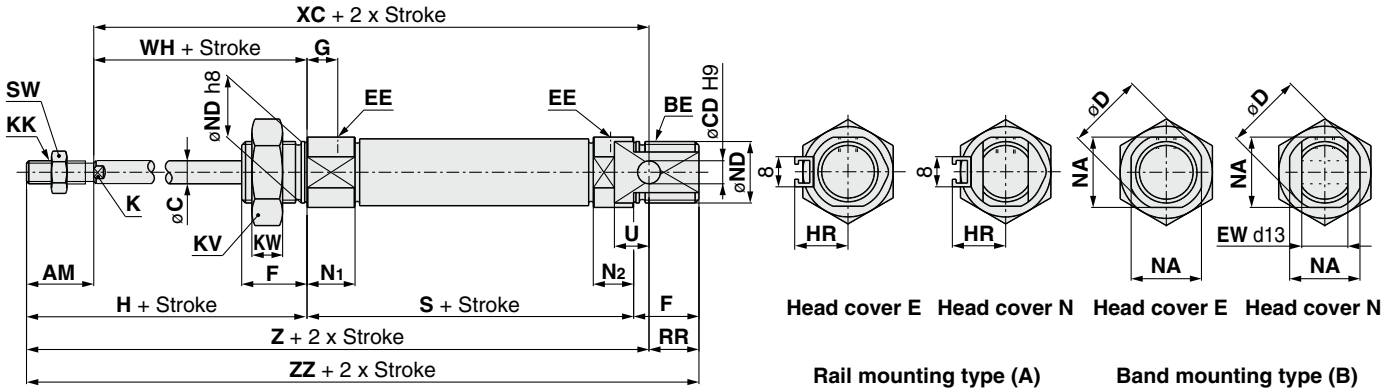


(mm)

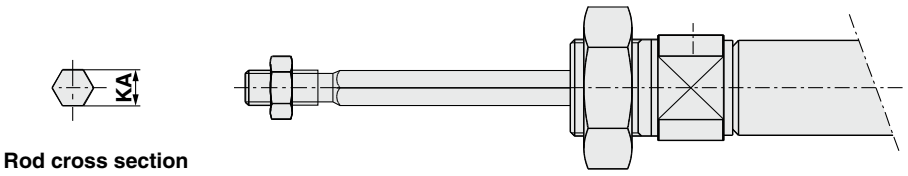
Bore size	Rod foot										Rod flange						Rod trunnion					
	AB	AO	AV	LT	NH	TR JS14	UR	US	W	XS	FBH13	FT	TF	UF	UR	W	TD e8	TM	TT	TZ	UW	XV
8	4.5	5	11	3.2	16	25	26	35	12.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
10	4.5	5	11	3.2	16	25	26	35	12.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
12	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
16	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
20	6.6	8	17	5	25	40	42	54	19	36	6.6	5	50	66	40	19	6	46	8	66	32	20
25	6.6	8	17	5	25	40	42	54	23	40	6.6	5	50	66	40	23	6	46	8	66	32	24

Dimensions

Single acting, Spring extended
C□85$^{N}_{E}$ Bore size – Stroke T – □
Without magnet, Built-in magnet



C□85KN/E
Non-rotating (Piston rod)



Rod cross section

(mm)

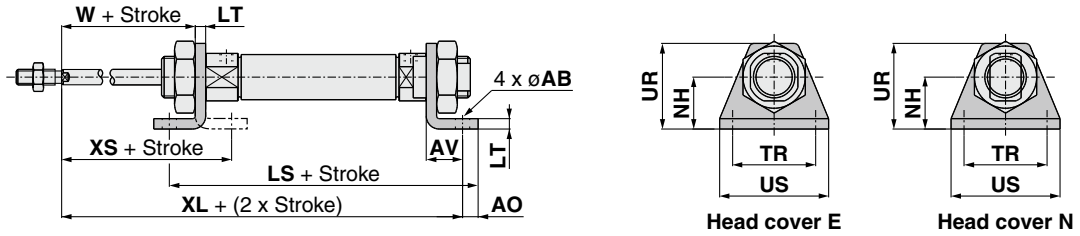
Bore size	AM	BE	C	CD	D	EE	EW	F	G	H	HR	K	KA	KK	KV	KW	N1	N2	NA	ND	RR	SW	U	WH
8	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	7	28	10	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	10	7	6	16
10	12	M12 x 1.25	4	4	16.7	M5 x 0.8	8	12	7	28	10.5	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	12	10	7	6	16
12	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	8	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	14	10	9	22
16	16	M16 x 1.5	6	6	19.7	M5 x 0.8	12	17	8	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	16	13	10	9	22
20	20	M22 x 1.5	8	8	28	G 1/8	16	20	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	22	11	13	12	24
25	22	M22 x 1.5	10	8	33.5	G 1/8	16	22	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	22	11	17	12	28

Bore size	S			XC			Z			ZZ		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
8	64.5 (70.5)	—	—	82.5 (88.5)	—	—	94.5 (100.5)	—	—	104.5 (110.5)	—	—
10	64.5 (68.5)	—	—	82.5 (86.5)	—	—	94.5 (98.5)	—	—	104.5 (108.5)	—	—
12	70 (73.5)	—	—	95 (98.5)	—	—	111 (114.5)	—	—	125 (128.5)	—	—
16	75 (78.5)	101 (104.5)	127 (130.5)	101 (104.5)	127 (130.5)	153 (156.5)	117 (120.5)	143 (146.5)	169 (172.5)	130 (133.5)	156 (159.5)	182 (185.5)
20	87	112	137	120	145	170	140	165	190	151	176	201
25	88.5	113.5	138.5	127.5	152.5	177.5	149.5	174.5	199.5	160.5	185.5	210.5

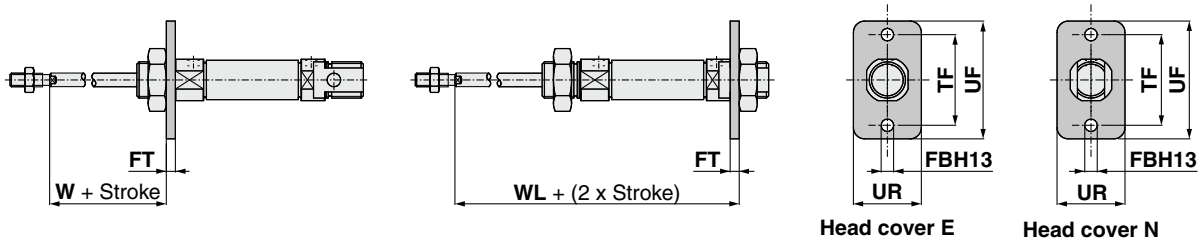
( ): In the case of auto switch style.

Dimensions

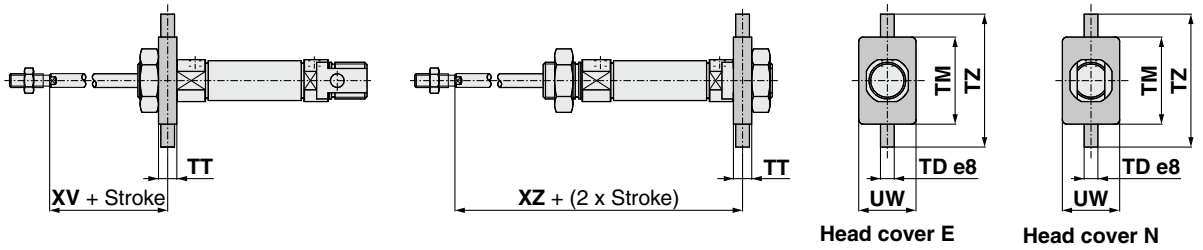
Single acting, Spring extended
C□85N, C□85E
Rod foot, Head foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



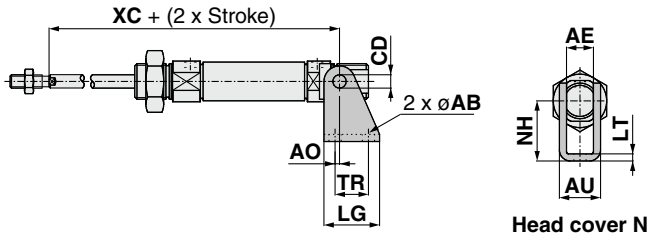
C□85N, C□85E
Rod flange, Head flange: C85F10, C85F16, C85F25



C□85N, C□85E
Rod trunnion, Head trunnion: C85T10, C85T16, C85T25



C□85N
Clevis: C85C10, C85C16, C85C25



(mm)

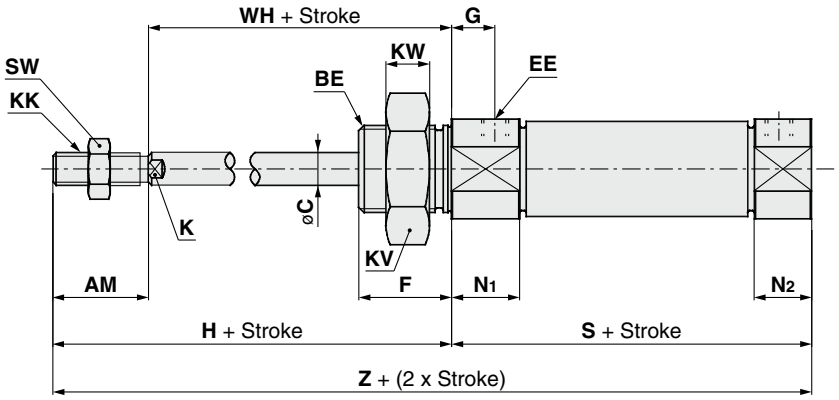
Bore size	Rod foot, Head foot																Rod flange, Head flange								
	AB	AO	AV	LS			LT	NH	TR JS14	UR	US	W	XL			XS	FBH13	FT	TF	UF	UR	W	WL		
				1 to 50	51 to 100	101 to 150							1 to 50	51 to 100	101 to 150								1 to 50	51 to 100	101 to 150
8	4.5	5	11	86.5 (92.5)	—	—	3.2	16	25	26	35	12.8	91.5 (97.5)	—	—	23.8	4.5	3.2	30	40	22	12.8	83.7 (89.7)	—	—
10	4.5	5	11	86.5 (90.5)	—	—	3.2	16	25	26	35	12.8	91.5 (95.5)	—	—	23.8	4.5	3.2	30	40	22	12.8	83.7 (87.7)	—	—
12	5.5	6	14	98 (101.5)	—	—	4	20	32	33	42	18	106 (109.5)	—	—	32	5.5	4	40	52	30	18	96 (99.5)	—	—
16	5.5	6	14	103 (106.5)	129 (132.5)	155 (158.5)	4	20	32	33	42	18	111 (114.5)	137 (140.5)	163 (166.5)	32	5.5	4	40	52	30	18	101 (104.5)	127 (130.5)	153 (156.5)
20	6.6	8	17	121	146	171	5	25	40	42	54	19	128	153	178	36	6.6	5	50	66	40	19	116	141	166
25	6.6	8	17	122.5	147.5	172.5	5	25	40	42	54	23	133.5	158.5	183.5	40	6.6	5	50	66	40	23	121.5	146.5	171.5

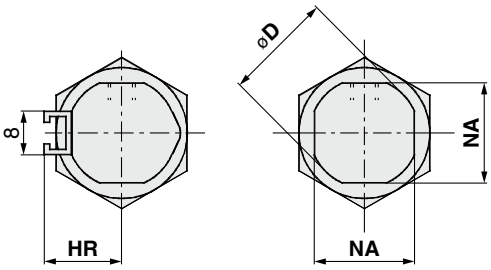
Bore size	Rod trunnion, Head trunnion									Clevis												
	TD e8	TM	TT	TZ	UW	XV	XZ			AB	AE	AO	AU	CD H9	LG	LT	NH	TR	XC		
							1 to 50	51 to 100	101 to 150										1 to 50	51 to 100	101 to 150
8	4	26	6	38	20	13	83.5 (89.5)	—	—	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	82.5 (88.5)	—	—
10	4	26	6	38	20	13	83.5 (87.5)	—	—	4.5	8.1	1.5	13.1	4	20	2.5	24	12.5	82.5 (86.5)	—	—
12	6	38	8	58	25	18	96 (99.5)	—	—	5.5	12.1	2	18.5	6	25	3.2	27	15	95 (98.5)	—	—
16	6	38	8	58	25	18	101 (104.5)	127 (130.5)	153 (156.5)	5.5	12.1	2	18.5	6	25	3.2	27	15	101 (104.5)	127 (130.5)	153 (156.5)
20	6	46	8	66	32	20	115	140	165	6.6	16.1	4	24.1	8	32	4	30	20	120	145	170
25	6	46	8	66	32	24	120.5	145.5	170.5	6.6	16.1	4	24.1	8	32	4	30	20	127.5	152.5	177.5

( ): In the case of auto switch style.

Dimensions

Single acting, Spring extended
C□85F Bore size − Stroke T − □
Without magnet, Built-in magnet

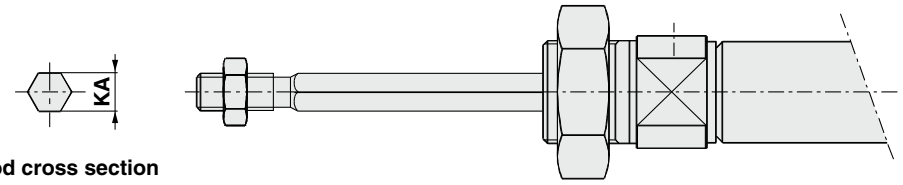




Rail mounting type (A)

Band mounting type (B) or non-magnet

C85KF, CD85KF
Non-rotating (Piston rod)



Rod cross section

(mm)

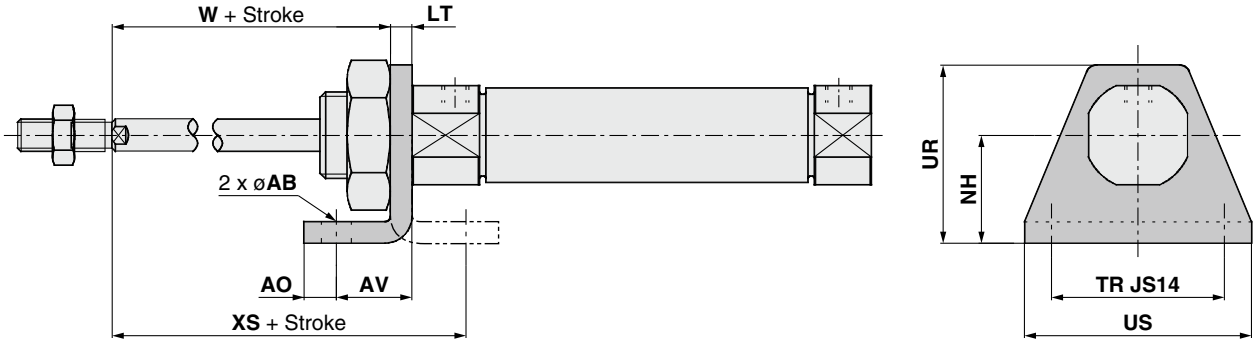
Bore size	AM	BE	C	D	EE	F	G	H	HR	K	KA	KK	KV	KW	N1	N2	NA	SW	WH
8	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	28	10	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	7	16
10	12	M12 x 1.25	4	16.7	M5 x 0.8	12	7	28	10.5	—	4.2	M4 x 0.7	19	6	11.5	9.5	15	7	16
12	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	10	22
16	16	M16 x 1.5	6	19.7	M5 x 0.8	17	8	38	14	5	6.2	M6 x 1	24	8	12.5	10.5	18.3	10	22
20	20	M22 x 1.5	8	28	G 1/8	20	8	44	17	6	8.2	M8 x 1.25	32	11	15	15	24	13	24
25	20	M22 x 1.5	10	33.5	G 1/8	22	8	50	20	8	10.2	M10 x 1.25	32	11	15	15	30	17	28

Bore size	S			Z		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
8	64.5 (70.5)	—	—	92.5 (98.5)	—	—
10	64.5 (68.5)	—	—	92.5 (96.5)	—	—
12	70 (73.5)	—	—	108 (111.5)	—	—
16	69 (72.5)	95 (98.5)	121 (124.5)	107 (110.5)	133 (136.5)	159 (162.5)
20	87	112	137	131	156	181
25	88.5	113.5	138.5	138.5	163.5	188.5

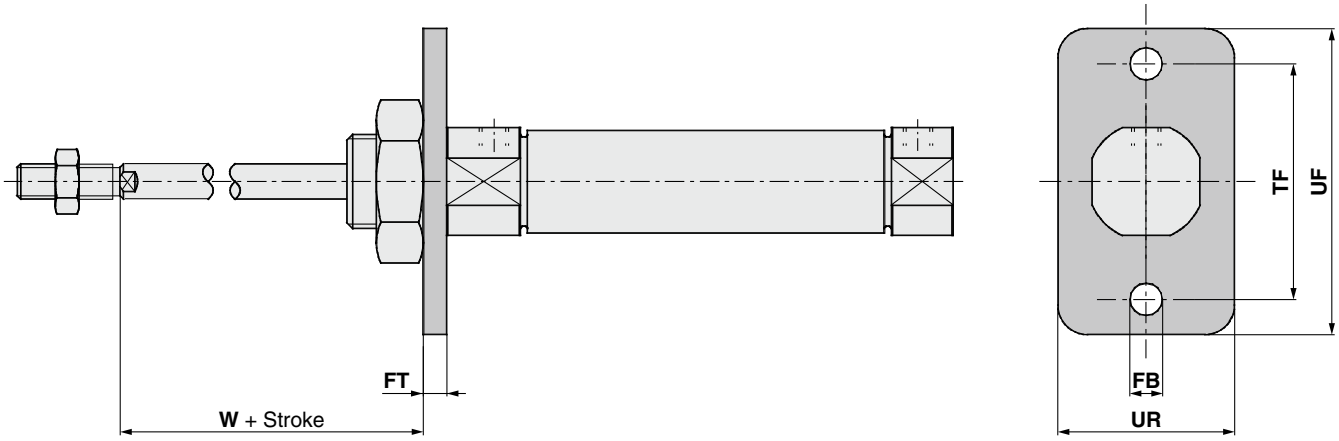
( ): In the case of auto switch style.

Dimensions

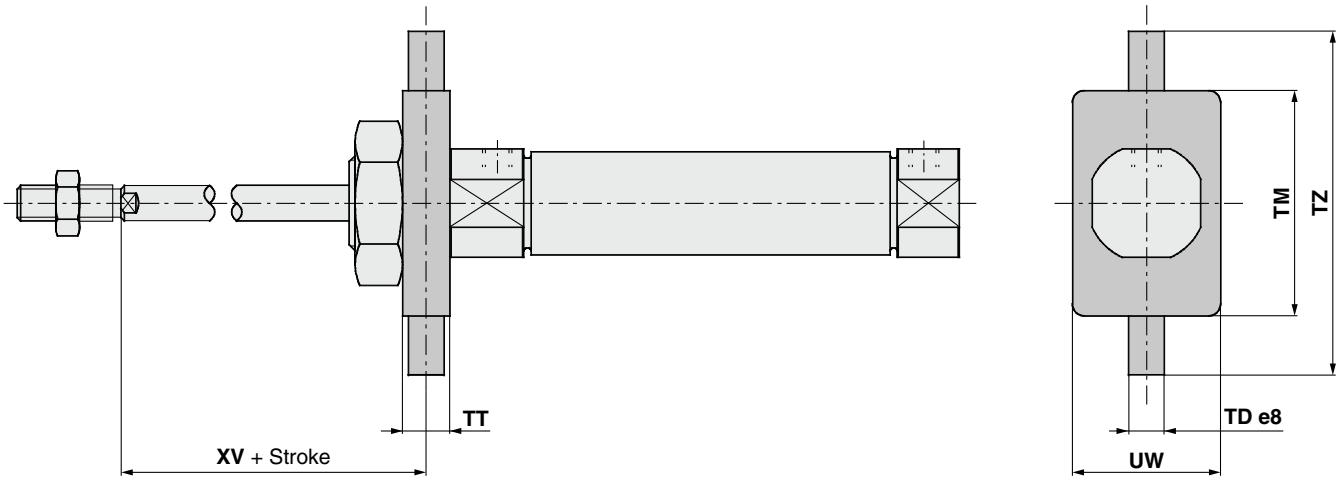
Single acting, Spring extended
Rod foot: C85L10A, C85L16A, C85L25A



Rod flange: C85F10, C85F16, C85F25



Rod trunnion: C85T10, C85T16, C85T25



(mm)

Bore size	Rod foot										Rod flange						Rod trunnion					
	AB	AO	AV	LT	NH	TR JS14	UR	US	W	XS	FBH13	FT	TF	UF	UR	W	TD e8	TM	TT	TZ	UW	XV
8	4.5	5	11	3.2	16	25	26	35	2.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
10	4.5	5	11	3.2	16	25	26	35	12.8	23.8	4.5	3.2	30	40	22	12.8	4	26	6	38	20	13
12	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
16	5.5	6	14	4	20	32	33	42	18	32	5.5	4	40	52	30	18	6	38	8	58	25	18
20	6.6	8	17	5	25	40	42	54	19	36	6.6	5	50	66	40	19	6	46	8	66	32	20
25	6.6	8	17	5	25	40	42	54	23	40	6.6	5	50	66	40	23	6	46	8	66	32	24

ISO Standards

Air Cylinder: Direct Mount Type
Double Acting, Single Rod
Series C85R
ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Double acting, Single rod

C D 85R A F 16 – 40 – B

Built-in magnet

Nil	None
D	Built-in magnet

Type

A	Bottom side mounting
B*	Front side mounting

* Only ø20, ø25

Mounting

F	Boss-cut/Basic
Y	Head cover axial port

Auto switch mounting

A	Rail mounting
B	Band mounting

Applicable auto switches are shown on page 32.
Order auto switches and bands separately.
(Auto switches and bands cannot be indicated here.)

Bore size / **Cylinder stroke**

Bore size (mm)	Standard stroke (mm)*	Max. stroke (mm)**
8	10, 25, 40, 50, 80, 100	200
10		400
12	10, 25, 40, 50, 80, 100 125, 160	
16		
20	10, 25, 40, 50, 80, 100 125, 160	1000
25		

* Other strokes on request.
** For exceeding the standard stroke range, it will be available as a special order (-X2018).

Mounting Bracket Part No.

Mounting bracket	Bore size (mm)					
	8	**10**	**12**	**16**	**20**	**25**
Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
Double knuckle joint	GKM4-8		GKM6-10		GKM8-16	GKM10-20
Floating joint	JA10-4-070		JA15-6-100		JA20 -8-125	JA30 -10-125

Replacement Parts

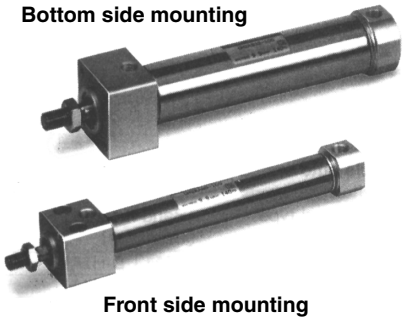
Bore size (mm)	Part no.	Note
20	C85-20PS	Every set includes: 1 rod seal 1 flat washer 1 retaining ring
25	C85-25PS	

Square rod cover makes direct mounting possible

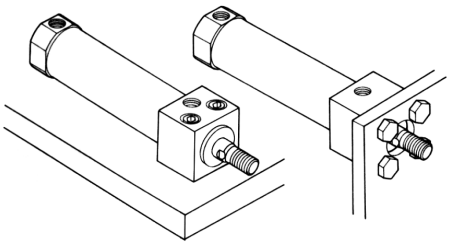
Space-saving
Mounting accuracy and rigidity made possible by means of faucet joint and direct mounting.

2 mounting types
Front side mounting and bottom side mounting available to suit your applications.

Bottom side mounting

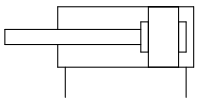


Front side mounting



Bottom side mounting **Front side mounting**

Double Acting, Single Rod



⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.

Specifications

Bore size (mm)	8	10	12	16	20	25
Piston rod dia. (mm)	4	4	6	6	8	10
Piston rod thread	M4 x 0.7	M4 x 0.7	M6 x 1	M6 x 1	M8 x 1.25	M10 x 1.25
Port size	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	G 1/8	G 1/8
Action	Double acting, Single rod					
Fluid	Air					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Min. operating pressure	0.1 MPa	0.08 MPa		0.05 MPa		
Ambient and fluid temperature	–20 to 80°C (Built-in magnet type: –10 to 60°C)					
Cushion	Rubber bumper (Standard)					
Lubrication	Not required. Use turbine oil Class 1 ISO VG32, if lubricated.					
Piston speed	50 to 1500 mm/s					
Allowable kinetic energy	0.02 J	0.03 J	0.04 J	0.09 J	0.27 J	0.4 J
Stroke length tolerance	$^{+1.0}_{0}$ mm			$^{+1.4}_{0}$ mm		

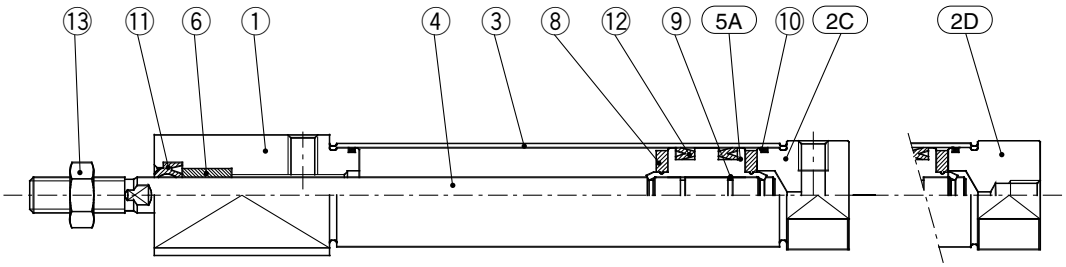
Weights

(g)

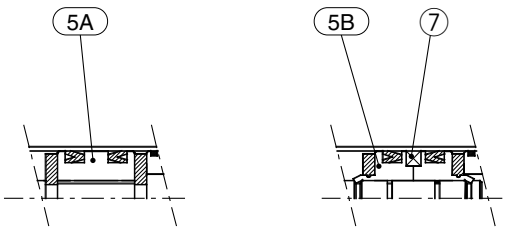
Bore size (mm)		8	10	12	16	20	25
Basic weight	Bottom side mounting	43	46	84	95	167	253
	Front side mounting	—	—	—	—	163	230
Additional weight per 10 mm of stroke		2	2.2	4.1	5.1	7.8	12.2

Construction

Double acting, Single rod
C□85RA8 to 16 (Disassembly is not possible.)



Standard ø10 to ø16 **Boss-cut/Basic** **Head cover axial port**



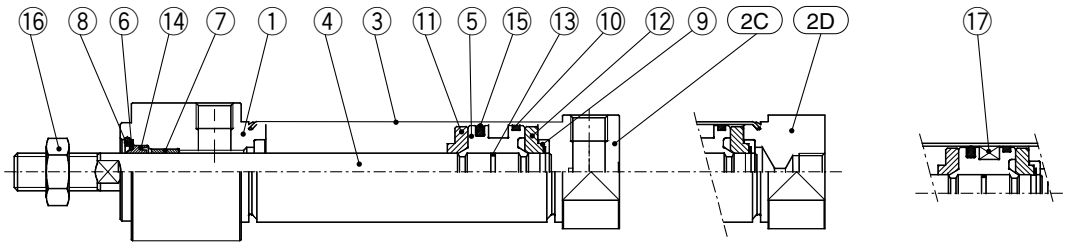
Standard ø8 **Built-in magnet**

Component Parts

No.	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2C	**Head cover F**	Aluminum alloy	1	Clear anodized
2D	**Head cover Y**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Stainless steel	1	
5A	**Piston A**	Brass (ø8), Aluminum alloy (ø10 to ø16)	1	
5B	**Piston B**	Brass (ø8), Aluminum alloy (ø10 to ø16)	2	(Switch type piston)
6	**Bushing**	Bearing alloy	1	

No.	Description	Material	Q'ty	Note
7	**Magnet**	Magnet	1	(Switch type only)
8	**Bumper**	Urethane	2	
9	**Piston gasket**	NBR	1	(2 for switch type)
10	**Tube gasket**	NBR	2	
11	**Rod seal**	NBR	1	
12	**Piston seal**	NBR	2	
13	**Rod end nut**	Carbon steel	1	Nickel plating

C□85R$^{A}_{B}$20/25



Standard **Boss-cut/Basic** **Head cover axial port** **Built-in magnet**

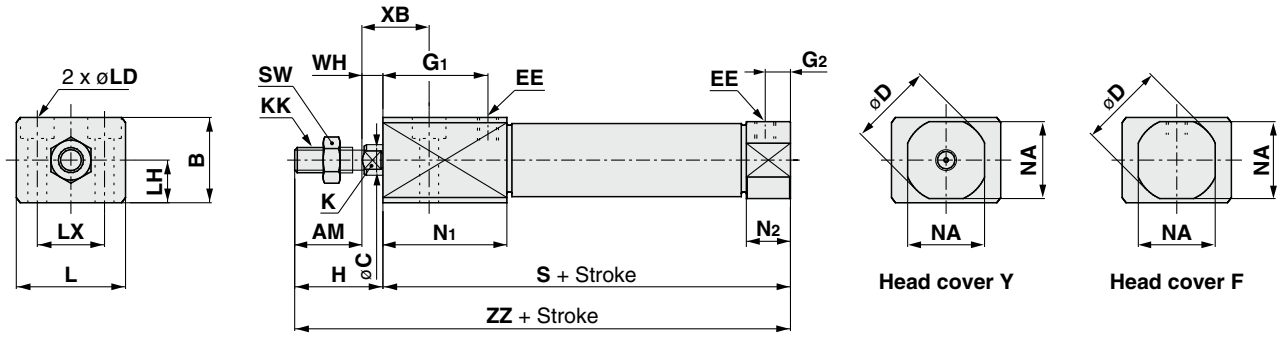
Component Parts

No	Description	Material	Q'ty	Note
1	**Rod cover**	Aluminum alloy	1	Clear anodized
2C	**Head cover F**	Aluminum alloy	1	Clear anodized
2D	**Head cover Y**	Aluminum alloy	1	Clear anodized
3	**Cylinder tube**	Stainless steel	1	
4	**Piston rod**	Carbon steel	1	Hard chrome plating
5	**Piston**	Aluminum alloy	1	Chromated
6	**Flat washer**	Stainless stee	1	
7	**Bushing**	Bearing alloy	1	
8	**Retaining ring**	Carbon steel	1	Phosphate coating

No	Description	Material	Q'ty	Note
9	**Retaining ring**	Stainless steel	1	
10	**Wear ring**	Resin	1	
11	**Bumper A**	Urethane	1	
12	**Bumper B**	Urethane	1	
13	**Piston gasket**	NBR	1	
14	**Rod seal**	NBR	1	
15	**Piston seal**	NBR	1	
16	**Rod end nut**	Carbon steel	1	Nickel plating
17	**Magnet**	Magnet	1	(Switch type only)

Dimensions

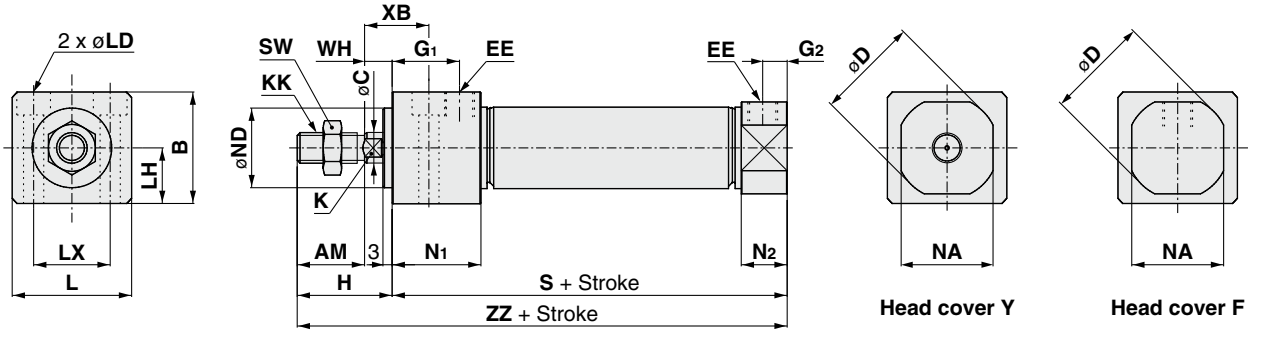
Double acting, Single rod
Bottom side mounting/C□85RA$^{F}_{Y}$ 8 to 16 – Stroke – B
Without magnet, Built-in magnet (Band mounting type)



(mm)

Bore size	AM	B	C	D	EE	G1	G2	H	K	KK	L	LD	LH	LX	N1	N2	NA	S	SW	WH	XB	ZZ
8	12	16	4	17	M5 x 0.8	19	5	16	—	M4 x 0.7	23	ø3.5, ø6.5 depth of counterbore 4	8	14	23.5	9.5	15	58	7	4	12	74
10	12	16	4	17	M5 x 0.8	19	5	16	—	M4 x 0.7	23	ø3.5, ø6.5 depth of counterbore 4	8	14	23.5	9.5	15	58	7	4	12	74
12	16	20	6	20	M5 x 0.8	25	6	21	5	M6 x 1	26	ø4.5, ø8 depth of counterbore 5	10	16	29.5	10.5	18.3	67	10	5	16	88
16	16	20	6	20	M5 x 0.8	25	6	21	5	M6 x 1	26	ø4.5, ø8 depth of counterbore 5	10	16	29.5	10.5	18.3	67	10	5	16	88

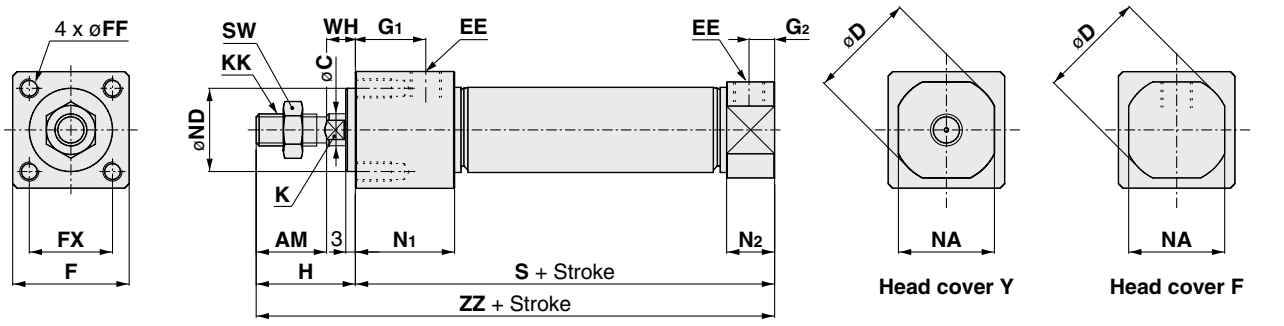
Bottom side mounting/C□85RA$^{F}_{Y}$ 20/25 – Stroke – B
Without magnet, Built-in magnet (Band mounting type)



(mm)

Bore size	AM	B	C	D	EE	G1	G2	H	K	KK	L	LD	LH	LX	N1	N2	NA	ND h8	S	SW	WH	XB	ZZ
20	20	30.3	8	28	G 1/8	22	8	30	6	M8 x 1.25	33.5	ø5.5, ø9.5 depth of counterbore 6.5	15	21	29	15	24	$20^{0}_{-0.033}$	76	13	10	22	106
25	22	36.6	10	33.5	G 1/8	22	8	36	8	M10 x 1.25	39	ø6.6, ø11 depth of counterbore 7.5	18	25	29	15	30	$26^{0}_{-0.033}$	79	17	14	26	115

Front side mounting/C□85RB$^{F}_{Y}$ 20/25 – Stroke – B
Without magnet, Built-in magnet (Band mounting type)



(mm)

Bore size	AM	C	D	EE	F	FF	FX	G1	G2	H	K	KK	N1	N2	NA	ND h8	S	SW	WH	ZZ
20	20	8	28	G 1/8	30.4	M5 x 0.8 depth 9	22	22	8	30	6	M8 x 1.25	29	15	24	$20^{0}_{-0.033}$	76	13	10	106
25	22	10	33.5	G 1/8	36.4	M6 x 1 depth 11	26	22	8	36	8	M10 x 1.25	29	15	30	$26^{0}_{-0.033}$	79	17	14	115

Series C85
Auto Switch

Please order auto switches and mounting brackets separately.

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model			Lead wire length (m)					Pre-wired connector	Applicable load	
					DC		AC	Band mounting	Rail mounting		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)			
									Perpendicular	In-line								
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V,12 V	—	**M9N**	—	—	●	●	●	○	—	○	IC	Relay, PLC
								—	**F7NV**	**F79**	●	—	●	○	—	○		
				3-wire (PNP)				**M9P**	—	—	●	●	●	○	—	○		
								—	**F7PV**	**F7P**	●	—	●	○	—	○		
				2-wire		12 V		**M9B**	—	—	●	●	●	○	—	○		
								—	**F7BV**	**J79**	●	—	●	○	—	○	—	
		Connector						**H7C**	**J79C**	—	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V,12 V		**M9NW**	—	—	●	●	●	○	—	○	IC	
								—	**F7NWV**	**F79W**	●	—	●	○	—	○		
				3-wire (PNP)				**M9PW**	—	—	●	●	●	○	—	○		
								—	—	**F7PW**	●	—	●	○	—	○		
				2-wire		12 V		**M9BW**	—	—	●	●	●	○	—	○		
								—	**F7BWV**	**J79W**	●	—	●	○	—	○	—	
	Water resistant (2-color indication)							**H7BA***1	**F7BAV***1	**F7BA***1	—	—	●	○	—	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V,12 V		**H7NF**	—	**F79F**	●	—	●	○	—	○	IC	
Reed auto switch	——	Grommet	Yes	3-wire (NPN Equivalent)	—	5 V	—	**A96****	—	**A76H**	●	—	●	—	—	—	IC	—
				2-wire		—	200 V	—	**A72**	**A72H**	●	—	●	—	—	—		Relay, PLC
					24 V	12 V	100 V	—	**A73**	**A73H**	●	—	●	●	—	—	—	
								A93**	—	—	●	●	●	●	—	—		
			No				100 V or less	**A90****	**A80**	**A80H**	●	—	●	—	—	—	IC	
		Connector	Yes				—	**C73C**	**A73C**	—	●	—	●	●	●	—	—	
			No				24 V or less	**C80C**	**A80C**	—	●	—	●	●	●	—	IC	
	Diagnostic indication (2-color indication)	Grommet	Yes			—	—	—	**A79W****	—	●	—	●	—	—	—	—	

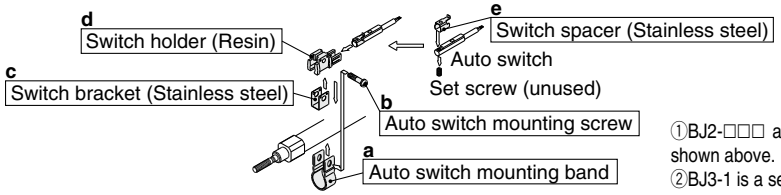
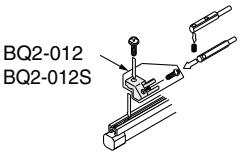
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

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

∗ Since there are other applicable auto switches than listed above, refer to the next page.
∗ For details about auto switches with pre-wired connector, refer to the Best Pneumatics No. 2.
∗ Band mounting type is not available for D-A9□V, M9□V, M9□WV, and D-M9□A(V) types.
∗ The D-A9□/M9□/M9□W/A7□□/A80□/F7□□/J7□□ auto switches are shipped together, (but not assembled). (However, when D-A9□/M9□/M9□W types are selected, only the auto switch mounting brackets are assembled before shipment.)
∗ When D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types are mounted on a ø8 to ø25 rail, order auto switch mounting brackets separately. Refer to the next page for details.
∗∗ D-A79W type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.
∗∗ D-A9□ type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

Auto Switch Mounting Brackets/Part No.

Auto switch mounting	Auto switch model	Bore size (mm) ø8	ø10	ø12	ø16	ø20	ø25
Band mounting	**D-A9□**Note 4) **D-M9□** **D-M9□W**	Note 1) ①BJ2-008 ②BJ3-1	Note 1) ①BJ2-010 ②BJ3-1	Note 1) ①BJ2-012 ②BJ3-1	Note 1) ①BJ2-016 ②BJ3-1	Note 1) ①BM2-020 ②BJ3-1	Note 1) ①BM2-025 ②BJ3-1
		 ①BJ2-□□□ and BM2-□□□ are a set of a and b shown above. ②BJ3-1 is a set of c, d and e shown in the drawing.					
	D-C7□/C80 **D-C73C/C80C** **D-H7□/H7□W** **D-H7BA/H7NF**	BJ2-008	BJ2-010	BJ2-012	BJ2-016	BM2-020	BM2-025
Rail mounting	**D-A9□**Note 4) **D-A9□V**Note 4) **D-M9□**Note 5) **D-M9□V**Note 5) **D-M9□W**Note 5) **D-M9□WV**Note 5) **D-M9□A**Note 3) **D-M9□AV**Note 3)	Note 2), Note 3) BQ2-012, BQ2-012S	Note 2), Note 3) BQ2-012, BQ2-012S	Note 2), Note 3) BQ2-012, BQ2-012S	Note 2), Note 3) BQ2-012, BQ2-012S	Note 2) BQ2-012	Note 2) BQ2-012
							

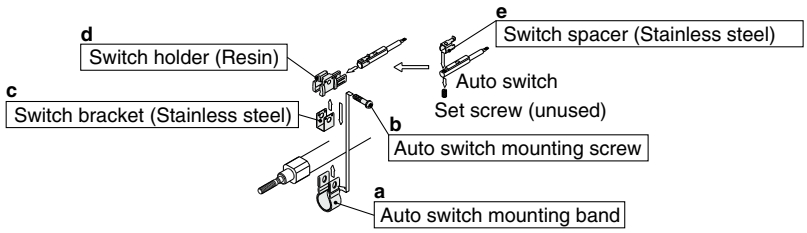
Note 1) Two kinds of auto switch mounting brackets are used as a set.
Note 2) When mounting a small auto switch on a rail mounting type of bore size ø8 to ø25 cylinders, auto switch mounting brackets are required as shown in the above chart. Order them separately from the cylinders.
Ordering example: CD85KN10-40-A···1 pc. D-M9BWV···2 pcs. BQ2-012···2 pcs.
Note 3) When using D-M9□A(V), order BQ2-012S which is produced with stainless steel mounting screw.
Note 4) When mounting a band and/or a rail on bore sizes ø8, ø10 and ø12 cylinder, D-A9□(V) type cannot be mounted.
Note 5) When mounting a rail on bore sizes ø20 and ø25 cylinder, D-M9□(V), M9□W(V) and M9□A(V) types cannot be mounted.

How to Order Auto Switch

The order procedure for the solid state auto switches, auto switch mounting brackets and order quantity, if the solid state auto switch D-M9B is mounted on the C85N8 series with band.

Type	Order No.	Order Qty.
Auto switch	D-M9B	2
Auto switch mounting bracket	BJ2-008 (Part number for a and b set)	2
	BJ3-1 (Part number for c, d, and e set)	2

∗ Order cylinders separately.



Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.
Refer to the Best Pneumatics No. 2 for the detailed specifications

Type	Auto switch model	Electrical entry	Features	Mounting	Applicable bore size
Reed	**D-A93V, A96V**	Grommet (Perpendicular)	—	Rail	ø16, ø20, ø25
	D-A90V		Without indicator light		
	D-C73, C76	Grommet (In-line)	—	Band	ø8 to ø25
	D-C80		Without indicator light		
Solid state	**D-M9NV, M9PV, M9BV**	Grommet (Perpendicular)	—	Rail	ø8 to ø16
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-color)		
	D-M9NAV, M9PAV, M9BAV		Water resistant (2-color)		
	D-H7A1, H7A2, H7B	Grommet (In-line)	—	Band	ø8 to ø25
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color)		

∗ Normally closed (NC = b contact) solid state switches (D-F9G/F9H) are also available. For details, refer to the Best Pneumatics No. 2.
∗ With pre-wired connector is also available for solid state auto switches. For details, refer to the Best Pneumatics No. 2.

Auto Switch Mounting

Minimum Stroke for Auto Switch Mounting

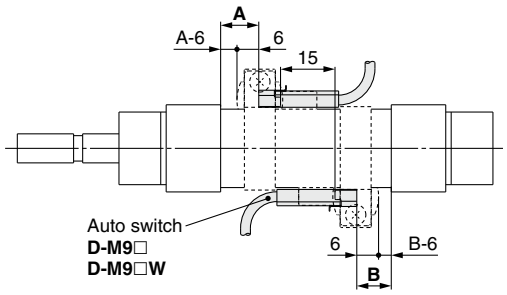
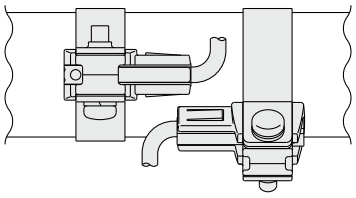
ø8, ø10, ø12, ø16 n: Number of auto switches (mm)

	Auto switch model	Number of auto switches: With 1 pc.	With 2 pcs.: Different surfaces	With 2 pcs.: Same surface	With n pcs.: ø8 to ø16: Different surfaces	With n pcs.: ø8 to ø16: Same surface
Band mounting	**D-M9□** **D-M9□W** **D-A9□** Note 2)	10	Note 1) 15	Note 1) 45	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···)	45 + 15 (n – 2) (n = 2, 4, 6···)
	D-C7□ **D-C80**	10	15	50	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6···)	50 + 20 (n – 2) (n = 2, 4, 6···)
	D-H7□ **D-H7□W** **D-H7BA** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···)	60 + 22.5 (n – 2) (n = 2, 4, 6···)
	D-H7C **D-C73C** **D-C80C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	50 + 27.5 (n – 2) (n = 2, 4, 6···)
Rail mounting	**D-M9□V** **D-F7□V** **D-J79C**	5	—	5	—	10 + 10 (n – 2) (n = 4, 6···)
	D-F7□ **D-J79**	5	—	5	—	15 + 15 (n – 2) (n = 4, 6···)
	D-A9□V Note 2)	5	—	10	—	10 + 15 (n – 2) (n = 4, 6···)
	D-A7□ **D-A80** **D-A73C** **D-A80C**	5	—	10	—	15 + 10 (n – 2) (n = 4, 6···)
	D-A7□H **D-A80H**	5	—	10	—	15 + 15 (n – 2) (n = 4, 6···)
	D-M9□ **D-A9□** Note 2)	10	—	10	—	15 + 15 (n – 2) (n = 4, 6···)
	D-F7□WV **D-F7BAV** **D-A79W** Note 2)	10	—	15	—	10 + 15 (n – 2) (n = 4, 6···)
	D-M9□WV **D-M9□AV**	10	—	15	—	15 + 15 (n – 2) (n = 4, 6···)
	D-F7□W **D-J79W** **D-F7BA**	10	—	15	—	15 + 20 (n – 2) (n = 4, 6···)
	D-M9□W	15	—	15	—	15 + 15 (n – 2) (n = 4, 6···)
	D-M9□A	15	—	20	—	20 + 15 (n – 2) (n = 4, 6···)

ø20, ø25 n: Number of auto switches (mm)

	Auto switch model	Number of auto switches: With 1 pc.	With 2 pcs.: Different surfaces	With 2 pcs.: Same surface	With n pcs.: ø20, ø25: Different surfaces	With n pcs.: ø20, ø25: Same surface
Band mounting	**D-M9□** **D-M9□W** **D-A9□**	10	Note 1) 15	Note 1) 45	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···)	45 + 45 (n – 2) (n = 2, 4, 6···)
	D-C7□ **D-C80**	10	15	50		50 + 45 (n – 2) (n = 2, 4, 6···)
	D-H7□ **D-H7□W** **D-H7BA** **D-H7NF**	10	15	60		60 + 45 (n – 2) (n = 2, 4, 6···)
	D-H7C **D-C73C** **D-C80C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	65 + 50 (n – 2) (n = 2, 4, 6···)
Rail mounting	**D-F7□V** **D-J79C**	5	—	5	—	10 + 10 (n – 2) (n = 4, 6···)
	D-F7□ **D-J79**	5	—	5	—	15 + 15 (n – 2) (n = 4, 6···)
	D-A9□ **D-A9□V**	5	—	10	—	10 + 15 (n – 2) (n = 4, 6···)
	D-A7□ **D-A80** **D-A73C** **D-A80C**	5	—	10	—	15 + 10 (n – 2) (n = 4, 6···)
	D-A7□H **D-A80H**	5	—	10	—	15 + 15 (n – 2) (n = 4, 6···)
	D-F7□WV **D-F7BAV** **D-A79W**	10	—	15	—	10 + 15 (n – 2) (n = 4, 6···)
	D-F7□W **D-J79W** **D-F7BA**	10	—	15	—	15 + 20 (n – 2) (n = 4, 6···)

Note 1) Auto switch mounting (With the stroke range within the below, an adjustment is required as shown in the chart below).

Auto switch model	With 2 auto switches: Different surfaces Note 1)	With 2 auto switches: Same surface Note 1)
	 The proper auto switch mounting position is 6 mm inward from the switch holder edge.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-A93	—	45 to less than 50 strokes
D-M9□/M9□W	15 to less than 20 strokes	45 to less than 55 strokes

Note 2) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.
Note 3) When mounting a rail on bore sizes ø20 and ø25 cylinder, D-M9□(V), M9□W(V) and M9□A(V) types cannot be mounted.

Operating Range

(mm)

Auto switch model		Bore size					
		8	10	12	16	20	25
Band mounting	**D-M9□** **D-M9□W**	2	2.5	2.5	3	3	3
	D-H7□ **D-H7□W** **D-H7BA** **D-H7NF**	3	3	3	4	4	4
	D-H7C	8	8	8	9	7	8.5
	D-A9□ Note 1)	—	—	—	7	6	6
	D-C7□/C80 **D-C73C/C80C**	7	7	7	7	7	8
Rail mounting	**D-M9□/M9□V** **D-M9□W/M9□WV** **D-M9□A/M9□AV**	2.5	3	3.5	3.5	—	—
	D-F7□/J79 **D-F7□V/J79C** **D-F7□W/J79W** **D-F7□WV** **D-F79F** **D-F7BA/F7BAV**	5	5	6	6	5	6
	D-A9□ Note 1) **D-A9□V**	—	—	—	6.5	5.5	6
	D-A7□/A80 **D-A7□H/A80H** **D-A73C/A80C**	8	8	9	9	7	7
	D-A79W Note 2)	—	—	—	13	10	10.5

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

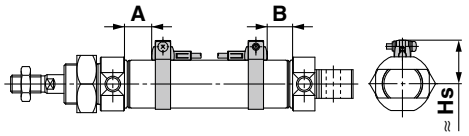
Note 1) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

Note 2) When mounting a rail on bore sizes ø20 and ø25 cylinder, D-M9□(V), M9□W(V) and M9□A(V) types cannot be mounted.

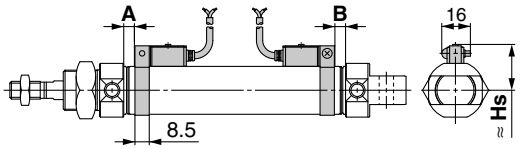
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Double/Single acting: Band Mounting

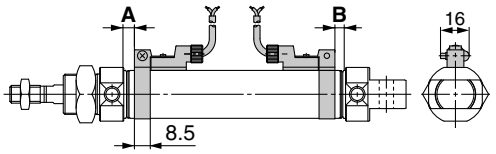
D-M9□
D-M9□W



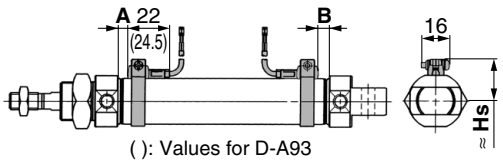
D-H7□
D-H7□W
D-H7BA
D-H7NF
D-C7□
D-C80



D-H7C

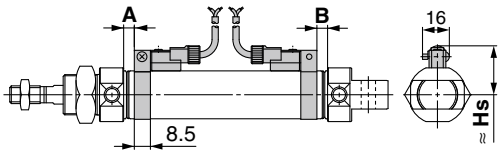


D-A9□



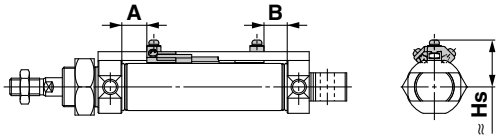
( ): Values for D-A93

D-C73C
D-C80C

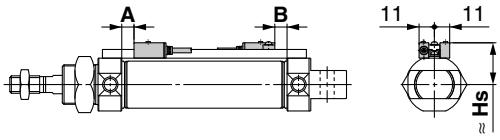


Double/Single acting: Rail Mounting

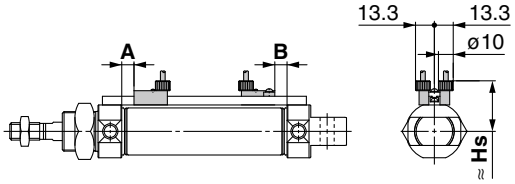
D-M9□
D-M9□V
D-M9□W
D-M9□WV
D-M9□A
D-M9□AV



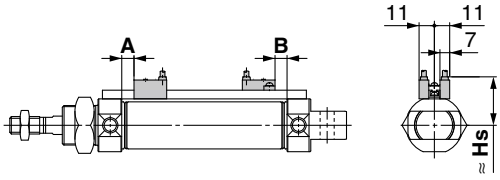
D-F7□
D-F7□W
D-J79
D-J79W
D-F7BA
D-F79F
D-A7□H
D-A80H



D-J79C
D-A73C
D-A80C



D-F7□V
D-F7□WV
D-F7BAV
D-A7□
D-A80
D-A79W



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

Applicable series: CD85 (Double acting, Single rod), CD85W (Double acting, Double rod), CD85R (Direct mounting type)

Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size	Band mounting							
	D-M9□ D-M9□W		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-A9□		D-C7□ D-C80 D-C73C D-C80C	
	A	B	A	B	A	B	A	B
8	6.5	6.5	2	2	—	—	3	3
10	6.5 (7)	6.5 (7)	2 (2.5)	2 (2.5)	—	—	3 (3.5)	3 (3.5)
12	7.5 (8.5)	7.5 (8.5)	3 (4)	3 (4)	—	—	4 (5)	4 (5)
16	7.5 (8.5)	13.5 (10.5) [7.5]	3 (4)	9 (6) [3]	3.5 (4.5)	9.5 (6.5) [3.5]	4 (5)	10 (7) [4]
20	10.5 (8.5)	9.5 (7.5)	6 (4)	5 (3)	6.5 (4.5)	5.5 (3.5)	7 (5)	6 (4)
25	12 (10)	11 (9)	7.5 (5.5)	6.5 (4.5)	8 (6)	7 (5)	8.5 (6.5)	7.5 (5.5)

∗ The value in ( ) is in cases with air cushion.
∗ The value in [ ] is in cases of CD85F16, CD85Y.
Note 1) D-A9□ type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.
Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.

(mm)

Auto switch model / Bore size	Rail mounting									
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-F7□/J79 D-F7□W/J79W D-F7□V D-F7□WV D-F79F/J79C D-F7BA D-F7BAV D-A72/A7□H D-A80H D-A73C/A80C		D-A9□ D-A9□V		D-A73 D-A80		D-A79W	
	A	B	A	B	A	B	A	B	A	B
8	5	5	4	4	—	—	3.5	3.5	—	—
10	5 (5.5)	5 (5.5)	4 (4.5)	4 (4.5)	—	—	3.5 (4)	3.5 (4)	—	—
12	6 (7)	6 (7)	5 (6)	5 (6)	—	—	4.5 (5.5)	4.5 (5.5)	—	—
16	6 (7)	12 (9) [6]	5 (6)	11 (8) [5]	3.5 (4.5)	9.5 (6.5) [3.5]	4.5 (5.5)	10.5 (7.5) [4.5]	2 (3)	8 (5) [2]
20	—	—	8 (6)	7 (5)	6.5 (4.5)	5.5 (3.5)	7.5 (5.5)	6.5 (4.5)	5 (3)	4 (2)
25	—	—	9.5 (7.5)	8.5 (6.5)	8 (6)	7 (5)	9 (7)	8 (6)	6.5 (4.5)	5.5 (3.5)

∗ The value in ( ) is in cases with air cushion.
∗ The value in [ ] is in cases of CD85F16, CD85Y.
Note 1) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.
Note 2) D-M9□(V), M9□W(V), and M9□A(V) types cannot be mounted on bore sizes ø20 and ø25 cylinder.
Note 3) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height (mm)

Auto switch model / Bore size	Band mounting			
	D-M9□ D-M9□W D-A9□ Note 1)	D-H7□ D-H7□W D-H7BA D-H7NF D-C7□ D-C80	D-H7C	D-C73C D-C80C
	Hs	Hs	Hs	Hs
8	15	16	19	18.5
10	16.5	17	20	19.5
12	18	18.5	21	21
16	20	20.5	23	23
20	22	22.5	25	25
25	24.5	25	27.5	27.5

Note 1) D-A9□ type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

(mm)

Auto switch model / Bore size	Rail mounting						
	D-M9□ Note 1) D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ Note 2) D-A9□V	D-F7□ D-J79 D-F7□W D-J79W D-F79F D-F7BA D-A7□H D-A80H	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W Note 2)
	Hs	Hs	Hs	Hs	Hs	Hs	Hs
8	19	19	21.5	23.5	18	25	—
10	19	19	21.5	23.5	18	25	—
12	20.5	20.5	23	25	19.5	26.5	—
16	20.5	20.5	23	25	19.5	26.5	22
20	23.5	23.5	26	29	22.5	29.5	25
25	26.5	26.5	29	32	25.5	32.5	28

Note 1) D-M9□(V), M9□W(V), and M9□A(V) types cannot be mounted on bore sizes ø20 and ø25 cylinder.
Note 2) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

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

Applicable series: CD85□-□S (Single acting, Spring return)

Auto Switch Proper Mounting Position

(mm)

Auto switch model		Bore size	A Dimensions 5 to 50 st	A Dimensions 51 to 100 st	A Dimensions 101 to 150 st	B
Band mounting	D-M9□ D-M9□W	8	18.5	18.5	18.5	6.5
		10	16.5	16.5	16.5	6.5
		12	18	18	18	7.5
		16	18	33.5	49	13.5 [7.5]
		20	10.5 (35.5)	60.5	85.5	9.5
		25	10.5 (35.5)	60.5	85.5	11
	D-H7□ D-H7C D-H7□W D-H7BA D-H7NF	8	14	14	14	2
		10	12	12	12	2
		12	13.5	13.5	13.5	3
		16	13.5	29	44.5	9 [3]
		20	6 (31)	56	81	5
		25	6 (31)	56	81	6.5
	D-A9□	16	14	29.5	45	9.5 [3.5]
		20	6.5 (31.5)	56.5	81.5	5.5
		25	6.5 (31.5)	56.5	81.5	7
	D-C7□ D-C80 D-C73C D-C80C	8	15	15	15	3
		10	13	13	13	3
		12	14.5	14.5	14.5	4
		16	14.5	30	45.5	10 [4]
		20	7 (32)	57	82	6
		25	7 (32)	57	82	7.5

(mm)

Auto switch model		Bore size	A Dimensions 5 to 50 st	A Dimensions 51 to 100 st	A Dimensions 101 to 150 st	B
Rail mounting	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV	8	17	17	17	5
		10	15	15	15	5
		12	16.5	16.5	16.5	6
		16	16.5	32	47.5	12 [6]
	D-F7□/J79 D-F7□W D-J79W D-F7□V D-F7□WV D-F79F/J79C D-F7BA D-F7BAV D-A72 D-A7□H/A80H D-A73C/A80C	8	16	16	16	4
		10	14	14	14	4
		12	15.5	15.5	15.5	5
		16	15.5	31	46.5	11 [5]
		20	8 (33)	58	83	7
		25	8 (33)	58	83	8.5
	D-A9□ D-A9□V D-A79W	16	12.5	28	43.5	8 [2]
		20	5 (30)	55	80	4
		25	5 (30)	55	80	5.5
	D-A73 D-A80	8	15.5	15.5	15.5	3.5
		10	13.5	13.5	13.5	3.5
		12	15	15	15	4.5
		16	15	30.5	46	10.5 [4.5]
		20	7.5 (32.5)	57.5	82.5	6.5
		25	7.5 (32.5)	57.5	82.5	8

∗ The value in ( ) is in cases of non-rotating.
∗ The value in [ ] is in cases of CD85F16, CD85Y.
Note 1) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.
Note 2) When mounting a rail on bore sizes ø20 and ø25 cylinder, D-M9□(V), M9□W(V) and M9□A(V) types cannot be mounted.
Note 3) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	Band mounting			
	D-M9□ D-M9□W D-A9□ Note 1)	D-H7□ D-H7□W D-H7BA D-H7NF D-C7□ D-C80	D-H7C	D-C73C D-C80C
	Hs	Hs	Hs	Hs
8	15	16	19	18.5
10	16.5	17	20	19.5
12	18	18.5	21	21
16	20	20.5	23	23
20	22	22.5	25	25
25	24.5	25	27.5	27.5

Note 1) D-A9□ type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

(mm)

Auto switch model / Bore size	Rail mounting						
	D-M9□ Note 1) D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ Note 2) D-A9□V	D-F7□ D-J79 D-F7□W D-J79W D-F79F D-F7BA D-A7□H D-A80H	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	Note 2) D-A79W
	Hs	Hs	Hs	Hs	Hs	Hs	Hs
8	19	19	21.5	23.5	18	25	—
10	19	19	21.5	23.5	18	25	—
12	20.5	20.5	23	25	19.5	26.5	—
16	20.5	20.5	23	25	19.5	26.5	22
20	23.5	23.5	26	29	22.5	29.5	25
25	26.5	26.5	29	32	25.5	32.5	28

Note 1) D-M9□(V), M9□W(V), and M9□A(V) types cannot be mounted on bore sizes ø20 and ø25 cylinder.
Note 2) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

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

Applicable series: CD85□-□T (Single acting, Spring extended type)

Auto Switch Proper Mounting Position

(mm)

Auto switch model		Bore size	A	B Dimensions		
				5 to 50 st	51 to 100 st	101 to 150 st
Band mounting	D-M9□ D-M9□W	8	6.5	31	31	31
		10	6.5	29	29	29
		12	7.5	31	31	31
		16	7.5	36 [30]	62 [56]	88 [82]
		20	10.5	34.5	59.5	84.5
		25	12	34.5	59.5	84.5
	D-H7□ D-H7C D-H7□W D-H7BA D-H7NF	8	2	26.5	26.5	26.5
		10	2	24.5	24.5	24.5
		12	3	26.5	26.5	26.5
		16	3	31.5 [25.5]	57.5 [51.5]	83.5 [77.5]
		20	6	30	55	80
		25	7.5	30	55	80
	D-A9□	16	3.5	32 [26]	58 [52]	84 [80]
		20	6.5	30.5	55.5	80.5
		25	8	30.5	55.5	80.5
	D-C7□ D-C80 D-C73C D-C80C	8	3	27.5	27.5	27.5
		10	3	25.5	25.5	25.5
		12	4	27.5	27.5	27.5
		16	4	32.5 [26.5]	58.5 [52.5]	84.5 [78.5]
		20	7	31	56	81
		25	8.5	31	56	81

(mm)

Auto switch model		Bore size	A	B Dimensions		
				5 to 50 st	51 to 100 st	101 to 150 st
Rail mounting	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV	8	5	29.5	29.5	29.5
		10	5	27.5	27.5	27.5
		12	6	29.5	29.5	29.5
		16	6	34.5 [28.5]	60.5 [54.5]	86.5 [80.5]
	D-F7□/J79 D-F7□W D-J79W D-F7□V D-F7□WV D-F79F/J79C D-F7BA D-F7BAV D-A72 D-A7□H/A80H D-A73C/A80C	8	4	28.5	28.5	28.5
		10	4	26.5	26.5	26.5
		12	5	28.5	28.5	28.5
		16	5	33.5 [27.5]	59.5 [53.5]	85.5 [79.5]
		20	8	32	57	82
		25	9.5	32	57	82
	D-A9□ D-A9□V D-A79W	16	2	30.5 [24.5]	56.5 [50.5]	82.5 [76.5]
		20	5	29	54	79
		25	6.5	29	54	79
	D-A73 D-A80	8	3.5	28	28	28
		10	3.5	26	26	26
		12	4.5	28	28	28
		16	4.5	33 [27]	59 [53]	85 [79]
		20	7.5	31.5	56.5	81.5
		25	9	31.5	56.5	81.5

∗ The value in [ ] is in cases of CD85F16, CD85Y.

Note 1) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

Note 2) When mounting a rail on bore sizes ø20 and ø25 cylinder, D-M9□(V), M9□W(V) and M9□A(V) types cannot be mounted.

Note 3) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	Band mounting			
	D-M9□ D-M9□W D-A9□ Note 1)	D-H7□ D-H7□W D-H7BA D-H7NF D-C7□ D-C80	D-H7C	D-C73C D-C80C
	Hs	Hs	Hs	Hs
8	15	16	19	18.5
10	16.5	17	20	19.5
12	18	18.5	21	21
16	20	20.5	23	23
20	22	22.5	25	25
25	24.5	25	27.5	27.5

Note 1) D-A9□ type cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

(mm)

Auto switch model / Bore size	Rail mounting						
	D-M9□ Note 1) D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ Note 2) D-A9□V	D-F7□ D-J79 D-F7□W D-J79W D-F79F D-F7BA D-A7□H D-A80H	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	Note 2) D-A79W
	Hs	Hs	Hs	Hs	Hs	Hs	Hs
8	19	19	21.5	23.5	18	25	—
10	19	19	21.5	23.5	18	25	—
12	20.5	20.5	23	25	19.5	26.5	—
16	20.5	20.5	23	25	19.5	26.5	22
20	23.5	23.5	26	29	22.5	29.5	25
25	26.5	26.5	29	32	25.5	32.5	28

Note 1) D-M9□(V), M9□W(V), and M9□A(V) types cannot be mounted on bore sizes ø20 and ø25 cylinder.

Note 2) D-A9□(V) and A79W types cannot be mounted on bore sizes ø8, ø10, and ø12 cylinder.

Series C85
How to Mount and Move the Auto Switch

Mounting Bracket Band Mounting Type

<Applicable auto switch>
Solid state ····· D-M9N, D-M9P, D-M9B
D-M9NW, D-M9PW, D-M9BW
Reed ····· D-A90, A93, A96

How to Mount and Move the Auto Switch

Mounting the Auto Switch

1. Attach the switch bracket to the switch holder.
   (Fit the convex part of the switch bracket over the concave part of the holder.)
2. Mount the auto switch mounting band to the cylinder tube.
3. Set the switch holder between the reinforcing plates of the band which is already attached to the cylinder.
4. Insert the auto switch mounting screw in the hole of the reinforcing plate through the switch holder, and thread it into the other plate. Tighten the screw temporarily.
5. Remove the set screw attached to the auto switch.
6. Attach the switch spacer to the auto switch.
7. Insert the auto switch with a switch spacer from the back of the switch holder and set it at the specified position.
   (Insert the auto switch with an angle of approximately 10 to 15°. See figure 1.)
8. To secure the auto switch, tighten the switch mounting screw with the specified torque (0.8 N·m to 1.0 N·m).

Adjusting the Switch Position

1. Unloosen the auto switch mounting screw 3 turns to adjust the auto switch set position.
2. Tighten the screw as described above (8) after adjustment.

Dismounting Auto Switch

1. Remove the auto switch mounting screw from the switch holder.
2. Move the auto switch back towards the position where it stops at the lead wire side.
3. Hold up the lead wire side of the auto switch at the angle of around 45°.
4. Maintain the angle, and pull back the auto switch obliquely at the same angle.

Note 1) Be careful not to pull or strain the lead wires.
Be careful not to apply excess tensile force (over 10 N) to the auto switches.
Adjust the auto switch position after sufficiently loosening its screw. For the band mounting type BJ3-1, loosen the screw three rotations or more.

Note 2) Be sure to use the switch spacer and switch bracket for the band mounting type.
Use together with the conventional auto switch mounting bands (brackets) BJ2-□□□ or BM2-□□□.
Confirm that a switch spacer is mounted to the end of the auto switch before fastening the auto switch. If the switch bracket is not mounted, the auto switch may move after installation.

⚠ Caution

1. Tighten the screw under the specified torque when mounting auto switch.
2. Set the auto switch mounting band perpendicularly to cylinder tube.

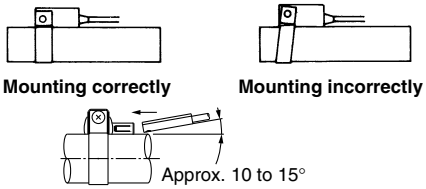
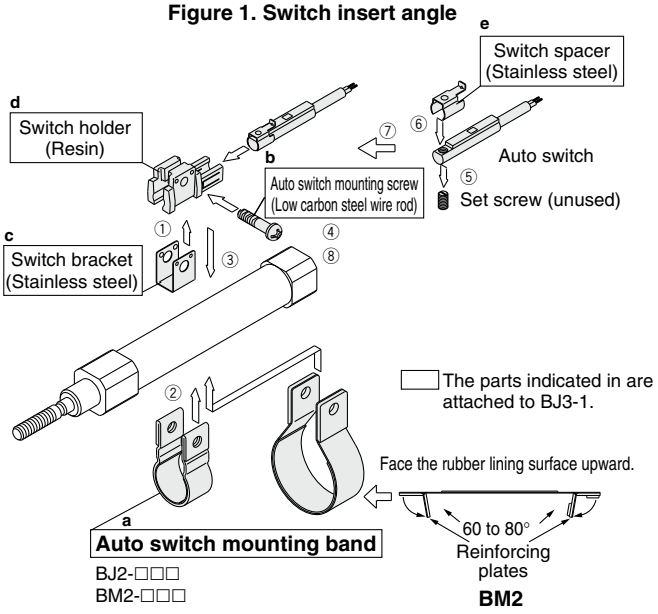


Figure 1. Switch insert angle



BJ2-□□□ and BM2-□□□ are a set of a and b shown above. BJ3-1 is a set of c, d and e shown above.

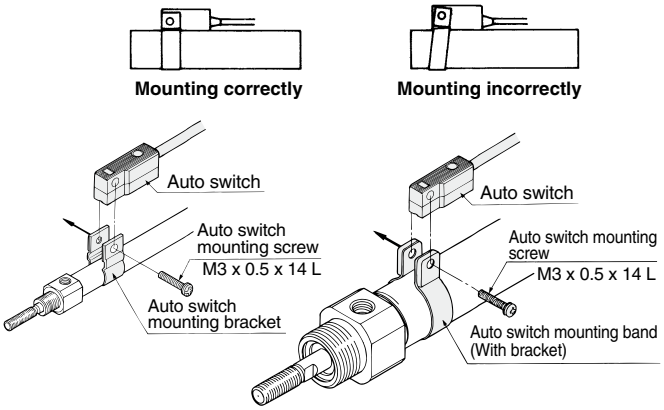
<Applicable auto switch>
Solid state ····· D-H7A1, D-H7A2, D-H7B,
D-H7BA, D-H7C, D-H7NF,
D-H7NW, D-H7PW, D-H7BW
Reed ····· D-C73, D-C76, D-C80, D-C73C,
D-C80C

How to Mount and Move the Auto Switch

1. Put a mounting band on the cylinder tube and set it at the auto switch mounting position.
2. Put the mounting section of the auto switch between the band mounting holes, then adjust the position of mounting holes of switch to those of mounting band.
3. Lightly thread the auto switch mounting screw (M3 x 0.5 x 14 L) through the mounting hole into the thread part of band fitting.
4. After setting the whole body to the detecting position by sliding, tighten the mounting screw (M3 x 0.5 x 14 L) to secure the auto switch while properly contacting the auto switch bottom part and the cylinder tube. (Tightening torque of M3 screw should be 0.8 to 1 N·m.)
5. Modification of the detection position should be made in the condition of 3.
6. After auto switch is mounted and fixed, attach a protective tube on the tip of an auto switch mounting screw (M3 x 0.5 x 14 L).

⚠ Caution

1. Tighten the screw under the specified torque when mounting auto switch.
2. Set the auto switch mounting band perpendicularly to cylinder tube.



[Stainless Steel Mounting Screw]
The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting band is not included, order it separately.)

BBA4: For D-C7/C8/H7

"D-H7BA" switch is set on the cylinder with the stainless steel screws above when shipped.
When only an auto switch is shipped independently, the BBA4 is attached.

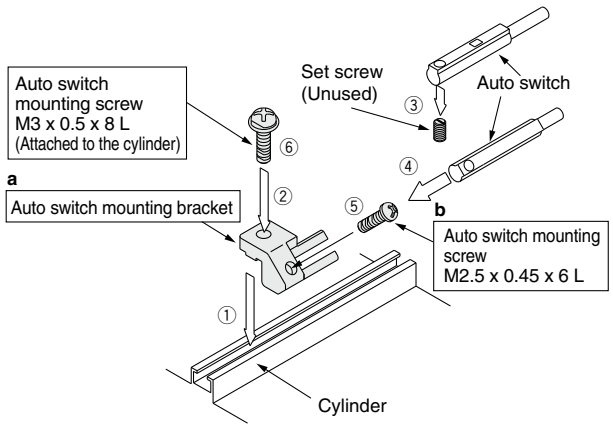
Stainless Steel Mounting Screw Set

Part no.	Contents			Applicable auto switch mounting bracket part no.	Applicable auto switch
	Description	Size	Q'ty		
BBA4	Auto switch mounting screw	M3 x 0.5 x 14 L	1	BJ2-006, BJ2-010, BJ2-016	D-C7, C8
				BM2-020, BM2-025, BM2-032, BM2-040	D-H7

Mounting Bracket Rail Mounting Type

<Applicable auto switch>
Solid state ····· D-M9N(V), D-M9P(V), D-M9B(V), D-M9NW(V), D-M9PW(V), D-M9BW(V), D-M9NA(V), D-M9PA(V), D-M9BA(V)
Reed ····· D-A90(V), A93(V), A96(V)

1. Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.
2. Fit the convex part of the auto switch mounting bracket arm over the concave part of the rail, and slide the arm to the nut position.
3. Push the auto switch mounting screw lightly into the hexagon nut through the hole of the auto switch mounting arm.
4. Remove the set screw (M2.5) attached to the auto switch.
5. Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.
6. Secure the auto switch mounting screw (M2.5 x 0.45 x 6 L). (Tightening torque of M2.5 screw: 0.1 to 0.2 N·m)
7. Secure the auto switch mounting screw (3) after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to 0.7 N·m)
8. Modify the detecting position while the auto switch is secured at the position of (3) in the figure.

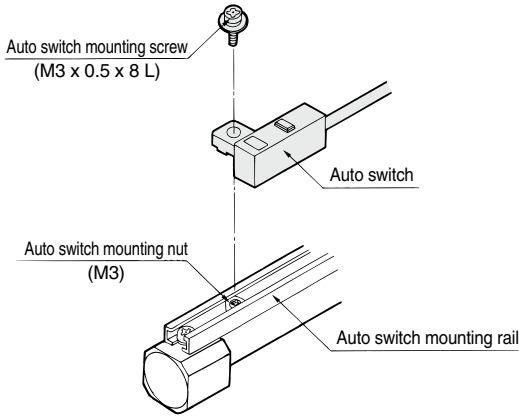


• BQ2-012 is a set of a and b shown above.

<Applicable auto switch>
Solid state ····· D-F79, D-F7P, D-J79, D-F7NV, D-F7PV, D-F7BV, D-J79C, D-F79W, D-F7PW, D-J79W, D-F7NWV, D-F7BWV, D-F79F, D-F7BA, D-F7BAV,
Reed ····· D-A72, D-A73, D-A80, D-A72H, D-A73H, D-A76H, D-A80H, D-A73C, D-A80C, D-A79W

How to Mount and Move the Auto Switch

1. Slide the auto switch mounting nut (M3) inserted into the mounting rail and set it at the auto switch mounting position.
2. Fit the convex part of auto switch mounting arm into the concave part of auto switch mounting rail. Then slide the switch over the nut.
3. Push the auto switch mounting screw (M3 x 0.5 x 8 L) lightly into the mounting nut (M3) through the hole of auto switch mounting arm.
4. After reconfirming the detecting position, tighten the mounting screw (M3 x 0.5 x 8 L) to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7 N·m.)
5. Modification of the detecting position should be made in the condition of 3.



[Stainless Steel Mounting Screw]
The following stainless steel mounting screw kit (including nuts) is available. Use it in accordance with the operating environment. (Since the auto switch spacer is not included, order it separately.)
BBA2: For D-A7/A8/F7/J7
"D-F7BA" auto switch is set on the cylinder with the stainless steel screws above when shipped.
When only an auto switch is shipped independently, the BBA2 is attached.

Stainless Steel Mounting Screw Set

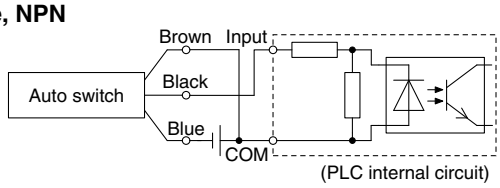
Part no.	Contents				Applicable auto switch mounting bracket part no.	Applicable auto switch
	No.	Description	Size	Q'ty		
BBA2	1	Auto switch mounting screw	M3 x 0.5 x 6 L	1	BMU1-025	D-A7, A8 D-F7, J7
			M3 x 0.5 x 8 L	1	BQ-1	
			M3 x 0.5 x 10 L	1	BQ-2	
	2	Auto switch mounting nut (Hexagon nut)	M3 x 0.5	1	BQ-1	
	3	Auto switch mounting nut (Convex shape)	M3 x 0.5	1	BQ-2	

Note 1) A spacer for BQ-2 (black resin) is not included.
Note 2) When using D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) auto switches with BQ2-012, use stainless steel screws suitable for the auto switch mounting bracket.

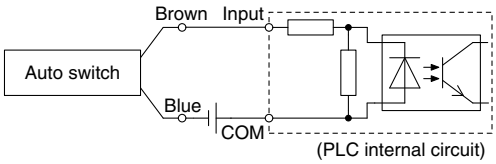
Prior to Use
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

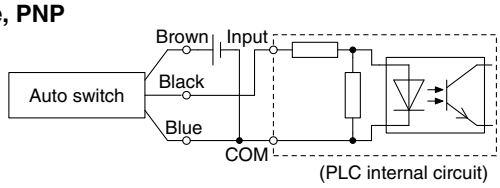


2-wire

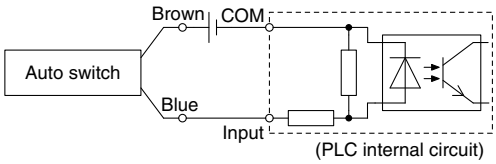


Source Input Specifications

3-wire, PNP



2-wire



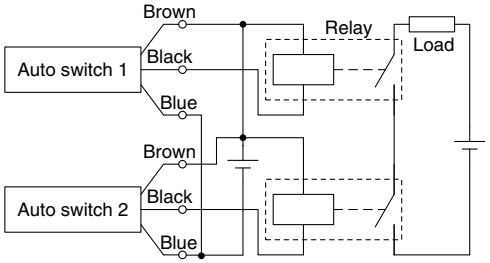
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

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

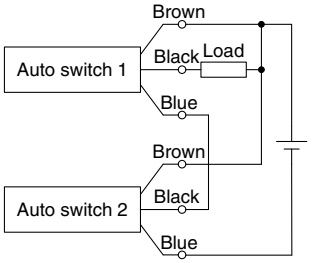
∗ When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

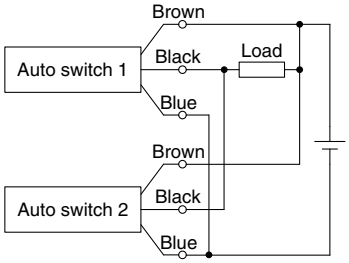
(Using relays)



(Performed with auto switches only)

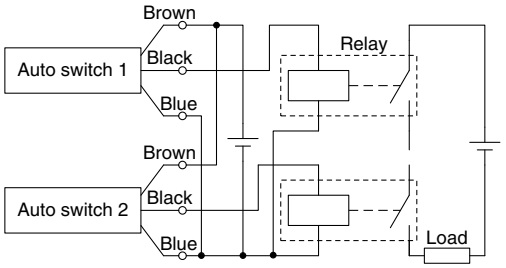


3-wire OR connection for NPN output

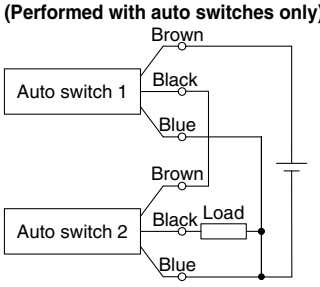


3-wire AND connection for PNP output

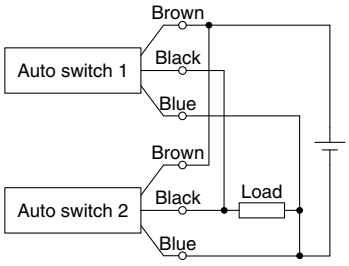
(Using relays)



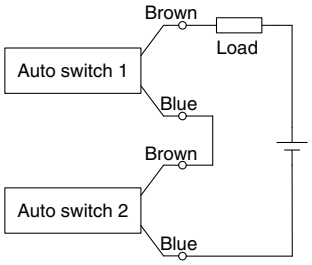
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

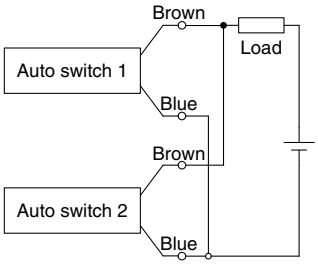


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up when both of the auto switches are in the ON state.
Auto switches with load voltage less than 20 V cannot be used.

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

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

2-wire OR connection



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

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

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

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

Air Cylinder: Standard
Double Acting with End of Stroke Cushioning
Series CP96
ø32, ø40, ø50, ø63, ø80, ø100, ø125

The CP96 series (standard type, ø32 to ø100) has been remodeled. When selecting a product, please consider using the new **CP96 series**.

How to order

CP96S B 32 – 100 J W – [ ]

With auto switch **CP96SD** B 32 – 100 J W – M9BW S – [ ]

With auto switch
(Built-in magnet)

Mounting

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

∗ Mounting brackets are shipped together, (but not assembled).

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm
125	125 mm

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 44.

Rod boot

Nil	Without rod boot
J	Nylon tarpaulin (one side)
JJ	Nylon tarpaulin (both sides)
K	Heat resistant tarpaulin (one side)
KK	Heat resistant tarpaulin (both sides)

Rod

Nil	Single rod
W	Double rod

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Made to Order
Refer to page 44 for details.

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

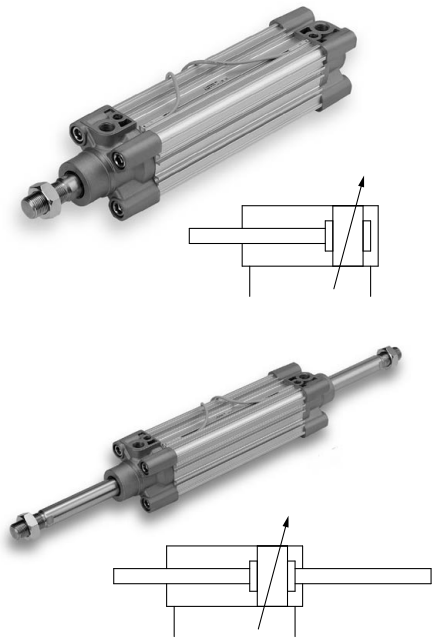
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				M9P	●	●	●	○	○		
				2-wire		12 V		M9B	●	●	●	○	○	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	●	●	●	○	○	IC	
				3-wire (PNP)				M9PW	●	●	●	○	○		
				2-wire		12 V		M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NA∗1	○	○	●	○	○	IC	
				3-wire (PNP)				M9PA∗1	○	○	●	○	○		
				2-wire		12 V		M9BA∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	●	—	●	—	—	IC	—
				2-wire	24 V	12 V	100 V	A93	●	●	●	●	—	—	Relay, PLC
			No				100 V or less	A90	●	—	●	—	—	IC	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

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

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

∗ Since there are other applicable auto switches than listed above, refer to the Best Pneumatics No. 2 for details.
∗ For details about auto switches with pre-wired connector, refer to the Best Pneumatics No. 2.
∗ The D-A9□/M9□/M9□W/M9□A auto switches are shipped together, (but not assembled).
(However, only the auto switch mounting brackets are assembled before shipment.)
Note) D-Y59A, Y69A, Y7P, Y7□W, Z7□, Z80 type cannot be mounted on the CP96 series.
Moreover, the D-M9□□ and A9□ auto switches cannot be mounted on square groove of the CP96 series.



Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 54.

Made to Order

(For details, refer to pages 84 to 91.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (150°C)
-XC4	With heavy duty scraper
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC22	Fluororubber seal
-XC35	With coil scraper
-XC68	Made of stainless steel (with hard chrome plated piston rod)

⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.

Specifications

Bore size (mm)	32	40	50	63	80	100	125
Action	Double acting						
Fluid	Air						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Min. operating pressure	0.05 MPa						
Ambient and fluid temperature	Without auto switch: –20 to 70°C (No freezing) With auto switch : –10 to 60°C (No freezing)						
Lubrication	Not required (Non-lube)						
Operating piston speed	50 to 1000 mm/s						50 to 700 mm/s
Allowable stroke tolerance	Up to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 to 1500 st: $^{+1.8}_{0}$, 1501 to 2000 st: $^{+2.2}_{0}$						
Cushion	Air cushion						
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2	G 1/2
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion						

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. stroke Note)
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	2000
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	2000
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	2000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	2000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800	2000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800	2000
125	—	2000

Intermediate strokes are available.
Note) Please consult with SMC for longer strokes.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Piston rod ball joint	●	●	●	●	●	●	●
	Rod clevis	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

∗ Do not use a piston rod ball joint (or floating joint) together with a single clevis with a ball joint (or clevis pivot bracket with a ball joint).

Theoretical Output

OUT IN

(N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	25	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7068	7854
		IN	7363	1473	2209	2945	3682	4418	5154	5890	6627	7363
125	32	OUT	12272	2454	3682	4909	6136	7363	8590	9817	11045	12272
		IN	11468	2294	3440	4587	5734	6881	8027	9174	10321	11468

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Weights (Single rod)

(kg)

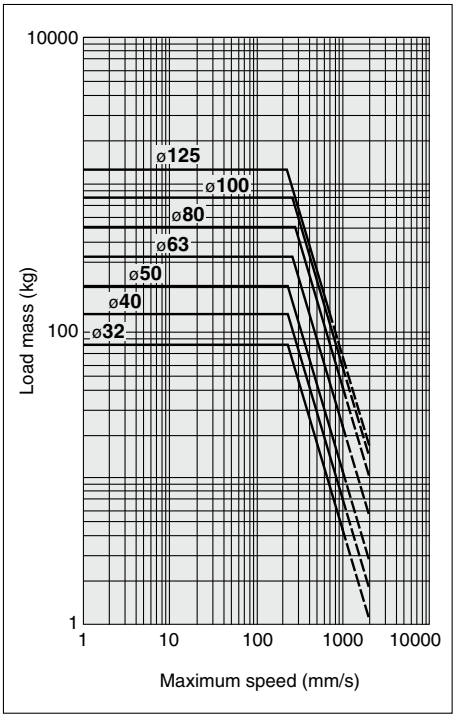
Bore size (mm)		**32**	**40**	**50**	**63**	**80**	**100**	**125**
Basic weight	Basic	0.55	0.84	1.36	1.77	2.84	3.77	6.82
	Foot	0.16	0.20	0.38	0.46	0.89	1.09	2.60
	Flange	0.20	0.23	0.47	0.58	1.30	1.81	4.10
	Single clevis	0.16	0.23	0.37	0.60	1.07	1.73	4.15
	Double clevis	0.20	0.32	0.45	0.71	1.28	2.11	4.25
	Trunnion	0.71	1.10	1.73	2.48	4.25	5.95	2.98
Additional weight per 50 mm of stroke	All mounting brackets	0.14	0.18	0.30	0.32	0.49	0.54	0.84
Accessories	Single clevis	0.07	0.11	0.22		0.40		1.20
	Double clevis	0.09	0.15	0.34		0.69		1.84

Calculation: Example) **CP96SD40-100**

- Basic weight ····· 0.84 (kg) (Basic, ø40)
- Additional weight ····· 0.18 (kg/50 st)
- Cylinder stroke ····· 100 (st)
- Mounting bracket weight ····· 0.32 (kg) (Double clevis)

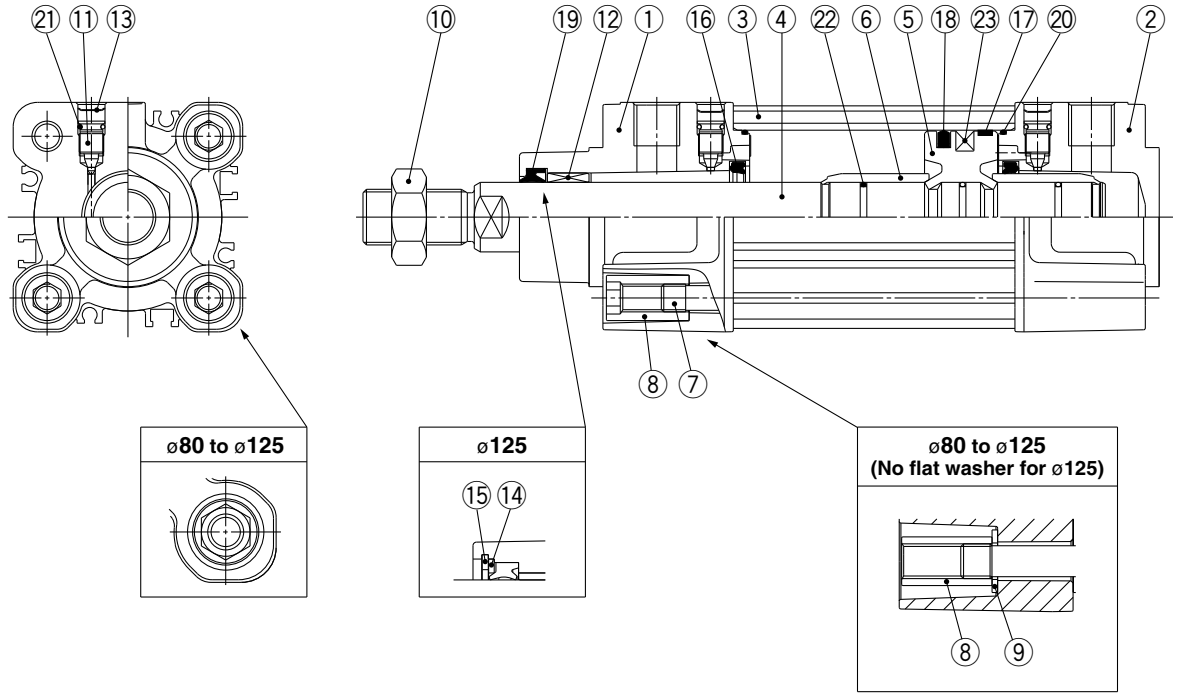
0.84 + 0.18 x 100 ÷ 50 + 0.32 = 1.52 kg

Allowable Kinetic Energy



(Example) Find the upper limit of rod end load when an air cylinder of ø63 is operated at 500 mm/s. From a point indicating 500 mm/s on the axis of abscissas, extend a line upward and find a point where it intersects with a line for the 63 mm bore size. Extend a line from the intersection to the left and find a load mass 80 kg.

Construction



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum die-cast	
2	**Head cover**	Aluminum die-cast	
3	**Cylinder tube**	Aluminum alloy	
4	**Piston rod**	Carbon steel	
5	**Piston**	Aluminum alloy	
6	**Cushion ring**	Aluminum alloy	
7	**Tie-rod**	Carbon steel	
8	**Tie-rod nut**	Steel	
9	**Flat washer**	Steel	ø80, ø100
10	**Rod end nut**	Steel	
11	**Cushion valve**	Steel wire	
12	**Bushing**	Bearing alloy	
13	**Retaining ring**	Steel for spring	ø40 to ø125
14	**Rod seal holder**	Stainless steel	ø125
15	**Retaining ring**	Steel for spring	ø125
16	**Cushion seal**	Urethane rubber	
17	**Wear ring**	Resin	
18	**Piston seal**	NBR	
19	**Rod seal**	NBR	
20	**Cylinder tube gasket**	NBR	
21	**Cushion valve seal**	NBR	
22	**Piston gasket**	NBR	
23	**Magnet**		

Replacement Parts/Seal Kit (Single rod)

Bore size (mm)	Kit no.	Contents
32	CS95-32	Kits include items ⑯ to ⑳.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS96-100	
125	CS96-125	

∗ Seal kits consist of items ⑯ to ⑳, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

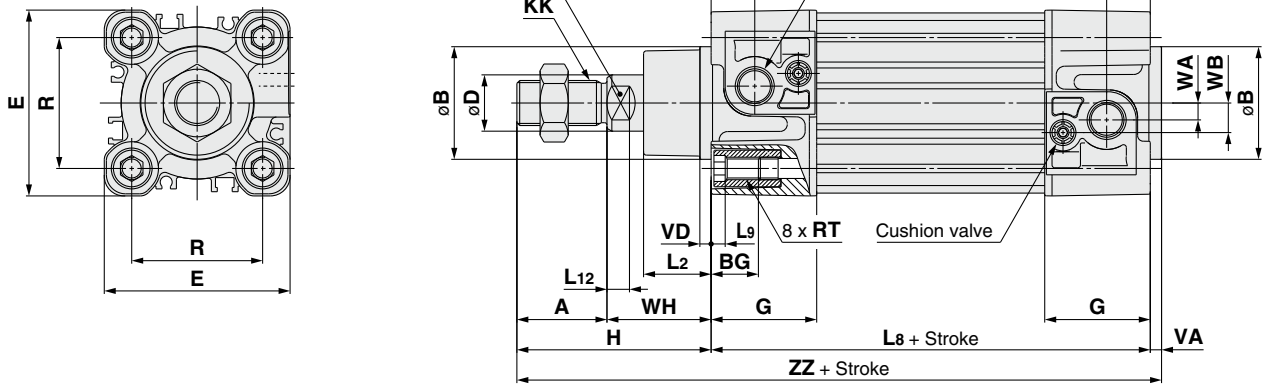
Seal Kit (Double rod)

Bore size (mm)	Kit no.	Contents
32	CS95W-32	Kits include items ⑯ and ⑱ to ⑳.
40	CS95W-40	
50	CS95W-50	
63	CS95W-63	
80	CS95W-80	
100	CS96W-100	
125	CS96W-125	

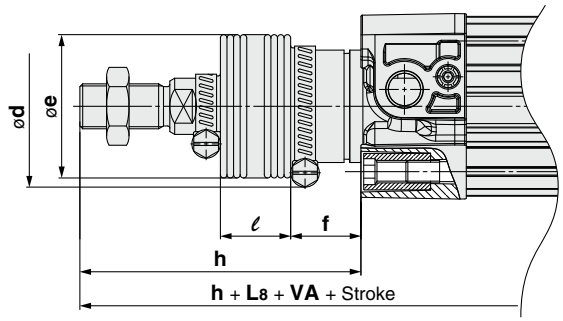
∗ Seal kits consist of items ⑯ and ⑱ to ⑳, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

Dimensions

Basic: CP96S(D)B Bore size – Stroke



With rod boot

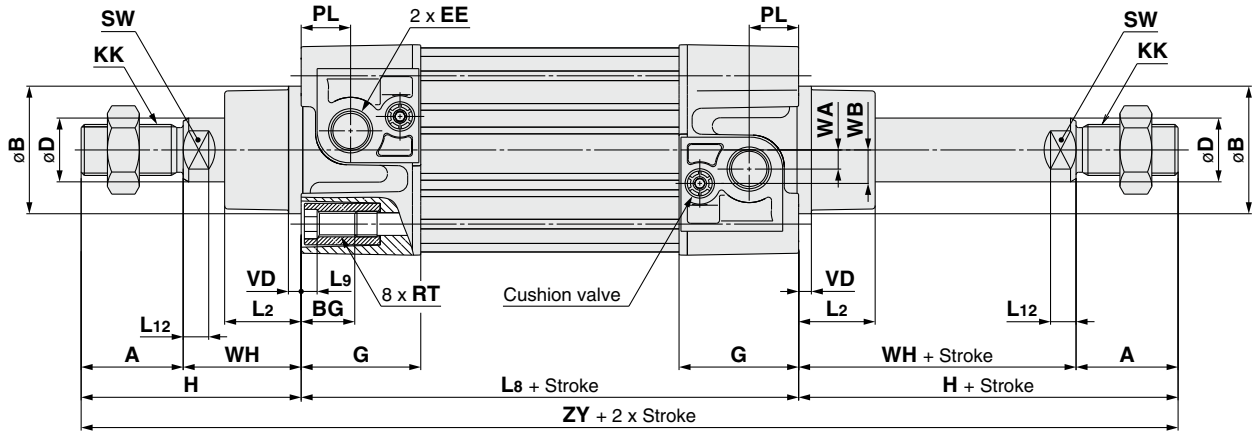


Bore size (mm)	Stroke range (mm)		A	øB d11	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	E	R
	Without rod boot	With rod boot																				
32	Up to 2000	Up to 1000	22	30	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	4	7	26	146	47	32.5
40	Up to 2000	Up to 1000	24	35	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	4	5	9	30	163	54	38
50	Up to 2000	Up to 1000	32	40	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	4	6	10.5	37	179	66	46.5
63	Up to 2000	Up to 1000	32	45	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	4	9	12	37	194	77	56.5
80	Up to 2000	Up to 1000	40	45	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	4	11.5	14	46	218	99	72
100	Up to 2000	Up to 1000	40	55	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	4	17	15	51	233	118	89
125	Up to 2000	Up to 1000	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	58	20	160	6	6	17	15	65	285	144	110

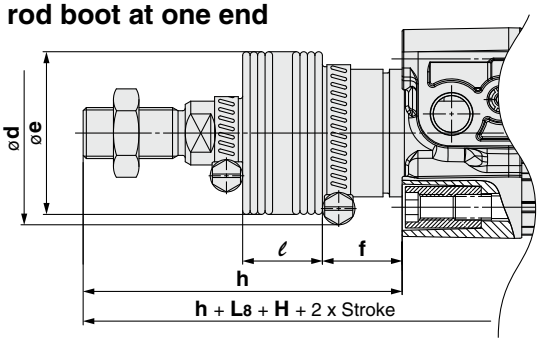
Bore size (mm)	L2	L9	H	ød	øe	f	ℓ											h										
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000
32	15	4	48	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
40	17	4	54	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
50	24	5	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
63	24	5	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
80	30	—	86	68	56	30	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
100	32	—	91	76	56	32	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
125	40	—	119	82	75	40	10	20	30	40	60	80	100	120	140	160	180	200	130	140	150	160	180	200	220	240	260	280	300	320

Dimensions

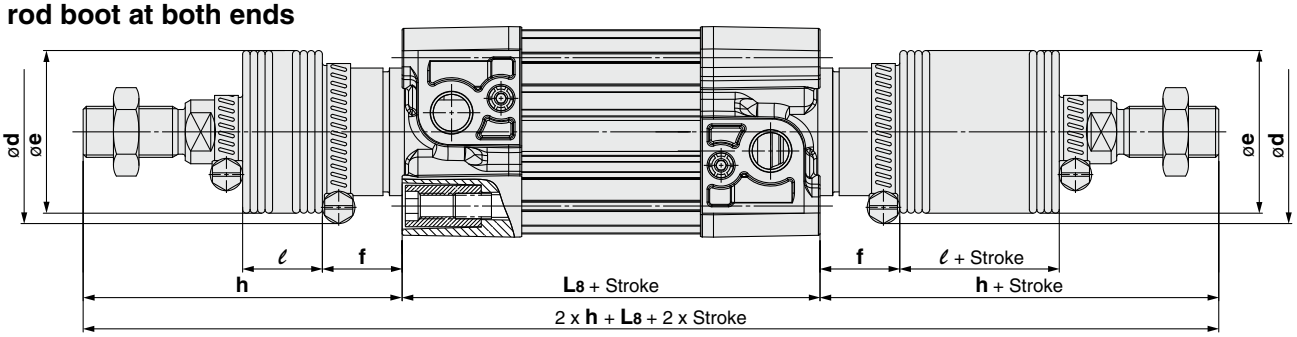
Basic: CP96S(D)B Bore size – Stroke W



With rod boot at one end



With rod boot at both ends

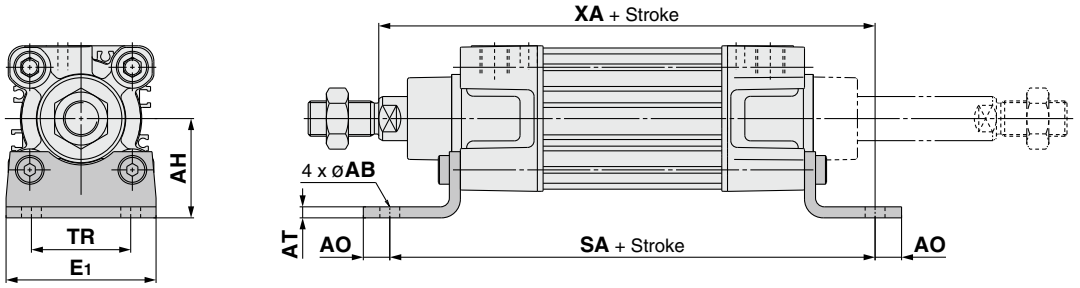


Bore size (mm)	Stroke range (mm)	A	øB d11	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	WA	WB	WH	ZY	L2	L9
32	Up to 1000	22	30	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	7	26	190	15	4
40	Up to 1000	24	35	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	5	9	30	213	17	4
50	Up to 1000	32	40	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	6	10.5	37	244	24	5
63	Up to 1000	32	45	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	9	12	37	259	24	5
80	Up to 1000	40	45	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	11.5	14	46	300	30	—
100	Up to 1000	40	55	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	17	15	51	320	32	—
125	Up to 1000	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	58	20	160	6	17	15	65	398	40	—

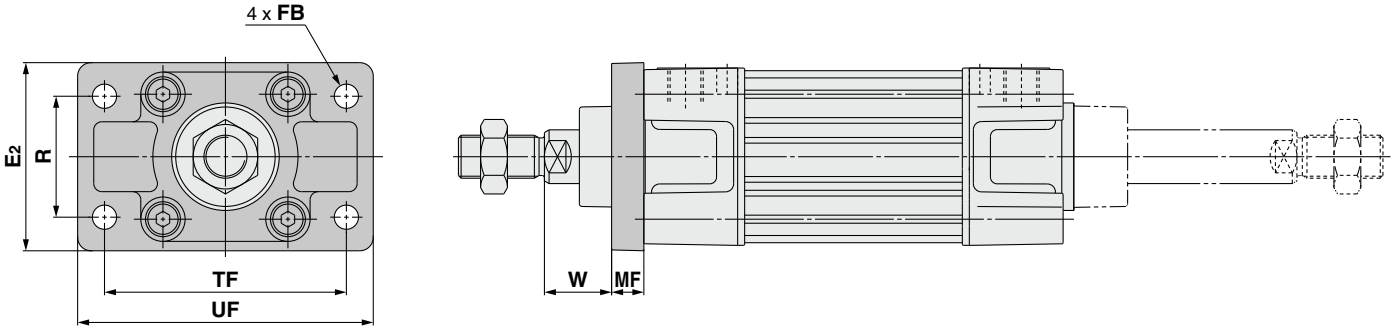
Bore size (mm)	H	ød	øe	f	ℓ												h											
					1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000
32	48	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
40	54	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
50	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
63	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
80	86	68	56	30	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
100	91	76	56	32	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
125	119	82	75	40	10	20	30	40	60	80	100	120	140	160	180	200	130	140	150	160	180	200	220	240	260	280	300	320

Dimensions

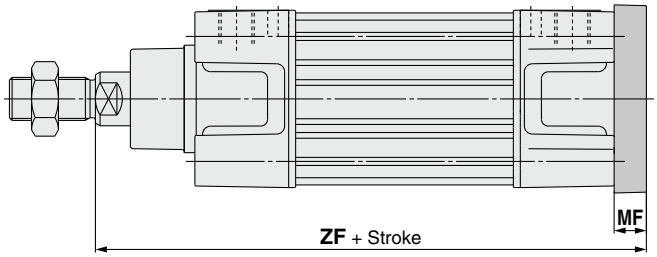
Axial foot (L)

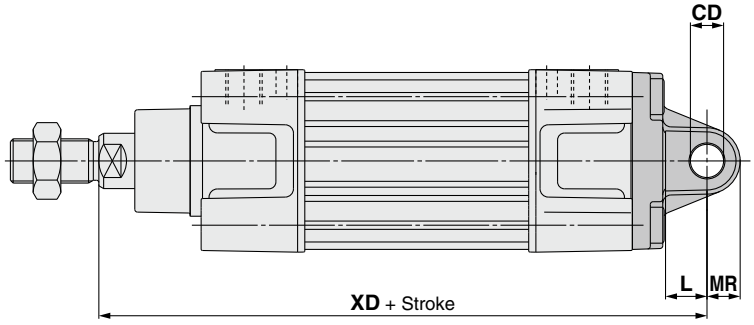


Rod flange (F)

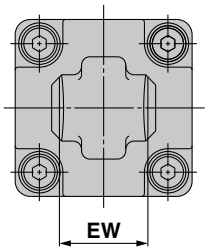


Head flange (G)

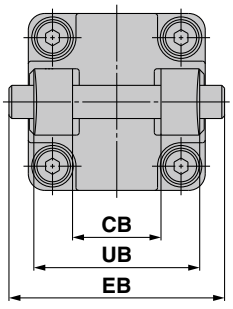




Single clevis (C)



Double clevis (D)



(mm)

Bore size (mm)	E1	TR	AH	AO	AT	AB	SA	XA	R	TF	FB	E2	UF	W	MF	ZF	UB h14	CB H14	EW	CD H9	L	MR	XD	EB
32	48	32	32	10	4.5	7	142	144	32	64	7	50	79	16	10	130	45	26	$26^{-0.2}_{-0.6}$	10	12	9.5	142	65
40	55	36	36	11	4.5	10	161	163	36	72	9	55	90	20	10	145	52	28	$28^{-0.2}_{-0.6}$	12	15	12	160	75
50	68	45	45	12	5.5	10	170	175	45	90	9	70	110	25	12	155	60	32	$32^{-0.2}_{-0.6}$	12	15	12	170	80
63	80	50	50	12	5.5	10	185	190	50	100	9	80	120	25	12	170	70	40	$40^{-0.2}_{-0.6}$	16	20	16	190	90
80	100	63	63	14	6.5	12	210	215	63	126	12	100	153	30	16	190	90	50	$50^{-0.2}_{-0.6}$	16	20	16	210	110
100	120	75	71	16	6.5	14.5	220	230	75	150	14	120	178	35	16	205	110	60	$60^{-0.2}_{-0.6}$	20	25	20	230	140
125	Max. 157	90	90	Max. 25	8	16	250	270	90	180	16	Max.157	Max. 224	45	20	245	130	70	$70^{-0.5}_{-1.2}$	25	Min. 30	Max. 26	275	Max. 157

ISO Standards

Air Cylinder: Non-rotating Type
Double Acting, Single/Double Rod
Series CP96K
ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CP96K **B** **32** – **100** **W**

With auto switch **CP96KD** **B** **32** – **100** **W** – **M9BW** **S**

With auto switch
(Built-in magnet)

Mounting

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

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Cylinder stroke (mm)
Refer to "Maximum Strokes" on page 51.

Rod

Nil	Single rod
W	Double rod

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Applicable Auto Switches/Tie-rod mounting

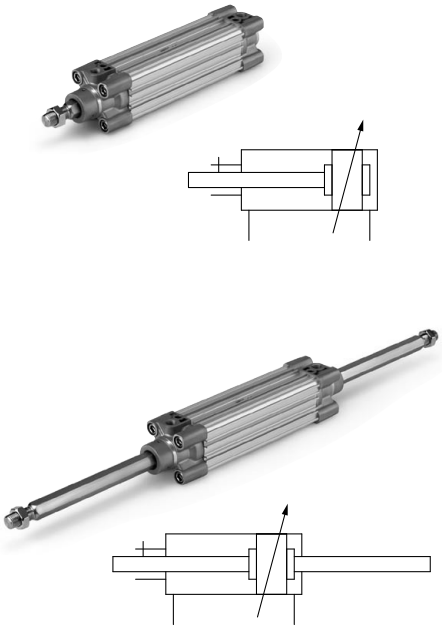
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9N**	●	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				**M9P**	●	●	●	○	○		
				2-wire		12 V		**M9B**	●	●	●	○	○	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**M9NW**	●	●	●	○	○	IC	
				3-wire (PNP)				**M9PW**	●	●	●	○	○		
				2-wire		12 V		**M9BW**	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NA**∗1	○	○	●	○	○	IC	
				3-wire (PNP)				**M9PA**∗1	○	○	●	○	○		
				2-wire		12 V		**M9BA**∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96**	●	—	●	—	—	IC	—
				2-wire	24 V	12 V	100 V	**A93**	●	●	●	●	—	—	Relay, PLC
			No				100 V or less	**A90**	●	—	●	—	—	IC	

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

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

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

∗ Since there are other applicable auto switches than listed above, refer to the Best Pneumatics No. 2 for details.
∗ For details about auto switches with pre-wired connector, refer to the Best Pneumatics No. 2.
∗ The D-A9□/M9□/M9□W/M9□AL auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)
Note) D-Y59A, Y69A, Y7P, Y7□W, Z7□, Z80 type cannot be mounted on the CP96K series. Moreover, the D-M9□□ and A9□ auto switches cannot be mounted on square groove of the CP96 series.



Specifications

Bore size (mm)	32	40	50	63	80	100
Action	Double acting					
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: –20 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Piston speed	50 to 1000 mm/s					
Stroke length tolerance	Up to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$					
Cushion	Both sides (Air cushion)					
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion					
Non-rotating accuracy	±0.5°		±0.5°		±0.3°	
Allowable rotational torque (N·m)	0.25	0.45	0.64		0.79	

Minimum Stroke for Auto Switch Mounting

Refer to “Minimum Stroke for Auto Switch Mounting” on page 54.

Maximum Strokes

Bore size (mm)	Maximum stroke *
32	500
40	500
50	600
63	600
80	800
100	800

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	—
	Clevis pin	—	—	—	—	—	●	—
Option	Piston rod ball joint	●	●	●	●	●	●	—
	Rod clevis	●	●	●	●	●	●	—
	Rod boot	—	—	—	—	—	—	—

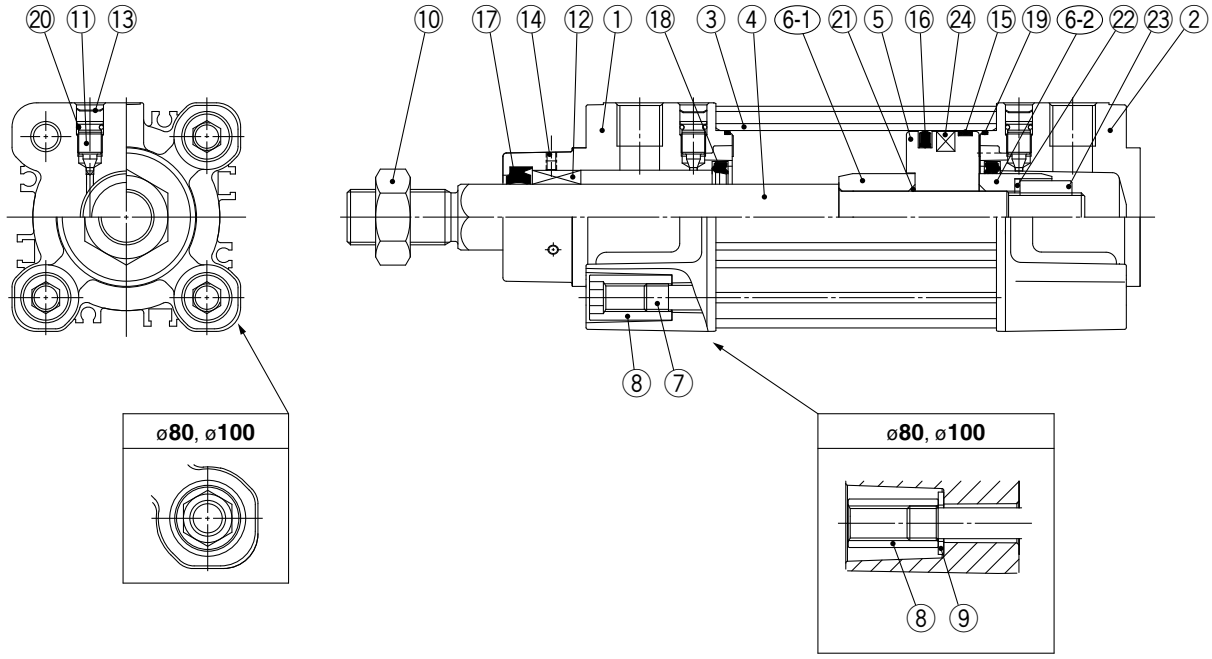
* Do not use a piston rod ball joint (or floating joint) together with a single clevis with a ball joint (or clevis pivot bracket with a ball joint).

⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuator and Auto Switch Precautions.

Construction



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum die-cast	
2	**Head cover**	Aluminum die-cast	
3	**Cylinder tube**	Aluminum alloy	
4	**Piston rod**	Stainless steel	
5	**Piston**	Aluminum alloy	
6-1	**Cushion ring**	Steel	
6-2	**Cushion ring**	Steel	
7	**Tie-rod**	Carbon steel	
8	**Tie-rod nut**	Steel	
9	**Flat washer**	Steel	ø80, ø100
10	**Rod end nut**	Steel	
11	**Cushion valve**	Steel wire	
12	**Non-rotating guide**	Bearing alloy	
13	**Retaining ring**	Steel for spring	ø40 to ø100
14	**Set screw**	Steel	
15	**Wear ring**	Resin	
16	**Piston seal**	NBR	
17	**Rod seal**	NBR	
18	**Cushion seal**	Urethane rubber	
19	**Cylinder tube gasket**	NBR	
20	**Cushion valve seal**	NBR	
21	**Piston gasket**	NBR	
22	**Spring washer**	Steel	
23	**Piston nut**	Steel	
24	**Magnet**		

Replacement Parts/Seal Kit (Single rod)

Bore size (mm)	Kit no.	Contents
32	CK95-32	Kits include items ⑮ to ⑲.
40	CK95-40	
50	CK95-50	
63	CK95-63	
80	CK95-80	
100	CK96-100	

∗ Seal kits consist of items ⑮ to ⑲, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

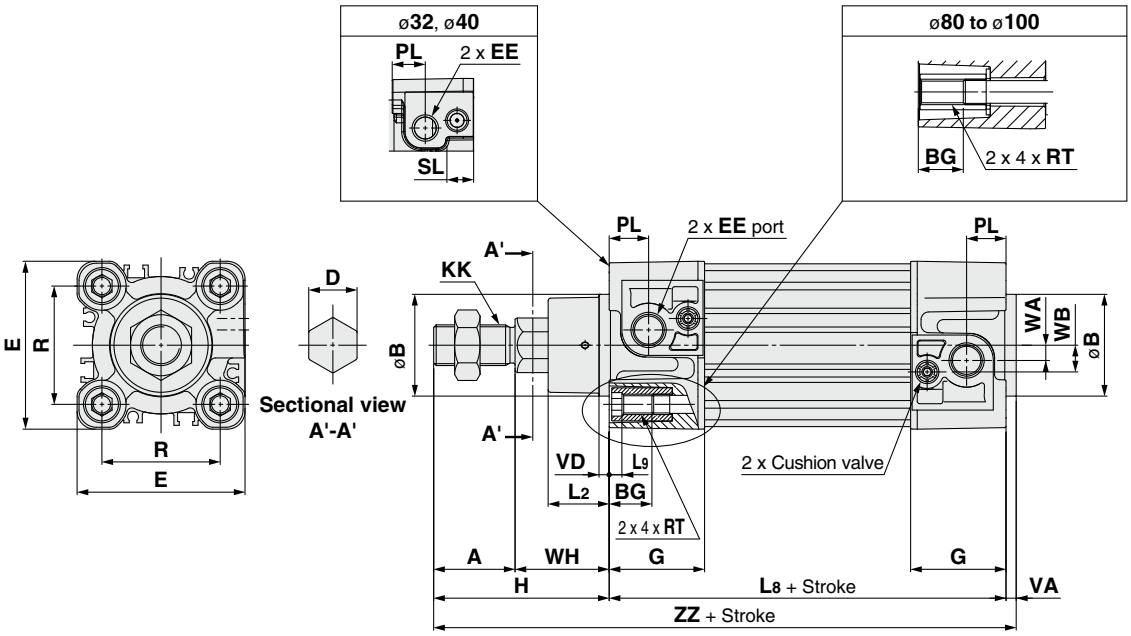
Seal Kit (Double rod)

Bore size (mm)	Kit no.	Contents
32	CK95W-32	Kits include items ⑯ to ⑲.
40	CK95W-40	
50	CK95W-50	
63	CK95W-63	
80	CK95W-80	
100	CK96W-100	

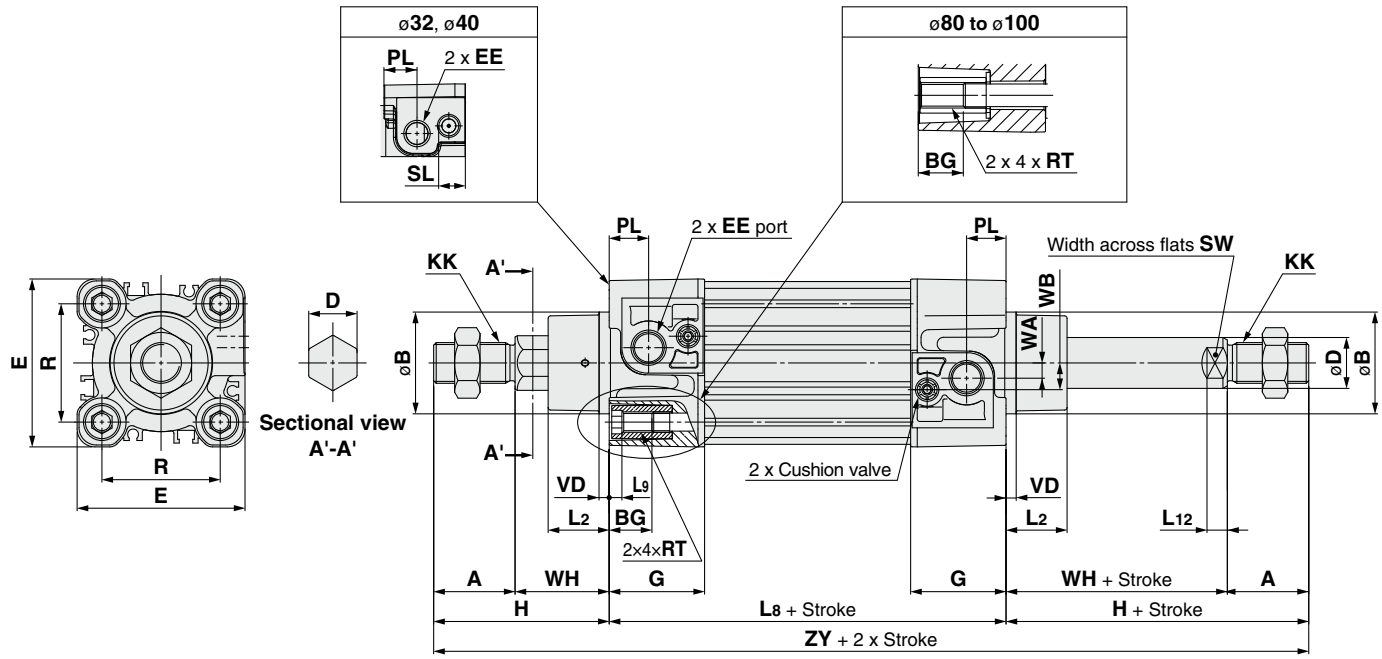
∗ Seal kits consist of items ⑯ to ⑲, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

Dimensions (Without mounting bracket)

CP96K(D)B Bore size – Stroke



CP96K(D)B Bore size – Stroke W



∗ Mounting brackets are the same as standard type. Refer to page 49 for details.

Bore size (mm)	Stroke range (mm)	A	øB d11	D	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	ZY	E	R	L2	L9	H	SL
32	Up to 500	22	30	12.2	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	4	7	26	146	190	47	32.5	15	4	48	10
40	Up to 500	24	35	14.2	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	4	5	9	30	163	213	54	38	17	4	54	12
50	Up to 600	32	40	19	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	4	6	10.5	37	179	244	66	46.5	24	5	69	—
63	Up to 600	32	45	19	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	4	9	12	37	194	259	77	56.5	24	5	69	—
80	Up to 800	40	45	23	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	4	11.5	14	46	218	300	99	72	30	—	86	—
100	Up to 800	40	55	23	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	4	17	15	51	233	320	118	89	32	—	91	—

Series CP96
Auto Switch Mounting

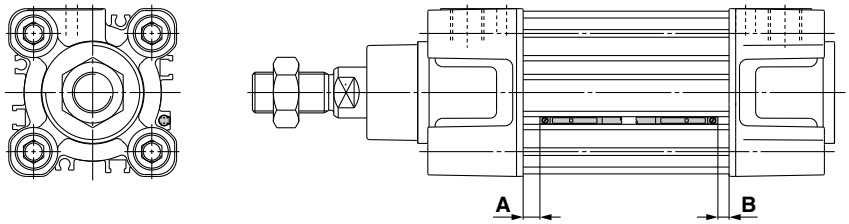
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches	32	40	50	63	80	100	125
D-M9□	With 2 pcs. (Different surfaces, Same surface)	15				10		
	With 1 pc.	15				10		
	With n pcs.	15 + 5 (n – 2)				10 + 10 (n – 2)		
D-M9□W D-M9□A	With 2 pcs. (Different surfaces, Same surface)	15				10		
	With 1 pc.	15				10		
	With n pcs.	15 + 10 (n – 20)				10 + 10 (n – 2)		10 + 15 (n – 2)
D-A9□	With 2 pcs. (Different surfaces, Same surface)	15						
	With 1 pc.	15				10		
	With n pcs.	15 + 10 (n – 20)		15 + 15 (n – 20)				15 + 20 (n – 2)

Note) n = 3 , 4, 5···

Auto Switch Proper Mounting Position (Detection at stroke end)



Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-M9□A		D-A9□	
	A	B	A	B
32	10.5	8	6.5	4
40	10.5	8	6.5	4
50	11	8.5	7	4.5
63	11	8.5	7	4.5
80	14	12.5	10	8.5
100	14	12.5	10	8.5
125	16	16	12	12

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

Operating Range

(mm)

Auto switch model	Bore size						
	32	40	50	63	80	100	125
D-M9□ D-M9□W D-M9□A	4	4	5	6	5.5	6	7
D-A9□	7	8	8.5	9.5	9.5	10.5	12.5

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

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

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

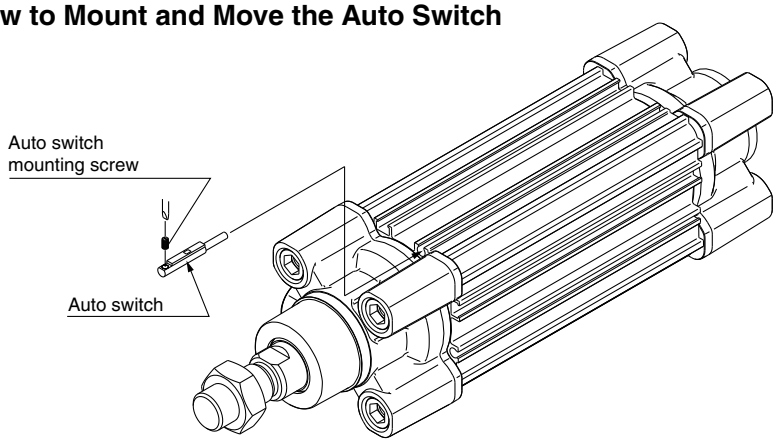
How to Mount and Move the Auto Switch

<Applicable Auto Switch>

Solid state switch····· D-M9N/M9P/M9B
D-M9NW/M9PW/M9BW
D-M9NA/M9PA/M9BA

Reed switch····· D-A90/A93/A96

How to Mount and Move the Auto Switch



• Use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm when tightening the auto switch mounting screw.

Auto switch mounting screw tightening torque

(N·m)

Auto switch model	Tightening torque
D-M9□ **D-M9□W** **D-M9□A**	0.05 to 0.15
D-A9□	0.10 to 0.20

∗ As a guide, turn 90° from the position where it comes to feel tight.
Note) D-M9□ and A9□ type cannot be mounted on square groove of the CP96 series.

ISO Standards

Air Cylinder: Standard Type
Double Acting, Single/Double Rod

Series C96

ø32, ø40, ø50, ø63, ø80, ø100, ø125

The C96 series (standard type, ø32 to ø100) has been remodeled. When selecting a product, please consider using the new **C96 series**.

How to Order

	C96S	B	32	–	100	J	W	–						
With auto switch	C96SD	B	32	–	100	J	W	–	M9BW	S	–			

With auto switch (Built-in magnet)

Mounting

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

∗ Mounting brackets except center trunnion type are shipped together, (but not assembled).

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm
125	125 mm

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 57.

Rod boot

Nil	Without rod boot
J	Nylon tarpaulin (one side)
JJ	Nylon tarpaulin (both sides)
K	Heat resistant tarpaulin (one side)
KK	Heat resistant tarpaulin (both sides)

Rod

Nil	Single rod
W	Double rod

Number of auto switches

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

Made to Order
Refer to page 57 for details.

Auto switch

Nil	Without auto switch

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

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

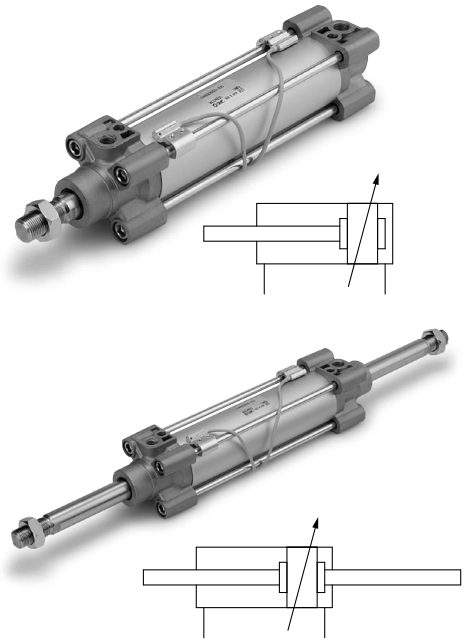
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				M9P	—	●	●	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○	—	
					—	—	100 V, 200 V	J51	—	●	—	●	○	—		
		Terminal conduit		3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	—	—	IC	
				2-wire		12 V		—	K39	—	—	—	—	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○	○	IC	
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NA∗1	—	○	○	●	○	○	IC	
				3-wire (PNP)				M9PA∗1	—	○	○	●	○	○		
				2-wire		12 V		M9BA∗1	—	○	○	●	○	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	—	●	—	●	○	○	IC	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		P4DW	—	—	—	●	●	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN Equivalent)	—	5 V	—	A96	—	●	—	●	—	—	IC	—
			No	2-wire	24 V	12 V	100 V	A93	—	●	●	●	●	—	—	Relay, PLC
			Yes				100 V or less	A90	—	●	—	●	—	—	IC	
			No				100 V, 200 V	A54	—	●	—	●	●	—	—	
							200 V or less	A64	—	●	—	●	—	—		
		Terminal conduit	Yes				—	—	A33	—	—	—	—	—		PLC
		DIN					100 V, 200 V	—	A34	—	—	—	—	—	—	Relay, PLC
								—	A44	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	—	●	—	●	—	—		

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

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

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

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



Specifications

Bore size (mm)	32	40	50	63	80	100	125
Action	Double acting						
Fluid	Air						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Min. operating pressure	0.05 MPa						
Ambient and fluid temperature	Without auto switch: –20 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)						
Lubrication	Not required (Non-lube)						
Operating piston speed	50 to 1000 mm/s						50 to 700 mm/s
Allowable stroke tolerance	Up to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 to 1500 st: $^{+1.8}_{0}$, 1501 to 2000 st: $^{+2.2}_{0}$						
Cushion	Air cushion						
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2	G 1/2
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion						

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. stroke Note)
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	1000
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	1900
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1900
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1900
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800	1900
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800	1900
125	—	2000

Intermediate strokes are available.
Note) Please consult with SMC for longer strokes.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Piston rod ball joint	●	●	●	●	●	●	●
	Rod clevis	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

∗ Do not use a piston rod ball joint (or floating joint) together with a single clevis with a ball joint (or clevis pivot bracket with a ball joint).

Minimum Stroke for Auto Switch Mounting

Refer to “Minimum Stroke for Auto Switch Mounting” on page 72.

Made to Order

(For details, refer to pages 84 to 91.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC14	Change of trunnion bracket mounting position
-XB6	Heat resistant cylinder (150°C)
-XB7	Cold resistant cylinder
-XC4	With heavy duty scraper
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC22	Fluororubber seal
-XC35	With coil scraper
-XC68	Made of stainless steel (with hard chrome plated piston rod)

⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuator and Auto Switch Precautions.

Theoretical Output

(N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	25	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7068	7854
		IN	7363	1473	2209	2945	3682	4418	5154	5890	6627	7363
125	32	OUT	12272	2454	3682	4909	6136	7363	8590	9817	11045	12272
		IN	11468	2294	3440	4587	5734	6881	8027	9174	10321	11468

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Weights (Single rod)

(kg)

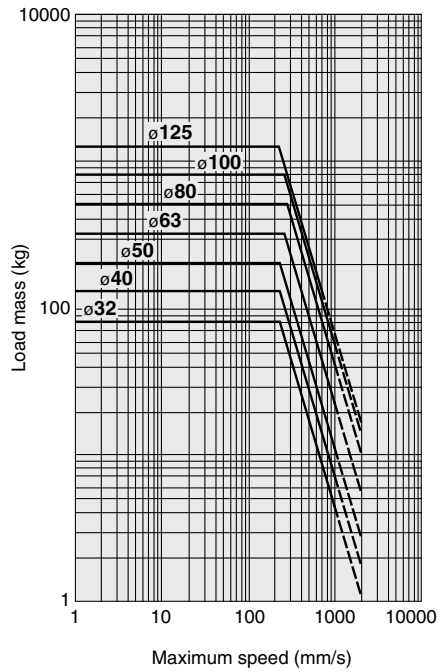
Bore size (mm)		**32**	**40**	**50**	**63**	**80**	**100**	**125**
Basic weight	Basic	0.53	0.83	1.33	1.74	2.77	3.69	6.70
	Foot	0.16	0.20	0.38	0.46	0.89	1.09	2.60
	Flange	0.20	0.23	0.47	0.58	1.30	1.81	4.10
	Single clevis	0.16	0.23	0.37	0.60	1.07	1.73	4.15
	Double clevis	0.20	0.32	0.45	0.71	1.28	2.11	4.25
	Trunnion	0.71	1.10	1.73	2.48	4.25	5.95	2.98
Additional weight per 50 mm of stroke	All mounting brackets	0.11	0.16	0.24	0.26	0.40	0.44	0.71
Accessories	Single clevis	0.07	0.11	0.22		0.40		1.20
	Double clevis	0.09	0.15	0.34		0.69		1.84

Calculation: Example) **C96SD40-100**

- Basic weight ····· 0.83 (kg) (Basic, ø40)
- Additional weight ····· 0.16 (kg/50 st)
- Cylinder stroke ····· 100 (st)
- Mounting bracket weight ····· 0.32 (kg) (Double clevis)

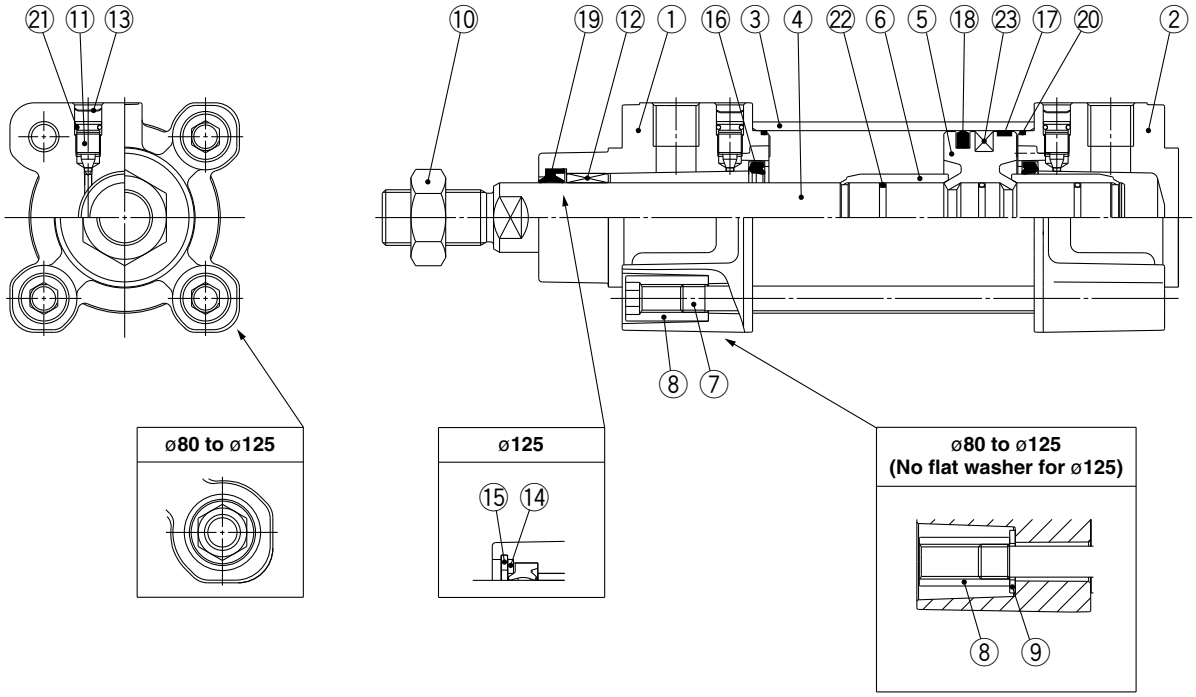
0.83 + 0.16 x 100 ÷ 50 + 0.32 = 1.47 kg

Allowable Kinetic Energy



(Example) Find the upper limit of rod end load when an air cylinder of ø63 is operated at 500 mm/s. From a point indicating 500 mm/s on the axis of abscissas, extend a line upward and find a point where it intersects with a line for the 63 mm bore size. Extend a line from the intersection to the left and find a load mass 80 kg.

Construction



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum die-cast	
2	**Head cover**	Aluminum die-cast	
3	**Cylinder tube**	Aluminum alloy	
4	**Piston rod**	Carbon steel	
5	**Piston**	Aluminum alloy	
6	**Cushion ring**	Aluminum alloy	
7	**Tie-rod**	Carbon steel	
8	**Tie-rod nut**	Steel	
9	**Flat washer**	Steel	ø80, ø100
10	**Rod end nut**	Steel	
11	**Cushion valve**	Steel wire	
12	**Bushing**	Bearing alloy	
13	**Retaining ring**	Steel for spring	ø40 to ø125
14	**Rod seal holder**	Stainless steel	ø125
15	**Retaining ring**	Steel for spring	ø125
16	**Cushion seal**	Urethane rubber	
17	**Wear ring**	Resin	
18	**Piston seal**	NBR	
19	**Rod seal**	NBR	
20	**Cylinder tube gasket**	NBR	
21	**Cushion valve seal**	NBR	
22	**Piston gasket**	NBR	
23	**Magnet**		

Replacement Parts/Seal Kit (Single rod)

Bore size (mm)	Kit no.	Contents
32	CS95-32	Kits include items ⑯ to ⑳.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS96-100	
125	CS96-125	

∗ Seal kits consist of items ⑯ to ⑳, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

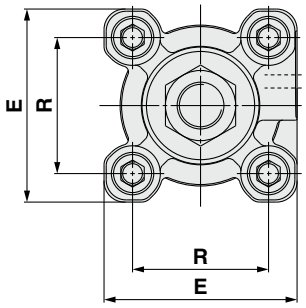
Seal Kit (Double rod)

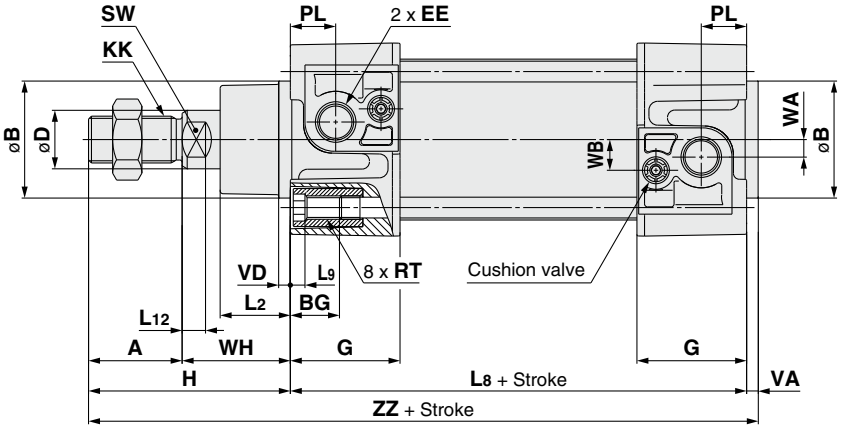
Bore size (mm)	Kit no.	Contents
32	CS95W-32	Kits include items ⑯ and ⑱ to ⑳.
40	CS95W-40	
50	CS95W-50	
63	CS95W-63	
80	CS95W-80	
100	CS96W-100	
125	CS96W-125	

∗ Seal kits consist of items ⑯ and ⑱ to ⑳, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

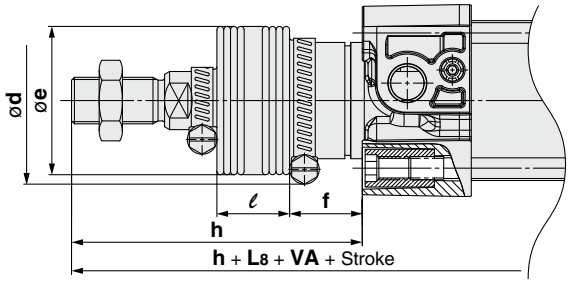
Dimensions

Basic: C96S(D)B Bore size – Stroke





With rod boot



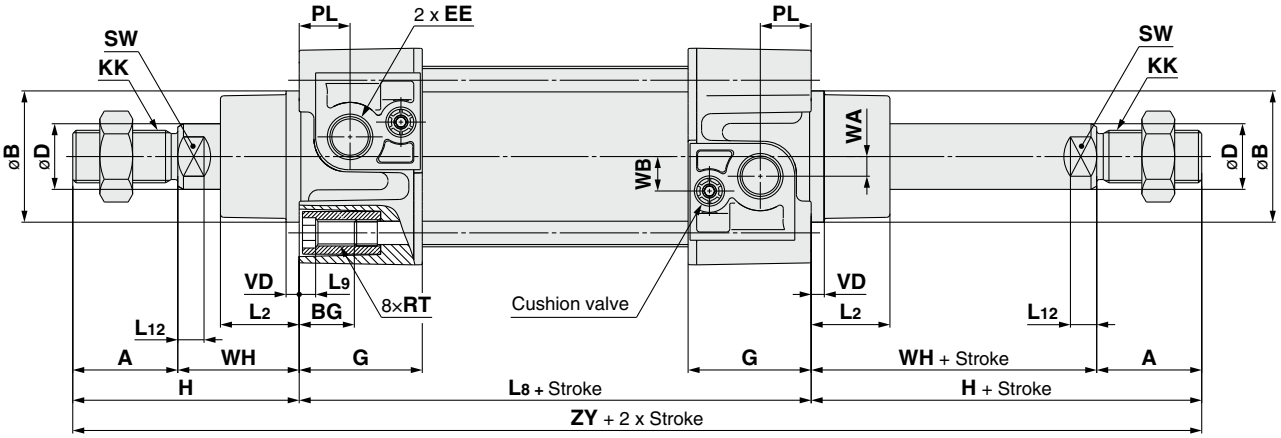
Bore size (mm)	Stroke range (mm)		A	øB d11	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	E	R
	Without rod boot	With rod boot																				
32	Up to 1000	Up to 1000	22	30	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	4	7	26	146	47	32.5
40	Up to 1900	Up to 1000	24	35	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	4	5	9	30	163	54	38
50	Up to 1900	Up to 1000	32	40	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	4	6	10.5	37	179	66	46.5
63	Up to 1900	Up to 1000	32	45	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	4	9	12	37	194	77	56.5
80	Up to 1900	Up to 1000	40	45	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	4	11.5	14	46	218	99	72
100	Up to 1900*	Up to 1000*	40	55	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	4	17	15	51	233	118	89
125	Up to 2000*	Up to 1000*	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	58	20	160	6	6	17	15	65	285	144	110

* Minimum stroke for trunnion mounting are below. Tube I.D. 32 to 80: 0 mm, Tube I.D. 100: 5 mm, Tube I.D. 125: 10 mm

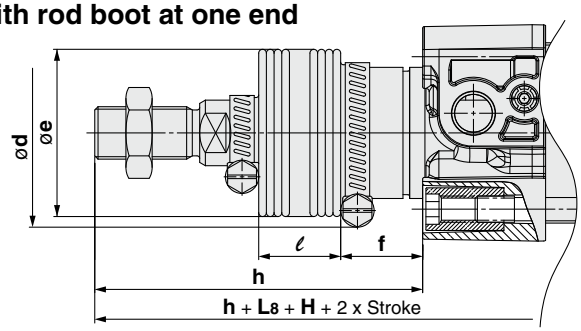
Bore size (mm)	L2	L9	H	ød	øe	f	ℓ											h										
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000
32	15	4	48	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
40	17	4	54	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
50	24	5	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
63	24	5	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
80	30	—	86	68	56	30	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
100	32	—	91	76	56	32	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
125	40	—	119	82	75	40	10	20	30	40	60	80	100	120	140	160	180	200	130	140	150	160	180	200	220	240	260	280	300	320

Dimensions

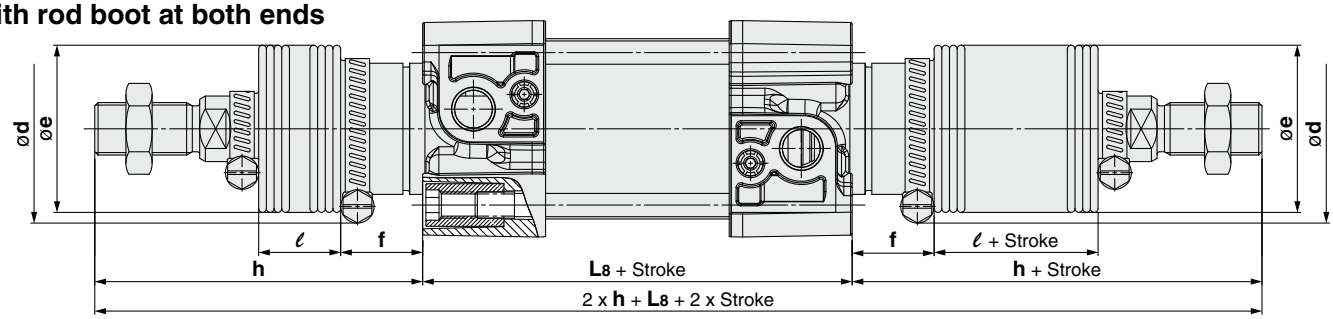
Basic: C96S(D)B Bore size − Stroke



With rod boot at one end



With rod boot at both ends



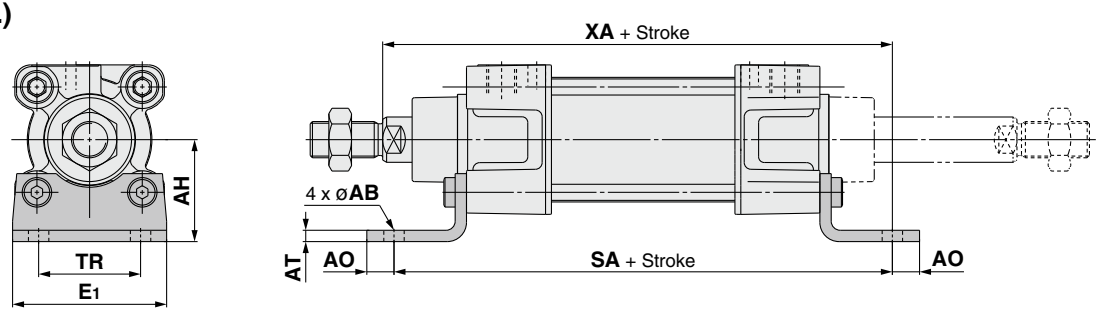
Bore size (mm)	Stroke range (mm)	A	øB d11	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	WA	WB	WH	ZY	L2	L9
32	Up to 1000	22	30	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	7	26	190	15	4
40	Up to 1000	24	35	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	5	9	30	213	17	4
50	Up to 1000	32	40	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	6	10.5	37	244	24	5
63	Up to 1000	32	45	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	9	12	37	259	24	5
80	Up to 1000	40	45	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	11.5	14	46	300	30	—
100	Up to 1000*	40	55	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	17	15	51	320	32	—
125	Up to 1000*	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	58	20	160	6	17	15	65	398	40	—

* Minimum stroke for trunnion mounting are below. Tube I.D. 32 to 80: 0 mm, Tube I.D. 100: 5 mm, Tube I.D. 125: 10 mm

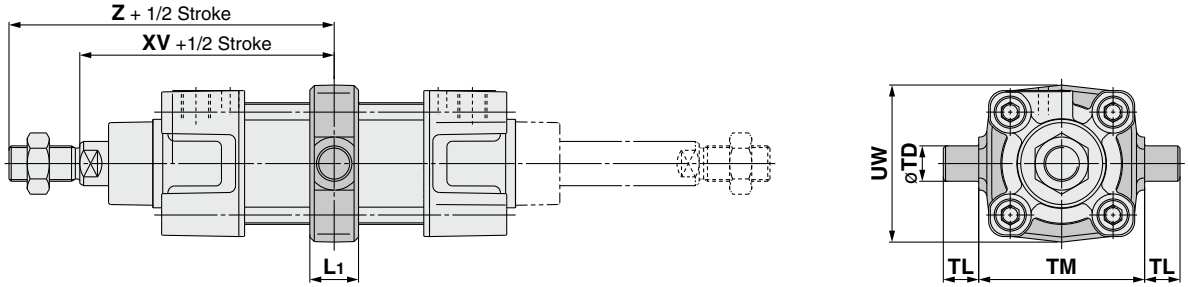
Bore size (mm)	H	ød	øe	f	ℓ												h											
					1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000
32	48	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
40	54	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250	75	88	100	113	138	163	188	213	238	263	288	313
50	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
63	69	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250	87	100	112	125	150	175	200	225	250	275	300	325
80	86	68	56	30	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
100	91	76	56	32	12.5	25	37.5	50	75	100	125	150	175	200	225	250	103	116	128	141	166	191	216	241	266	291	316	341
125	119	82	75	40	10	20	30	40	60	80	100	120	140	160	180	200	130	140	150	160	180	200	220	240	260	280	300	320

Dimensions

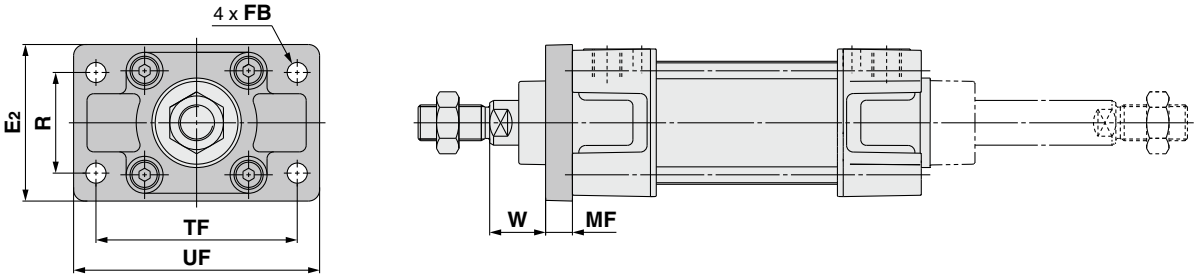
Axial foot (L)



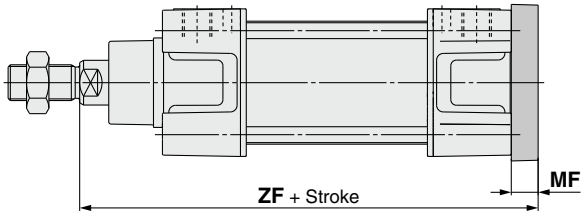
Center trunnion (T)



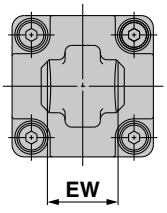
Rod flange (F)



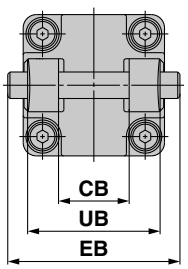
Head flange (G)

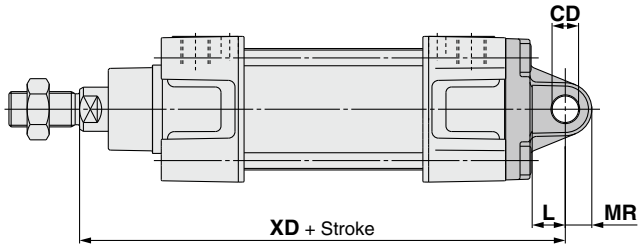


Single clevis (C)



Double clevis (D)





(mm)

Bore size (mm)	E_1	TR	AH	AO	AT	AB	SA	XA	TM	TL	TD e8	UW	L_1	XV	Z	R	TF	FB	E_2	UF	W	MF	ZF	UB h14	CB H14	EW	CD H9	L	MR	XD	EB
32	48	32	32	10	4.5	7	142	144	50	12	12	49	17	73	95	32	64	7	50	79	16	10	130	45	26	$26^{-0.2}_{-0.6}$	10	12	9.5	142	65
40	55	36	36	11	4.5	10	161	163	63	16	16	58	22	82.5	106.5	36	72	9	55	90	20	10	145	52	28	$28^{-0.2}_{-0.6}$	12	15	12	160	75
50	68	45	45	12	5.5	10	170	175	75	16	16	71	22	90	122	45	90	9	70	110	25	12	155	60	32	$32^{-0.2}_{-0.6}$	12	15	12	170	80
63	80	50	50	12	5.5	10	185	190	90	20	20	87	28	97.5	129.5	50	100	9	80	120	25	12	170	70	40	$40^{-0.2}_{-0.6}$	16	20	16	190	90
80	100	63	63	14	6.5	12	210	215	110	20	20	110	34	110	150	63	126	12	100	153	30	16	190	90	50	$50^{-0.2}_{-0.6}$	16	20	16	210	110
100	120	75	71	16	6.5	14.5	220	230	132	25	25	136	40	120	160	75	150	14	120	178	35	16	205	110	60	$60^{-0.2}_{-0.6}$	20	25	20	230	140
125	Max. 157	90	90	Max. 25	8	16	250	270	160	25	25	Max. 160	50	145	199	90	180	16	Max. 157	Max. 224	45	20	245	130	70	$70^{-0.5}_{-1.2}$	25	Min. 30	Max. 26	275	Max. 157

Air Cylinder: Non-rotating Type
Double Acting, Single/Double Rod
Series C96K
ø32, ø40, ø50, ø63, ø80, ø100

How to Order

	C96K	B	32	–	100	W			
With auto switch	C96KD	B	32	–	100	W	– M9BW	S	

With auto switch (Built-in magnet)

Mounting

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

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Rod

Nil	Single rod
W	Double rod

Cylinder stroke (mm)
Refer to "Maximum Strokes" on page 64.

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Applicable Auto Switches/Tie-rod mounting

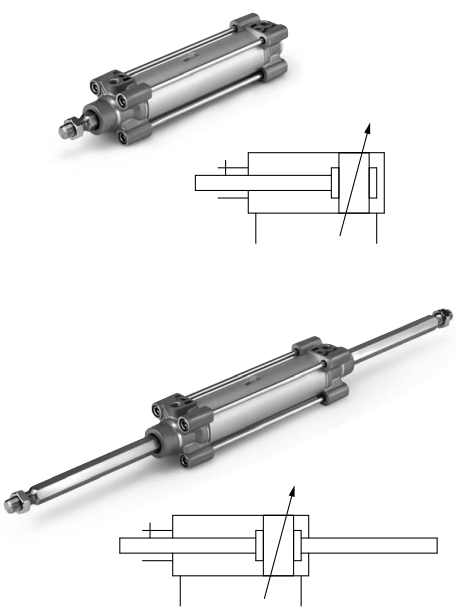
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				M9P	—	●	●	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○	—	
					—	—	100 V, 200 V	J51	—	●	—	●	○	—		
		Terminal conduit		3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	—	—	IC	
				2-wire		12 V		—	K39	—	—	—	—	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○	○	IC	
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NA∗1	—	○	○	●	○	○	IC	
				3-wire (PNP)				M9PA∗1	—	○	○	●	○	○		
				2-wire		12 V		M9BA∗1	—	○	○	●	○	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	—	●	—	●	○	○	IC	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		P4DW	—	—	—	●	●	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN Equivalent)	—	5 V	—	A96	—	●	—	●	—	—	IC	—
			No	2-wire	24 V	12 V	100 V	A93	—	●	●	●	●	—	—	Relay, PLC
			Yes				100 V or less	A90	—	●	—	●	—	—	IC	
			No				100 V, 200 V	A54	—	●	—	●	●	—	—	
							200 V or less	A64	—	●	—	●	—	—		
		Terminal conduit	Yes				—	—	A33	—	—	—	—	—	—	PLC
		DIN					100 V, 200 V	—	A34	—	—	—	—	—		Relay, PLC
								—	A44	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	—	●	—	●	—	—		

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

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

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

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



Specifications

Bore size (mm)	32	40	50	63	80	100
Action	Double acting					
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: –20 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Piston speed	50 to 1000 mm/s					
Stroke length tolerance	Up to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$					
Cushion	Both sides (Air cushion)					
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion					
Non-rotating accuracy	±0.5°		±0.5°		±0.3°	
Allowable rotational torque (N·m)	0.25	0.45	0.64		0.79	

Minimum Stroke for Auto Switch Mounting

Refer to “Minimum Stroke for Auto Switch Mounting” on page 72.

Maximum Strokes

Bore size (mm)	Maximum stroke *
32	500
40	500
50	600
63	600
80	800
100	800

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	—
	Clevis pin	—	—	—	—	—	●	—
Option	Piston rod ball joint	●	●	●	●	●	●	—
	Rod clevis	●	●	●	●	●	●	—
	Rod boot	—	—	—	—	—	—	—

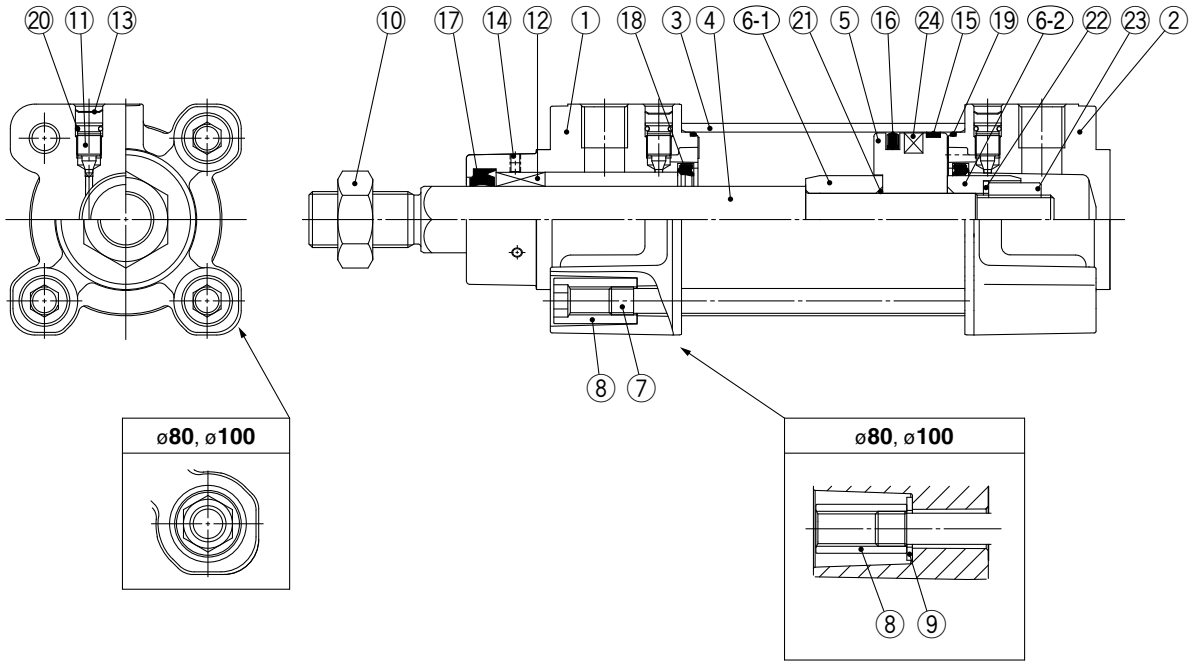
* Do not use a piston rod ball joint (or floating joint) together with a single clevis with a ball joint (or clevis pivot bracket with a ball joint).

⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuator and Auto Switch Precautions.

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum die-cast	
2	Head cover	Aluminum die-cast	
3	Cylinder tube	Aluminum alloy	
4	Piston rod	Stainless steel	
5	Piston	Aluminum alloy	
6-1	Cushion ring	Steel	
6-2	Cushion ring	Steel	
7	Tie-rod	Carbon steel	
8	Tie-rod nut	Steel	
9	Flat washer	Steel	ø80, ø100
10	Rod end nut	Steel	
11	Cushion valve	Steel wire	
12	Non-rotating guide	Bearing alloy	
13	Retaining ring	Steel for spring	ø40 to ø100
14	Set screw	Steel	
15	Wear ring	Resin	
16	Piston seal	NBR	
17	Rod seal	NBR	
18	Cushion seal	Urethane rubber	
19	Cylinder tube gasket	NBR	
20	Cushion valve seal	NBR	
21	Piston gasket	NBR	
22	Spring washer	Steel	
23	Piston nut	Steel	
24	Magnet		

Replacement Parts/Seal Kit (Single rod)

Bore size (mm)	Kit no.	Contents
32	CK95-32	Kits include items ⑮ to ⑲.
40	CK95-40	
50	CK95-50	
63	CK95-63	
80	CK95-80	
100	CK96-100	

∗ Seal kits consist of items ⑮ to ⑲, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

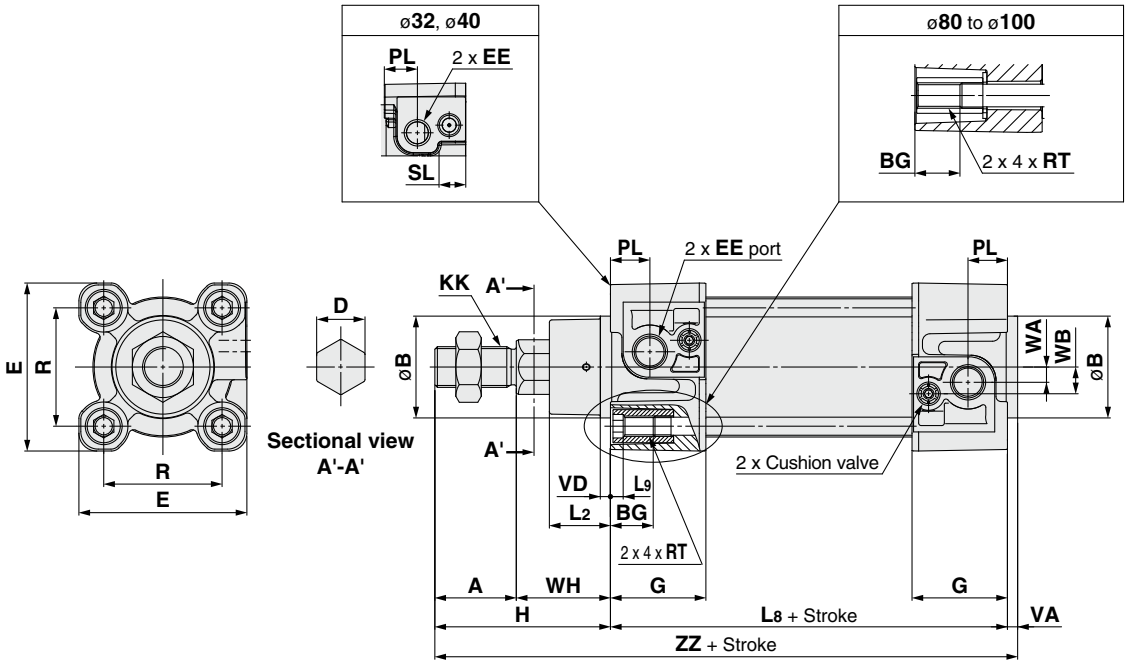
Seal Kit (Double rod)

Bore size (mm)	Kit no.	Contents
32	CK95W-32	Kits include items ⑯ to ⑲.
40	CK95W-40	
50	CK95W-50	
63	CK95W-63	
80	CK95W-80	
100	CK96W-100	

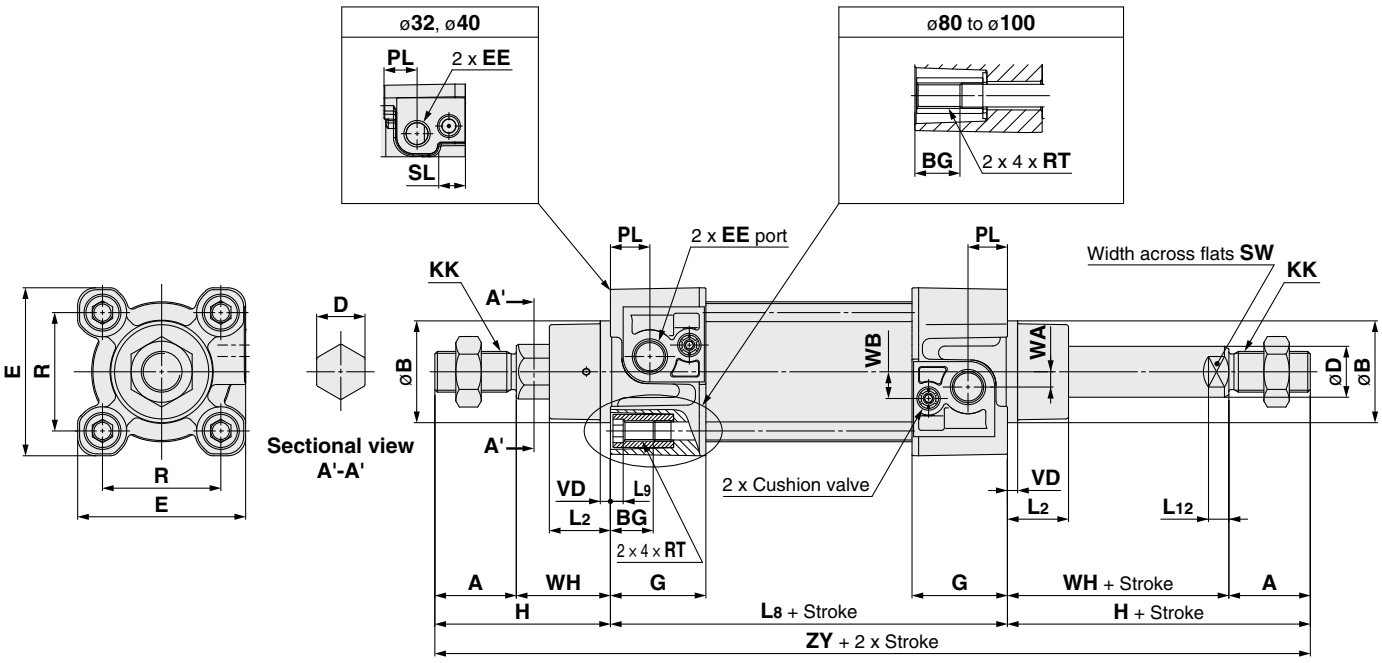
∗ Seal kits consist of items ⑯ to ⑲, and can be ordered by using the seal kit number corresponding to each bore size.
∗ The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100).
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S010 (10 g), GR-S-020 (20 g)

Dimensions (Without mounting bracket)

C96K(D)B Bore size − Stroke



C96K(D)B Bore size − Stroke W



∗ Mounting brackets are the same as standard type. Refer to page 62 for details.

Bore size (mm)	Stroke range (mm)	A	øB d11	D	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	ZY	E	R	L2	L9	H	SL
32	Up to 500	22	30	12.2	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	32	16	94	4	4	4	7	26	146	190	47	32.5	15	4	48	10
40	Up to 500	24	35	14.2	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	37.5	16	105	4	4	5	9	30	163	213	54	38	17	4	54	12
50	Up to 600	32	40	19	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	17	37.5	16	106	4	4	6	10.5	37	179	244	66	46.5	24	5	69	—
63	Up to 600	32	45	19	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	17	45	16	121	4	4	9	12	37	194	259	77	56.5	24	5	69	—
80	Up to 800	40	45	23	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	22	45	17	128	4	4	11.5	14	46	218	300	99	72	30	—	86	—
100	Up to 800	40	55	23	25	G 1/2	19	M10 x 1.5	10	M20 x 1.5	22	50	17	138	4	4	17	15	51	233	320	118	89	32	—	91	—

Smooth Cylinder
Double Acting, Single Rod
Series C96Y
ø32, ø40, ø50, ø63, ø80, ø100, ø125

The C96Y series smooth cylinders (**ø32 to ø100**) have been remodeled. When selecting a product, please consider using the new **C96Y series**.

How to Order

C96Y **B** **32** – **100**

With auto switch **C96YD** **B** **32** – **100** – **M9BW** **S**

With auto switch
(Built-in magnet)

Mounting

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

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm
125	125 mm

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Cylinder stroke (mm)
Refer to "Maximum Strokes" on page 68.

Applicable Auto Switches/Tie-rod mounting

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9N**	—	●	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				**M9P**	—	●	●	●	○	○		
				2-wire		12 V		**M9B**	—	●	●	●	○	○	—	
					—	—	100 V, 200 V	**J51**	—	●	—	●	○	—		
		Terminal conduit		3-wire (NPN)	24 V	5 V, 12 V	—	—	**G39**	—	—	—	—	—	IC	
				2-wire		12 V		—	**K39**	—	—	—	—	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**M9NW**	—	●	●	●	○	○	IC	
				3-wire (PNP)				**M9PW**	—	●	●	●	○	○		
				2-wire		12 V		**M9BW**	—	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NA**∗1	—	○	○	●	○	○	IC	
				3-wire (PNP)				**M9PA**∗1	—	○	○	●	○	○		
				2-wire		12 V		**M9BA**∗1	—	○	○	●	○	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**F59F**	—	●	—	●	○	○	IC	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		**P4DW**	—	—	—	●	●	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN Equivalent)	—	5 V	—	**A96**	—	●	—	●	—	—	IC	—
			No	2-wire	24 V	12 V	100 V	**A93**	—	●	●	●	●	—	—	Relay, PLC
			Yes				100 V or less	**A90**	—	●	—	●	—	—	IC	
			No				100 V, 200 V	**A54**	—	●	—	●	●	—	—	
							200 V or less	**A64**	—	●	—	●	—	—		
		Terminal conduit	Yes				—	—	**A33**	—	—	—	—	—	—	PLC
		DIN					100 V, 200 V	—	**A34**	—	—	—	—	—		
								—	**A44**	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	—	**A59W**	—	●	—	●	—	—		

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

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

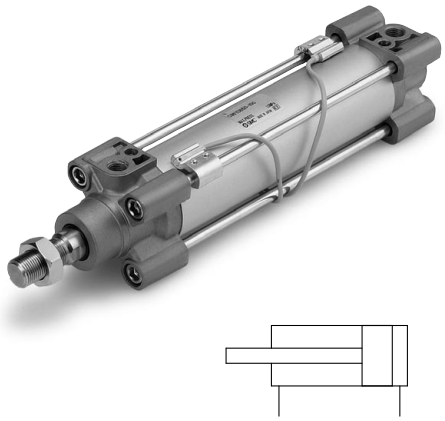
∗ Solid state auto switches marked with "○" are produced upon receipt of order.

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

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

Low sliding resistance

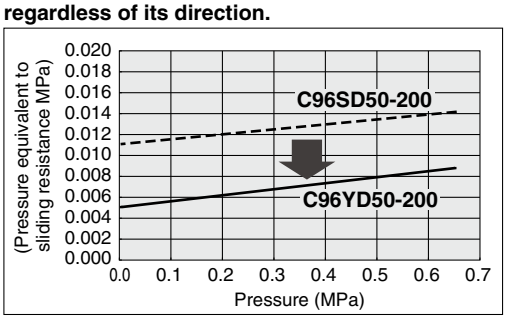
Min. operating pressure –0.01 MPa



Sliding resistance

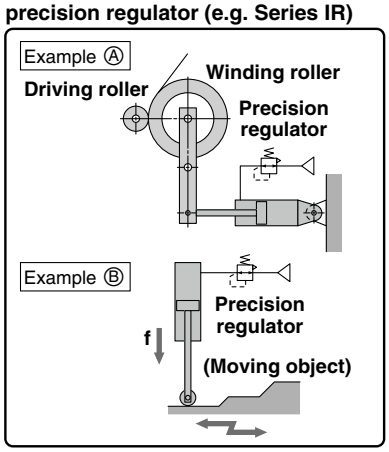
Bi-directional low-friction operation possible.

Pressure can be controlled regardless of its direction.



Application Example

Smooth cylinder combined with precision regulator (e.g. Series IR)



Specifications

Bore size (mm)	32	40	50	63	80	100	125
Action	Double acting						
Fluid	Air						
Proof pressure	1.05 MPa						
Maximum operating pressure	0.7 MPa						
Minimum operating pressure	0.02 MPa		0.01 MPa				
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)						
Lubrication	Not required (Non-lube)						
Piston speed	5 to 500 mm/s						
Stroke length tolerance	Up to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$						
Cushion	None						
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2	G 1/2
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion						
Allowable leakage rate	0.5 L/min (ANR)						

Minimum Stroke for Auto Switch Mounting

Refer to “Minimum Stroke for Auto Switch Mounting” on page 72.

Maximum Strokes

Bore size (mm)	Maximum stroke*
32	800
40	800
50	1000
63	1000
80	1000
100	1000
125	1000

Intermediate strokes are available.

* Please consult with SMC for longer strokes.

⚠ Caution

Be sure to read before handling.

Refer to page 105 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuator and Auto Switch Precautions.

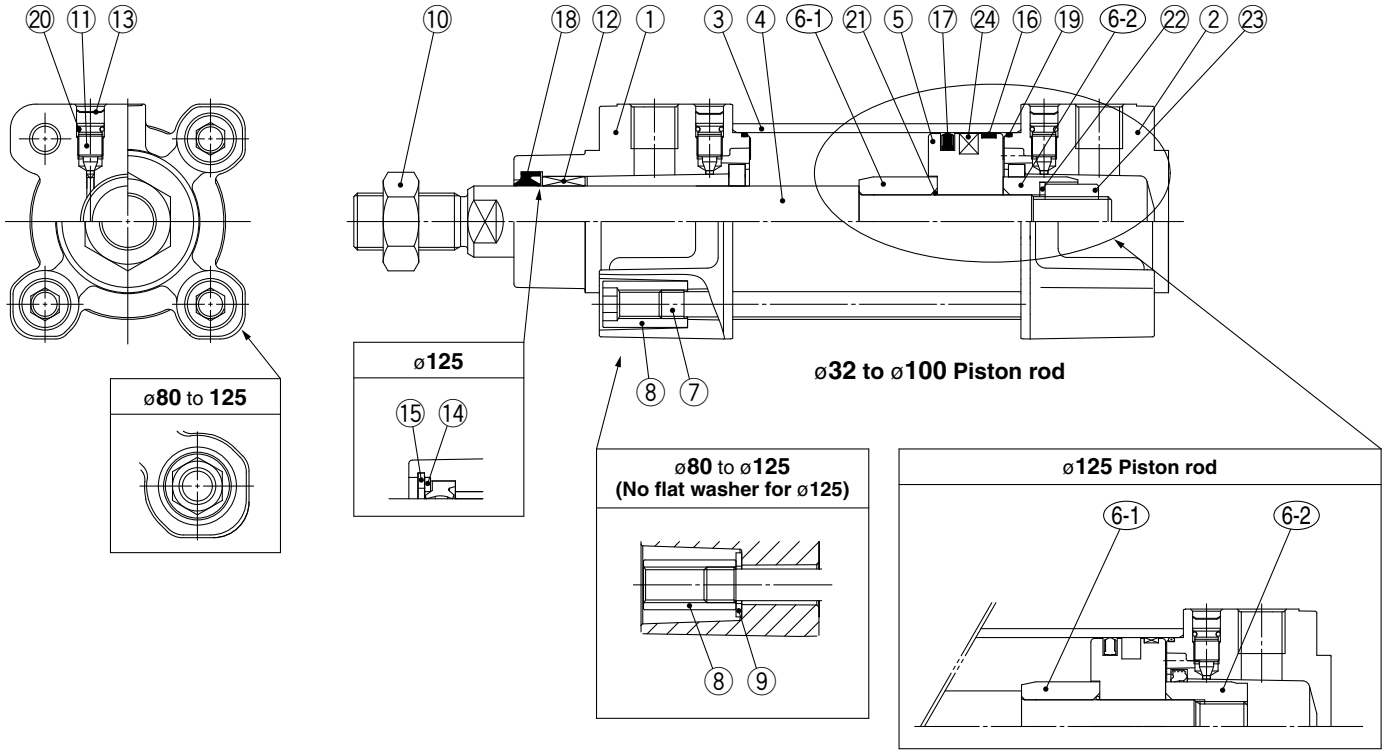
Dimensions are the same as standard type. For details, refer to page 60.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Piston rod ball joint	●	●	●	●	●	●	●
	Rod clevis	●	●	●	●	●	●	●
	Rod boot	—	—	—	—	—	—	—

* Do not use a piston rod ball joint (or floating joint) together with a single clevis with a ball joint (or clevis pivot bracket with a ball joint).

Construction



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum die-cast	
2	**Head cover**	Aluminum die-cast	
3	**Cylinder tube**	Aluminum alloy	
4	**Piston rod**	Carbon steel	
5	**Piston**	Aluminum alloy	
6-1	**Cushion ring**	Steel	
6-2	**Cushion ring**	Steel	
7	**Tie-rod**	Carbon steel	
8	**Tie-rod nut**	Steel	
9	**Flat washer**	Steel	ø80, ø100
10	**Rod end nut**	Steel	
11	**Cushion valve**	Steel wire	
12	**Bushing**	Bearing alloy	
13	**Retaining ring**	Steel for spring	ø40 to ø125
14	**Rod seal holder**	Stainless steel	ø125
15	**Retaining ring**	Steel for spring	ø125
16	**Wear ring**	Resin	
17	**Piston seal**	NBR	
18	**Rod seal**	NBR	
19	**Cylinder tube gasket**	NBR	
20	**Cushion valve seal**	NBR	
21	**Piston gasket**	NBR	
22	**Spring washer**	Steel	
23	**Piston nut**	Steel	
24	**Magnet**		

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
32	C96Y32-PS	Kits include items ⑯ to ⑲.
40	C96Y40-PS	
50	C96Y50-PS	
63	C96Y63-PS	
80	C96Y80-PS	
100	C96Y100-PS	
125	C96Y125-PS	

∗ Seal kits consist of items ⑯ to ⑲, and can be ordered by using the seal kit number corresponding to each bore size.

∗ Only use the grease recommended by SMC.
Order using the following part numbers when only maintenance grease is needed.

Volume	Part no.
5 g	GR-L-005
10 g	GR-L-010
150 g	GR-L-150

Smooth Cylinders Specific Product Precautions 1

Be sure to read before handling.
Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.

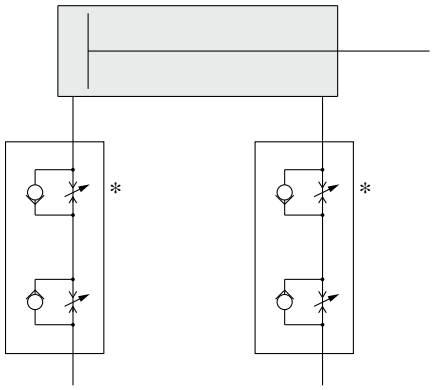
Recommended Pneumatic Circuit

Refer to the diagrams below when controlling speed with the smooth cylinder.

⚠Warning

Horizontal Operation (Speed control)

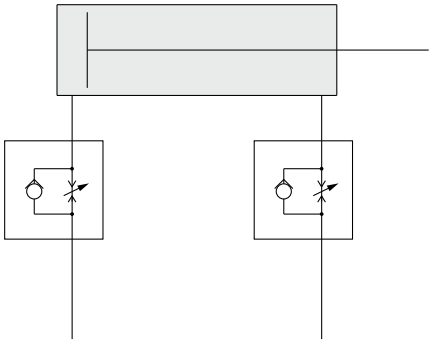
Ⅰ



Dual speed controller

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

Ⅱ

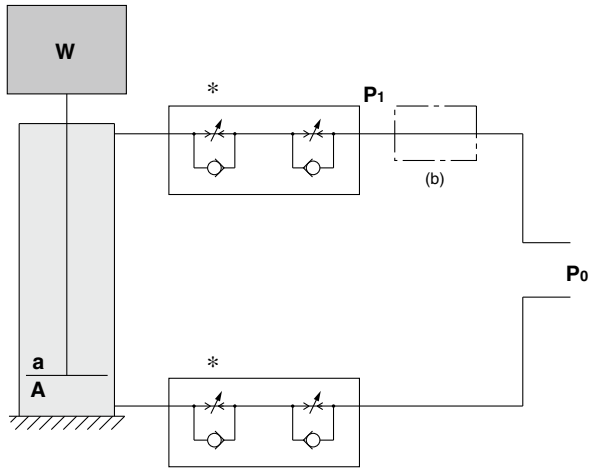


Meter-in speed controller

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

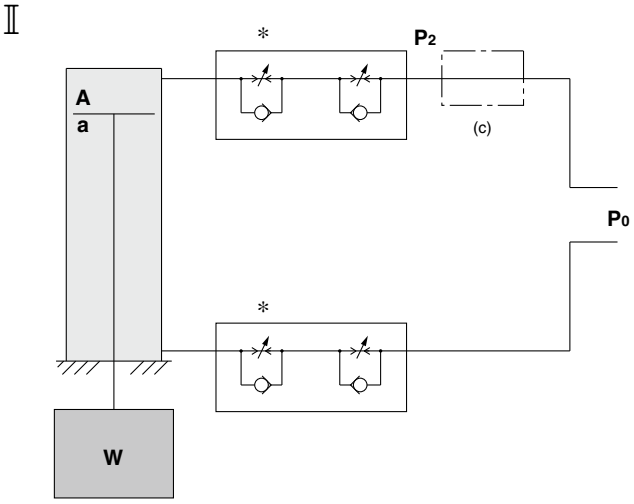
Vertical Operation (Speed control)

Ⅰ



(1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
(2) Depending on the size of the load, installing a regulator with check valve at position (b) can reduce lurching during descent and operation delay during ascent.
As a guide,
when **W + P0a > P0A**,
adjust **P1** to make **W + P1a = P0A**.

Ⅱ



(1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
(2) Installing a regulator with check valve at position (c) can reduce lurching during descent and operation delay during ascent.
As a guide,
adjust **P2** to make **W + P2A = P0a**.

W: Load (N) **P0**: Operating pressure (MPa) **P1**, **P2**: Reduced pressure (MPa) **a**: Rod side piston area (mm^2) **A**: Head side piston area (mm^2)

Smooth Cylinders Specific Product Precautions 2

Be sure to read before handling.
Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.

Lubrication

⚠Caution

1. Operate without lubrication from a pneumatic system lubricator.

A malfunction may occur when lubricated in this fashion.

2. Only use the grease recommended by SMC.

The use of grease other than the specified type can cause a malfunction.

- Order using the following part numbers when only maintenance grease is needed.

Grease

Volume	Part no.
5 g	GR-L-005
10 g	GR-L-010
150 g	GR-L-150

3. Do not wipe out the grease in the sliding part of the air cylinder.

Wiping grease from the sliding part of the air cylinder forcefully may cause malfunction.

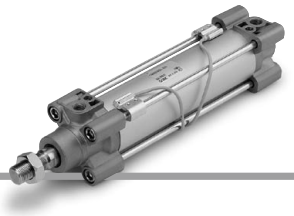
Air Supply

⚠Caution

1. Take measures to prevent pressure fluctuation.

A malfunction may occur with the fluctuation of pressure.

Auto Switch Mounting

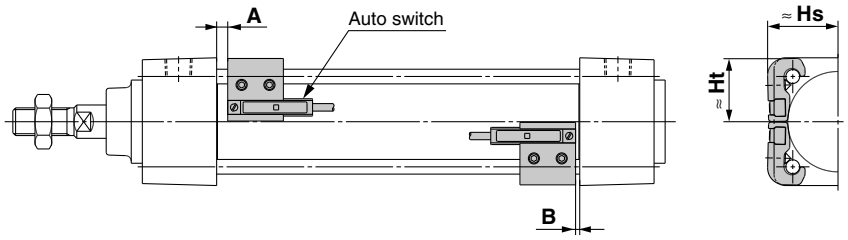


Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches	Center trunnion							Support bracket other than center trunnion		
		ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø32, ø40, ø50, ø63	ø80, ø100	ø125
D-A9□	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	70	75		80	85	95	100	15		
	With n pcs.	70 + 40 (n – 4)/2 n = 4, 8, 12, 16···	75 + 40 (n – 4)/2 n = 4, 8, 12, 16···		80 + 40 (n – 4)/2 n = 4, 8, 12, 16···	85 + 40 (n – 4)/2 n = 4, 8, 12, 16···	95 + 40 (n – 4)/2 n = 4, 8, 12, 16···	100 + 40 (n – 4)/2 n = 4, 8, 12, 16···	15 + 40 (n – 2)/2 n = 2, 4, 6, 8···		
D-A9□V	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	45	50		55	60	70	75	10		
	With n pcs.	45 + 30 (n – 4)/2 n = 4, 8, 12, 16···	50 + 30 (n – 4)/2 n = 4, 8, 12, 16···		55 + 30 (n – 4)/2 n = 4, 8, 12, 16···	60 + 30 (n – 4)/2 n = 4, 8, 12, 16···	70 + 30 (n – 4)/2 n = 4, 8, 12, 16···	75 + 30 (n – 4)/2 n = 4, 8, 12, 16···	10 + 30 (n – 2)/2 n = 2, 4, 6, 8···		
D-M9□ D-M9□W	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	75	80		85	90	95	105	15		
	With n pcs.	75 + 40 (n – 4)/2 n = 4, 8, 12, 16···	80 + 40 (n – 4)/2 n = 4, 8, 12, 16···		85 + 40 (n – 4)/2 n = 4, 8, 12, 16···	90 + 40 (n – 4)/2 n = 4, 8, 12, 16···	95 + 40 (n – 4)/2 n = 4, 8, 12, 16···	105 + 40 (n – 4)/2 n = 4, 8, 12, 16···	15 + 40 (n – 2)/2 n = 2, 4, 6, 8···		
D-M9□V D-M9□WV	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	50	55		60	65	70	80	10		
	With n pcs.	50 + 30 (n – 4)/2 n = 4, 8, 12, 16···	55 + 30 (n – 4)/2 n = 4, 8, 12, 16···		60 + 30 (n – 4)/2 n = 4, 8, 12, 16···	65 + 30 (n – 4)/2 n = 4, 8, 12, 16···	70 + 30 (n – 4)/2 n = 4, 8, 12, 16···	80 + 30 (n – 4)/2 n = 4, 8, 12, 16···	10 + 30 (n – 2)/2 n = 2, 4, 6, 8···		
D-M9□A	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	80	85		90	95	100	110	15		
	With n pcs.	80 + 40 (n – 2)/2 n = 4, 8, 12, 16···	85 + 40 (n – 2)/2 n = 4, 8, 12, 16···		90 + 40 (n – 2)/2 n = 4, 8, 12, 16···	95 + 40 (n – 2)/2 n = 4, 8, 12, 16···	100 + 40 (n – 2)/2 n = 4, 8, 12, 16···	110 + 40 (n – 2)/2 n = 4, 8, 12, 16···	15 + 40 (n – 2)/2 n = 2, 4, 6, 8···		
D-M9□AV	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	55	60		65	70	75	85	15		
	With n pcs.	55 + 30 (n – 2)/2 n = 4, 8, 12, 16···	60 + 30 (n – 2)/2 n = 4, 8, 12, 16···		65 + 30 (n – 2)/2 n = 4, 8, 12, 16···	70 + 30 (n – 2)/2 n = 4, 8, 12, 16···	75 + 30 (n – 2)/2 n = 4, 8, 12, 16···	85 + 30 (n – 2)/2 n = 4, 8, 12, 16···	15 + 30 (n – 2)/2 n = 2, 4, 6, 8···		
D-A3□ D-G39 D-K39	With 2 pcs. (Different surfaces)	60	65		75	80	85	90	35		
	With 2 pcs. (Same surface)	90	95		100	105	110	125	100		
	With n pcs. (Different surfaces)	60 + 30 (n – 2) n = 2, 4, 6, 8···	65 + 30 (n – 2) n = 2, 4, 6, 8···		75 + 30 (n – 2) n = 2, 4, 6, 8···	80 + 30 (n – 2) n = 2, 4, 6, 8···	85 + 30 (n – 2) n = 2, 4, 6, 8···	90 + 30 (n – 2) n = 2, 4, 6, 8···	35 + 30 (n – 2) n = 2, 3, 4···		
	With n pcs. (Same surface)	90 + 100 (n – 2) n = 2, 4, 6, 8···	95 + 100 (n – 2) n = 2, 4, 6, 8···		100 + 100 (n – 2) n = 2, 4, 6, 8···	105 + 100 (n – 2) n = 2, 4, 6, 8···	110 + 100 (n – 2) n = 2, 4, 6, 8···	125 + 100 (n – 2) n = 2, 4, 6, 8···	100 + 100 (n – 2) n = 2, 3, 4···		
	With 1 pc.	60	65		75	80	85	90	10		
D-A44	With 2 pcs. (Different surfaces)	70	75		80		85	90	35		
	With 2 pcs. (Same surface)	70	75		80		85	90	55		
	With n pcs. (Different surfaces)	70 + 30 (n – 2) n = 2, 4, 6, 8···	75 + 30 (n – 2) n = 2, 4, 6, 8···		80 + 30 (n – 2) n = 2, 4, 6, 8···		85 + 30 (n – 2) n = 2, 4, 6, 8···	90 + 30 (n – 2) n = 2, 4, 6, 8···	35 + 30 (n – 2) n = 2, 3, 4···		
	With n pcs. (Same surface)	70 + 50 (n – 2) n = 2, 4, 6, 8···	75 + 50 (n – 2) n = 2, 4, 6, 8···		80 + 50 (n – 2) n = 2, 4, 6, 8···		85 + 50 (n – 2) n = 2, 4, 6, 8···	90 + 50 (n – 2) n = 2, 4, 6, 8···	55 + 50 (n – 2) n = 2, 3, 4···		
	With 1 pc.	70	75		80		85	90	10		
D-A5□ D-A6□	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	60		80	105	110	115		15	20	
	With n pcs. (Same surface)	60 + 55 (n – 4)/2 n = 4, 8, 12, 16···		80 + 55 (n – 4)/2 n = 4, 8, 12, 16···	105 + 55 (n – 4)/2 n = 4, 8, 12, 16···	110 + 55 (n – 4)/2 n = 4, 8, 12, 16···	115 + 55 (n – 4)/2 n = 4, 8, 12, 16···		15 + 55 (n – 2)/2 n = 2, 4, 6, 8···	20 + 55 (n – 2)/2 n = 2, 4, 6, 8···	
D-A59W	With 2 pcs. (Different surfaces, Same surface)	60	70	85	110	115	120		20	25	
	With n pcs. (Same surface)	60 + 55 (n – 4)/2 n = 4, 8, 12, 16···	70 + 55 (n – 4)/2 n = 4, 8, 12, 16···	85 + 55 (n – 4)/2 n = 4, 8, 12, 16···	110 + 55 (n – 4)/2 n = 4, 8, 12, 16···	115 + 55 (n – 4)/2 n = 4, 8, 12, 16···	120 + 55 (n – 4)/2 n = 4, 8, 12, 16···		20 + 55 (n – 2)/2 n = 2, 4, 6, 8···	25 + 55 (n – 2)/2 n = 2, 4, 6, 8···	
	With 1 pc.	60	70	85	110	115	120		15	25	
D-F5□ D-J5□ D-F5□W D-J59W D-F5BA D-F59F	With 2 pcs. (Different surfaces, Same surface)	90	95		110	115	120	130	15	25	
	With n pcs. (Same surface)	90 + 55 (n – 4)/2 n = 4, 8, 12, 16···	95 + 55 (n – 4)/2 n = 4, 8, 12, 16···		110 + 55 (n – 4)/2 n = 4, 8, 12, 16···	115 + 55 (n – 4)/2 n = 4, 8, 12, 16···	120 + 55 (n – 4)/2 n = 4, 8, 12, 16···	130 + 55 (n – 4)/2 n = 4, 8, 12, 16···	15 + 55 (n – 2)/2 n = 2, 4, 6, 8···	25 + 55 (n – 2)/2 n = 2, 4, 6, 8···	
	With 1 pc.	90	95		110	115	120	130	10	25	
D-F5NT	With 2 pcs. (Different surfaces, Same surface)	100	105		120	125	130	140	15	25	30
	With n pcs. (Same surface)	100 + 55 (n – 4)/2 n = 4, 8, 12, 16···	105 + 55 (n – 4)/2 n = 4, 8, 12, 16···		120 + 55 (n – 4)/2 n = 4, 8, 12, 16···	125 + 55 (n – 4)/2 n = 4, 8, 12, 16···	130 + 55 (n – 4)/2 n = 4, 8, 12, 16···	140 + 55 (n – 4)/2 n = 4, 8, 12, 16···	15 + 55 (n – 2)/2 n = 2, 4, 6, 8···	25 + 55 (n – 2)/2 n = 2, 4, 6, 8···	30 + 55 (n – 2)/2 n = 2, 4, 6, 8···
	With 1 pc.	100	105		120	125	130	140	10	25	30
D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	80	85	90		95	100	105	15		
	With n pcs.	80 + 40 (n – 4)/2 n = 4, 8, 12, 16···	85 + 40 (n – 4)/2 n = 4, 8, 12, 16···	90 + 40 (n – 4)/2 n = 4, 8, 12, 16···		95 + 40 (n – 4)/2 n = 4, 8, 12, 16···	100 + 40 (n – 4)/2 n = 4, 8, 12, 16···	105 + 40 (n – 4)/2 n = 4, 8, 12, 16···	15 + 40 (n – 2)/2 n = 2, 4, 6, 8···		
D-Y69□ D-Y7PV D-Y7□WV	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	60	65		70	75	85		10		
	With n pcs.	60 + 30 (n – 4)/2 n = 4, 8, 12, 16···	65 + 30 (n – 4)/2 n = 4, 8, 12, 16···		70 + 30 (n – 4)/2 n = 4, 8, 12, 16···	75 + 30 (n – 4)/2 n = 4, 8, 12, 16···	85 + 30 (n – 4)/2 n = 4, 8, 12, 16···		10 + 30 (n – 2)/2 n = 2, 4, 6, 8···		
D-Y7BA	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	85	90		100	105	110	115	20		
	With n pcs.	85 + 45 (n – 4)/2 n = 4, 8, 12, 16···	90 + 45 (n – 4)/2 n = 4, 8, 12, 16···		100 + 45 (n – 4)/2 n = 4, 8, 12, 16···	105 + 45 (n – 4)/2 n = 4, 8, 12, 16···	110 + 45 (n – 4)/2 n = 4, 8, 12, 16···	115 + 45 (n – 4)/2 n = 4, 8, 12, 16···	20 + 45 (n – 2)/2 n = 2, 4, 6, 8···		
D-P4DW	With 2 pcs. (Different surfaces, Same surface) With 1 pc.	120		130		140		150	15		20
	With n pcs.	120 + 65 (n – 4)/2 n = 4, 8, 12, 16···		130 + 65 (n – 4)/2 n = 4, 8, 12, 16···		140 + 65 (n – 4)/2 n = 4, 8, 12, 16···		150 + 65 (n – 4)/2 n = 4, 8, 12, 16···	15 + 65 (n – 2)/2 n = 2, 4, 6, 8···		20 + 65 (n – 2)/2 n = 2, 4, 6, 8···

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



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A5□ D-A6□		D-A59W		D-F5□W D-J59W D-F5□ D-J5□ D-F5BA D-F59F		D-F5NT		D-A3□ D-A44 D-G39 D-K39		D-Z7□ D-Z80 D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	6.5	4	10.5	8	0.5	0	4.5	2	7	4.5	12	9.5	0.5	0	4	1.5	3.5	1
40	6.5	4	10.5	8	0.5	0	4.5	2	7	4.5	12	9.5	0.5	0	4	1.5	3.5	1
50	7	4.5	11	8.5	1	0	5	2.5	7.5	5	12.5	10	1	0	4.5	2	4	1.5
63	7	4.5	11	8.5	1	0	5	2.5	7.5	5	12.5	10	1	0	4.5	2	4	1.5
80	10	8.5	14	12.5	4	2.5	8	6.5	10.5	9	15.5	14	4	2.5	7.5	6	7	5.5
100	10	8.5	14	12.5	4	2.5	8	6.5	10.5	9	15.5	14	4	2.5	7.5	6	7	5.5
125	12	12	16	16	6	6	10	10	12.5	12.5	17.5	17.5	6	6	9.5	9.5	9	9

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

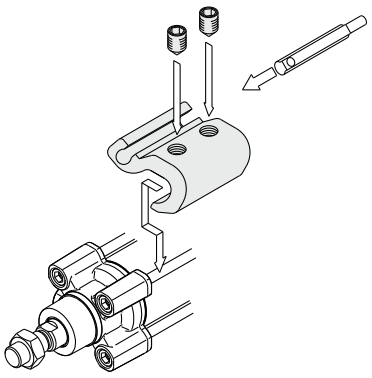
Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-A9□ D-M9□ D-M9□W D-M9□A		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F59F D-F5□W D-J59W D-F5BA D-F5NT		D-A3□ D-G39 D-K39		D-A44		D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA		D-Y69□ D-Y7PV D-Y7□WV		D-P4DW	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	24.5	23	27.5	23	30.5	23	35	24.5	32.5	25	67	27.5	77	27.5	25.5	23	26.5	23	38	31
40	28.5	25.5	31.5	25.5	34	25.5	38.5	27.5	36.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	42	33
50	33.5	31	36	31	38.5	31	43.5	34.5	41	34	77	—	87	—	33.5	31	34.5	31	46.5	39
63	38.5	36	40.5	36	43	36	48.5	39.5	46	39	83.5	—	93.5	—	39	36	40	36	51.5	44
80	46.5	45	49	45	52	45	55	46.5	52.5	46.5	92.5	—	103	—	47.5	45	48.5	45	58	51.5
100	54	53.5	57	53.5	59.5	53.5	62	55	59.5	55	103	—	113.5	—	55.5	53.5	56.5	53.5	65.5	60.5
125	65.5	64.5	68.5	64.5	71	64.5	71.5	66.5	70.5	66.5	115	—	125	—	67.5	65	68.5	65	76.5	72

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)						
	ø32	ø40	ø50	ø63	ø80	ø100	ø125
D-A9□/A9□V **D-M9□/M9□V** **D-M9□W/M9□WV** **D-M9□A/M9□AV**	BMB5-032	BMB5-032	BA7-040	BA7-040	BA7-063	BA7-063	BA7-080
D-A3□/A44 **D-G39/K39**	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100	BS1-125
D-A5□/A6□ **D-A59W** **D-F5□/J5□** **D-F5□W/J59W** **D-F59F** **D-F5BA** **D-F5NT**	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06	BT-08
D-P4DW	BMB3T-040	BMB3T-040	BMB3T-050	BMB3T-050	BMB3T-080	BMB3T-080	BAP2T-080
D-Z7□/Z80 **D-Y59□/Y69□** **D-Y7P/Y7PV** **D-Y7□W** **D-Y7□WV** **D-Y7BA**	BMB4-032	BMB4-032	BMB4-050	BMB4-050	BA4-063	BA4-063	BA4-080



● Mounting example for D-A9□(V), M9□(V), M9□W(V), M9□A(V)

[Stainless Steel Mounting Screw]

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

BBA1: For D-A5/A6/F5/J5

Note 1) For details on BBA1, refer to page 78.
"D-F5BA" switch is set on the cylinder with the stainless steel screws above when shipped from factory. When only an auto switch is shipped independently, the BBA1 is attached.

Note 2) When using type D-M9□A(V) or Y7BA, please do not use the iron set screws included with the auto switch mounting bracket (BMB5-032, BA7-□□□, BMB4-□□□, BA4-□□□) shown above, instead order the set of stainless steel set screws (BBA1), and please use the stainless steel set screws (M4 x 6 L) included in BBA1.

Operating Range

(mm)

Auto switch model	Bore size						
	32	40	50	63	80	100	125
D-A9□/A9□V	7	7.5	8.5	9.5	9.5	10.5	12
D-M9□/M9□V **D-M9□W/M9□WV** **D-M9□A/M9□AV**	4	4.5	5	6	6	6	7
D-Z7□/Z80	7.5	8.5	7.5	9.5	9.5	10.5	13
D-A5□/A6□	9	9	10	11	11	11	10
D-A59W	13	13	13	14	14	15	17
D-A3□/A44	9	9	10	11	11	11	10
D-Y59□/Y69□ **D-Y7P/Y7□V** **D-Y7□W/Y7□WV** **D-Y7BA**	5.5	5.5	7	7.5	6.5	5.5	7
D-F5□/J5□ **D-F5□W/J59W** **D-F5BA/F5NT** **D-F59F**	3.5	4	4	4.5	4.5	4.5	5
D-G39/K39	9	9	9	10	10	11	11
D-P4DW	4	4	4	4.5	4	4.5	4.5

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

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.
Refer to the Best Pneumatics No. 2 for the detailed specifications.

Type	Part no.	Electrical entry	Features
Sold state	**D-M9NV, M9PV, M9BV**	Grommet (Perpendicular)	—
	D-Y69A, Y69B, Y7PV		
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-color indication)
	D-Y7NWV, Y7PWV, Y7BWV		
	D-M9NAV, M9PAV, M9BAV		Water resistant (2-color indication)
	D-Y59A, Y59B, Y7P	Grommet (In-line)	—
	D-F59, F5P, J59		
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color indication)
	D-F59W, F5PW, J59W		
	D-F5BA, Y7BA		Water resistant (2-color indication)
	D-F5NT		With timer
	D-P5DW		Magnetic field resistant (2-color indication)
Reed	**D-A93V, A96V**	Grommet (Perpendicular)	—
	D-A90V		Without indicator light
	D-A67, Z80	Grommet (In-line)	
	D-A53, A56, Z73, Z76		—

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available.
For details, refer to the Best Pneumatics No. 2.
∗ With pre-wired connector is also available for solid state auto switches. For details, refer to the Best Pneumatics No. 2.

⚠ Specific Product Precautions

Adjustment

⚠Warning

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

Cushion valves are provided with a crimp (ø32) or a retaining ring (ø40 to ø100) as a stopping mechanism, and the cushion valve should not be opened above that point.

If air is supplied and operation started without confirming the above condition, the cushion valve may be ejected from the cover.

2. Be certain to activate the air cushion at the stroke end.

When it is intended to use the cushion valve in the fully opened position, select a style with a damper. If this is not done, the tie-rods or piston rod assembly will be damaged.

3. When replacing brackets, use the hexagon wrenches shown below.

Bore size (mm)	Width across flats	Tightening torque (N·m)
32, 40	4	5.1
50, 63	5	11
80, 100	6	19.2
125	10	30.1

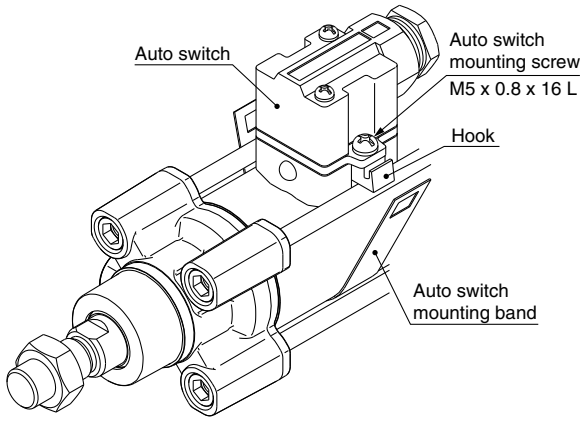
How to Mount and Move the Auto Switch 1

Mounting Bracket **Tie-rod Mounting Type**

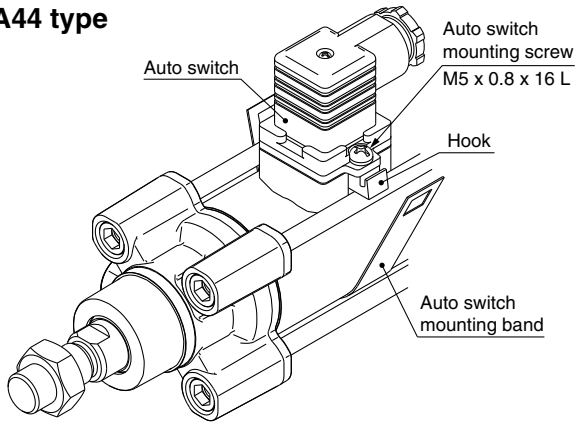
<Applicable Auto Switch>
Solid state switch ··· D-G39, D-K39
Reed switch ····· D-A33, D-A34, D-A44

How to Mount and Move the Auto Switch

D-A3□, D-G3/K3 type



D-A44 type



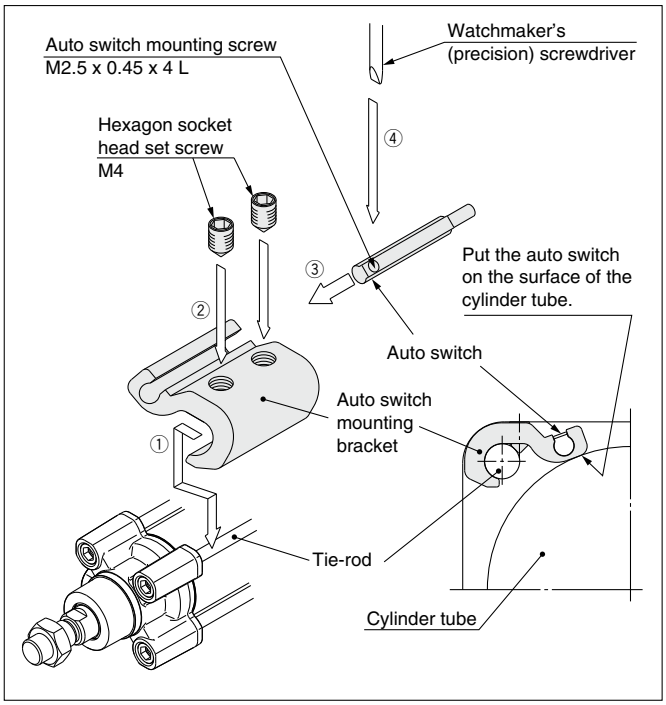
1. Loosen the auto switch mounting screws at both sides to pull down the hook.
2. Put an auto switch mounting band on the cylinder tube and set it at the auto switch mounting position, and then hook the band.
3. Screw lightly the auto switch mounting screw (M5 x 0.8 x 16 L).
4. Set the whole body to the detecting position by sliding, tighten the mounting screw (M5 x 0.8 x 16 L) to secure the auto switch. (The tightening torque should be about 2 to 3 N·m.)
5. Modification of the detecting position should be made in the state of 3.

Auto Switch Mounting Bracket Part No. (Band)

Cylinder series	Applicable bore size (mm)						
	32	**40**	**50**	**63**	**80**	**100**	**125**
C96	BMB2 -032	BMB2 -040	BMB1 -050	BMB1 -063	BMB1 -080	BMB1 -100	BS1 -125

<Applicable Auto Switch>
Solid state switch ··· D-M9N(V), D-M9P(V), D-M9B(V)
D-M9NW(V), D-M9PW(V), D-M9BW(V)
D-M9NA(V), D-M9PA(V), D-M9BA(V)
Reed switch ····· D-A90(V), A93(V), A96(V)

How to Mount and Move the Auto Switch



1. Fix it to the detecting position with a set screw by installing an auto switch mounting bracket in cylinder tie-rod and letting the bottom surface of an auto switch mounting bracket contact the cylinder tube firmly.
2. Fix it to the detecting position with a set screw (M4). (Use a hexagon wrench.)
3. Fit an auto switch into the auto switch mounting groove to set it roughly to the mounting position for an auto switch.
4. After confirming the detecting position, tighten up the mounting screw (M2.5 x 0.45 x 4 L) attached to an auto switch, and secure the auto switch.
5. When changing the detecting position, carry out in the state of 3.

Note 1) To protect auto switches, ensure that main body of an auto switch should be embedded into auto switch mounting groove with a depth of 15 mm or more.
Note 2) Set the tightening torque of a hexagon socket head set screw (M4) to be 1.0 to 1.2 N·m.
Note 3) When tightening an auto switch mounting screw (M2.5 x 0.45 x 4 L), use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm. Also, set the tightening torque to be 0.05 to 0.15 N·m. As a guide, turn 90° from the position where it comes to feel tight.

Auto Switch Mounting Bracket Part No. (Including Bracket, Set Screw)

Cylinder series	Applicable bore size (mm)						
	32	**40**	**50**	**63**	**80**	**100**	**125**
C96	BMB5 -032	BMB5 -032	BA7 -040	BA7 -040	BA7 -063	BA7 -063	BA7 -080

Note 1) When using D-M9□A(V) type, please order stainless steel screw set BBA1 separately (page 78) , and use the stainless steel set screws, after selecting set screws of the appropriate length for the cylinder series—as shown in the table above.
Note 2) Color or gloss differences in the metal surfaces have no effect on metal performance.
The special properties of the chromate (trivalent) applied to the main body of the auto switch mounting bracket for BA7-□ and BMB5-□ result in differences in coloration depending on the production lot, but these have no adverse impact on corrosion resistance.

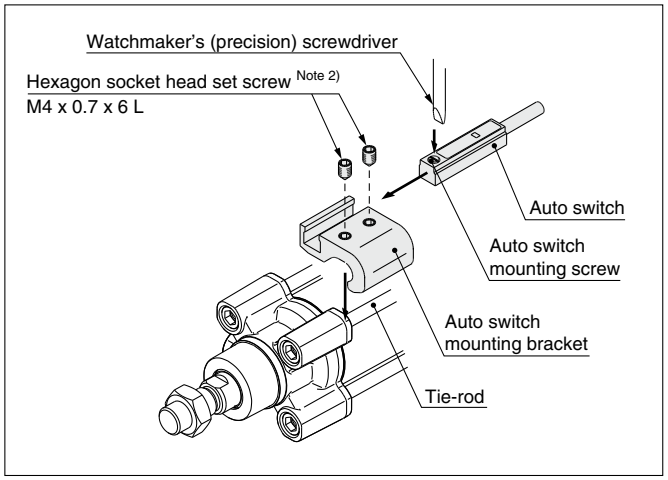
How to Mount and Move the Auto Switch 2

Mounting Bracket Tie-rod Mounting Type

<Applicable Auto Switch>

Solid state switch ··· D-Y59$^{A}_{B}$, Y69$^{A}_{B}$, D-Y7P(V)
D-Y7NW(V), Y7PW(V), Y7BW(V)
D-Y7BA
Reed switch ····· D-Z73, Z76, Z80

How to Mount and Move the Auto Switch



Note 1) When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm. Also, set the tightening torque to be 0.05 to 0.1 N·m. As a guide, turn 90° from the position where it comes to feel tight. Set the tightening torque of a hexagon socket head set screw (M4 x 0.7 x 6 L) to be 1.0 to 1.2 N·m.

1. Fix it to the detecting position with a set screw by installing an auto switch mounting bracket in cylinder tie-rod and letting the bottom surface of an auto switch mounting bracket contact the cylinder tube firmly. (Use a hexagon wrench.)
2. Fit an auto switch into the auto switch mounting groove to set it roughly to the mounting position for an auto switch.
3. After confirming the detecting position, tighten up the mounting screw attached to an auto switch, and secure the auto switch.
4. When changing the detecting position, carry out in the state of 2.

∗ To protect auto switches, ensure that main body of an auto switch should be embedded into auto switch mounting groove with a depth of 15 mm or more.

Auto Switch Mounting Bracket Part No. (Including Bracket, Set Screw)

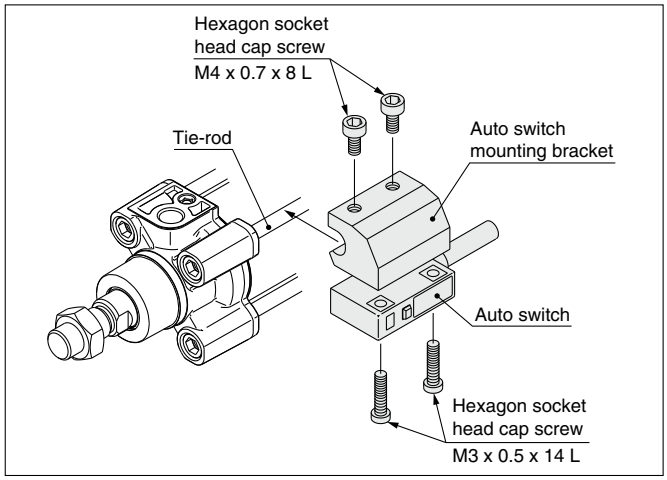
Cylinder series	Applicable bore size (mm)						
	32	40	50	63	80	100	125
C96	BMB4 -032	BMB4 -032	BMB4 -050	BMB4 -050	BA4 -063	BA4 -063	BA4 -080

Note 2) When using D-Y7BA type, please order stainless steel screw set BBA1 separately (page 78), and use the stainless steel set screws, after selecting set screws of the appropriate length for the cylinder series — as shown in the table above.

<Applicable Auto Switch>

Solid state switch ··· D-P4DW

How to Mount and Move the Auto Switch



1. Slightly screw the hexagon socket head cap screw (M4 x 0.7 x 8 L) into the M4 tapped portion of auto switch mounting bracket. (2 locations) Use caution that the tip of the hexagon socket head cap screw should not stick out to the concave portion of auto switch mounting bracket.
2. Put a hexagon socket head cap screw (M3 x 0.5 x 14 L) through the auto switch's through-hole (2 locations), and then push it down into the M3 tapped part on the auto switch mounting bracket while turning it lightly.
3. Place the concave part of the auto switch mounting bracket into the cylinder tie-rod, and slide the auto switch mounting bracket in order to set roughly to the detecting position.
4. After reconfirming the detecting position, tighten the M3 mounting screw to secure the auto switch by making the bottom face of auto switch attached to the cylinder tube. (Tightening torque of M3 screw should be 0.5 to 0.7 N·m.)
5. Tighten up M4 screw of auto switch mounting bracket to secure the auto switch mounting bracket. (Ensure that tightening torque of M4 screw should be set 1.0 to 1.2 N·m.)

Auto Switch Mounting Bracket Part No. (Including Bracket, Screw)

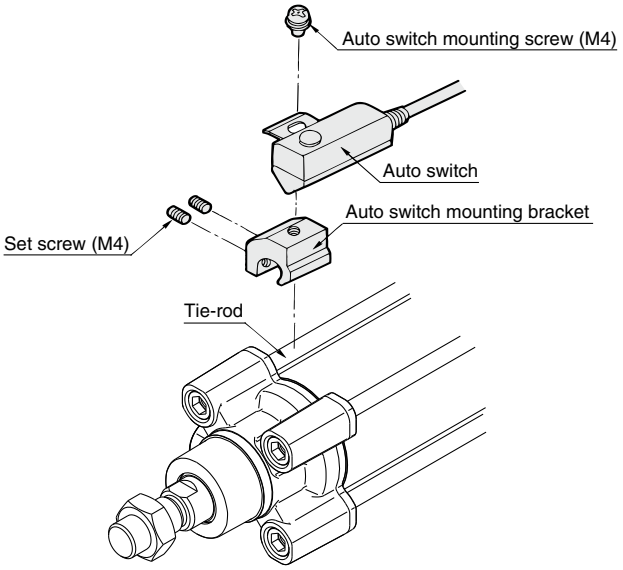
Cylinder series	Applicable bore size (mm)						
	32	40	50	63	80	100	125
C96	BMB3T -040	BMB3T -040	BMB3T -050	BMB3T -050	BMB3T -080	BMB3T -080	BAP2T -080

Mounting Bracket Tie-rod Mounting Type

<Applicable Auto Switch>

Solid state switch ··· D-F59, D-F5P
D-J59, D-J51, D-F5BA
D-F59W, D-F5PW, D-J59W
D-F59F, D-F5NT

Reed switch ····· D-A53, D-A54, D-A56, D-A64, D-A67
D-A59W



1. Fix the auto switch on the auto switch mounting bracket with the auto switch mounting screw (M4) and install the set screw (M4).
2. Fit the auto switch mounting bracket into the cylinder tie-rod and then fix the auto switch at the detecting position with a set screw (M4). (Be sure to put the auto switch on the surface of cylinder tube.) (Use a hexagon wrench.)
3. When changing the detecting position, loosen the set screw to move the auto switch and then re-fix the auto switch on the cylinder tube. (Tightening torque of M4 screw should be 1.0 to 1.2 N·m.)

Auto Switch Mounting Bracket Part No. (Including Bracket, Screw, Set Screw)

Cylinder series	Applicable bore size (mm)						
	32	**40**	**50**	**63**	**80**	**100**	**125**
C96	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06	BT-08

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

BBA1: For D-A5/A6/F5/J5

"D-F5BA" switch is set on the cylinder with the stainless steel screws above when shipped from factory.
When only an auto switch is shipped independently, the BBA1 is attached.

Stainless Steel Mounting Screw Set

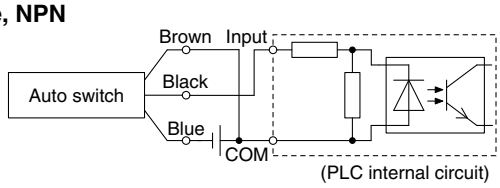
Part no.	Contents				Applicable auto switch mounting bracket part no.	Applicable auto switch
	No.	Description	Size	Q'ty		
BBA1	1	Auto switch mounting screw	M4 x 0.7 x 8 L	1	BT-□□	D-A5, A6 D-F5, J5
	2	Set screw	M4 x 0.7 x 6 L	2	BT-03, BT-04, BT-05 BT-06, BT-08, BT-12	
					BA4-040, BA4-063, BA4-080 BMB4-032, BMB4-050	D-Z7, Z8 D-Y5, Y6, Y7
					BMB5-032 BA7-040, BA7-063, BA7-080	D-A9 D-M9
	3	Set screw	M4 x 0.7 x 8 L	2	BT-16, BT-18A, BT-20	D-A5, A6 D-F5, J5
					BS4-125, BS4-160 BS4-180, BS4-200	D-Z7, Z8 D-Y5, Y6, Y7
					BS5-125, BS5-160 BS5-180, BS5-200	D-A9 D-M9

Note) Use the set screw after selecting the appropriate length for the auto switch mounting bracket.
(Example) When using the BA7-040, select the 6 L type. 8 L type is not required.

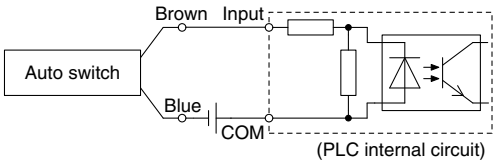
Prior to Use
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

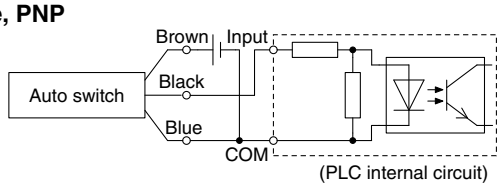


2-wire

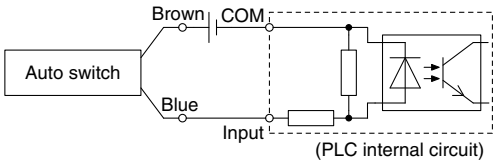


Source Input Specifications

3-wire, PNP



2-wire



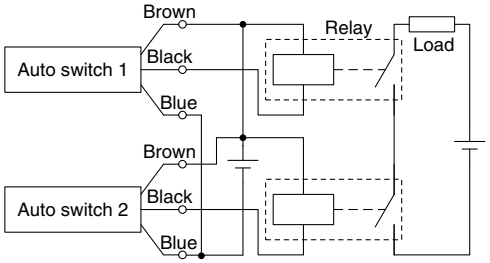
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

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

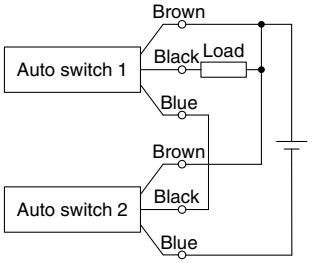
∗ When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

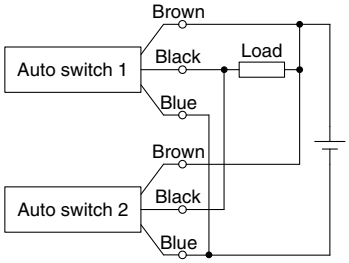
(Using relays)



(Performed with auto switches only)

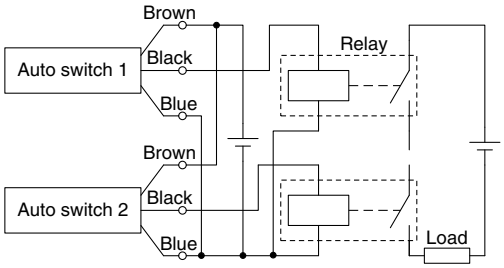


3-wire OR connection for NPN output

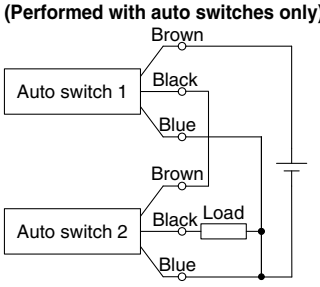


3-wire AND connection for PNP output

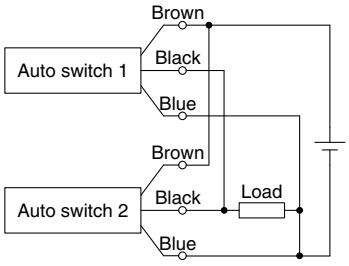
(Using relays)



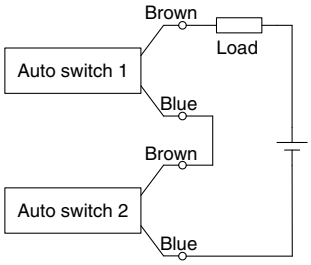
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

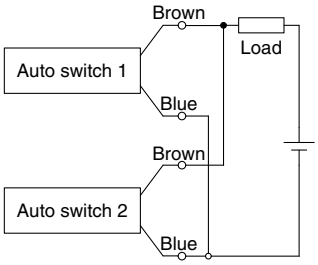


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up when both of the auto switches are in the ON state.
Auto switches with load voltage less than 20 V cannot be used.

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

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

2-wire OR connection



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

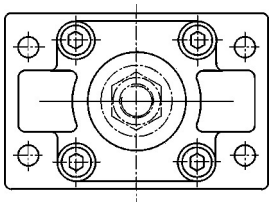
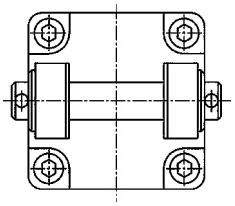
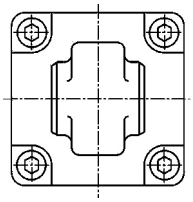
(Reed)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

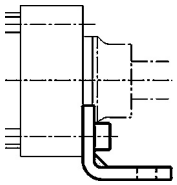
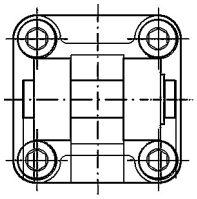
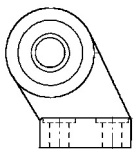
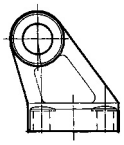
Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

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

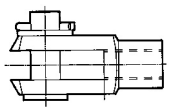
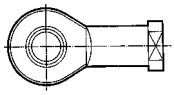
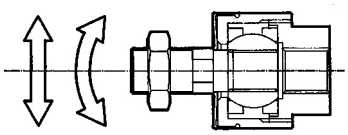
Series CP96/C96
Accessories

Cylinder Mounting Accessories/Part No.

Bore size (mm)	**F** Rod/Head flange	**D** Double clevis (Corresponds to E accessory)	**C** Single clevis	
				
	∗ Supplied with 4 screws.	∗ Supplied with 4 screws, clevis pin, and safety device.	∗ Supplied with 4 screws.	
			Plain	With ball joint
32	F5032	D5032	C5032	CS5032
40	F5040	D5040	C5040	CS5040
50	F5050	D5050	C5050	CS5050
63	F5063	D5063	C5063	C95063
80	F5080	D5080	C5080	CS5080
100	F5100	D5100	C5100	CS5100
125	F5125	D5125	C5125	CS5125
	Refer to page 62 for dimensions.	Refer to page 81 for dimensions.	Refer to page 81 for dimensions.	

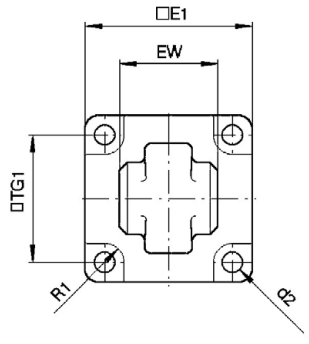
Bore size (mm)	**L** Foot	**DS** Double clevis (for ES accessory)	**ES** Clevis pivot bracket with ball joint	**E** Clevis pivot bracket
				
	∗ Supplied with 2 pieces and 4 screws.			
32	L5032	DS5032	ES5032	E5032
40	L5040	DS5040	ES5040	E5040
50	L5050	DS5050	ES5050	E5050
63	L5063	DS5063	ES5063	E5063
80	L5080	DS5080	ES5080	E5080
100	L5100	DS5100	ES5100	E5100
125	L5125	DS5125	ES5125	E5125
	Refer to page 62 for dimensions.	Refer to page 82 for dimensions.	Refer to page 82 for dimensions.	Refer to page 81 for dimensions.

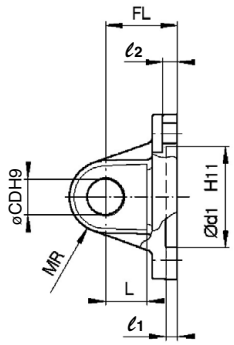
Piston Rod Mounting Accessories/Part No.

Bore size (mm)	**GKM** Rod clevis (ISO 8140)	**KJ** Piston rod ball joint (ISO 8139)	**JA** Floating joint
			
	∗ Supplied with clevis pin and safety device.		
32	GKM10-20	KJ10D	JA30-10-125
40	GKM12-24	KJ12D	JA40-12-125
50	GKM16-32	KJ16D	JA50-16-150
63	GKM16-32	KJ16D	JA50-16-150
80	GKM20-40	KJ20D	JAH50-20-150
100	GKM20-40	KJ20D	JAH50-20-150
125	GKM30-54	KJ27D	JA125-27-200
	Refer to page 83 for dimensions.	Refer to page 83 for dimensions.	Refer to page 83 for dimensions.

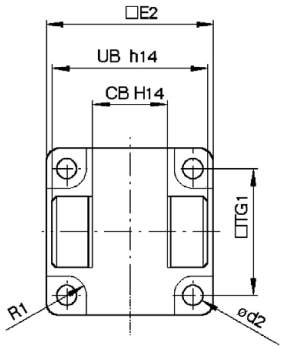
Dimensions: Cylinder Mounting Accessories

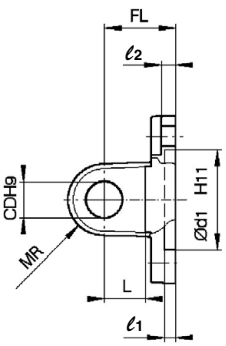
Single clevis (C)





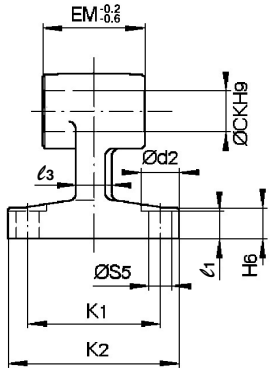
Double clevis (D)

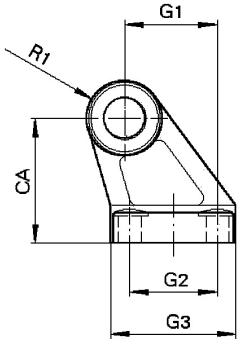




Bore size (mm)	E_1	EW	TG_1	FL	ℓ_1	L	ℓ_2	ød1	øCD	MR	ød2	R_1	E_2	UB	CB
32	45	$26^{-0.2}_{-0.6}$	32.5	22	5	12	5.5	30	10	9.5	6.6	6.5	48	45	26
40	51	$28^{-0.2}_{-0.6}$	38	25	5	15	5.5	35	12	12	6.6	6.5	56	52	28
50	64	$32^{-0.2}_{-0.6}$	46.5	27	5	15	6.5	40	12	12	9	8.5	64	60	32
63	74	$40^{-0.2}_{-0.6}$	56.5	32	5	20	6.5	45	16	16	9	8.5	75	70	40
80	94	$50^{-0.2}_{-0.6}$	72	36	5	20	10	45	16	16	11	11	95	90	50
100	113	$60^{-0.2}_{-0.6}$	89	41	5	25	10	55	20	20	11	12	115	110	60
125	Max.157	$70^{-0.5}_{-1.2}$	110	50	7	30	10	60	25	26	13.5	10	Max.157	130	70

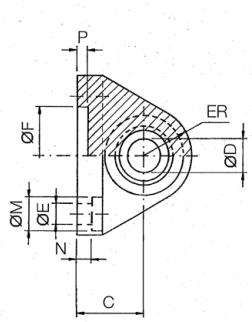
Clevis pivot bracket (E)

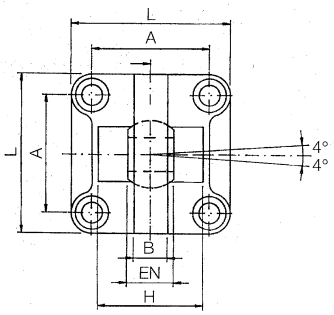




Bore size (mm)	ød2	øCK	øS5	K_1	K_2 (Max.)	ℓ_3 (Max.)	G_1	ℓ_1	G_2	EM	G_3 (Max.)	CA	H_6	R_1
32	11	10	6.6	38	51	10	21	7	18	$26^{-0.2}_{-0.6}$	31	32	8	10
40	11	12	6.6	41	54	10	24	9	22	$28^{-0.2}_{-0.6}$	35	36	10	11
50	15	12	9	50	65	12	33	11	30	$32^{-0.2}_{-0.6}$	45	45	12	12
63	15	16	9	52	67	14	37	11	35	$40^{-0.2}_{-0.6}$	50	50	12	15
80	18	16	11	66	86	18	47	12.5	40	$50^{-0.2}_{-0.6}$	60	63	14	15
100	18	20	11	76	96	20	55	13.5	50	$60^{-0.2}_{-0.6}$	70	71	15	19
125	20	25	14	94	124	30	70	17	60	$70^{-0.5}_{-1.5}$	90	90	20	22.5

Single clevis with ball joint (CS)



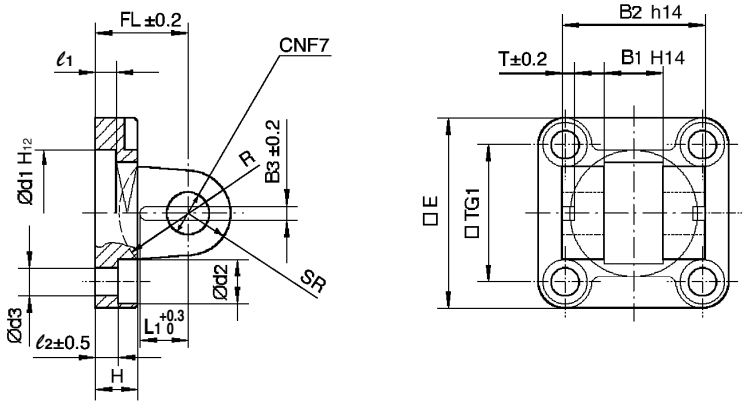


Bore size (mm)	A	B (Max.)	C	øDH7	EN 0 −0.1	ER (Max.)	øFH11	øE	L	øM	N	P	H ±0.5
32	32.5	10.5	22	10	14	15	30	6.6	45	10.5	5.5	5	—
40	38	12	25	12	16	18	35	6.6	55	11	5.5	5	—
50	46.5	15	27	16	21	20	40	9	65	15	6.5	5	51
63	56.5	15	32	16	21	23	45	9	75	15	6.5	5	—
80	72	18	36	20	25	27	45	11	95	18	10	5	70
100	89	18	41	20	25	30	55	11	115	18	10	5	—
125	110	25	50	30	37	40	60	13.5	140	20	10	7	100

∗ Black color

Dimensions: Cylinder Mounting Accessories

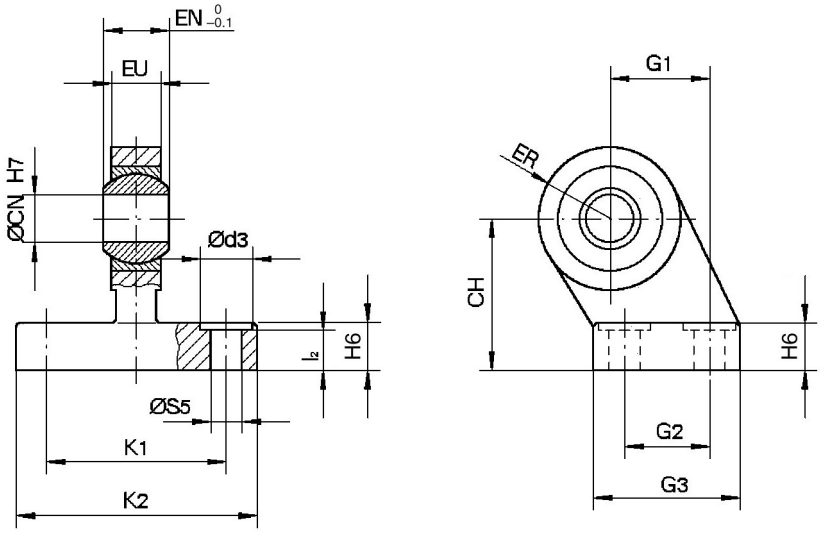
Double clevis (DS)



Bore size (mm)	E	B_1	B_2	B_3	L_1	TG_1	T	ℓ_1 (Min.)	ℓ_2	FL	H (Max.)	ød_1	ød_2	ød_3	øCN	SR (Max.)	R
32	45	14	34	3.3	11.5	32.5	3	5	5.5	22	10	30	10.5	6.6	10	11	17
40	55	16	40	4.3	12	38	4	5	5.5	25	10	35	11	6.6	12	13	20
50	65	21	45	4.3	14	46.5	4	5	6.5	27	12	40	15	9	16	18	22
63	75	21	51	4.3	14	56.5	4	5	6.5	32	12	45	15	9	16	18	25
80	95	25	65	4.3	16	72	4	5	10	36	16	45	18	11	20	22	30
100	115	25	75	6.3	16	89	4	5	10	41	16	55	18	11	20	22	32
125	140	37	97	6.3	24	110	6	7	10	50	20	60	20	13.5	30	30	42

∗ Black color

Clevis pivot bracket with ball joint (ES)

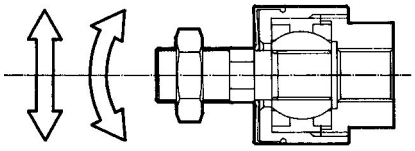


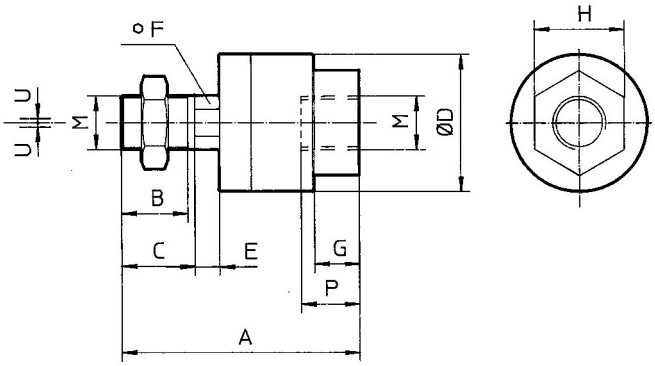
Bore size (mm)	ød_3	øCN	øS_5	K_1	K_2 (Max.)	ℓ_2	G_1	G_2	G_3 (Max.)	EN	EU	CH	H_6	ER (Max.)
32	11	10	6.6	38	51	8.5	21	18	31	14	10.5	32	10	15
40	11	12	6.6	41	54	8.5	24	22	35	16	12	36	10	18
50	15	16	9	50	65	10.5	33	30	45	21	15	45	12	20
63	15	16	9	52	67	10.5	37	35	50	21	15	50	12	23
80	18	20	11	66	86	11.5	47	40	60	25	18	63	14	27
100	18	20	11	76	96	12.5	55	50	70	25	18	71	15	30
125	20	30	13.5	94	124	17	70	60	90	37	25	90	20	40

∗ Black color

Dimensions: Piston Rod Mounting Accessories

Floating Joint JA

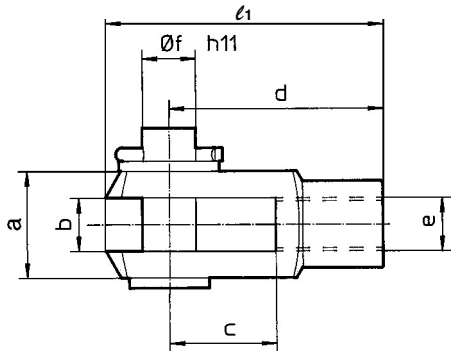




Bore size (mm)	M	Part no.	A	B	C	øD	E	F	G	H	P	U	Load (kN)	Weight (g)	Angle
32	M10 x 1.25	**JA30-10-125**	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5	70	
40	M12 x 1.25	**JA40-12-125**	60	20	—	31	6	11	11	22	13	0.75	4.4	160	
50, 63	M16 x 1.5	**JA50-16-150**	71.5	22	—	41	7.5	14	13.5	27	15	1	11	300	±0.5°
80, 100	M20 x 1.5	**JAH50-20-150**	101	28	31	59.5	11.5	24	16	32	18	2	18	1080	
125	M27 x 2	**JA125-27-200**	123	34	38	66	13	27	20	41	24	2	28	1500	

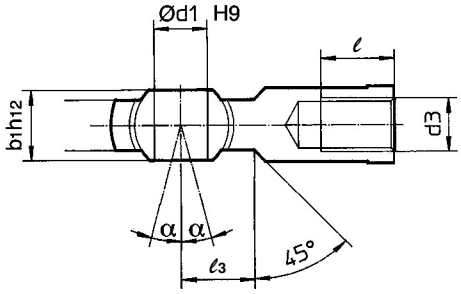
∗ Black color

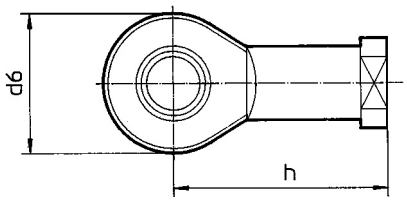
Rod Clevis GKM (ISO 8140), Supplied with clevis pin and Safety Device



Bore size (mm)	e	Part no.	b	d	øf h11 (Shaft)	øf H9 (Hole)	ℓ1	c (Min.)	a (Max.)
32	M10 x 1.25	**GKM10-20**	$10^{+0.5}_{+0.15}$	40	10	10	52	20	20
40	M12 x 1.25	**GKM12-24**	$12^{+0.5}_{+0.15}$	48	12	12	62	24	24
50, 63	M16 x 1.5	**GKM16-32**	$16^{+0.5}_{+0.15}$	64	16	16	83	32	32
80, 100	M20 x 1.5	**GKM20-40**	$20^{+0.5}_{+0.15}$	80	20	20	105	40	40
125	M27 x 2	**GKM30-54**	$30^{+0.5}_{+0.15}$	110	30	30	148	54	55

Piston Rod Ball Joint KJ (ISO 8139)





Bore size (mm)	d3	Part no.	ød1 H9	h	d6 (Max.)	b1 h12	ℓ (Min.)	α	ℓ3
32	M10 x 1.25	**KJ10D**	10	43	28	14	20	4°	15
40	M12 x 1.25	**KJ12D**	12	50	32	16	22	4°	17
50, 63	M16 x 1.5	**KJ16D**	16	64	42	21	28	4°	23
80, 100	M20 x 1.5	**KJ20D**	20	77	50	25	33	4°	27
125	M27 x 2	**KJ27D**	30	110	70	37	51	4°	36

Series CP96/C96
Simple Specials

These changes are dealt with Simple Specials System.

1 Change of Rod End Shape

Symbol
-XA0 to -XA30

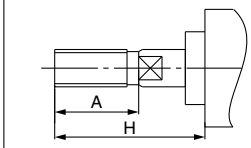
Applicable Series

Series	Description	Model	Action	Symbol for change of rod end shape
C96	Standard type	C96S	Double acting, Single rod	XA0 to 30
		C96SW	Double acting, Double rod	XA0 to 30
	Smooth type	C96Y	Double acting, Single rod	XA0 to 30
CP96	Standard type	CP96S	Double acting, Single rod	XA0 to 30
		CP96SW	Double acting, Double rod	XA0 to 30

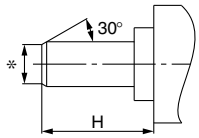
⚠ Precautions

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

Symbol: A0



Symbol: A1



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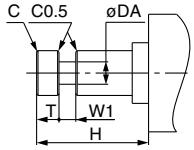

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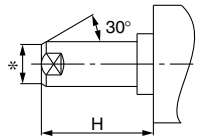

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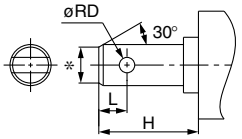

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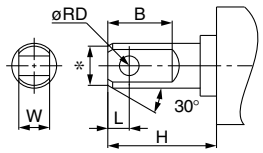

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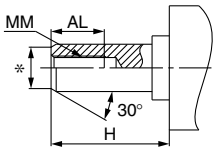

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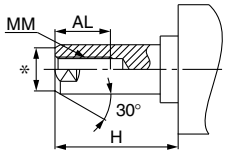
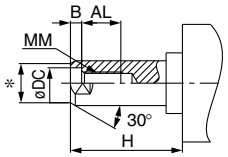


Symbol: A8



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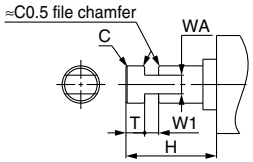
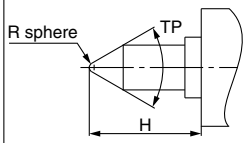


Symbol: A10



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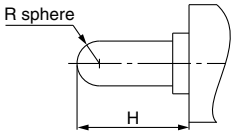

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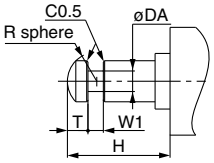

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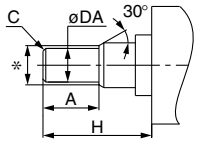

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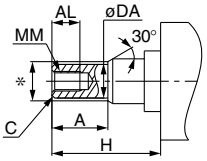
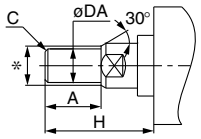
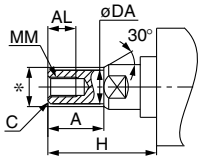


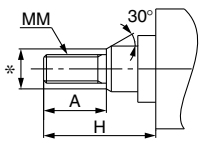
Symbol: A15



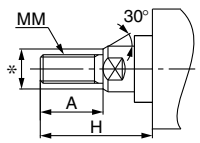
Symbol: A16



Symbol: A17



Symbol: A18



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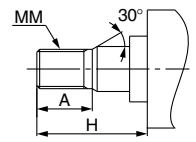

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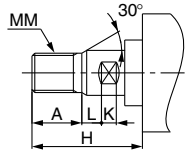

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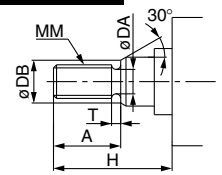

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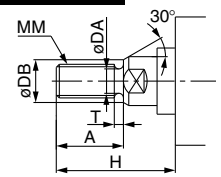

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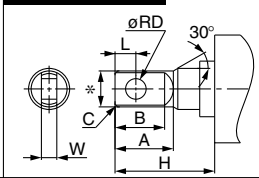

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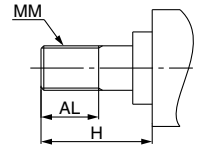

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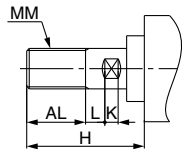

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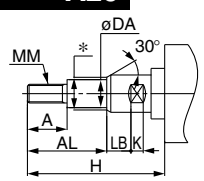

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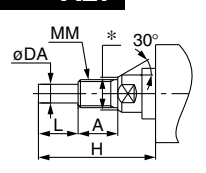

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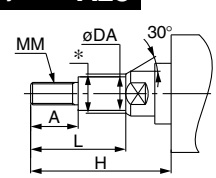

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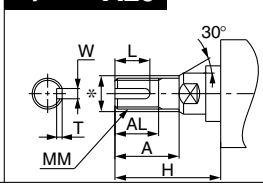
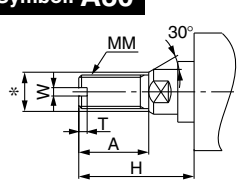


Symbol: A30



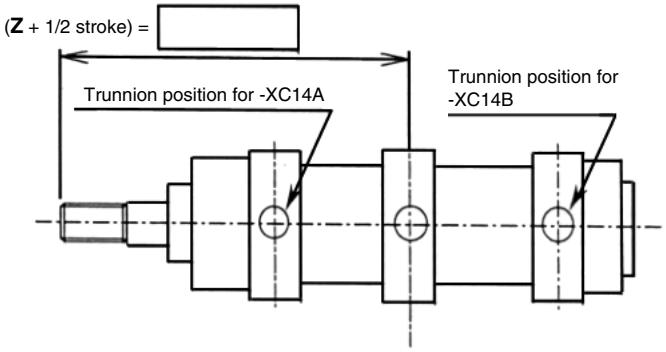
Symbol
-XC14

2 Change of Trunnion Bracket Mounting Position

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

Applicable Series

Series	Description	Model	Action	Note
C96	Standard type	**C96**	Double acting, Single rod	
		C96W	Double acting, Double rod	



⚠ Precautions

1. Specify "Z + 1/2 stroke" in the case the trunnion bracket position is not -XC14A, B or trunnion is not a center trunnion.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. The possible range of trunnion bracket mounting position is indicated in the table below.
4. Some trunnion mounting positions do not allow auto switch mounting. Please consult with SMC for more information.

Series C96

(mm)

Symbol / Bore size	Trunnion bracket position			
	For -XC14		Reference: Standard (Center trunnion)	Minimum stroke
	Minimum	Maximum		
32	89	101 + Stroke	95 + 0.5 stroke	0
40	103	110 + Stroke	106.5 + 0.5 stroke	
50	118	126 + Stroke	122 + 0.5 stroke	
63	128.5	130.5 + Stroke	129.5 + 0.5 stroke	
80	148.5	151.5 + Stroke	150 + 0.5 stroke	
100	161.5	158.5 + Stroke	160 + 0.5 stroke	5
125	202.5	195.5 + Stroke	199 + 0.5 stroke	10

Made to Order

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

Made to Order

Symbol **-XB6**

3 Heat Resistant Cylinder (–10 to 150°C)

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

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod		Page 43
		CP96SW	Double acting, Double rod		
C96	Air cylinder	**C96S**	Double acting, Single rod		Page 56
		C96SW	Double acting, Double rod		

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

How to Order

Standard model no. **–XB6**

Heat resistant cylinder

Specifications

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

⚠ Warning

Precautions

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

Symbol **-XB7**

4 Cold Resistant Cylinder (–40 to 70°C)

Air cylinder which changed the seal material and grease, so that it could be used even at lower temperature down to –40°C.

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
C96	Air cylinder	**C96S**	Double acting, Single rod	Except with auto switch. Mounting bracket: Basic type only. Minimum operating pressure 0.2 MPa	Page 56

Note 1) Operate without lubrication from a pneumatic system lubricator.
Note 2) Use dry air which is suitable for heatless air dryer etc. not to cause the moisture to be frozen.
Note 3) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
Note 4) Mounting auto switch is impossible.

How to Order

Standard model no. **–XB7**

Cold resistant cylinder

Specifications

Ambient temperature range	–40 to 70°C
Seal material	Low nitrile rubber
Grease	Cold resistant grease
Auto switch	Not mountable
Dimensions	Same as standard type
Specifications other than above	Same as standard type

⚠ Warning

Precautions

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

Symbol

5 With Heavy Duty Scraper -XC4

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

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	ø32 to ø100	Page 43
		CP96SW	Double acting, Double rod	ø32 to ø100	
C96	Air cylinder	**C96S**	Double acting, Single rod	ø32 to ø100	Page 56
		C96SW	Double acting, Double rod	ø32 to ø100	

How to Order

Standard model no. **−XC4**

With heavy duty scraper (SCB scraper)

Specifications: Same as standard type

Dimensions: Same as standard type

⚠Caution

Do not replace heavy duty scrapers.

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

Symbol

6 Tie-rod, Cushion Valve, Tie-rod Nut, etc. Made of Stainless Steel -XC7

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

Applicable Series

Series	Description	Model	Action	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	Page 43
		CP96SW	Double acting, Double rod	
C96	Air cylinder	**C96S**	Double acting, Single rod	Page 56
		C96SW	Double acting, Double rod	

How to Order

Standard model no. **−XC7**

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

Specifications

Parts changed to stainless steel	Tie-rod, Tie-rod nut, Mounting bracket nut, Spring washer, Cushion valve, Lock nut
Specifications other than above	Same as standard type
Dimensions	Same as standard type

Symbol
-XC10

7 Dual Stroke Cylinder/Double Rod Type

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

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	Except clevis and trunnion types	Page 43
C96	Air cylinder	**C96S**	Double acting, Single rod	Except clevis and trunnion types	Page 56

How to Order

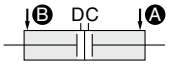
CP96S / C96S | Mounting style | Bore size | − | Stroke A | + | Stroke B | − **XC10**

XC10: Dual stroke cylinder

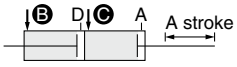
Specifications

Series	Bore size (mm)	Maximum manufacturable stroke (mm)
CP96 / **C96**	32 to 125	1000

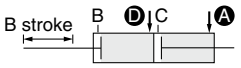
Function



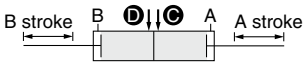
When air pressure is supplied to ports A and B, both A and B strokes retract.



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

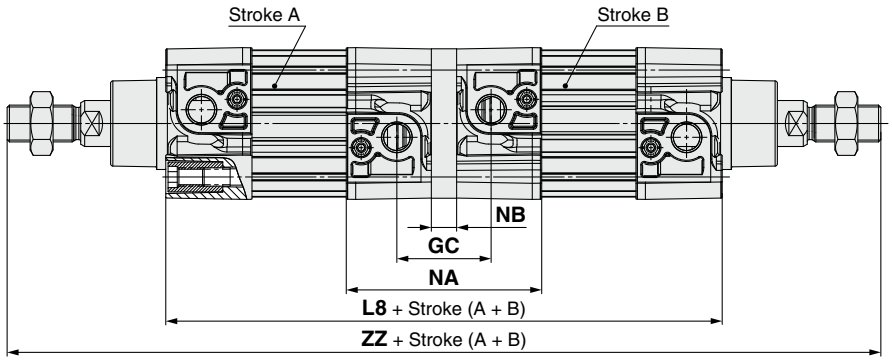


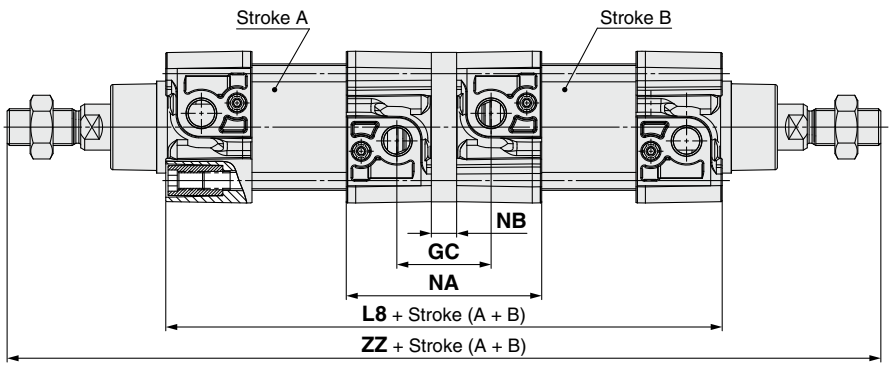
When air pressure is supplied to ports A and D, B out strokes.



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

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





Bore size (mm)	L8	ZZ	NA	NB	GC
ø**32**	198	294	74	10	36
ø**40**	220	328	85	10	38
ø**50**	222	360	85	10	41
ø**63**	252	390	100	10	43
ø**80**	270	442	104	14	52
ø**100**	290	472	114	14	52
ø**125**	334	572	130	14	52

Symbol

8 Dual Stroke Cylinder/Single Rod Type — -XC11

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

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	Except trunnion type	Page 43
C96	Air cylinder	**C96S**	Double acting, Single rod	Except trunnion type	Page 56

How to Order

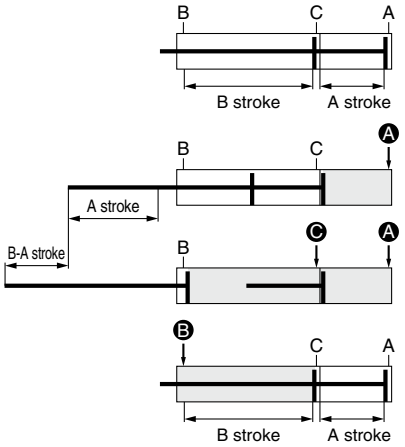
CP96S / C96S [Mounting style] [Bore size] – [Stroke A] + [Stroke B-A] – **XC11**

XC11: Dual stroke cylinder/Single rod type

Specifications: Same as standard type

Function

Functional description of dual stroke cylinder



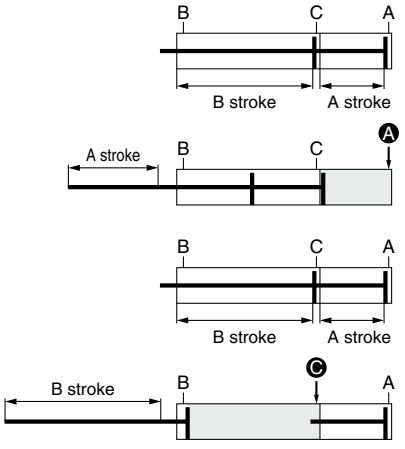
1) Initial state
(0 stroke position)

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

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

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

A stroke or B stroke operation can be made individually.



A stroke operation

1) Initial state
(0 stroke position)

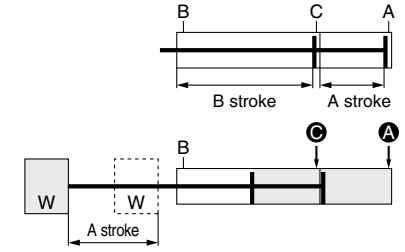
2) Operation
When the air pressure is supplied from the A port, the rod operates the A stroke.

B stroke operation

1) Initial state
(0 stroke position)

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

Double output is possible.



1) Initial state
(0 stroke position)

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

Precautions

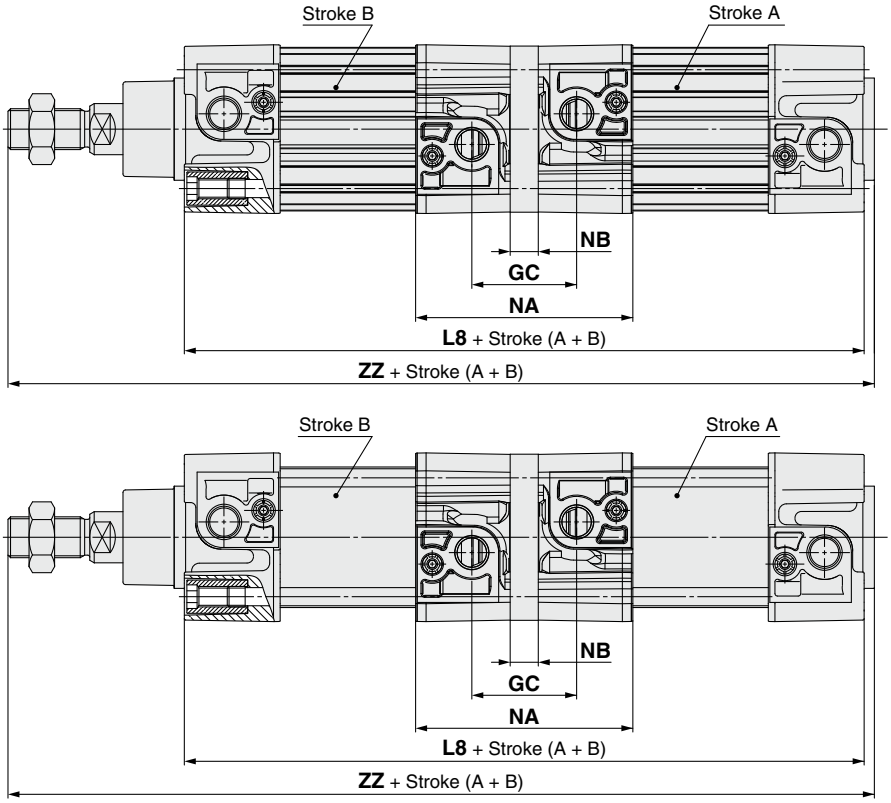
⚠ Caution

1. Do not supply air until the cylinder is fixed with the attached bolt.

2. If air is supplied without securing the cylinder, the cylinder could lurch, posing the risk of bodily injury or damage to the peripheral equipment.

Symbol
8 Dual Stroke Cylinder/Single Rod Type -XC11

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



Bore size (mm)	L8	ZZ	NA	NB	GC
ø32	199	251	74	10	36
ø40	221	279	85	10	38
ø50	223	296	85	10	41
ø63	253	326	100	10	43
ø80	271	361	104	14	52
ø100	291	386	114	14	52
ø125	335	460	130	14	52

Symbol
9 Fluororubber Seal -XC22

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	CP96S	Double acting, Single rod		Page 43
		CP96SW	Double acting, Double rod		
C96	Air cylinder	C96S	Double acting, Single rod		Page 56
		C96SW	Double acting, Double rod		

How to Order

Standard model no. − XC22

Fluororubber seal

Specifications

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

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

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

10 With Coil Scraper

Symbol: **-XC35**

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

Applicable Series

Series	Description	Model	Action	Note	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	ø32 to ø100	Page 43
		CP96SW	Double acting, Double rod	ø32 to ø100	
C96	Air cylinder	**C96S**	Double acting, Single rod	ø32 to ø100	Page 56
		C96SW	Double acting, Double rod	ø32 to ø100	

How to Order

Standard model no. – **XC35**

With coil scraper

Specifications: Same as standard type

Dimensions: Same as standard type

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

Symbol: **-XC68**

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

Applicable Series

Series	Description	Model	Action	Page for the standard type
CP96	Air cylinder	**CP96S**	Double acting, Single rod	Page 43
		CP96SW	Double acting, Double rod	
C96	Air cylinder	**C96S**	Double acting, Single rod	Page 56
		C96SW	Double acting, Double rod	

Note) There is a maximum stroke limit for C(P)96 cylinder.

Maximum Stroke

(mm)

Series	Double acting, Single rod	Double acting, Double rod
CP96	ø32: 1800 ø40 to ø100: 1700 ø125: 1600	1000 (Same as standard type)
C96	ø32: 1000 ø40 to ø100: 1700 ø125: 1600	1000 (Same as standard type)

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Other specifications and external dimensions	Same as standard type

How to Order

Standard model no. – **XC68**

Made of stainless steel
(With hard chrome plated piston rod)

Compact Cylinder Double Acting, Single Rod
Series C55
ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

C55 [B] [20] – [10] [ ] – [ ]

With auto switch: CD55 [B] [20] – [10] [ ] – [M9B] [S] – [ ]

With auto switch (Built-in magnet): D

Mounting

B	Through-hole/Both ends tapped common (Standard)
L	Foot
F	Rod flange
G	Head flange
C	Single clevis

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Cylinder stroke (mm)
Refer to page 93 for standard and intermediate strokes.

Rod end thread

Nil	Female rod end
M	Male rod end

∗ A rubber bumper comes as standard.

Auto switch

Nil	Without auto switch (Built-in magnet cylinder)

∗ For applicable auto switches, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

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

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

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

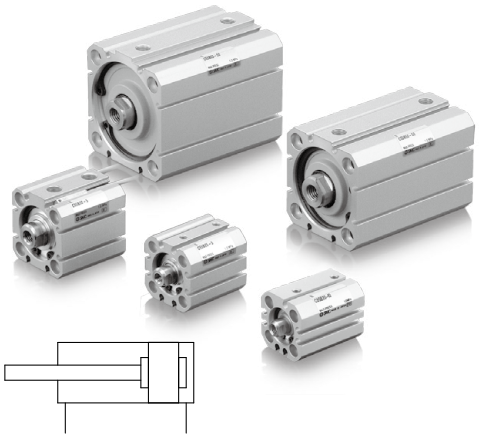
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	●	○	—	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	●	○	—	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NWV**	**M9NW**	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	—	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NAV**∗1	**M9NA**∗1	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PAV**∗1	**M9PA**∗1	○	○	●	○	—	○		
				2-wire		12 V		**M9BAV**∗1	**M9BA**∗1	○	○	●	○	—	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		—	**P3DW**	●	—	●	●	—	●		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	—	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**∗2	**A93**	●	●	●	●	—	—	—	Relay, PLC
			No			5 V, 12 V	100 V or less	**A90V**	**A90**	●	—	●	—	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

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

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

∗ Since there are other applicable auto switches than listed above, refer to the **WEB catalog** or the Best Pneumatics No. 2 for details.
∗ For details about auto switches with pre-wired connector, refer to the **WEB catalog** or the Best Pneumatics No. 2.
∗ For details about D-P3DWA type, refer to the **WEB catalog**.
∗ Auto switches are shipped together, (but not assembled).



⚠ Caution

Be sure to read before handling.

1. Refer to page 105 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuator and Auto Switch Precautions.
2. This product should not be used as a stopper.
3. Use the G thread fittings for this cylinder.

Made to Order

(For details, refer to pages 100-1 and 100-2.)

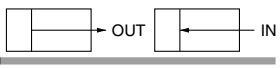
Symbol	Specifications
-XA□	Change of rod end shape
-XC6	Made of stainless steel (Rod, retaining ring and rod end nut made of stainless steel)

Mounting Bracket Part No.

Bore size (mm)	Foot	Flange	Single clevis
20	C55-L020	C55-F020	C55-C020
25	C55-L025	C55-F025	C55-C025
32	C55-L032	C55-F032	C55-C032
40	C55-L040	C55-F040	C55-C040
50	C55-L050	C55-F050	C55-C050
63	C55-L063	C55-F063	C55-C063
80	C55-L080	C55-F080	C55-C080
100	C55-L100	C55-F100	C55-C100

- Order two foot brackets per cylinder.
- Parts belonging to each bracket are as follows. Foot, Flange, Single clevis/Body mounting bolt

Theoretical Output



(N)

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3180
	OUT	1510	2520	3520
100	IN	2150	3580	5010
	OUT	2360	3930	5500

Specifications

Type		Pneumatic (Non-lube)
Action		Double acting, Single rod
Fluid		Air
Proof pressure		1.5 MPa
Maximum operating pressure		1.0 MPa
Minimum operating pressure		0.05 MPa (ø20 to ø63), 0.03 MPa (ø80, ø100)
Ambient and fluid temperature		Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)
Cushion		Rubber bumper on both ends
Stroke length tolerance Note)		+1.0 0 mm
Piston speed	**ø20 to ø63**	50 to 500 mm/s
	ø80, ø100	50 to 300 mm/s

Note) Stroke length tolerance does not include the amount of bumper change.

Standard Strokes

Bore size (mm)	Standard stroke (mm)
20 to 63	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80, 100, 125, 150
80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80, 100, 125

Manufacture of Intermediate Stroke

Description	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke
Part no.	Refer to "How to Order" for the standard model no. (page 92)
Stroke range	6 to 149
Example	Part no.: C55B32-47
	Makes 47 stroke tube

Weights

Without Auto Switch

Unit: g

Bore size (mm)	Cylinder stroke (mm)														
	5	10	15	20	25	30	35	40	45	50	60	80	100	125	150
20	111	124	137	150	163	176	189	202	215	228	254	306	357	422	487
25	152	168	183	199	214	230	246	261	277	292	323	386	448	526	603
32	250	273	295	317	339	362	384	406	428	451	495	584	673	785	896
40	315	339	364	388	412	436	461	485	509	533	582	679	776	897	1018
50	497	534	570	607	644	681	718	755	791	828	902	1049	1197	1381	1565
63	677	717	757	797	837	877	917	957	997	1037	1117	1277	1437	1638	1838
80	—	1164	1223	1281	1339	1398	1456	1514	1573	1631	1748	1981	2214	2506	—
100	—	2213	2295	2377	2459	2541	2623	2705	2787	2870	3034	3362	3690	4101	—

With Auto Switch (Built-in magnet)

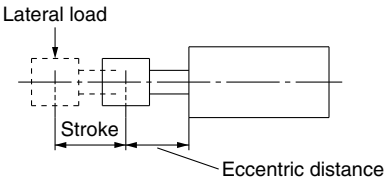
Unit: g

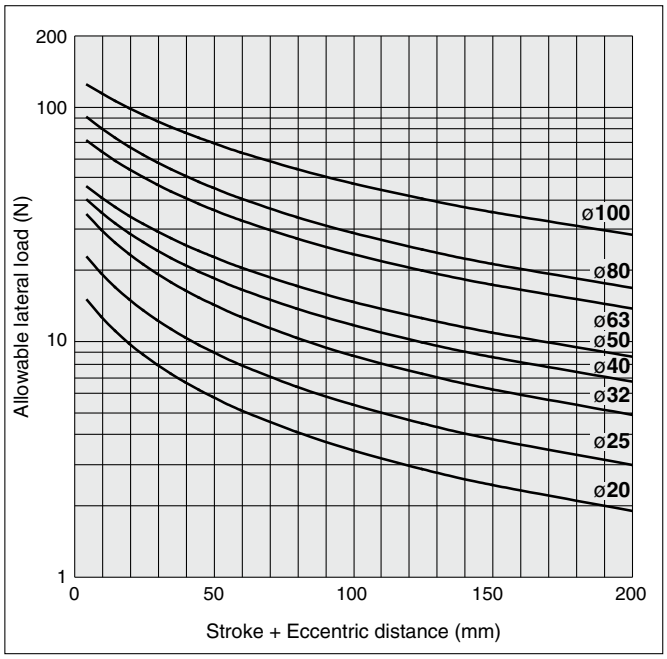
Bore size (mm)	Cylinder stroke (mm)														
	5	10	15	20	25	30	35	40	45	50	60	80	100	125	150
20	113	126	139	152	165	178	191	204	216	229	255	307	359	424	489
25	154	170	185	201	217	232	248	263	279	294	325	388	450	528	606
32	254	277	299	321	343	366	388	410	432	455	499	588	677	788	900
40	319	344	368	392	416	441	465	489	513	537	586	683	780	901	1022
50	502	539	575	612	649	686	723	760	796	833	907	1054	1202	1386	1570
63	685	725	765	805	845	885	925	965	1005	1045	1125	1285	1445	1645	1845
80	—	1188	1246	1305	1363	1421	1480	1538	1596	1654	1771	2004	2238	2529	—
100	—	2248	2330	2412	2494	2577	2659	2741	2823	2905	3069	3397	3726	4136	—

Add each weight of auto switches and mounting brackets when auto switches are mounted.
Refer to the Best Pneumatics No. 2 for auto switch weight.

Allowable Lateral Load

Make sure to operate strictly within the allowable lateral load range to the rod end.
Operation outside of this range may result in shorter service life or damage to the device.

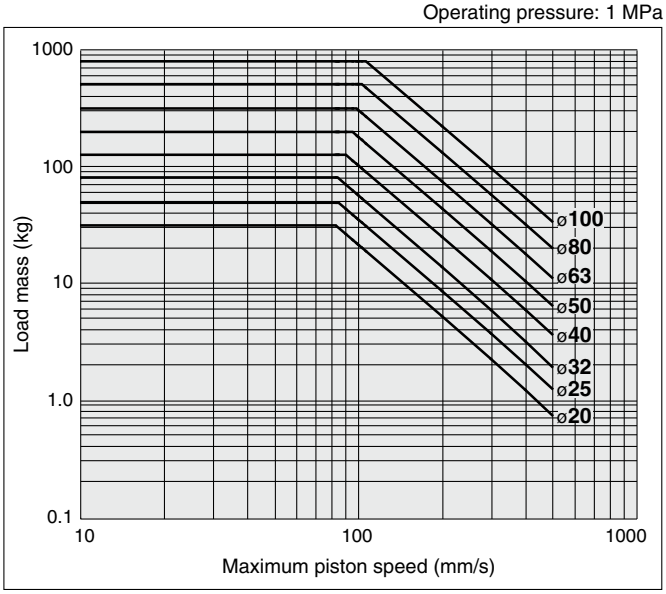




Allowable Kinetic Energy

Make sure to operate strictly within the allowable range of the load mass and maximum speed.
Operation outside of this range may cause excessive impact, which may result in the damage to the device.

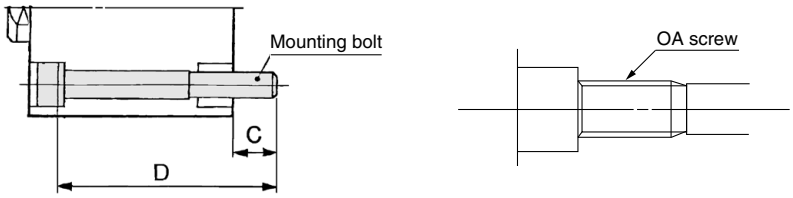
Operating pressure: 1 MPa



∗ For details about model selection, refer to "Model Selection" in Best Pneumatics No. 2.

Mounting Bolt

When mounting a cylinder with through-hole, use the mounting bolt listed in the table below.



Note) When using the through-hole mounting bolts for bore sizes 20 to 63 mm, be sure to use the attached flat washers.

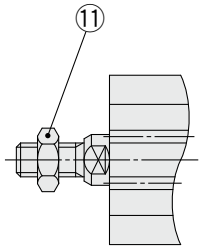
Mounting Bolt for C55

Model	C	D	Mounting bolt
C(D)55B20-5	7.2	45	M4 x 45L
-10		50	x 50L
-15		55	x 55L
-20		60	x 60L
-25		65	x 65L
-30		70	x 70L
-35		75	x 75L
-40		80	x 80L
-45		85	x 85L
-50		90	x 90L
-60	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-80			
-100			
-125			
-150			
C(D)55B25-5	10.2	50	M4 x 50L
-10		55	x 55L
-15		60	x 60L
-20		65	x 65L
-25		70	x 70L
-30		75	x 75L
-35		80	x 80L
-40		85	x 85L
-45		90	x 90L
-50		95	x 95L
-60	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-80			
-100			
-125			
-150			
C(D)55B32-5	10	55	M5 x 55L
-10		60	x 60L
-15		65	x 65L
-20		70	x 70L
-25		75	x 75L
-30		80	x 80L
-35		85	x 85L
-40		90	x 90L
-45		95	x 95L
-50		100	x 100L
-60		110	x 110L
-80		130	x 130L
-100		150	x 150L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-150			

Model	C	D	Mounting bolt
C(D)55B40-5	9	55	M5 x 55L
-10		60	x 60L
-15		65	x 65L
-20		70	x 70L
-25		75	x 75L
-30		80	x 80L
-35		85	x 85L
-40		90	x 90L
-45		95	x 95L
-50		100	x 100L
-60		110	x 110L
-80		130	x 130L
-100		150	x 150L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-150			
C(D)55B50-5	8.4	55	M6 x 55L
-10		60	x 60L
-15		65	x 65L
-20		70	x 70L
-25		75	x 75L
-30		80	x 80L
-35		85	x 85L
-40		90	x 90L
-45		95	x 95L
-50		100	x 100L
-60		110	x 110L
-80		130	x 130L
-100		150	x 150L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-150			
C(D)55B63-5	9.4	60	M6 x 60L
-10		65	x 65L
-15		70	x 70L
-20		75	x 75L
-25		80	x 80L
-30		85	x 85L
-35		90	x 90L
-40		95	x 95L
-45		100	x 100L
-50		105	x 105L
-60		115	x 115L
-80		135	x 135L
-100		155	x 155L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		
-150			

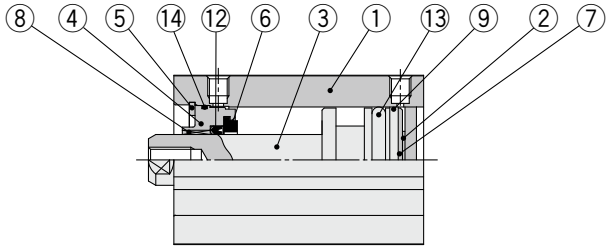
Model	C	D	Mounting bolt
C(D)55B80-10	11	70	M8 x 70L
-15		75	x 75L
-20		80	x 80L
-25		85	x 85L
-30		90	x 90L
-35		95	x 95L
-40		100	x 100L
-45		105	x 105L
-50		110	x 110L
-60		120	x 120L
-80		140	x 140L
-100		160	x 160L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		
C(D)55B100-10	13	85	M8 x 85L
-15		90	x 90L
-20		95	x 95L
-25		100	x 100L
-30		105	x 105L
-35		110	x 110L
-40		115	x 115L
-45		120	x 120L
-50		125	x 125L
-60		135	x 135L
-80		155	x 155L
-100		175	x 175L
-125	Use the OA screw provided on the cylinder tube to secure the cylinder.		

Construction

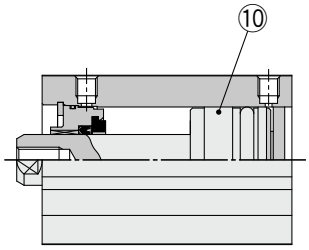


M: Male rod end

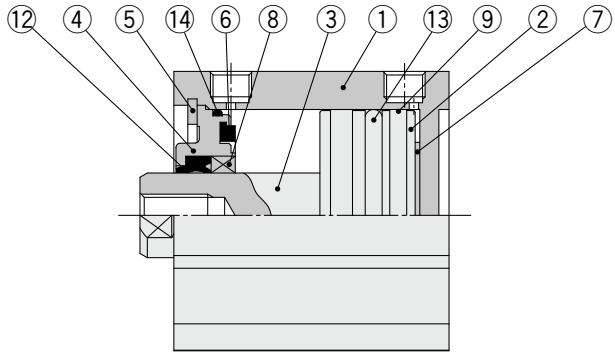
ø20, ø25



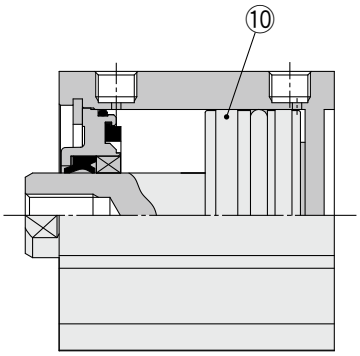
With auto switch (Built-in magnet)



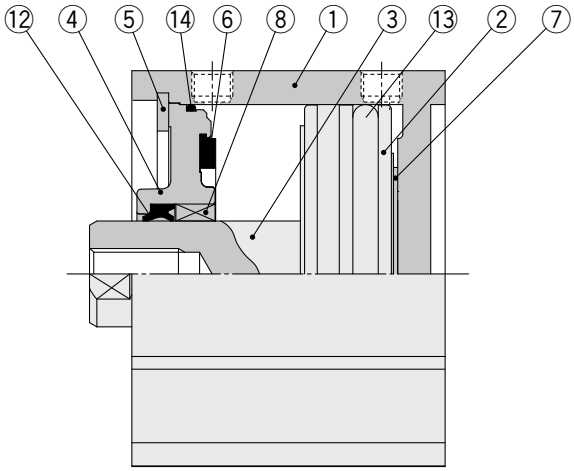
ø32 to ø63



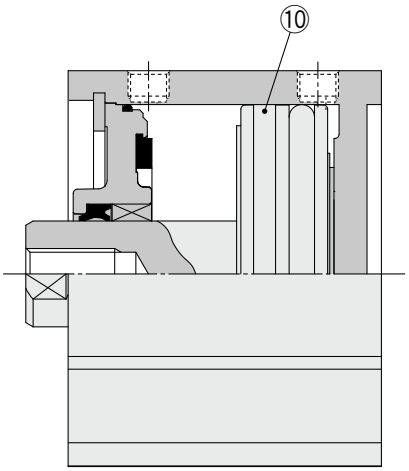
With auto switch (Built-in magnet)



ø80, ø100



With auto switch (Built-in magnet)



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Piston**	Aluminum alloy	Chromated
3	**Piston rod**	Stainless steel	ø20, ø25
		Carbon steel	ø32 to ø100 Hard chrome plating
4	**Collar**	Aluminum alloy	ø20 to ø40 Anodized
		Aluminum alloy casted	ø50 to ø100 Painted after chromated
5	**Retaining ring**	Carbon tool steel	Phosphate coated
6	**Bumper A**	Urethane	
7	**Bumper B**	Urethane	
8	**Bushing**	Bearing alloy	
9	**Wear ring**	Resin	ø20 to ø63
10	**Magnet**	—	
11	**Rod end nut**	Carbon steel	Trivalent zinc chromated
12	**Rod seal**	NBR	
13	**Piston seal**	NBR	
14	**Tube gasket**	NBR	

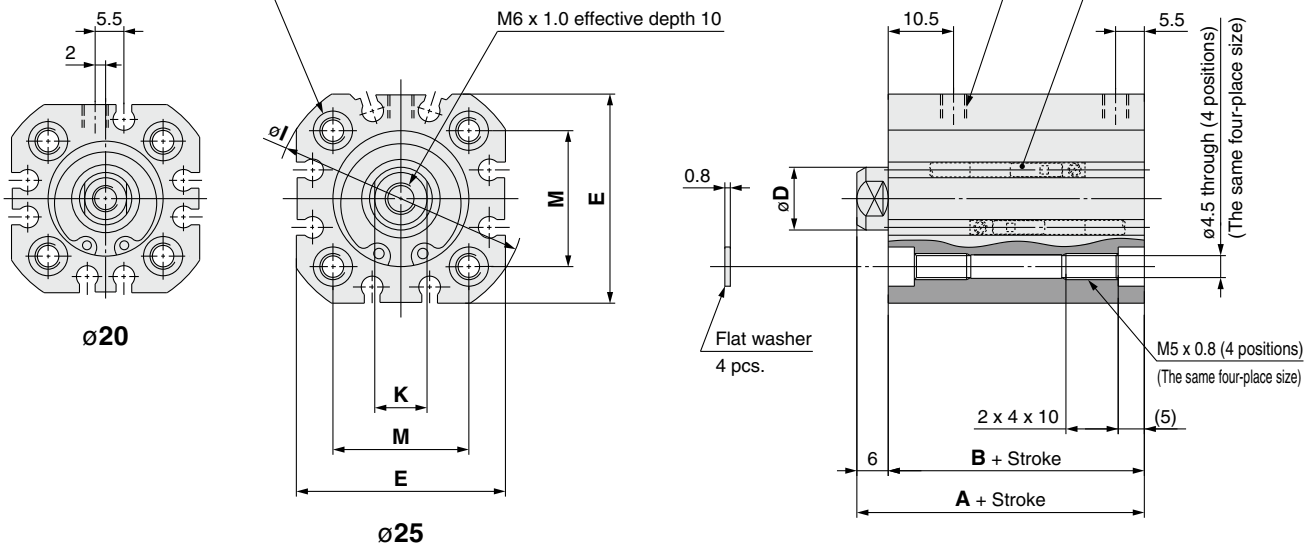
Replacement Parts/Seal Kit

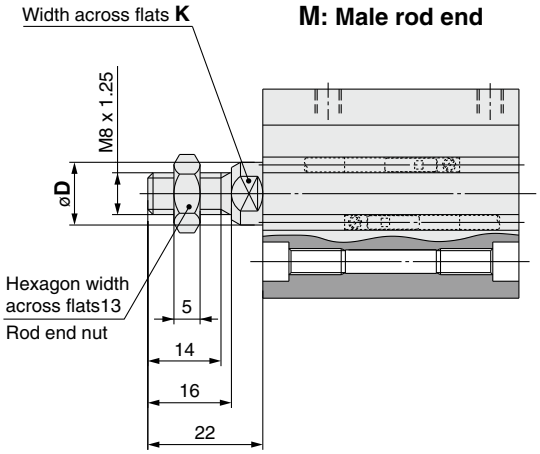
Bore size (mm)	Kit no.	Contents
20	CQ2B20-PS	Kits include items ⑫, ⑬, ⑭ from the table.
25	CQ2B25-PS	
32	CQ2B32-PS	
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	

∗ Seal kits consist of items ⑫, ⑬ and ⑭, and can be ordered by using the seal kit number corresponding to each bore size.

Dimensions (With and without auto switch are the same size)

ø20, ø25





Standard Type (mm)

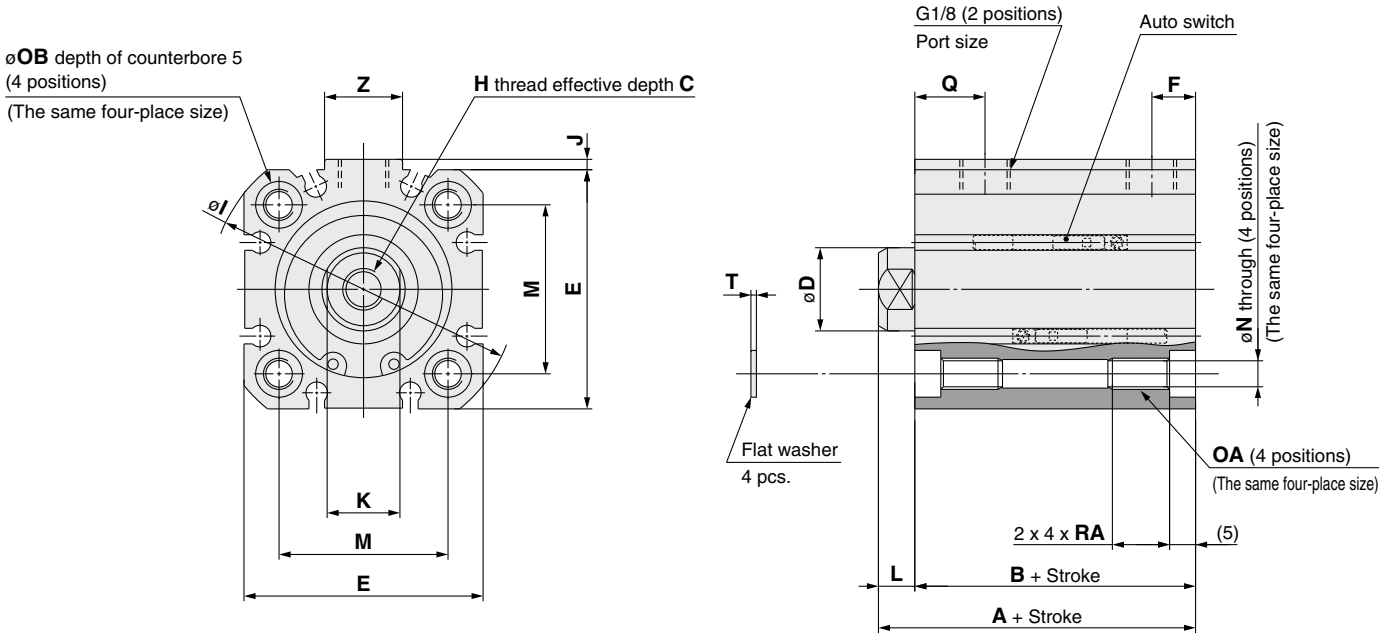
Bore size (mm)	A	B	D	E	I	K	M
20	43	37	10	36	43	8	22
25	45	39	12	40	48	10	26

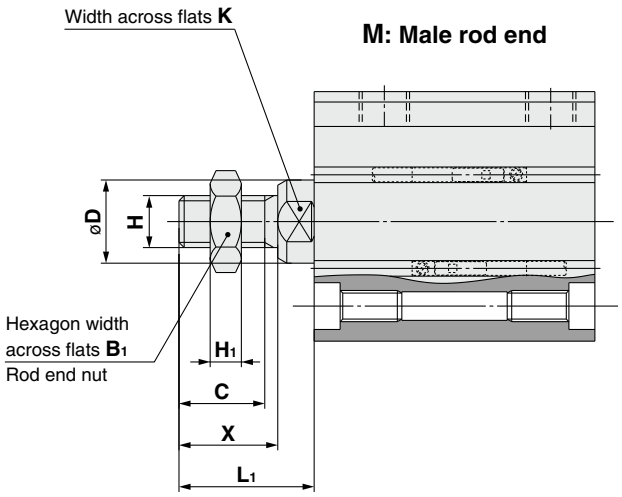
Male Rod End (mm)

Bore size (mm)	D	K
20	10	8
25	12	10

Dimensions (With and without auto switch are the same size)

ø32 to ø63





Male Rod End (mm)

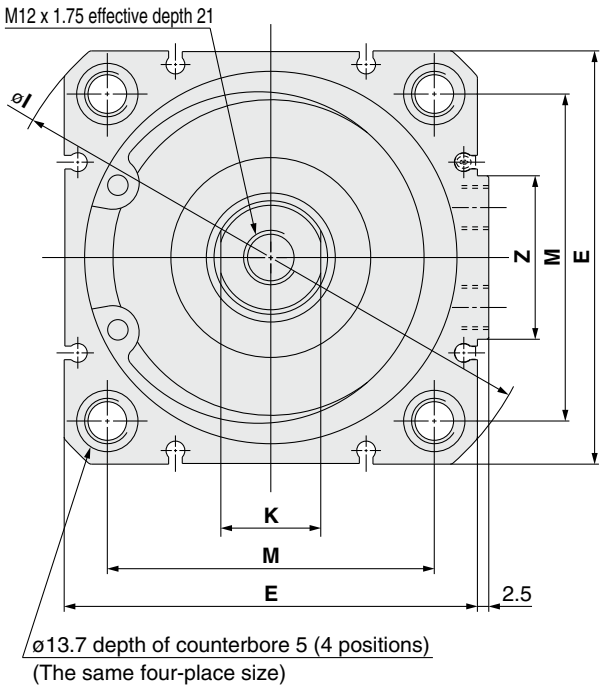
Bore size (mm)	B_1	C	D	H	H_1	K	L_1	X
32	17	16.5	16	M10 x 1.25	6	14	26	19
40	17	16.5	16	M10 x 1.25	6	14	26	19
50	19	19.5	20	M12 x 1.25	7	17	30	22
63	19	19.5	20	M12 x 1.25	7	17	30	22

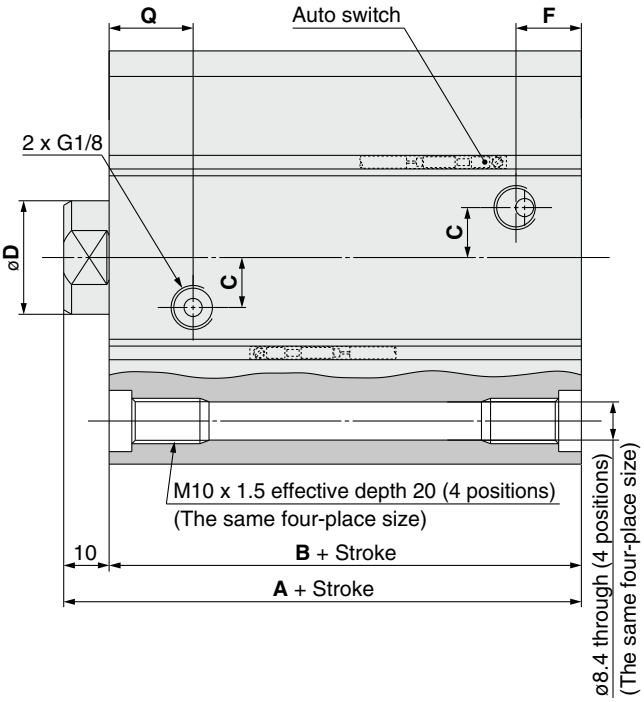
Standard Type (mm)

Bore size (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N	OA	OB	Q	RA	T	Z
32	51	44	12	16	46	8.5	M8×1.25	59	2	14	7	32.5	5.5	M6 x 1.0	9	11	11	1	15
40	52	45	12	16	52	9.5	M8×1.25	67	3	14	7	38	5.5	M6 x 1.0	9	14.5	11	1	17
50	53	45	16	20	64	10.5	M10×1.5	82	2	17	8	46.5	6.6	M8 x 1.25	10.5	13.5	15	1.6	17
63	57	49	16	20	74	14.5	M10×1.5	96	3	17	8	56.5	6.6	M8 x 1.25	10.5	15.5	15	1.6	17

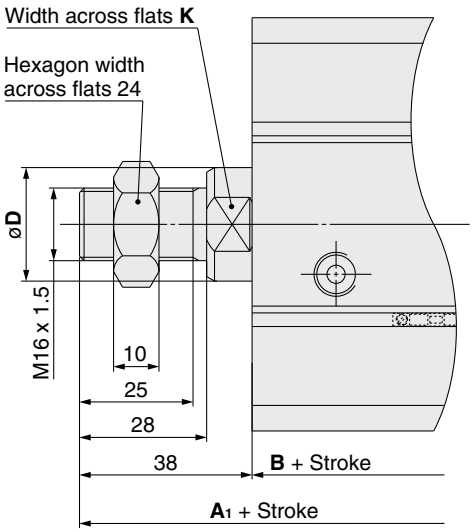
Dimensions (With and without auto switch are the same size)

ø80, ø100





M: Male rod end



Standard Type (mm)

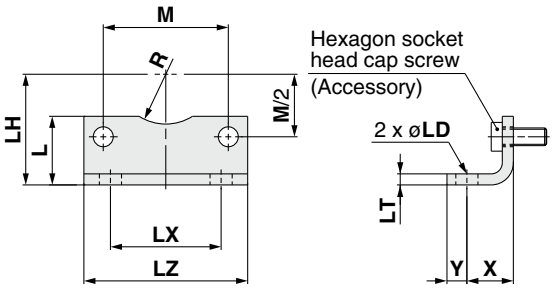
Bore size (mm)	A	B	C	D	E	F	I	K	M	Q	Z
80	64	54	11	25	91	15	121	22	72	19	36
100	77	67	14	30	111	18	145	27	89	26	42

Male Rod End (mm)

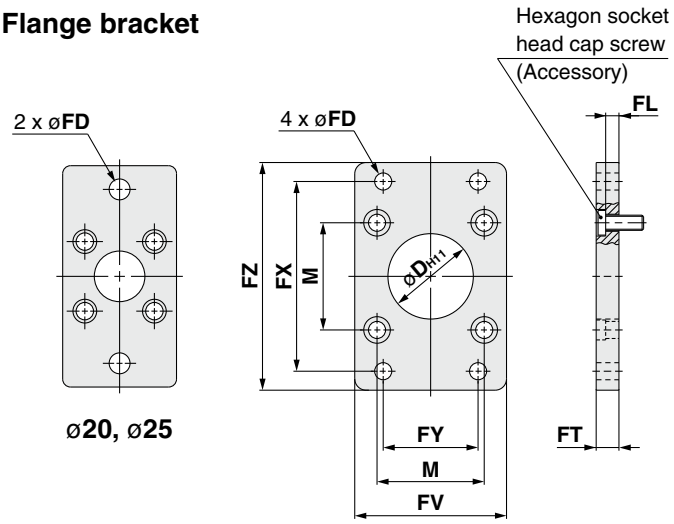
Bore size (mm)	A_1
80	92
100	106.5

Mounting Bracket

Foot bracket



Flange bracket



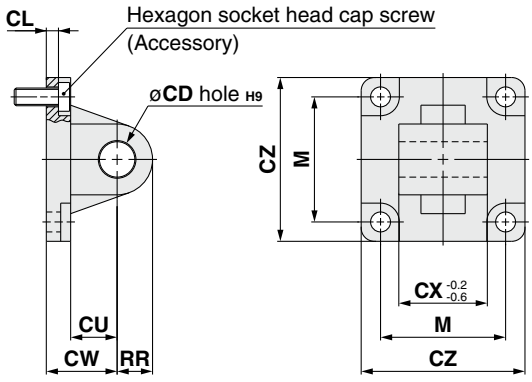
(mm)

Bore size (mm)	L	LD	LH	LT	LX	LZ	M	R	X	Y	Hexagon socket head cap screw
20	22	7	27	4	22	36	22	8	16	7	M5
25	22	7	29	4	26	40	26	10	16	7	M5
32	24.5	7	33.5	4	32	46	32.5	15	16	7	M6
40	26	10	38	4	36	52	38	17.5	18	9	M6
50	31	10	45	5	45	64	46.5	20	21	9	M8
63	31	10	50	5	50	74	56.5	22.5	21	9	M8
80	38.5	12	63	6	63	96	72	—	26	11	M10
100	45	14.5	74	6	75	116	89	—	27	13	M10

(mm)

Bore size (mm)	D	M	FD	FL	FT	FV	FX	FY	FZ	Hexagon socket head cap screw
20	16	22	6.6	2.8	8	38	55	—	68	M5
25	16	26	6.6	2.8	8	38	60	—	73	M5
32	30	32.5	7	5	10	50	64	32	79	M6
40	35	38	9	5	10	55	72	36	90	M6
50	40	46.5	9	6	12	70	90	45	110	M8
63	45	56.5	9	6	12	80	100	50	120	M8
80	45	72	12	8	16	100	126	63	153	M10
100	55	89	14	8	16	120	150	75	178	M10

Single clevis bracket



(mm)

Bore size (mm)	CDH9	CL	CU	CW	CX	CZ	M	RR	Hexagon socket head cap screw
20	8	3	12	20	16	35	22	9	M5
25	8	3	12	20	16	40	26	9	M5
32	10	5.5	12	22	26	45	32.5	9.5	M6
40	12	5.5	15	25	28	51	38	12	M6
50	12	6.5	15	27	32	64	46.5	12	M8
63	16	6.5	20	32	40	74	56.5	16	M8
80	16	10	20	36	50	94	72	16	M10
100	20	10	25	41	60	113	89	20	M10

Simple Specials

These changes are dealt with Simple Specials System.

1 Change of Rod End Shape

Symbol
-XA1 to 23, -XA26 to 30

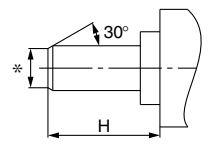
Applicable Series

Series	Description	Action	Bore size	Symbol for change of rod end shape
C55	Standard type	Double acting, Single rod	20, 25	XA1, XA2, XA6 XA7, XA11, XA17 XA18
			32 to 100	XA1 to 23, XA26 to 30

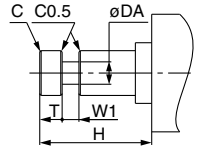
⚠ Precautions

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

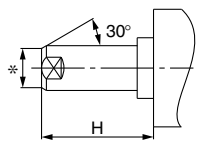
Symbol: A1



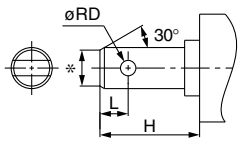
Symbol: A2



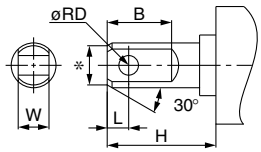
Symbol: A3



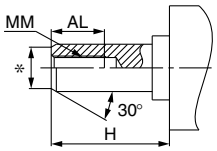
Symbol: A4



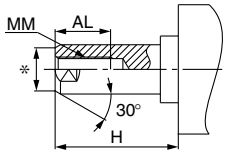
Symbol: A5



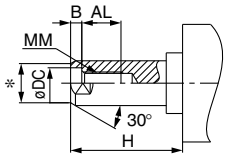
Symbol: A6



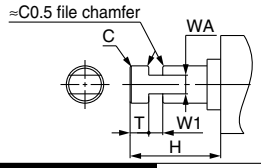
Symbol: A7



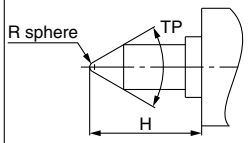
Symbol: A8



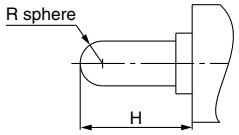
Symbol: A9



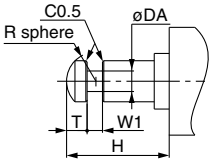
Symbol: A10



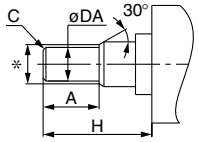
Symbol: A11



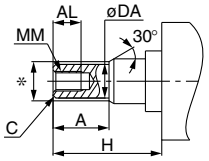
Symbol: A12



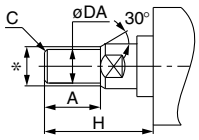
Symbol: A13



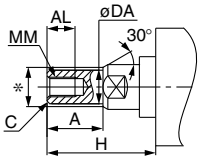
Symbol: A14



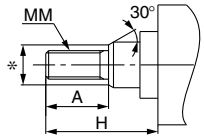
Symbol: A15



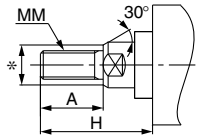
Symbol: A16



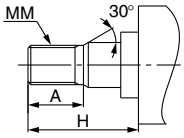
Symbol: A17



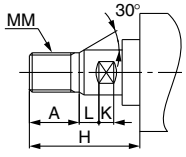
Symbol: A18



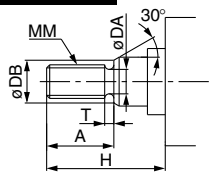
Symbol: A19



Symbol: A20



Symbol: A21



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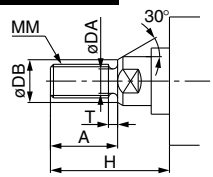

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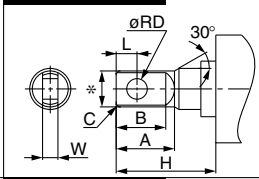
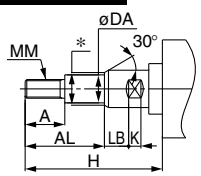
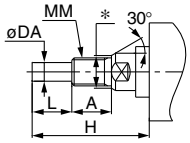


Symbol: A26



Symbol: A27



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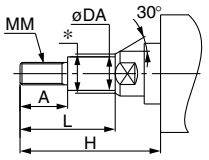

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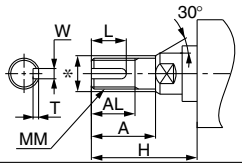
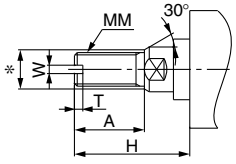


Symbol: A30



Made to Order

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

Made to Order

2 Made of Stainless Steel

Symbol **-XC6**

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

How to Order

Standard model no. **−XC6**

Made of stainless steel

Specifications

Parts changed to stainless steel	Piston rod, Retaining ring, Rod end nut (Male thread only)
Specifications other than above and external dimensions	Same as standard

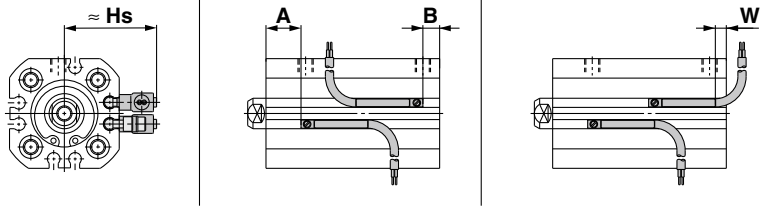
Auto Switch Mounting

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

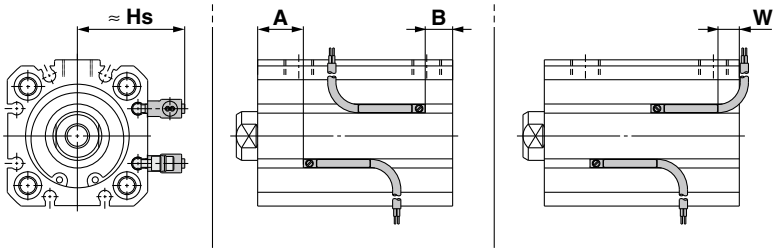
Reed auto switch
D-A9□

Solid state auto switch
D-M9□
D-M9□W
D-M9□A
D-P3DW

ø20, ø25



ø32, ø40, ø50, ø63, ø80, ø100



∗ Figures in the table below are used as a reference when mounting the auto switches for stroke end detection. Adjust the auto switch after confirming the operating condition in the actual setting.

(mm)

Auto switch model / Bore size (mm)	D-A9□			D-M9□ D-M9□W			D-M9□A			D-P3DW			
	A	B	W	A	B	W	A	B	W	A	B	W	Hs
20	11.5	5.5	1 (3.5)	15.5	9.5	–0.5	15.5	9.5	–2.5	6.0	0.5	–3.0	30
25	12.5	7.5	3 (5.5)	16.5	11.5	1.5	16.5	11.5	–0.5	7	2.5	–1	32
32	14.5	9.5	5 (7.5)	18.5	13.5	3.5	18.5	13.5	1.5	9.5	4	1	35
40	13	12	7.5 (10)	17	16	6	17	16	4	8	7	3.5	38
50	9.5	15.5	11 (13.5)	13.5	19.5	9.5	13.5	19.5	7.5	4.5	10.5	7	44
63	10.5	18.5	14 (16.5)	14.5	22.5	12.5	14.5	22.5	10.5	5.5	13.5	10	49
80	16.5	17.5	13 (15.5)	20.5	21.5	11.5	20.5	21.5	9.5	11.5	12.5	9	57.5
100	24.5	22.5	18 (20.5)	28.5	26.5	16.5	28.5	26.5	14.5	19.5	17.5	14	67.5

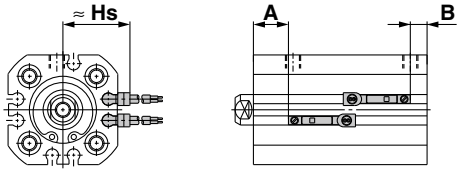
The dimensions inside ( ) is for D-A96.

Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.

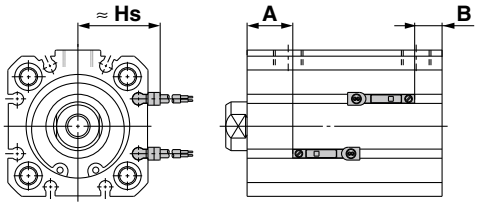
Reed auto switch
D-A9□V

Solid state auto switch
D-M9□V
D-M9□WV
D-M9□AV

ø20, ø25



ø32, ø40, ø50, ø63, ø80, ø100



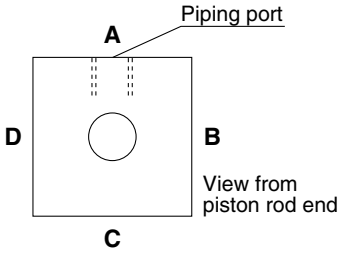
∗ Figures in the table below are used as a reference when mounting the auto switches for stroke end detection. Adjust the auto switch after confirming the operating condition in the actual setting.

(mm)

Auto switch model / Bore size (mm)	D-A9□V			D-M9□V D-M9□WV D-M9□AV		
	A	B	Hs	A	B	Hs
20	11.5	5.5	22	15.5	9.5	24
25	12.5	7.5	24	16.5	11.5	26
32	14.5	9.5	27	18.5	13.5	29
40	13	12	30	17	16	32
50	9.5	15.5	36	13.5	19.5	38
63	10.5	18.5	41	14.5	22.5	43
80	16.5	17.5	49.5	20.5	21.5	52
100	24.5	22.5	60	28.5	26.5	62

The Number of Surfaces and Grooves Where an Auto Switch Can Be Mounted (As direct mounting)

The number of the surfaces and grooves where the auto switch can be mounted, by switch type, are shown in the table below.



Mounting the D-P3DW on a ø20 to ø25 port surface interferes with the fitting, so it needs to be mounted on a place other than the port surface.
For ø32 to ø100, if the corner of the fitting hexagon interferes with the D-P3DW series, adjust the tightening of the fitting to eliminate the interference.
Also, in the case of interference with an elbow type fitting, direct the port of the fitting away from the D-P3DW series.
If you have any other questions, please contact SMC.

Auto switch model	D-A9□, M9□				D-P3DW			
Bore size (mm)	A (Mounting groove no.)	B (Mounting groove no.)	C (Mounting groove no.)	D (Mounting groove no.)	A (Mounting groove no.)	B (Mounting groove no.)	C (Mounting groove no.)	D (Mounting groove no.)
20	○ (1)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
25	○ (2)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
32	○ (2)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
40	○ (2)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
50	○ (2)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
63	○ (2)	○ (2)	○ (2)	○ (2)	×	○ (2)	○ (2)	○ (2)
80	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)
100	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)

Operating Range

(mm)

Auto switch model	Bore size							
	20	**25**	**32**	**40**	**50**	**63**	**80**	**100**
D-A9□(V)	9	9	9	9	9	10.5	14	10.5
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	5	4.5	5	4	4.5	5	10	8
D-P3DW	5	5.5	5.5	5.5	5.5	6.5	9	7

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

Minimum Stroke for Auto Switch Mounting

(mm)

Bore size (mm)	Auto switch model / Number of auto switches	D-A9□	D-A9□V	D-M9□	D-M9□W D-M9□A	D-M9□V	D-M9□WV	D-M9□AV	D-P3DW
20	With 2 pcs.	10	10	15	15	5	10	10	15
	With 1 pc.	10	5	15	15	5	5	10	15
25	With 2 pcs.	10	10	10	15	5	10	10	15
	With 1 pc.	10	5	10	15	5	5	10	15
32, 40, 50	With 2 pcs.	10	10	10	15	5	10	10	10
	With 1 pc.	10	5	10	15	5	5	10	10
63	With 2 pcs.	10	10	10	15	5	10	10	10
	With 1 pc.	5	5	5	15	5	5	10	10
80, 100	With 2 pcs.	10	10	15	15	5	10	10	10
	With 1 pc.	10	5	15	15	5	5	10	10

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

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) and solid state auto switch D-F8 type are also available. For details, refer to the Best Pneumatics No. 2.

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

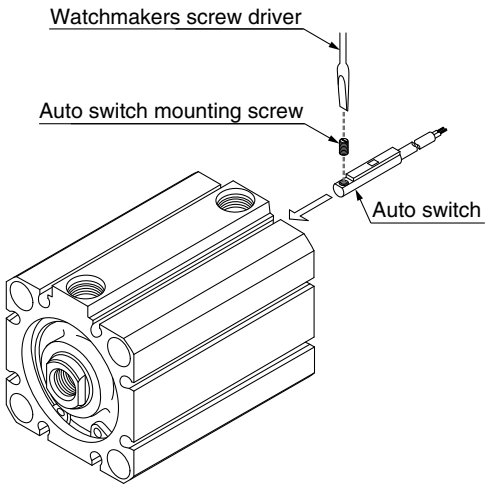
Mounting of Auto Switch/Direct Mounting Style

To mount auto switches, follow the instruction illustrated below.

<Applicable auto switch>

Solid state·····D-M9□(V)
D-M9□W(V)
D-M9□A(V)
Reed·····D-A9□(V)

ø20 to ø100



Use a watchmakers screwdriver with a handle 5 to 6 mm in diameter when tightening the auto switch mounting screw.

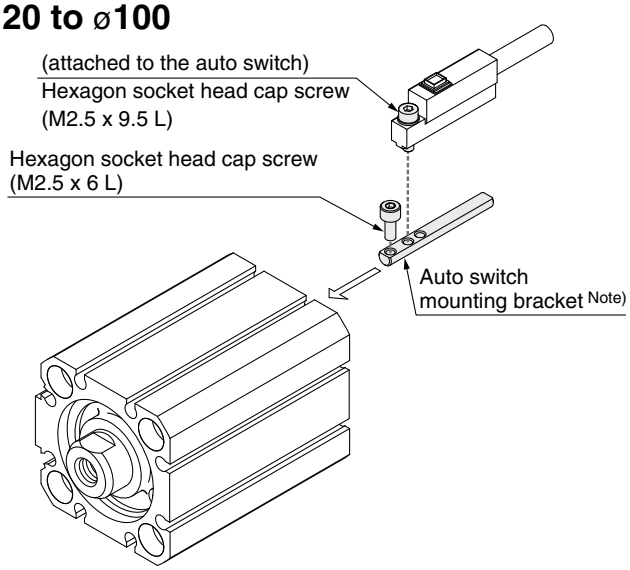
Tightening Torque of Auto Switch Mounting Screws (N·m)

Auto switch model	Tightening torque
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	0.05 to 0.15
D-A9□(V)	0.10 to 0.20

<Applicable auto switch>

Solid state·····D-P3DW

ø20 to ø100



Note) When the auto switch mounting bracket is ordered by its part number, it includes all the bracket and bolts in the above chart.

Applicable auto switch	Auto switch mounting bracket part no.
D-P3DW	BQ6-032S

① Fix the auto switch and the auto switch mounting bracket temporarily by tightening the hexagon socket head cap screw (M2.5 x 9.5 L) 1 to 2 turns.

② Insert the temporarily tightened mounting bracket into the mating groove of the cylinder tube, and slide the auto switch onto the cylinder tube through the groove.

When inserting into the mating groove of the cylinder/actuator, please hold the rear end of the auto switch (lead wire side) and the rear end of the auto switch mounting bracket together whilst working.

③ Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9.5 L).*

④ If the detecting position is changed, go back to step ②.

* The hexagon socket head cap screw (M2.5 x 6 L) is used to fix the mounting bracket and cylinder tube.
This enables the replacement of the auto switch without adjusting the auto switch position.

Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.

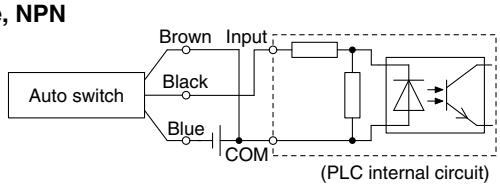
Note 2) The torque for tightening the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9.5 L) is 0.2 to 0.3 N·m.

Note 3) Tighten the hexagon socket head cap screws evenly.

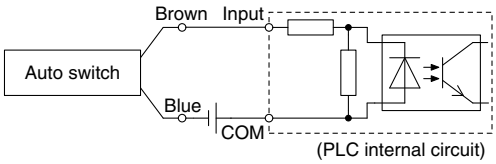
Prior to Use
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

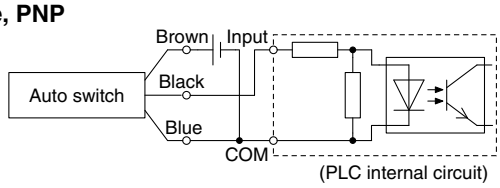


2-wire

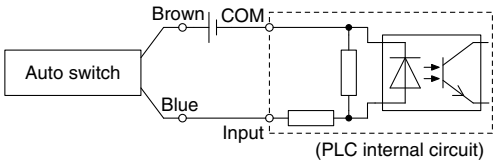


Source Input Specifications

3-wire, PNP



2-wire



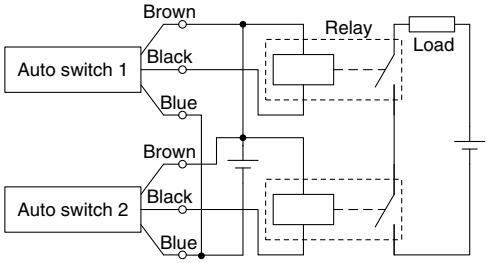
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

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

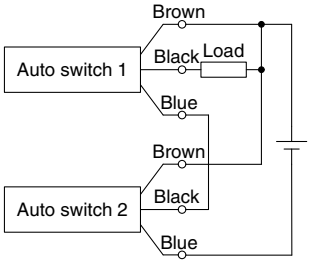
∗ When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid.

3-wire AND connection for NPN output

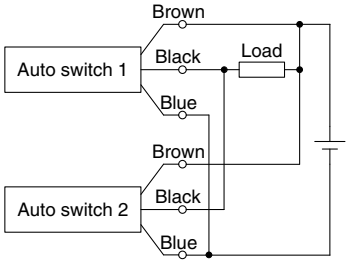
(Using relays)



(Performed with auto switches only)

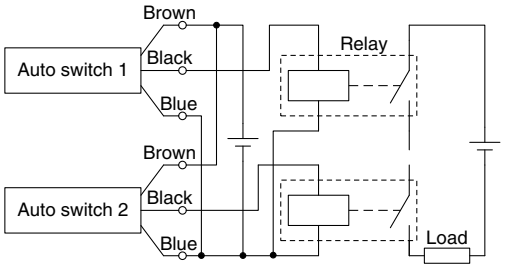


3-wire OR connection for NPN output

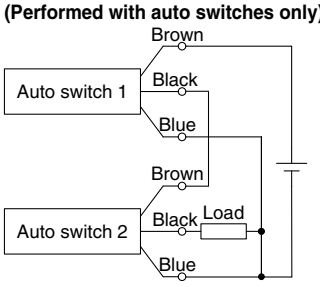


3-wire AND connection for PNP output

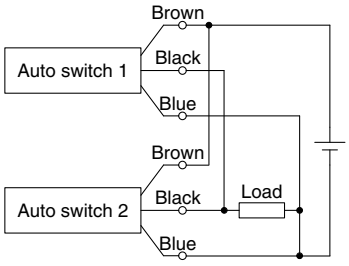
(Using relays)



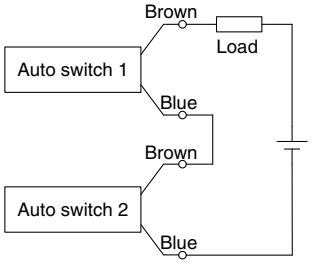
(Performed with auto switches only)



3-wire OR connection for PNP output



2-wire AND connection

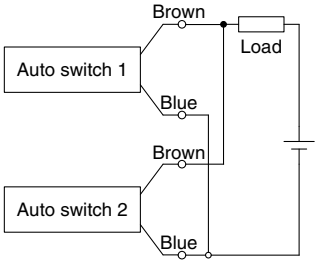


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up when both of the auto switches are in the ON state.
Auto switches with load voltage less than 20 V cannot be used.

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

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

2-wire OR connection



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

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

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

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

⚠ Safety Instructions

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

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

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

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

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

⚠ Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment.**
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

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

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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