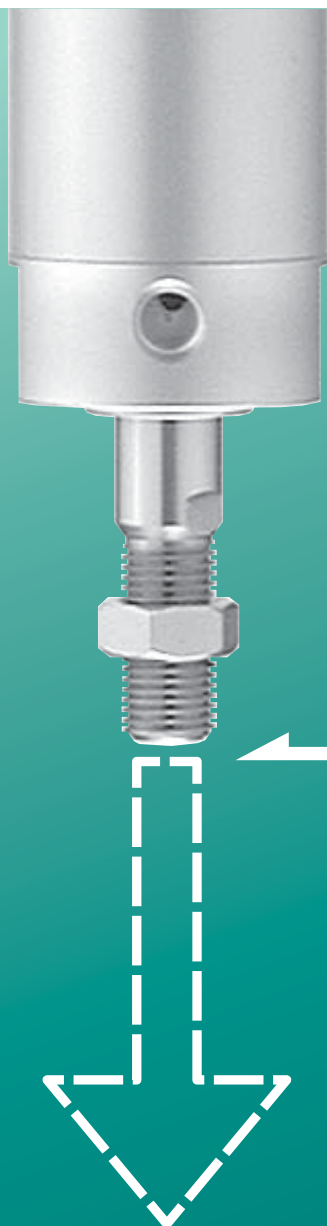


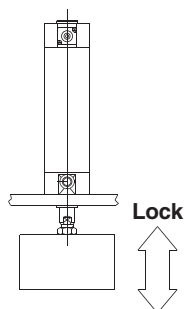
End Lock Cylinder

Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100



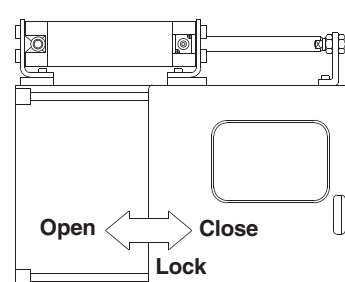
Drop prevention at end of lift

With rear lock



Door locking

With front lock



Holds a cylinder position even with the air supply off

Prevents trouble at the restart of operation by locking when the air is exhausted at the stroke end position.

Rubber bumper and air cushion standardised (mounting dimensions are the same)

Non-locking and locking type manual overrides standardised

Auto switch capable



Series Variations

Series	Action	Rod	Cushion	Basic	Standard variations				Bore size [mm]
					Built-in One touch fittings	With rod boot	Air-hydro	Clean series	
With End Lock CBG1	Double acting	Single rod	Rubber	●		●			20 to 100
			Air	●		●			

Series CBG1



EMC-CBG1-A-UK

End Lock Cylinder

Series *CBG1*

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CBG1 **L** **N** **25** - **100** **□** - **H** **N** - **□**

CDBG1 **L** **N** **25** - **100** **□** - **H** **N** - **M9BW** **□** - **C** - **□**

With auto switch
(Built-in magnet)

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
U*	Rod side trunnion style
T*	Head side trunnion style
D	Clevis style

* Not available for bore size ø80 and ø100.
Besides, trunnion cannot be attached in the side to which an end lock is attached.
Note) Mounting brackets are shipped together, (but not assembled).

Type

N	Rubber bumper
A	Air cushion

Bore size

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

Cylinder stroke [mm]
Refer to "Standard Stroke" on next page.

Manual release type

N	Non-lock type
L	Lock type

Lock position

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

With rod boot

—	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

* In the case of w/ rod boot, and a foot bracket or rod side flange as a bracket, those parts are to be assembled at the time of shipment.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

—	Without auto switch
----------	---------------------

* For the applicable auto switch model, refer to the table below.

Auto switch mounting bracket Note)

Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (—)

Made to Order
Refer to next page for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDBG1FA32-100-RL

Applicable Auto Switches/Refer to the Auto Switch Guide 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	Applicable bore size			0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)					
							ø20 to ø63		ø80, ø100										
							Perpendicular	In-line								In-line			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	—	●	●	●	○	—	○	IC circuit			
				3-wire (PNP)			—	—	G59	●	—	●	○	—	○				
				—			—	—	G5P	●	—	●	○	—	○				
		2-wire		12 V			M9BV	M9B	—	●	●	●	○	—	○		—		
		—					—	K59	●	—	●	○	—	○					
		—					H7C	—	●	—	●	●	●	—					
	Diagnostic indication (2-colour indication)	Grommet		3-wire (NPN)	24 V		5 V, 12 V	M9NWV	M9NW	—	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)				—	—	G59W	●	—	●	○	—	○			
				—				—	G5PW	●	—	●	○	—	○				
				2-wire				12 V	M9BWV	M9BW	—	●	●	●	○	—		○	—
				—				—	K59W	●	—	●	○	—	○				
				3-wire (NPN)				5 V, 12 V	M9NAV**	M9NA**	—	○	○	●	○	—		○	
	3-wire (PNP)	M9PAV**	M9PA**	—	○	○	●		○	—	○								
	2-wire	12 V	M9BAV**	M9BA**	—	○	○		●	○	—	○	—						
	Water resistant (2-colour indication)	Grommet	—	—	G5BA**	—	—	—	●	○	—	○		IC circuit					
			—	—	H7NF	—	●	—	●	○	—	○							
Diagnostic output (2-colour indication)			Grommet	4-wire (NPN)	5 V, 12 V	—	—	—	—	—	—	—	○		IC circuit				
				—	—	—	—	—	—	—	—	—	○						
Reed auto switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	A96V	A96	—	●	—	●	—	—	—	IC circuit	Relay, PLC		
				2-wire	24 V	12 V	100 V	A93V	A93	—	●	—	●	●	—			—	—
							100 V or less	A90V	A90	—	●	—	●	—	—			IC circuit	
							100 V, 200 V	—	B54		●	—	●	●	—				
		200 V or less					—	B64		●	—	●	—	—	—				
		—					—	C73C	—	●	—	●	●	●	—	IC circuit			
		24 V or less					—	C80C	—	●	—	●	●	●	—				
		Grommet		—	—	—	B59W		●	—	●	—	—	—					
				—	—	—	—		●	—	●	—	—						

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

* Lead wire length symbols: 0.5 m — (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX
None N (Example) H7CN

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

* Since there are other applicable auto switches than listed, refer to the Auto Switch Guide for details.

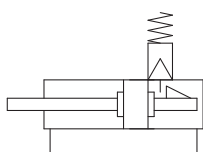
* For details about auto switches with pre-wired connector, refer to the Auto Switch Guide.

* D-A9□□/M9□□□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

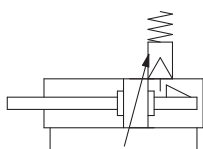


Symbol

Rubber bumper



Air cushion



Made to Order Specifications
(For details, refer to pages 18 to 20.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC13	Auto switch rail mounting

Refer to pages 12 to 16 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Switch mounting bracket: Part no.

Specifications

Bore size [mm]	20	25	32	40	50	63	80	100
Action	Double acting, Single rod							
Lubricant	Not required (Non-lube)							
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.15 MPa *							
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing)							
	With auto switch: -10 to 60°C (No freezing)							
Piston speed	50 to 1000 mm/s							50 to 700 mm/s
Stroke length tolerance	Up to 1000 ^{st+1.4} mm, to 1200 ^{st+1.8} mm							Up to 1000 ^{st+1.4} mm Up to 1500 ^{st+1.8} mm
Cushion	Rubber bumper, Air cushion							
Mounting **	Basic style, Axial foot style, Rod side flange style Head side flange style, Rod side trunnion style Head side trunnion style, Clevis style (Used for changing the port location by 90°.)							

* 0.05 MPa except locking parts.

** Rod/Head side trunnion styles are not available for bore sizes ø80 and ø100.
Trunnion is not attached for a cover on which lock mechanism is equipped.

Lock Specifications

Lock position	Head end, Rod end, Double end							
Holding force (Max.) [N]	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
	215	330	550	860	1340	2140	3450	5390
Backlash	2 mm or less							
Manual release	Non-lock type, Lock type							

Adjust the switch position so that it operates upon movement to both the stroke end and backlash (2 mm) positions.

Standard Stroke

Bore size [mm]	Standard stroke [mm] ⁽¹⁾	Long stroke [mm]	Maximum manufacturable stroke [mm]
20	25, 50, 75, 100, 125, 150, 200	201 to 350	1500
25	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 400	
32		301 to 450	
40		301 to 800	
50, 63		301 to 1200	
80		301 to 1400	
100		301 to 1500	

Note 1) Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

Note 2) Long stroke applies to the axial foot style and the rod side flange style.

If other mounting brackets are used, or the length exceeds the long stroke limit, the stroke should be determined based on the stroke selection table in the technical data.

Rod Boot Material

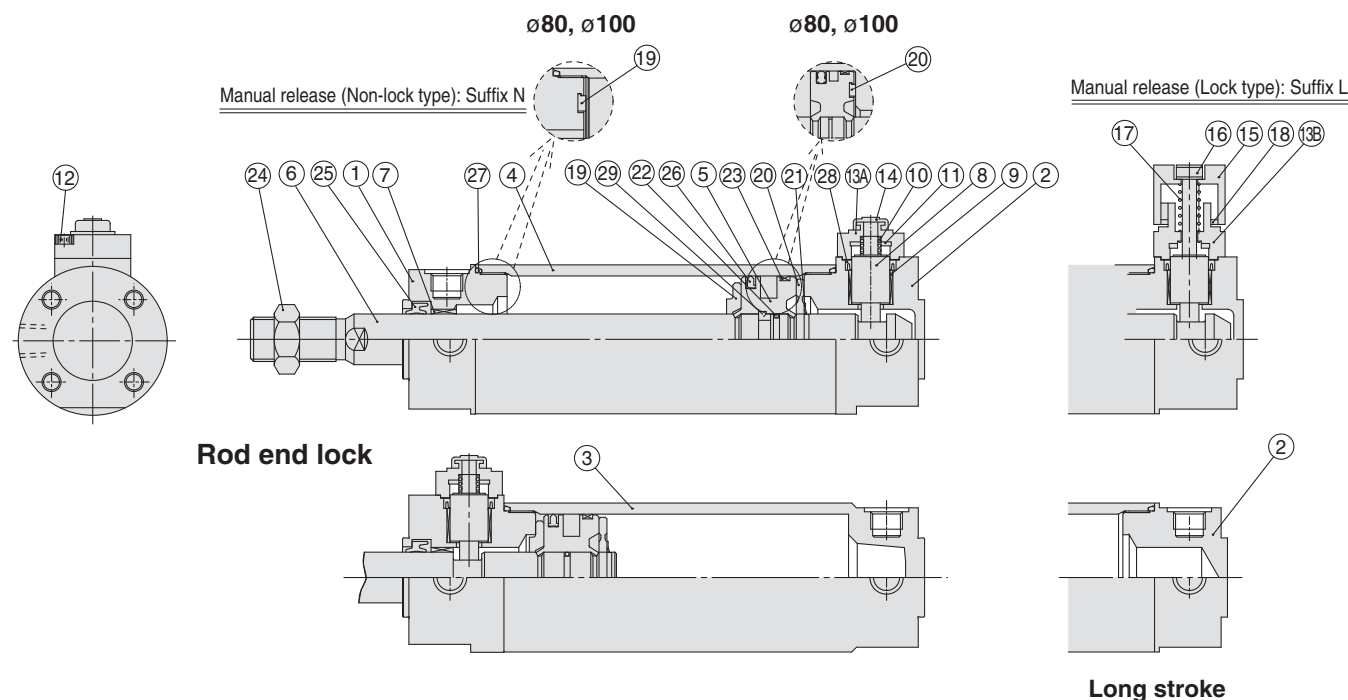
Symbol	Rod boot material	Maximum operating temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Series CBG1

Construction: With Rubber Bumper

Head end lock



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminium alloy	Clear hard anodised
2	Head cover	Aluminium alloy	Clear hard anodised
3	Tube cover	Aluminium alloy	Clear hard anodised
4	Cylinder tube	Aluminium alloy	Hard anodised
5	Piston	Aluminium alloy	Chromated
6	Piston rod	Carbon steel *	Hard chrome plated
7	Bushing	Bearing alloy	
8	Lock piston	Carbon steel	Hard chrome plated, Heat treated
9	Lock bushing	Copper alloy	
10	Lock spring	Stainless steel	
11	Bumper	Urethane	
12	Hexagon socket head cap screw	Alloy steel	Black zinc chromated
13A	Cap A	Aluminium die-casted	Black painted
13B	Cap B	Carbon steel	Oxide film treated
14	Rubber cap	Synthetic rubber	
15	M/O knob	Zinc die-casted	Black painted
16	M/O bolt	Alloy steel	Black zinc chromated, Red painted
17	M/O spring	Steel wire	Zinc chromated
18	Stopper ring	Carbon steel	Zinc chromated
19	Bumper A	Urethane	
20	Bumper B	Urethane	ø40 or larger: the same as bumper A

Note) In the case of cylinders with auto switches, magnets are installed in the piston.
 * The material is stainless steel on auto switch equipped styles ø20 and ø25.

Replacement Parts/Seal Kit (With lock at single end)

Series	Bore size [mm]	Kit no.	Contents
CBG1□N	20	CBG1N20-PS	Set of nos. above (25, 26, 27, 28) and grease pack
Rubber bumper	25	CBG1N25-PS	
type	32	CBG1N32-PS	
	40	CBG1N40-PS	

Order seal kit in accordance with the bore size.

* The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g)

⚠ Caution

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, etc., and then remove the cover.

When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

No.	Description	Material	Note
21	Retaining ring	Stainless steel	None for ø80, ø100
22	Piston gasket	NBR	
23	Wear ring	Resin	
24	Rod end nut	Rolled steel	Zinc chromated
25	Rod seal	NBR	
26	Piston seal	NBR	
27	Cylinder tube gasket	NBR	1 pc. when using tube cover
28	Lock piston seal	NBR	2 pcs. for with locks in both sides
29	Piston holder	Urethane	ø40 to ø100, head end lock only

Replacement Parts/Seal Kit (With lock at double end)

Series	Bore size [mm]	Kit no.	Contents
CBG1□N	20	CBG1N20-PS-W	Set of nos. above (25, 26, 27, 28) and grease pack
Rubber bumper	25	CBG1N25-PS-W	
type	32	CBG1N32-PS-W	
	40	CBG1N40-PS-W	

Order seal kit in accordance with the bore size.

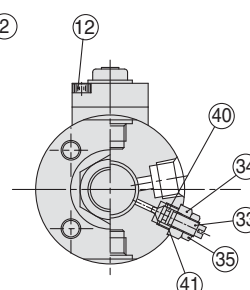
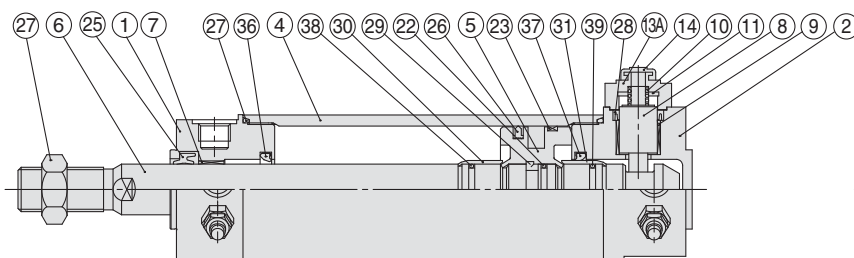
* The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g)

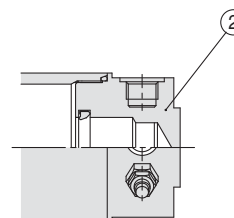
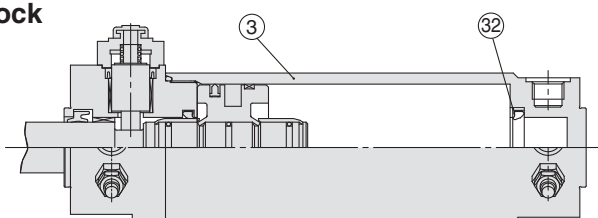
Construction: With Air Cushion

With air cushion Head end lock

Manual release (Non-lock type): Suffix N



Rod end lock



Long stroke

Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminium alloy	Clear hard anodised
2	Head cover	Aluminium alloy	Clear hard anodised
3	Tube cover	Aluminium alloy	Clear hard anodised
4	Cylinder tube	Aluminium alloy	Hard anodised
5	Piston	Aluminium alloy	Chromated
6	Piston rod	Carbon steel *	Hard chrome plated *
7	Bushing	Bearing alloy	
8	Lock piston	Carbon steel	Hard chrome plated, Heat treated
9	Lock bushing	Copper alloy	
10	Lock spring	Stainless steel	
11	Bumper	Urethane	
12	Hexagon socket head cap screw	Alloy steel	Black zinc chromated
13A	Cap A	Aluminium die-casted	Black painted
13B	Cap B	Carbon steel	Oxide film treated
14	Rubber cap	Synthetic rubber	
15	M/O knob	Zinc die-casted	Black painted
16	M/O bolt	Alloy steel	Black zinc chromated, Red painted
17	M/O spring	Steel wire	Zinc chromated
18	Stopper ring	Carbon steel	Zinc chromated

Note) In the case of cylinders with auto switches, magnets are installed in the piston.

* The material is stainless steel on auto switch equipped styles ø20 and ø25.

No.	Description	Material	Note
22	Piston gasket	NBR	
23	Wear ring	Resin	
24	Rod end nut	Rolled steel	Zinc chromated
25	Rod seal	NBR	
26	Piston seal	NBR	
27	Cylinder tube gasket	NBR	1 pc. when using tube cover
28	Lock piston seal	NBR	2 pcs. for with locks in both sides
29	Piston holder	Urethane	ø40 to ø100 only
30	Cushion ring A	Aluminium alloy	Anodised
31	Cushion ring B	Aluminium alloy	Anodised
32	Seal retainer	Rolled steel	Only when using nickel plated, tube cover
33	Cushion valve	Rolled steel	Electroless nickel plated
34	Valve retainer	Rolled steel	Electroless nickel plated
35	Lock nut	Rolled steel	Nickel plated
36	Cushion seal A	Urethane	
37	Cushion seal B	Urethane	ø32 or larger: The same as A
38	Cushion ring gasket A	NBR	
39	Cushion ring gasket B	NBR	ø32 or larger: The same as A
40	Valve seal	NBR	
41	Valve retaining gasket	NBR	

Replacement Parts/Seal Kit (With lock at single end)

Series	Bore size [mm]	Kit no.	Contents
CBG1□A Air cushion type	20	CBG1A20-PS	Set of nos. above (25, 26, 27, 28, (40, 41) and grease pack
	25	CBG1A25-PS	
	32	CBG1A32-PS	
	40	CBG1A40-PS	

Order seal kit in accordance with the bore size.

* The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g)

Replacement Parts/Seal Kit (With lock at double end)

Series	Bore size [mm]	Kit no.	Contents
CBG1□A Air cushion type	20	CBG1A20-PS-W	Set of nos. above (25, 26, 27, 28, (40, 41) and grease pack
	25	CBG1A25-PS-W	
	32	CBG1A32-PS-W	
	40	CBG1A40-PS-W	

Order seal kit in accordance with the bore size.

* The seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g)

⚠ Caution

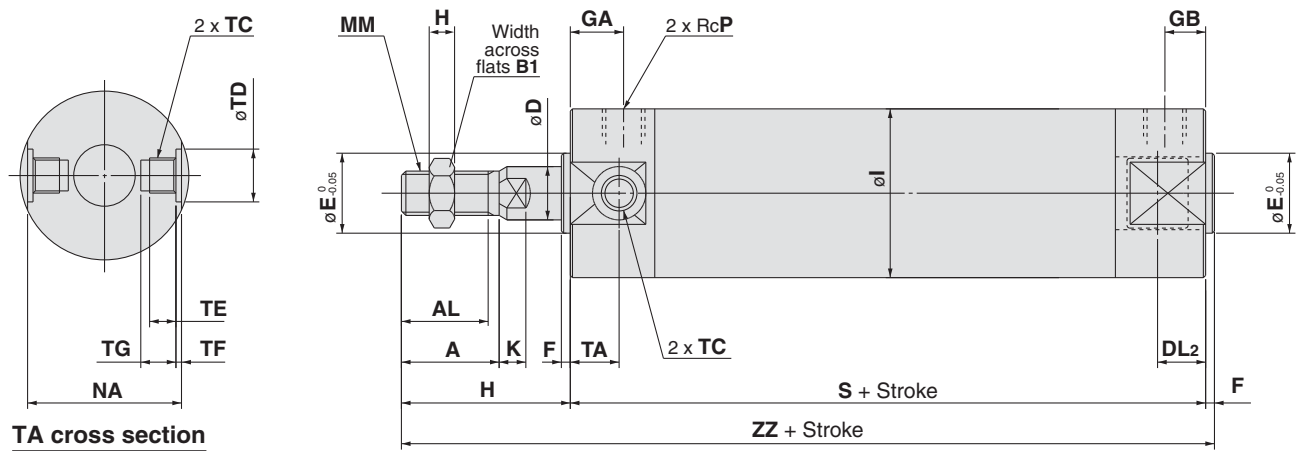
When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, etc., and then remove the cover.

When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

Series CBG1

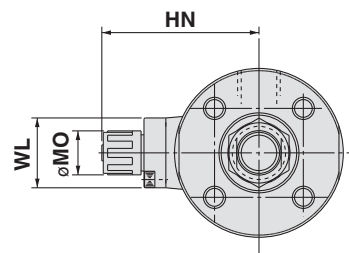
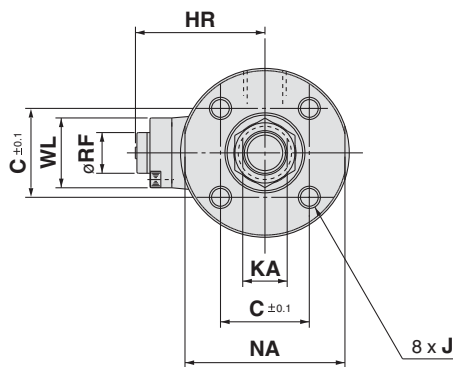
Rubber Bumper Type: CBG1BN

Head end lock: CBG1BN Bore size Stroke H□



Manual release (Non-lock type): Suffix N

Manual release (Lock type): Suffix L



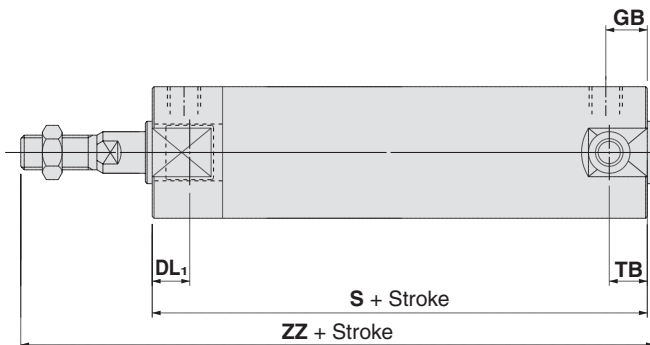
[mm]

Bore size [mm]	Stroke range	A	AL	B ₁	C	D	DL ₂	E	F	GA	GB	H	H ₁	HR	HN (Max.)	I	J
20	Up to 350	18	15.5	13	14	8	12.5	12	2	12	12	35	5	25.3	37	26	M4 x 0.7 depth 7
25	Up to 400	22	19.5	17	16.5	10	12.5	14	2	12	12	40	6	28.3	40	31	M5 x 0.8 depth 7.5
32	Up to 450	22	19.5	17	20	12	12	18	2	12	12	40	6	31.3	43	38	M5 x 0.8 depth 8
40	Up to 800	30	27	19	26	16	15	25	2	13	13	50	8	38.3	52.5	47	M6 x 1 depth 12
50	Up to 1200	35	32	27	32	20	16.5	30	2	14	14	58	11	44.5	58.5	58	M8 x 1.25 depth 16
63	Up to 1200	35	32	27	38	20	16.5	32	2	14	14	58	11	45	59	72	M10 x 1.5 depth 16
80	Up to 1400	40	37	32	50	25	19	40	3	20	20	71	13	53.5	68	89	M10 x 1.5 depth 22
100	Up to 1500	40	37	41	60	30	20	50	3	20	20	71	16	64.5	79	110	M12 x 1.75 depth 22

Bore size [mm]	K	KA	MM	MO	NA	P	RF	S	TA	TC	TD	TE	TF	TG	WL	ZZ
20	5	6	M8 x 1.25	15	24	1/8	11	81	11	M5 x 0.8	8 ^{+0.08} ₀	4	0.5	5.5	15	118
25	5.5	8	M10 x 1.25	15	29	1/8	11	81	11	M6 x 0.75	10 ^{+0.08} ₀	5	1	6.5	15	123
32	5.5	10	M10 x 1.25	15	35.5	1/8	11	81	11	M8 x 1.0	12 ^{+0.08} ₀	5.5	1	7.5	24	123
40	6	14	M14 x 1.5	19	44	1/8	11	92	12	M10 x 1.25	14 ^{+0.08} ₀	6	1.25	8.5	24	144
50	7	18	M18 x 1.5	19	55	1/4	11	107	13	M12 x 1.25	16 ^{+0.08} ₀	7.5	2	10	24	167
63	7	18	M18 x 1.5	19	69	1/4	11	107	13	M14 x 1.5	18 ^{+0.08} ₀	11.5	3	14.5	24	167
80	10	22	M22 x 1.5	23	80	3/8	21	130	—	—	—	—	—	—	40	204
100	10	26	M26 x 1.5	23	100	1/2	21	130	—	—	—	—	—	—	40	204

Rubber Bumper Type: CBG1BN

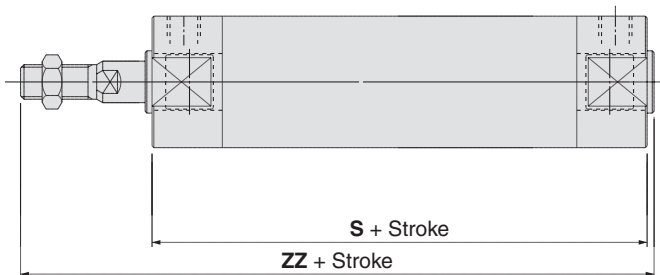
Rod end lock: CBG1BN **Bore size** **Stroke** – R□



Bore size [mm]	DL1	GB	S	TB	ZZ
20	19.5	10 (12)	80 (88)	11	117 (125)
25	19.5	10 (12)	80 (88)	11	122 (130)
32	20	10 (12)	81 (89)	10 (11)	123 (131)
40	19	10 (13)	87 (96)	10 (12)	139 (148)
50	23.5	12 (14)	102 (114)	12 (13)	162 (174)
63	23.5	12 (14)	102 (114)	12 (13)	162 (174)
80	27	16 (20)	124 (138)	—	198 (212)
100	30	16 (20)	124 (138)	—	198 (212)

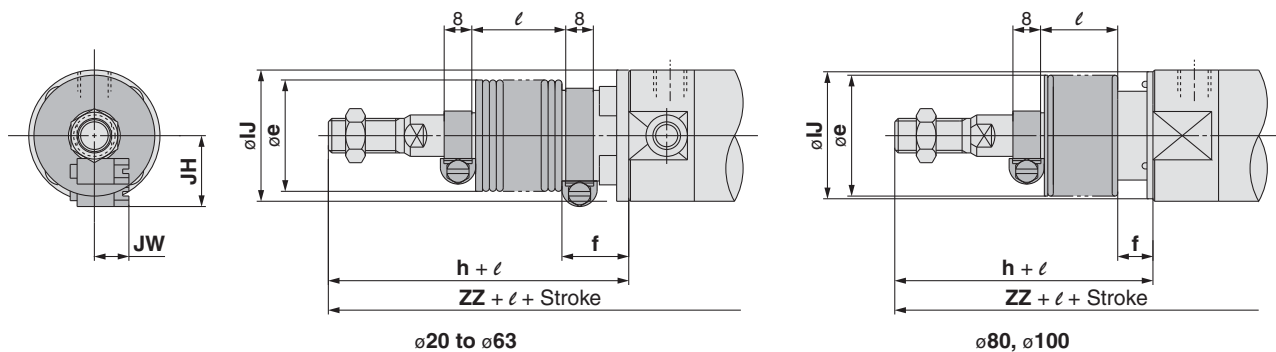
* (): Denotes the dimensions for long stroke.

Double end lock: CBG1BN **Bore size** **Stroke** – W□



Bore size [mm]	S	ZZ
20	92	129
25	92	134
32	91	133
40	101	153
50	119	179
63	119	179
80	146	220
100	146	220

With rod boot



Bore size [mm]	e	f	h	IJ	JH (Reference)	JW (Reference)	l	Head end lock (-H□) ZZ	Rod end lock (-R□) ZZ	Double end lock (-W□) ZZ
20	30	18	55	27	15.5	10.5	1/4 stroke	138	137 (145)	149
25	30	19	62	32	16.5	10.5	1/4 stroke	145	144 (152)	156
32	35	19	62	38	18.5	10.5	1/4 stroke	145	145 (153)	155
40	35	19	70	48	21.5	10.5	1/4 stroke	164	159 (168)	173
50	40	19	78	59	24	10.5	1/4 stroke	187	182 (194)	199
63	40	20	78	72	24	10.5	1/4 stroke	187	182 (194)	199
80	52	10	80	59	—	—	1/4 stroke	213	207 (221)	229
100	62	7	80	71	—	—	1/4 stroke	213	207 (221)	229

* (): Denotes the dimensions for long strokes.

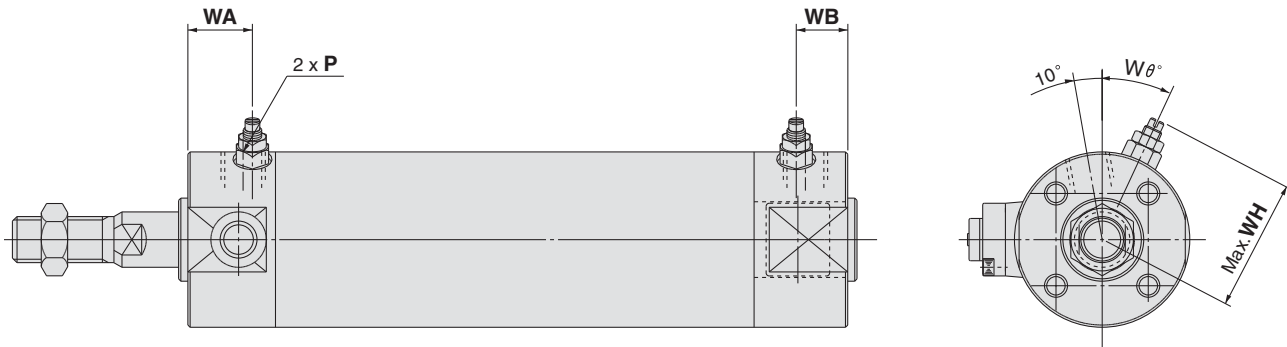
** The minimum stroke with rod boot is 20 mm.

Series CBG1

Air Cushion Type: CBG1BA

Head end lock: CBG1BA Bore size — Stroke — H□

Rod end lock: CBG1BA Bore size — Stroke — R□



Head End Lock: -H□

[mm]

Bore size [mm]	P	WA	WB	WH	Wθ
20	M5 x 0.8	16	16	23	30°
25	M5 x 0.8	16	16	25	30°
32	Rc 1/8	16	16	28.5	25°
40	Rc 1/8	16	16	33	20°
50	Rc 1/4	18	18	40.5	20°
63	Rc 1/4	18	18	47.5	20°
80	Rc 3/8	22	22	60.5	20°
100	Rc 1/2	22	22	71	20°

* For dimensions other than listed above, refer to the dimensions with rubber bumper.

Rod End Lock: -R□

[mm]

Bore size [mm]	P	WA	WB	WH	Wθ
20	M5 x 0.8	16	15 (16)	23	30°
25	M5 x 0.8	16	15 (16)	25	30°
32	Rc 1/8	16	15 (16)	28.5	25°
40	Rc 1/8	16	15 (16)	33	20°
50	Rc 1/4	18	17 (18)	40.5	20°
63	Rc 1/4	18	17 (18)	47.5	20°
80	Rc 3/8	22	22	60.5	20°
100	Rc 1/2	22	22	71	20°

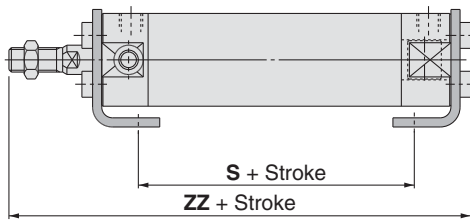
* (): Denotes the dimensions for long strokes.

** For dimensions other than the listed above, refer to the dimensions with rubber bumper.

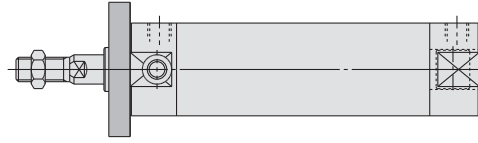
With Mounting Bracket

(For dimensions other than listed below, refer to pages 5 to 7.)

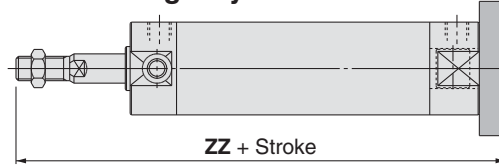
Axial foot style: CBG1L□



Rod side flange style: CBG1F□



Head side flange style: CBG1G□



Foot Style

[mm]

Bore size [mm]	Head end lock: -H□			Rod end lock: -R□			Double end lock: -W□		
	LS	ZZ		LS	ZZ		LS	ZZ	
	—	Without rod boot	With rod boot	—	Without rod boot	With rod boot	—	Without rod boot	With rod boot
20	57	122	142 + ℓ	56 (64)	121 (129)	141 (149) + ℓ	68	133	153 + ℓ
25	57	127.5	149.5 + ℓ	56 (64)	126.5 (134.5)	148.5 (156.5) + ℓ	68	138.5	160.5 + ℓ
32	55	127.5	149.5 + ℓ	55 (63)	127.5 (135.5)	149.5 (157.5) + ℓ	65	137.5	159.5 + ℓ
40	65	149	169 + ℓ	60 (69)	144 (153)	164 (173) + ℓ	74	158	178 + ℓ
50	72	174.5	194.5 + ℓ	67 (79)	169.5 (181.5)	189.5 (201.5) + ℓ	84	186.5	206.5 + ℓ
63	72	174.5	194.5 + ℓ	67 (79)	169.5 (181.5)	189.5 (201.5) + ℓ	84	186.5	206.5 + ℓ
80	82	210.5	219.5 + ℓ	76 (90)	204.5 (218.5)	213.5 (227.5) + ℓ	98	226.5	235.5 + ℓ
100	82	214	223 + ℓ	76 (90)	208 (222)	217 (231) + ℓ	98	230	239 + ℓ

* (): Denotes the dimensions for long stroke.

Rod Side Flange Style Overall length is the same as basic style.

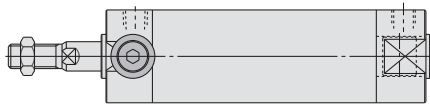
Head Side Flange Style

[mm]

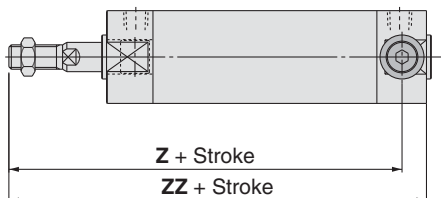
Bore size [mm]	Head end lock: -H□		Rod end lock: -R□		Double end lock: -W□	
			ZZ (Head side flange)			
	Without rod boot	With rod boot	Without rod boot	With rod boot	Without rod boot	With rod boot
20	124	144 + ℓ	123	143 + ℓ	135	155 + ℓ
25	130	152 + ℓ	129	151 + ℓ	141	163 + ℓ
32	130	152 + ℓ	130	152 + ℓ	140	162 + ℓ
40	152	172 + ℓ	147 (156)	167 (176) + ℓ	161	181 + ℓ
50	176	196 + ℓ	171 (183)	191 (203) + ℓ	188	208 + ℓ
63	176	196 + ℓ	171 (183)	191 (203) + ℓ	188	208 + ℓ
80	215	224 + ℓ	209 (223)	218 (232) + ℓ	231	240 + ℓ
100	218	227 + ℓ	212 (226)	221 (235) + ℓ	234	243 + ℓ

* (): Denotes the dimensions for long stroke.

Rod side trunnion style: CBG1U□ (Rod end lock-H□ only)



Head side trunnion style: CBG1T□ (Rod end lock -R□ only)



Rod Side Trunnion Style Overall length is the same as basic style. Head Side Trunnion Style

[mm]

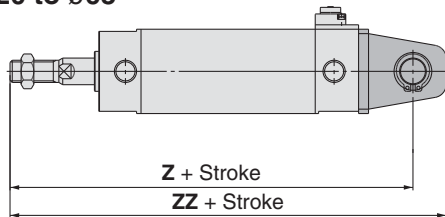
Bore size [mm]	Rod end lock: -R□			
	Z (Head side trunnion)		ZZ (Head side trunnion)	
	Without rod boot	With rod boot	Without rod boot	With rod boot
20	104	124 + ℓ	117	137 + ℓ
25	109	131 + ℓ	122	144 + ℓ
32	111	133 + ℓ	123	145 + ℓ
40	127 (134)	147 (154) + ℓ	139 (148)	159 (168) + ℓ
50	148 (159)	168 (179) + ℓ	162 (174)	182 (194) + ℓ
63	148 (159)	168 (179) + ℓ	162 (174)	182 (194) + ℓ

* (): Denotes the dimensions for long stroke.

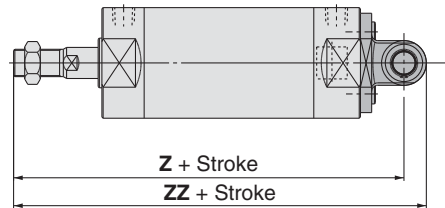
Series CBG1

With Mounting Bracket

Clevis style: CBG1D□
ø20 to ø63



Clevis style: CBG1D□
ø80 to ø100



Clevis Style

[mm]

Bore size [mm]	Head end lock: -H□				Rod end lock: -R□			
	Z		ZZ		Z		ZZ	
	Without rod boot	With rod boot	Without rod boot	With rod boot	Without rod boot	With rod boot	Without rod boot	With rod boot
20	130	150 + ℓ	141	161 + ℓ	129	149 + ℓ	140	160 + ℓ
25	137	159 + ℓ	150	172 + ℓ	136	158 + ℓ	149	171 + ℓ
32	141	163 + ℓ	156	178 + ℓ	141	163 + ℓ	156	178 + ℓ
40	164	184 + ℓ	182	202 + ℓ	159 (168)	179 (188) + ℓ	177 (186)	197 (206) + ℓ
50	190	210 + ℓ	210	230 + ℓ	185 (197)	205 (217) + ℓ	205 (217)	225 (237) + ℓ
63	195	215 + ℓ	217	237 + ℓ	190 (202)	210 (222) + ℓ	212 (224)	232 (244) + ℓ
80	236	245 + ℓ	254	263 + ℓ	230 (244)	239 (253) + ℓ	248 (262)	257 (277) + ℓ
100	244	253 + ℓ	266	275 + ℓ	238 (252)	247 (261) + ℓ	260 (274)	269 (283) + ℓ

Bore size [mm]	Double end lock: -W□			
	Z		ZZ	
	Without rod boot	With rod boot	Without rod boot	With rod boot
20	141	161 + ℓ	152	172 + ℓ
25	148	170 + ℓ	161	183 + ℓ
32	151	173 + ℓ	166	188 + ℓ
40	173	193 + ℓ	191	211 + ℓ
50	202	222 + ℓ	222	242 + ℓ
63	207	227 + ℓ	229	249 + ℓ
80	252	261 + ℓ	270	279 + ℓ
100	260	269 + ℓ	282	291 + ℓ

* (): Denotes the dimensions for long stroke.



Series CBG1

Specific Product Precautions 1

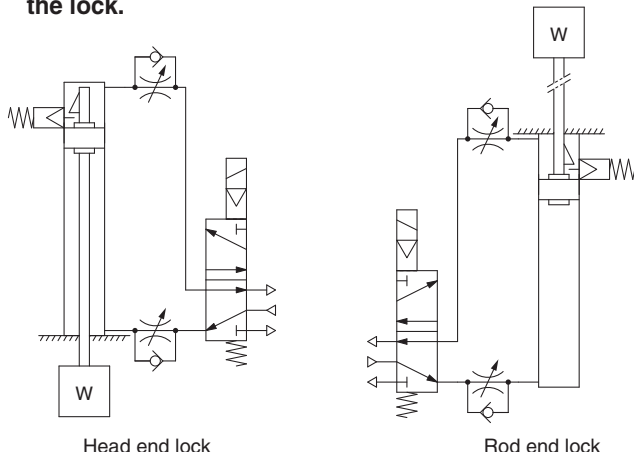
Be sure to read before handling.

Refer to for Safety Instructions and Auto Switch Precautions.

Use the Recommended Pneumatic Circuit

⚠ Caution

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



Operating Precautions

⚠ Caution

- Do not use 3 position solenoid valves.**
Avoid use in combination with 3 position solenoid valves (especially closed centre metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.
- Back pressure is required when releasing the lock.**
Be sure air is supplied to side of cylinder without the locking mechanism, as above, prior to supplying air pressure to the side with end lock or lock may not be released. (⇒ Refer to "Releasing the Lock".)
- Release the lock when mounting or adjusting the cylinder.**
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.
- Operate with a load ratio of 50% or less.**
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
- Do not operate multiple cylinders in synchronization.**
Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.
- Use a speed controller with meter-out control.**
Lock cannot be released occasionally by meter-in control.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**
If the cylinder piston does not reach the end of the stroke, locking and unlocking may not be possible.
- Do not use an air cylinder as an air-hydro cylinder.**
This could result in leakage of oil.
- Install a rod boot without twisting.**
If the cylinder is installed with its bellows twisted, it could damage the bellows.
- Adjust an auto switch position so that it operates for movement to both the stroke end and backlash (2 mm) positions.**
When a 2-colour indication switch is adjusted for green indication at the stroke end, it may change to red for the backlash return, but this is not abnormal.

Operating Precautions

⚠ Warning

- Do not operate the cushion valve in the fully closed or fully opened state.**
Using it in the fully closed state will cause the cushion seal to be damaged. Using it in the fully opened state will cause the piston rod assembly or the cover to be damaged.
- Operate within the specified cylinder speed.**
Otherwise, cylinder and seal damage may occur.

Operating Pressure

⚠ Caution

- Use pressures over 0.15 MPa at port with locking mechanism. This is required to release the lock.

Exhaust Speed

⚠ Caution

- Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

Relation to Cushion

⚠ Caution

- When cushion valve at side with locking mechanism is fully opened or closed, piston rod may reached at stroke end. Thus lock is not established. And when locking is done at cushion valve fully closed, adjust cushion valve since lock may not be released.

Releasing the Lock

⚠ Warning

- Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the piston rod is very dangerous.

Disassembly/Replacement

⚠ Caution

- Do not replace the bushings or the cushion seals.**
The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.
- To replace a seal, apply grease to the new seal before installing it.**
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.
- Those with a bore of ø50 or more cannot be disassembled.**
When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, etc., and then remove the cover.
When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)



Series CBG1

Specific Product Precautions 2

Be sure to read before handling.
Refer to Safety Instructions and Auto Switch Precautions.

Manual Release

⚠ Caution

1. Manual release non-lock type

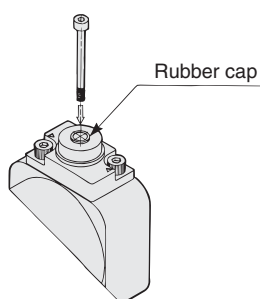
Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

Thread sizes, pulling forces and strokes are as shown below.

Bore size [mm]	Thread size	Pulling force	Stroke [mm]
20, 25, 32	M2.5 x 0.45 x 25L or more	4.9N	2
40, 50, 63	M3 x 0.5 x 30L or more	10N	3
80, 100	M5 x 0.8 x 40L or more	24.5N	3

Remove the bolt for normal operation.

It can cause lock malfunction or faulty release.

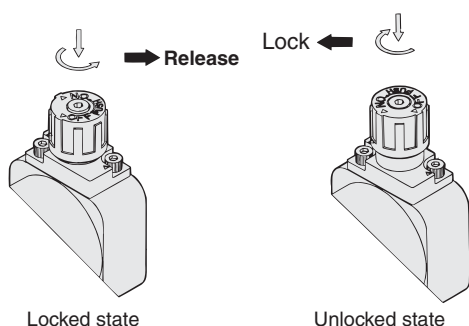


2. Manual release lock type

While pushing the M/O knob, turn it 90° counterclockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼OFF mark on the M/O knob.

When locking is desired, turn the M/O knob 90° clockwise while pushing completely down, and align the ▲ mark on the cap with the ▼ ON mark on the M/O knob. The correct position is confirmed by a clicking sound.

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

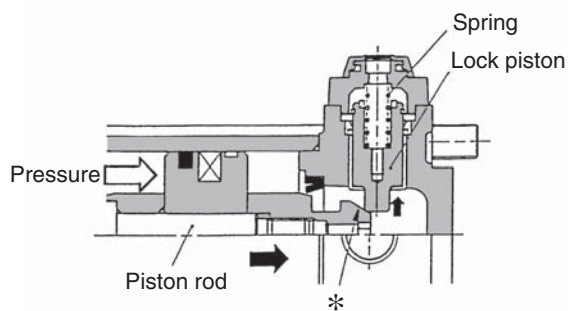


Working Principle

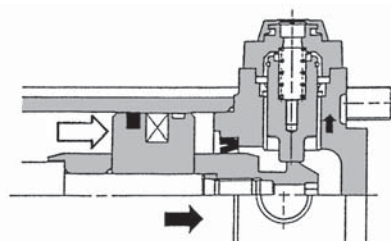
* The figures below are the same as those for Series CBA2.

●Head end lock (Rod end lock is the same.)

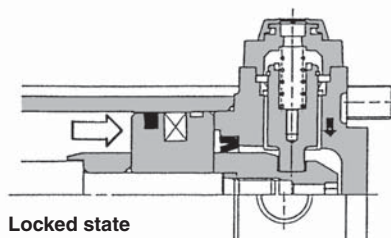
1. When the piston rod is getting closer to the stroke end, the taper part (*) of the piston rod edge will push the lock piston up.



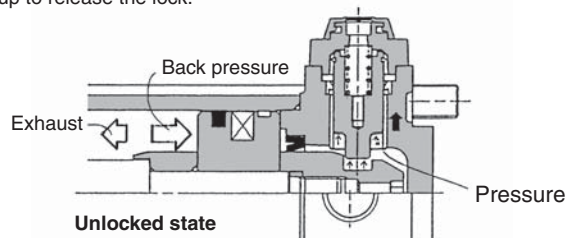
2. The lock piston is pushed up further.



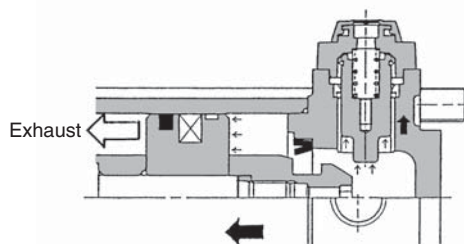
3. The lock piston is pushed up into the groove of the piston rod to lock it. (The lock piston is pushed up by spring force.) At this time, it is exhausted from the port on the head side and introduced into the atmosphere.



4. When pressure is supplied in the head side, lock piston will be pushed up to release the lock.



5. When the lock is released, the cylinder will move forward.



Series CBG1

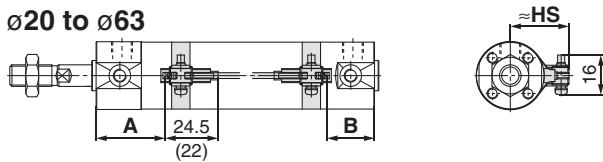
Auto Switch Mounting 1

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

Reed auto switch

D-A9□

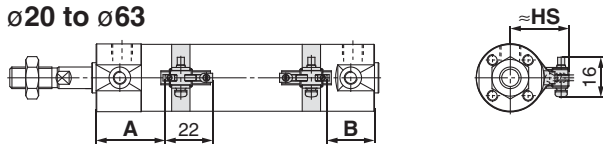
ø20 to ø63



(): Dimension of the D-A96. A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

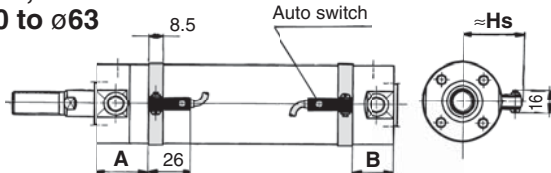
ø20 to ø63



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

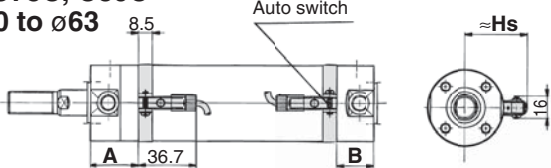
D-C7, C8

ø20 to ø63



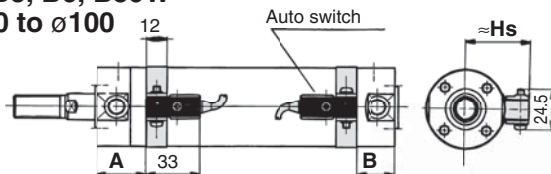
D-C73C, C80C

ø20 to ø63



D-B5, B6, B59W

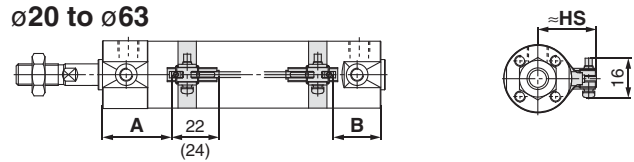
ø20 to ø100



Solid state auto switch

D-M9□/D-M9□W/D-M9□A

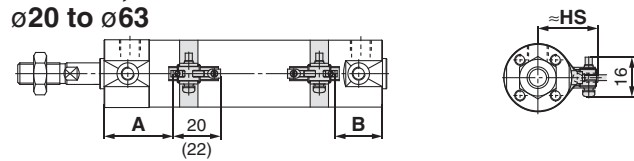
ø20 to ø63



(): Dimension of the D-M9□A. A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V, M9□WV/D-M9□AV

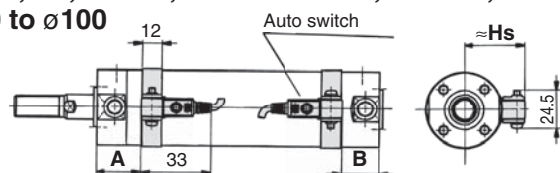
ø20 to ø63



(): Dimension of the D-M9□AV. A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

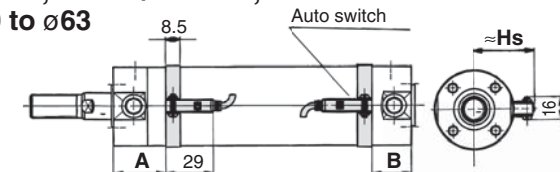
D-G5, K5, G5□W, G5BA/D-K59W, D-G59F, D-G5NT

ø20 to ø100



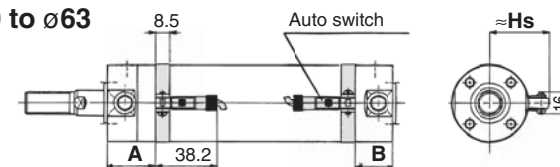
D-H7□, H7□W/D-H7NF, H7BA

ø20 to ø63



D-H7C

ø20 to ø63



[mm]				
Auto switch model	D-M9□V D-M9□WV D-M9□AV D-A9□V	D-C7/C8 D-H7□ D-H7□W D-H7NF D-H7BA D-A9□ D-M9□ D-M9□W D-M9□A	D-C73C D-C80C	D-B5/B6 D-B59W D-G5/K5 D-G5□W D-G5BA D-K59W
Bore size [mm]	Hs	Hs	Hs	Hs
20	25.5	24.5	27	27.5
25	28	27	29.5	30
32	31.5	30.5	33	33.5
40	36	35	37.5	38
50	41.5	40.5	43	43.5
63	48.5	47.5	50	50.5
80	—	—	—	59
100	—	—	—	69.5

Operating Range

Auto switch model	Bore size [mm]							
	20	25	32	40	50	63	80	100
D-A9□ (V)	7	6	8	8	8	9	—	—
D-M9□ (V) D-M9□W (V) D-M9□A (V)	4.5	5.0	4.5	5.5	5.0	5.5	—	—
D-C7/C80 D-C73C/C80C	8	10	9	10	10	11	—	—
D-B5□/B64	8	10	9	10	10	11	11	11
D-B59W	13	13	14	14	14	17	16	18
D-H7□/H7□W D-H7NF/H7BA	4	4	4.5	5	6	6.5	—	—
D-H7C	7	8.5	9	10	9.5	10.5	—	—
D-G5□/G5□W/G59F D-G5BA/K59/K59W	4	4	4.5	5	6	6.5	6.5	7
D-G5NT	4	4	4.5	5	6	6.5	6.5	7
D-G5NB	35	40	40	45	45	45	45	50

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Series CBG1

Auto Switch Mounting 2

Proper Auto Switch Mounting Position

Auto switch model		Locking position	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-C7 D-C8 D-C73C D-C80C		D-B5 D-B6		D-B59W		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-G5□W D-K59W D-G59F D-G5 D-K5 D-G5NT D-G5BA	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	Head side		29	32	33	36	29.5	32.5	23.5	26.5	26.5	29.5	28.5	31.5	25	28
	Rod side		40	20 (28)	44	24 (32)	40.5	20.5 (28.5)	34.5	14.5 (22.5)	37.5	17.5 (25.5)	39.5	19.5 (27.5)	36	16 (24)
	Double sides		40	32	44	36	40.5	32.5	34.5	26.5	37.5	29.5	39.5	31.5	36	28
25	Head side		29	32	33	36	29.5	32.5	23.5	26.5	26.5	29.5	28.5	31.5	25	28
	Rod side		40	20 (28)	44	24 (32)	40.5	20.5 (28.5)	34.5	14.5 (22.5)	37.5	17.5 (25.5)	39.5	19.5 (27.5)	36	16 (24)
	Double sides		40	32	44	36	40.5	32.5	34.5	26.5	37.5	29.5	39.5	31.5	36	28
32	Head side		30	31	34	35	30.5	31.5	24.5	25.5	27.5	28.5	29.5	30.5	26	27
	Rod side		40	21 (29)	44	25 (33)	40.5	21.5 (29.5)	34.5	15.5 (23.5)	37.5	18.5 (26.5)	39.5	20.5 (28.5)	36	17 (25)
	Double sides		40	31	44	35	40.5	31.5	34.5	25.5	37.5	28.5	39.5	30.5	36	27
40	Head side		35	37	39	41	35.5	37.5	29.5	31.5	32	34.5	34.5	36.5	31	33
	Rod side		44	23 (32)	48	27 (36)	44.5	23.5 (32.5)	38.5	17.5 (26.5)	41	20.5 (29.5)	43.5	22.5 (31.5)	40	19 (28)
	Double sides		44	37	48	41	44.5	37.5	38.5	31.5	41	34.5	43.5	36.5	40	33
50	Head side		42	45	46	49	42.5	45.5	36.5	39.5	39.5	42.5	41.5	44.5	38	41
	Rod side		54	28 (40)	58	32 (44)	54.5	28.5 (40.5)	48.5	22.5 (34.5)	51.5	25.5 (37.5)	53.5	27.5 (39.5)	50	24 (36)
	Double sides		54	45	58	49	54.5	45.5	48.5	39.5	51.5	42.5	53.5	44.5	50	41
63	Head side		42	45	46	49	42.5	45.5	36.5	39.5	39.5	42.5	41.5	44.5	38	41
	Rod side		54	28 (40)	58	32 (44)	54.5	28.5 (40.5)	48.5	22.5 (34.5)	51.5	25.5 (37.5)	53.5	27.5 (39.5)	50	24 (36)
	Double sides		54	45	58	49	54.5	45.5	48.5	39.5	51.5	42.5	53.5	44.5	50	41
80	Head side								46.5	52.5	49.5	55.5			48	54
	Rod side		—	—	—	—	—	—	62.5	30.5 (44.5)	65.5	33.5 (47.5)	—	—	64	32 (46)
	Double sides								62.5	52.5	65.5	55.5			64	54
100	Head side								46.5	52.5	49.5	55.5			48	54
	Rod side		—	—	—	—	—	—	62.5	30.5 (44.5)	65.5	33.5 (47.5)	—	—	64	32 (46)
	Double sides								62.5	52.5	65.5	55.5			64	54

Note 1) Figures in parentheses are for the long stroke type.

Note 2) In the actual setting, adjust them after confirming the auto switch operating condition.

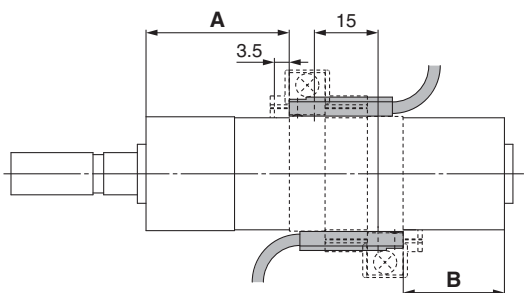
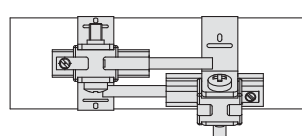
Auto Switch Mounting 3

Minimum Auto Switch Mounting Stroke

Auto switch model	No. of auto switch mounted				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	15 Note 1)	40 Note 1)	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$55 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$55 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-M9□A	10	25	40 Note 1)	$25 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$60 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-M9□V	5	20	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$35 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-A9□V	5	15	25	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$25 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-M9□WV D-M9□AV	10	20	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$35 + 35 (n-2)$ (n = 2, 3, 4, 5···)
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$50 + 45 (n-2)$ (n = 2, 3, 4, 5···)
D-H7□ D-H7□W D-H7BA D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$60 + 45 (n-2)$ (n = 2, 3, 4, 5···)
D-C73C D-C80C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$65 + 50 (n-2)$ (n = 2, 3, 4, 5···)
D-B5□ D-B64 D-G5□ D-K59□	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$75 + 55 (n-2)$ (n = 2, 3, 4, 5···)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	$75 + 55 (n-2)$ (n = 2, 3, 4, 5···)

Note 3) When “n” is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 <p>Correct auto switch mounting position is 3.5 mm from the back face of the switch holder.</p>	 <p>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.</p>
D-M9□ D-M9□W	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-M9□A	Less than 20 stroke Note 2)	Less than 60 stroke Note 2)
D-A9□	—	Less than 50 stroke Note 2)

Note 2) Minimum stroke for mounting auto switches in the other mounting styles mentioned in Note 1.

Auto Switch Mounting Bracket: Part No.

Auto switch model	Bore size [mm]							
	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
D-M9□(V) D-M9□W(V) D-A9□(V)	Note 1) BMA3-020	Note 1) BMA3-025	Note 1) BMA3-032	Note 1) BMA3-040	Note 1) BMA3-050	Note 1) BMA3-063	—	—
D-M9□A(V)	Note 2) BMA3-020S	Note 2) BMA3-025S	Note 2) BMA3-032S	Note 2) BMA3-040S	Note 2) BMA3-050S	Note 2) BMA3-063S	—	—
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF	BMA2-020A	BMA2-025A	BMA2-032A	BMA2-040A	BMA2-050A	BMA2-063A	—	—
D-H7BAL	BMA2-020AS	BMA2-025AS	BMA2-032AS	BMA2-040AS	BMA2-050AS	BMA2-063AS	—	—
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BA/G59F D-G5NT D-G5NB	BA-01	BA-02	BA-32	BA-04	BA-05	BA-06	BA-08	BA-10

Note 1) Set part number which includes the auto switch mounting band (BMA2-□□□A) and the holder kit (BJ5-1/Switch bracket: Transparent).

Note 2) Set part number which includes the auto switch mounting band (BMA2-□□□AS/Stainless steel screw) and the holder kit (BJ4-1/Switch bracket: White).

Note 3) For the D-M9□A(V) type auto switch, do not install the switch bracket on the indicator light.

[Stainless Steel Mounting Screw Kit]

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

BBA3: For D-B5/B6/G5/K5 types

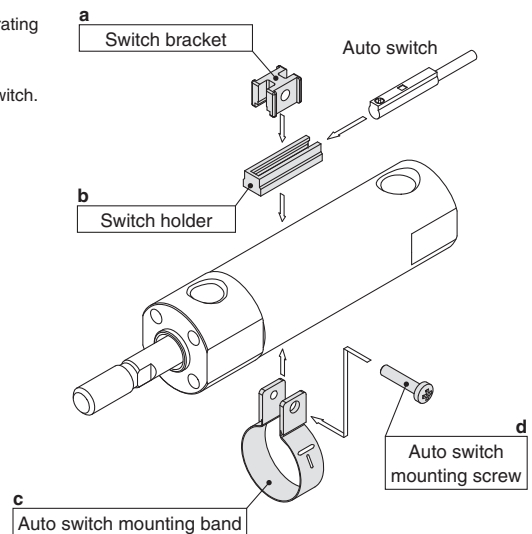
The above stainless steel screws are used when a cylinder is shipped with the G5BA auto switch. When only an auto switch is shipped independently, the BBA3 is attached.

(1) BMA2-□□□A(S) is a set of "c" and "d" in the figure.

(2) BJ□-1 is a set of "a" and "b" in the figure.

BJ4-1 (Switch bracket: White)

BJ5-1 (Switch bracket: Transparent)









Series CBG1

Auto Switch Mounting 5

Cylinder Bracket, by Stroke/Auto Switch Mounting Surfaces

st: Stroke [mm]

Auto switch model	Basic style, Foot style, Flange style, Clevis style			Trunnion style		
	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)
Switch mounting surface	Port surface 	Port surface 	Port surface 			
Switch type						
D-A9□ (V) D-M9□ (V) D-M9□W (V) D-M9□A (V)	10 st or more	15 to 44 st	45 st or more	10 st or more	15 to 44 st	45 st or more
D-C7/C8	10 st or more	15 to 49 st	50 st or more	10 st or more	15 to 49 st	50 st or more
D-H7□/H7□W D-H7BA/H7NF	10 st or more	15 to 59 st	60 st or more	10 st or more	15 to 59 st	60 st or more
D-C73C/C80C/H7C	10 st or more	15 to 64 st	65 st or more	10 st or more	15 to 64 st	65 st or more
D-B5/B6/G5/K5 D-G5□W/K59W/G5BA D-G59F/G5NT	10 st or more	15 to 74 st	75 st or more	10 st or more	15 to 74 st	75 st or more
D-B59W	15 st or more	20 to 74 st	75 st or more	15 st or more	20 to 74 st	75 st or more

* Trunnion style is not available for bore sizes ø80 and ø100.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.

Type	Model	Electrical entry	Features	Applicable bore size
Reed auto switch	D-H7A1, H7A2, H7B	Grommet (In-line)	—	ø20 to ø63
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-colour indication)	
	D-H7BA		Water resistant (2-colour indication)	
	D-G5NT		With timer	ø20 to ø100
Solid state auto switch	D-B53	Grommet (In-line)	—	ø20 to ø63
	D-C73, C76		—	
	D-C80		Without indicator light	

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to the Auto Switch Guide for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to the Auto Switch Guide for details.

* Wide range detection type, solid state switches (D-G5NB type) are also available. Refer to the Auto Switch Guide for details.

Simple Specials: -XA0 to XA30: Change of Rod End Shape

These changes are dealt with Simple Specials System.

1 Change of Rod End Shape

Applicable Series

Series	Description	Action	Symbol for change of rod end shape	Note
CBG1	End lock cylinder	Double acting, Single rod	XA0 to 30	

⚠ Precautions

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

Symbol : A0 	Symbol : A1 	Symbol : A2 	Symbol : A3 	Symbol : A4
Symbol : A5 	Symbol : A6 	Symbol : A7 	Symbol : A8 	Symbol : A9
Symbol : A10 	Symbol : A11 	Symbol : A12 	Symbol : A13 	Symbol : A14
Symbol : A15 	Symbol : A16 	Symbol : A17 	Symbol : A18 	Symbol : A19
Symbol : A20 	Symbol : A21 	Symbol : A22 	Symbol : A23 	Symbol : A24
Symbol : A25 	Symbol : A26 	Symbol : A27 	Symbol : A28 	Symbol : A29
Symbol : A30 				

Made to Order Common Specifications: -XC13: Auto Switch Rail Mounting Style



25 Auto Switch Rail Mounting Style

Symbol

-XC13

A cylinder on which a rail is mounted to enable auto switches, in addition to the standard method for mounting auto switches (Band mounting style).

Applicable Series

Series	Description	Action	Note
CBG1	End lock cylinder	Double acting, Single rod	For XC13A only

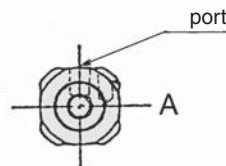
How to Order

CDBG1 Standard model no. – XC13A

* Trunnion style cannot be mounted.

Rail mounting direction

XC13A	Mounted on the right side when viewed from the rod with the ports facing upwards.
--------------	---



Applicable Auto Switches

Rail mounting style	Solid state	D-M9□/M9□V, D-M9□W/M9□WV, D-M9□A/M9□AV, D-F7□, D-F7□V, D-F7BA, D-F79F, D-F79W, D-F7□WV, D-J79, D-J79C, D-J79W
	Reed	D-A7/A8, D-A7□H/A80H, D-A73C/A80C, D-A79W

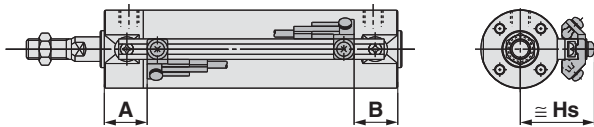
Made to Order Common Specifications: -XC13: Auto Switch Rail Mounting Style



25 Auto Switch Rail Mounting Style

Symbol
-XC13

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



Proper Auto Switch Mounting Position

[mm]

Auto switch model Bore size [mm]	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV		D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV		D-F7BA/F7BAV D-A72/A7□H/A80H D-A73C/A80C		D-F7NT		D-A7□ D-A80		D-A79W	
	A	B	A	B	A	B	A	B	A	B	A	B
20	31.5	22.5 (30.5)	30.5	21.5 (29.5)	35.5	26.5 (34.5)	29.5	20.5 (28.5)	27.5	18.5 (26.5)		
25	31.5	22.5 (30.5)	30.5	21.5 (29.5)	35.5	26.5 (34.5)	29.5	20.5 (28.5)	27.5	18.5 (26.5)		
32	32.5	23.5 (31.5)	31.5	22.5 (30.5)	36.5	27.5 (35.5)	30.5	21.5 (29.5)	28.5	19.5 (27.5)		
40	37.5	25.5 (34.5)	36.5	24.5 (33.5)	41.5	29.5 (38.5)	35.5	23.5 (32.5)	33.5	21.5 (30.5)		
50	44.5	30.5 (42.5)	43.5	29.5 (41.5)	48.5	34.5 (46.5)	42.5	28.5 (40.5)	40.5	26.5 (38.5)		
63	44.5	30.5 (42.5)	43.5	29.5 (41.5)	48.5	34.5 (46.5)	42.5	28.5 (40.5)	40.5	26.5 (38.5)		
80	54.5	38.5 (52.5)	53.5	37.5 (51.5)	58.5	42.5 (56.5)	52.5	36.5 (50.5)	50.5	34.5 (48.5)		
100	54.5	38.5 (52.5)	53.5	37.5 (51.5)	58.5	42.5 (56.5)	52.5	36.5 (50.5)	50.5	34.5 (48.5)		

Note 1) (): For long stroke type

Note 2) Adjust the auto switch after confirming the operating conditions in the actual setting.

Note 3) For the dimensions other than the proper auto switch mounting position and its mounting height, refer to standard type for series CBG1.

Proper Auto Switch Mounting Position

[mm]

Lock position Bore size [mm]	H (Head side)		R (Rod side)		W (Both sides)	
	A	B ⁽²⁾	A	B	A	B ⁽²⁾
20	+ 0	+ 12	+ 11	+ 0	+ 11	+ 12
25	+ 0	+ 12	+ 11	+ 0	+ 11	+ 12
32	+ 0	+ 10	+ 10	+ 0	+ 10	+ 10
40	+ 0	+ 14	+ 9	+ 0	+ 9	+ 14
50	+ 0	+ 17	+ 12	+ 0	+ 12	+ 17
63	+ 0	+ 17	+ 12	+ 0	+ 12	+ 17
80	+ 0	+ 22	+ 16	+ 0	+ 16	+ 22
100	+ 0	+ 22	+ 16	+ 0	+ 16	+ 22

Note 1) Add the above values to those listed in the previous table.

Note 2) For the head side and both sides lock, add the above values to the long stroke values listed in the previous table.

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

Note 4) For the dimensions other than the proper auto switch mounting position and its mounting height, refer to standard type for series CBG1.

Auto Switch Mounting Height

[mm]

Auto switch model Bore size [mm]	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-F7□/F79F D-J79/F7NT D-F7□W/J79W/F7BA	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W
	Hs	Hs	Hs	Hs	Hs	Hs
20	26.5	29	32	25.5	32.5	28
25	29	31.5	34.5	28	35	30.5
32	32.5	35	38	31.5	38.5	34
40	36.5	39	42	35.5	42.5	38
50	42	44.5	47.5	41	48	43.5
63	49	51.5	54.5	48	55	50.5
80	59	61.5	64.5	58	65	60.5
100	69.5	72	75	68.5	75.5	71

Made to Order Common Specifications: -XC13: Auto Switch Rail Mounting Style



25 Auto Switch Rail Mounting Style

Symbol
-XC13

Minimum Auto Switch Mounting Stroke

Auto switch model	No. of auto switch mounted		
	1	2 Same surface	n (n: No. of auto switches) Same surface
D-M9□/M9□V D-F7□V D-J79C	5	5	10 + 10 (n-2) ^{Note)} (n=4, 6··)
D-M9□WV D-M9□AV D-F7□WV D-F7BAV D-A79W	10	15	10 + 15 (n-2) ^{Note)} (n=4, 6··)
D-M9□W D-M9□A	10	15	15 + 15 (n-2) ^{Note)} (n=4, 6··)
D-F7□ D-J79	5	5	15 + 15 (n-2) ^{Note)} (n=4, 6··)
D-F7□W/J79W D-F7BA D-F79F/F7NT	10	15	15 + 20 (n-2) ^{Note)} (n=4, 6··)
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	10	15 + 10 (n-2) ^{Note)} (n=4, 6··)
D-A7□H D-A80H	5	10	15 + 15 (n-2) ^{Note)} (n=4, 6··)

Note) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation. However, the minimum even number is 4. So, 4 is used for the calculation when "n" is 1 to 3.

Operating Range

Auto switch model	Bore size [mm]							
	20	25	32	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4	4	5	4	5.5	6.5	7.5	7
D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV D-F7BA/F7BAV D-F7NT	4.5	4	4.5	5	5	6	6	6
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	9	9	10	11	11	13.5	13	13.5
D-A79W	11	11	13	14	14	16.5	16	16.5

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed. (Assuming approximately ±30% dispersion.) It may vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket: Part No.

Auto switch model	Bore size [mm]
	ø20 to ø100
D-M9□/M9□V D-M9□W/M9□WV	BQ2-012
D-A9□A/A9□AV	BQ2-012S

Note 1) When adding D-M9□(V) and D-A9□W(V), order a set of auto switch mounting brackets BQ-1 and BQ2-012 for the CDQ2 series (ø12 to ø25) separately.

When ordering the auto switches other than D-M9□□□ mentioned on the left and D-F7BA(V), order auto switch mounting brackets BQ-1 separately.

Note 2) When adding D-M9□A(V), order a stainless steel screw set BBA2 together with BQ2-012S separately.

When adding the auto switch D-F7BA(V), order a stainless steel screw set BBA2 separately.

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 catalogue 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 catalogue.
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.

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 catalogue for the particular products.

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

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

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.

Caution

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

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

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

SMC Corporation (Europe)

Austria	☎ +43 (0)2262622800	www.smc.at	office@smc.at
Belgium	☎ +32 (0)33551464	www.smc-pneumatics.be	info@smc-pneumatics.be
Bulgaria	☎ +359 (0)2807670	www.smc.bg	office@smc.bg
Croatia	☎ +385 (0)13707288	www.smc.hr	office@smc.hr
Czech Republic	☎ +420 541424611	www.smc.cz	office@smc.cz
Denmark	☎ +45 70252900	www.smc.dk	smc@smc.dk
Estonia	☎ +372 6510370	www.smc-pneumatics.ee	smc@smc-pneumatics.ee
Finland	☎ +358 207513513	www.smc.fi	smc@smc.fi
France	☎ +33 (0)164761000	www.smc-france.fr	promotion@smc-france.fr
Germany	☎ +49 (0)61034020	www.smc.de	info@smc.de
Greece	☎ +30 210 2717265	www.smc-hellas.gr	sales@smc-hellas.gr
Hungary	☎ +36 23511390	www.smc.hu	office@smc.hu
Ireland	☎ +353 (0)14039000	www.smc-pneumatics.ie	sales@smc-pneumatics.ie
Italy	☎ +39 0292711	www.smc-italia.it	mailbox@smc-italia.it
Latvia	☎ +371 67817700	www.smc.lv	info@smc.lv

Lithuania	☎ +370 5 2308118	www.smc.lt	info@smc.lt
Netherlands	☎ +31 (0)205318888	www.smc-pneumatics.nl	info@smc-pneumatics.nl
Norway	☎ +47 67129020	www.smc-norge.no	post@smc-norge.no
Poland	☎ +48 (0)222119616	www.smc.pl	office@smc.pl
Portugal	☎ +351 226166570	www.smc.eu	postpt@smc-smc.es
Romania	☎ +40 213205111	www.smc-romania.ro	smcromania@smcromania.ro
Russia	☎ +7 8127185445	www.smc-pneumatik.ru	info@smc-pneumatik.ru
Slovakia	☎ +421 (0)413213212	www.smc.sk	office@smc.sk
Slovenia	☎ +386 (0)73885412	www.smc.si	office@smc.si
Spain	☎ +34 902184100	www.smc.eu	post@smc-smc.es
Sweden	☎ +46 (0)86031200	www.smc.nu	post@smc.nu
Switzerland	☎ +41 (0)523963131	www.smc.ch	info@smc.ch
Turkey	☎ +90 212 489 0 440	www.smc-pneumatik.com.tr	info@smc-pneumatik.com.tr
UK	☎ +44 (0)845 121 5122	www.smc-pneumatics.co.uk	sales@smc-pneumatics.co.uk

SMC CORPORATION Akihbara UDX 15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN Phone: 03-5207-8249 FAX: 03-5298-5362