Series 10-/11-/21-/22-CG1-Z

Air Cylinder: Double acting, Single rod
ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Clean series

10	Relief type
11	Vacuum suction type

Built-in magnet

Nil	No
D	With auto switch (Built-in magnet)

Type

N	Rubber bumper/ø20 to ø100

Bore size (mm)

10-C D G 1 B N 40-150 Z-M9BW

21-C D G 1 B N 40-150 Z-M9BW

Copper, fluorine and silicon-free + Low particle generation

21	Relief type
22	Vacuum suction type

Mounting style

B*	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style

* No trunnion mounting female thread is provided for clean series.

Cylinder stroke (mm)

Rod end thread

Nil	Male rod end
F	Female rod end

Type of auto switch

Solid state switch	M9B, M9BW, K59, K59W
Reed switch	A93, B54

Number of auto switches

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

Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke Note 2) (mm)	Long stroke (mm) Note 1) Note 2)	Auto switch mounting	Cushion Rubber
Relief type	**10-/21-CG1□20**	20	1/8	Non-lube	Double acting, Single rod	25, 50, 75, 100, 125, 150, 200	Up to 1500	○	○
	10-/21-CG1□25	25				25, 50, 75, 100,125, 150, 200, 250, 300			
	10-/21-CG1□32	32							
	10-/21-CG1□40	40							
	10-/21-CG1□50	50	1/4						
	10-/21-CG1□63	63							
	10-/21-CG1□80	80	3/8						
	10-/21-CG1□100	100	1/2						
Vacuum suction type	**11-/22-CG1□20**	20	1/8			25, 50, 75, 100, 125, 150, 200			
	11-/22-CG1□25	25				25, 50, 75, 100,125, 150, 200, 250, 300			
	11-/22-CG1□32	32							
	11-/22-CG1□40	40							
	11-/22-CG1□50	50	1/4						
	11-/22-CG1□63	63							
	11-/22-CG1□80	80	3/8						
	11-/22-CG1□100	100	1/2						

Note 1) When exceeding the standard strokes above, the particle generation grade may not be satisfied.
Note 2) Intermediate strokes and long strokes not listed above are produced upon receipt of order.

Specifications

Item	Bore size (mm)	20	25	32	40	50	63	80	100
Proof pressure		1.5 MPa							
Maximum operating pressure		1.0 MPa							
Minimum operating pressure		0.05 MPa							
Ambient and fluid temperature		Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)							
Piston speed		10-/11-: 30 to 400 mm/s, 21-/22-: 50 to 400 mm/s							
Stroke length tolerance		Up to 1000 $^{+1.4}_{0}$ mm, Up to 1500 $^{+1.5}_{0}$ mm							
Mounting style		Basic style/Axial foot style Rod side flange style/Head side flange style							
Grease		10-/11-: Fluorine grease 21-/22-: Lithium soap based grease							
Particle generation grade (Refer to front matter 13 for details.)		10-: Grade 2, 21-: Grade 3 11-/22-: Grade 1							
Allowable kinetic energy (J)	**Rubber bumper** **Male rod end**	0.28	0.41	0.66	1.20	2.00	3.40	5.90	9.90
	Rubber bumper **Female rod end**	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54

Note) Operate the cylinder within the allowable kinetic energy.

Suction flow rate of vacuum suction type (Reference values)

Bore size	Suction flow rate L/min (ANR)
20/25/32/40	10
50/63/80/100	20

Applicable Auto Switches (Refer to Best Pneumatics No. 2 for auto switches not in the following table.)

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model ø20 to ø63	Auto switch model ø80, ø100	Lead wire length (mm)* 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
								—	G59	●	—	●	○	○		
				3-wire (PNP)				M9P	—	●	●	●	○	○		
								—	G5P	●	—	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○	—	
								—	K59	●	—	●	○	○		
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○	○	IC circuit	
								—	G59W	●	—	●	○	○		
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
								—	G5PW	●	—	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○	—	
								—	K59W	●	—	●	○	○		
Reed auto switch	—	Grommet	Yes	2-wire	24 V	12 V	100 V	A93	—	●	—	●	●	—	—	Relay, PLC
			No				100 V or less	A90	—	●	—	●	—	—	IC circuit	
			Yes				100 V, 200 V	B54		●	—	●	●	—	—	
			No				200 V or less	B64		●	—	●	—	—		

* 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

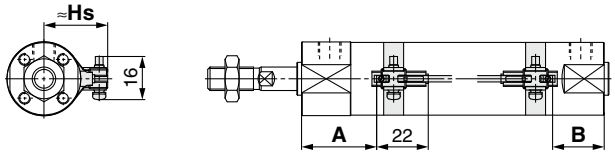
* Solid state auto switches marked with "○" are produced upon receipt of order.
PLC: Programmable Logic Controller

* For applicable auto switches other than listed above, refer to the table in the dashed line on the last page of the standard cylinder series in Best Pneumatics No. 2.

Refer to page 182 for a list of applicable auto switches.

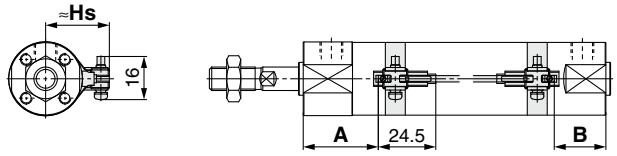
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Solid state auto switch
D-M9□, M9□W
ø20 to **ø63**



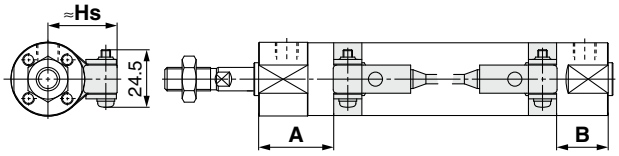
A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

Reed auto switch
D-A9□
ø20 to **ø63**

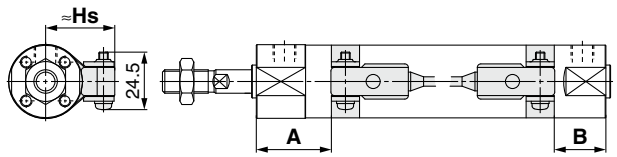


A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

D-G5, K5, G5□W
D-K59W
ø20 to **ø100**



D-B5, B6
ø20 to **ø100**



Auto Switch Proper Mounting Position (Detection at stroke end) (mm)

Auto switch model / Bore size	D-M9□ D-M9□W A	D-M9□ D-M9□W B	D-A9□ A	D-A9□ B	D-G5□/K59 D-G5□W/K59W A	D-G5□/K59 D-G5□W/K59W B	D-B5□ D-B64 A	D-B5□ D-B64 B
20	41	24 (32)	37	20 (28)	33	16 (24)	31.5	14.5 (22.5)
25	40.5	24.5 (32.5)	36.5	20.5 (28.5)	32.5	16.5 (24.5)	31	15 (23)
32	42	25 (33)	38	21 (29)	34	17 (25)	32.5	15.5 (23.5)
40	39	27 (36)	35	23 (32)	31	19 (28)	29.5	17.5 (26.5)
50	46	32 (44)	42	28 (40)	38	24 (36)	36.5	22.5 (34.5)
63	44.5	33.5 (45.5)	40.5	29.5 (41.5)	36.5	25.5 (37.5)	35	24 (36)
80	—	—	—	—	49.5	30.5 (44.5)	48	29 (43)
100	—	—	—	—	48.5	31.5 (45.5)	47	30 (44)

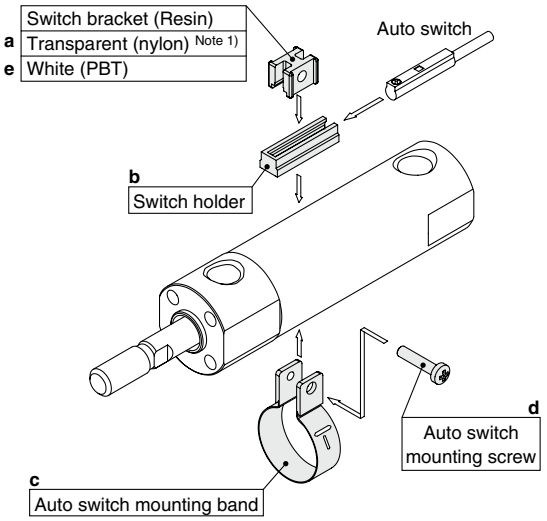
Auto Switch Mounting Height (mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-A9□ Hs	D-G5/K5 D-G5□W D-K59W D-B5/B6 Hs
20	24.5	27.5
25	27	30
32	30.5	33.5
40	35	38
50	40.5	43.5
63	47.5	50.5
80	—	59
100	—	69.5

Note 1) Figures in parentheses are for the long stroke type.
Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto switch mounting brackets/Part no.

Auto switch model	Bore size (mm)							
	20	**25**	**32**	**40**	**50**	**63**	**80**	**100**
D-M9□ **D-M9□W** **D-A9□**	BMA3-020 (A set of a, b, c, d)	BMA3-025 (A set of a, b, c, d)	BMA3-032 (A set of a, b, c, d)	BMA3-040 (A set of a, b, c, d)	BMA3-050 (A set of a, b, c, d)	BMA3-063 (A set of a, b, c, d)	—	—



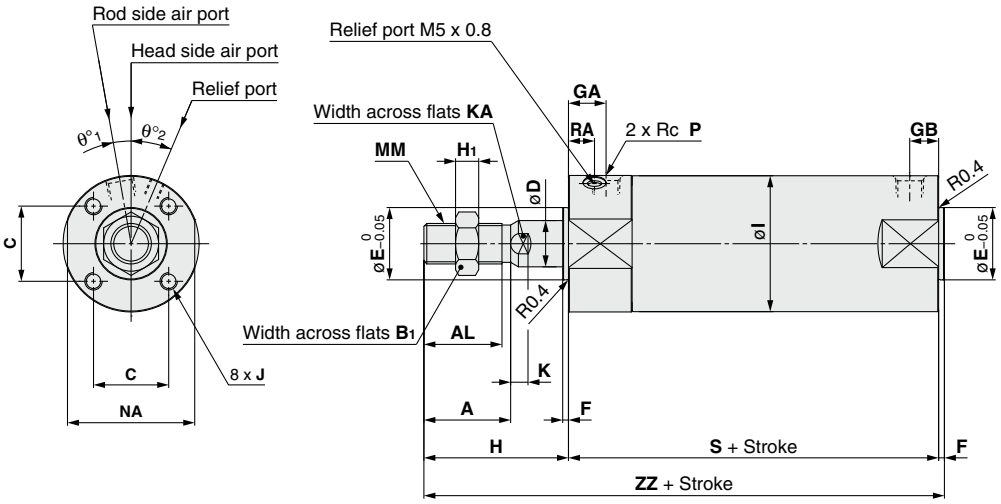
∗ Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

D-B5□/B64 **D-G5□/K59** **D-G5□W/K59W**	BA-01 (A set of band and screw)	BA-02 (A set of band and screw)	BA-32 (A set of band and screw)	BA-04 (A set of band and screw)	BA-05 (A set of band and screw)	BA-06 (A set of band and screw)	BA-08 (A set of band and screw)	BA-10 (A set of band and screw)

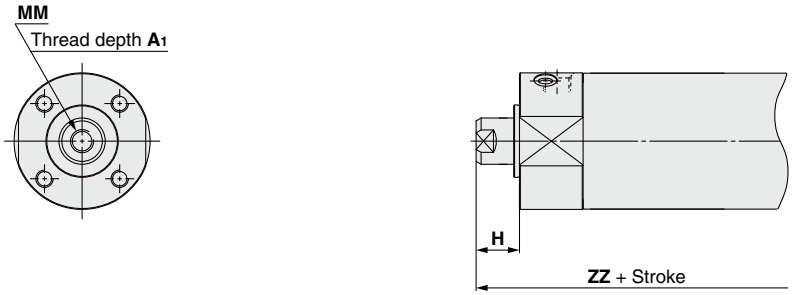
Note) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used.
Please contact SMC regarding other chemicals.

Basic style (B) / $^{10\text{-}}_{11\text{-}}$CG1B, $^{21\text{-}}_{22\text{-}}$CG1B

With rubber bumper



Female rod end



(mm)

Bore size	Stroke range		A	AL	B_1	C	D	E	F	GA	GB	H	H_1	I	J	K	KA	MM	NA	P	RA	S	$\theta°_1$	$\theta°_2$	ZZ
	Standard	Long																								
20	Up to 200	201 to 1500	18	15.5	13	14	8	12	2	20	10 (12)	35	5	26	M4 x 0.7 depth 7	5	6	M8 x 1.25	24	1/8	7	77 (85)	0	0	114 (122)
25			22	19.5	17	16.5	10	14	2	20	10 (12)	40	6	31	M5 x 0.8 depth 7.5	5.5	8	M10 x 1.25	29	1/8	7	77 (85)	0	0	119 (127)
32			22	19.5	17	20	12	18	2	20	10 (12)	40	6	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25	35.5	1/8	7	79 (87)	0	0	121 (129)
40			30	27	19	26	16	25	2	13	10 (13)	50	8	47	M6 x 1 depth 12	6	14	M14 x 1.5	44	1/8	9	78 (87)	10	23	130 (139)
50	Up to 300	301 to 1500	35	32	27	32	20	30	2	14	12 (14)	58	11	58	M8 x 1.25 depth 16	7	18	M18 x 1.5	55	1/4	10	90 (102)	10	23	150 (162)
63			35	32	27	38	20	32	2	14	12 (14)	58	11	72	M10 x 1.5 depth 16	7	18	M18 x 1.5	69	1/4	10	90 (102)	10	20	150 (162)
80			40	37	32	50	25	40	3	20	16 (20)	71	13	89	M10 x 1.5 depth 22	10	22	M22 x 1.5	86	3/8	10	108 (122)	10	20	182 (196)
100			40	37	41	60	30	50	3	20	16 (20)	71	16	110	M12 x 1.75 depth 22	10	26	M26 x 1.5	106	1/2	10	108 (122)	10	20	182 (196)

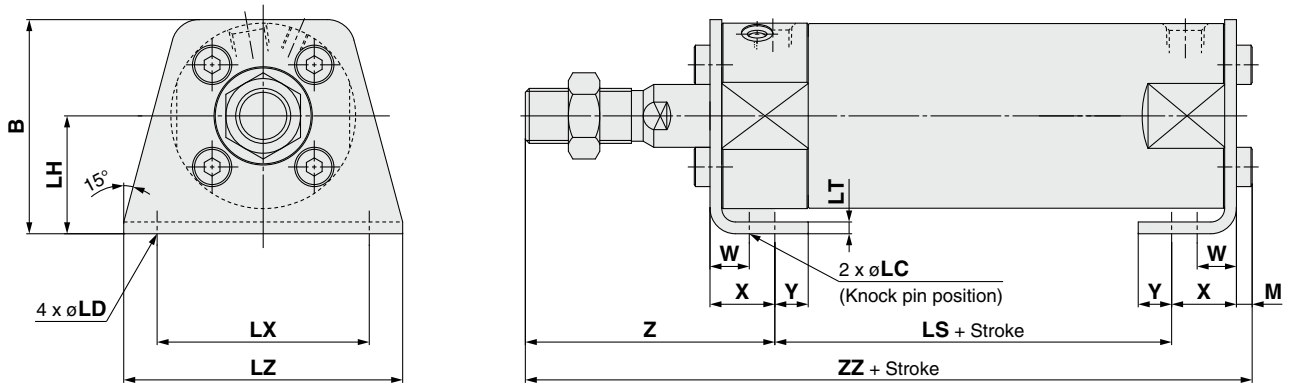
∗ No trunnion mounting female thread is provided for clean series.
( ): Denotes the dimensions for long stroke.

Female rod end (mm)

Bore size	A_1	H	MM	ZZ
20	8	13	M4 x 0.7	92 (100)
25	8	14	M5 x 0.8	93 (101)
32	12	14	M6 x 1.0	95 (103)
40	13	15	M8 x 1.25	95 (104)
50	18	16	M10 x 1.5	108 (120)
63	18	16	M10 x 1.5	108 (120)
80	21	19	M14 x 1.5	130 (144)
100	25	22	M16 x 1.5	133 (147)

Axial foot style (L) / 10-11-CG1L, 21-22-CG1L

With rubber bumper



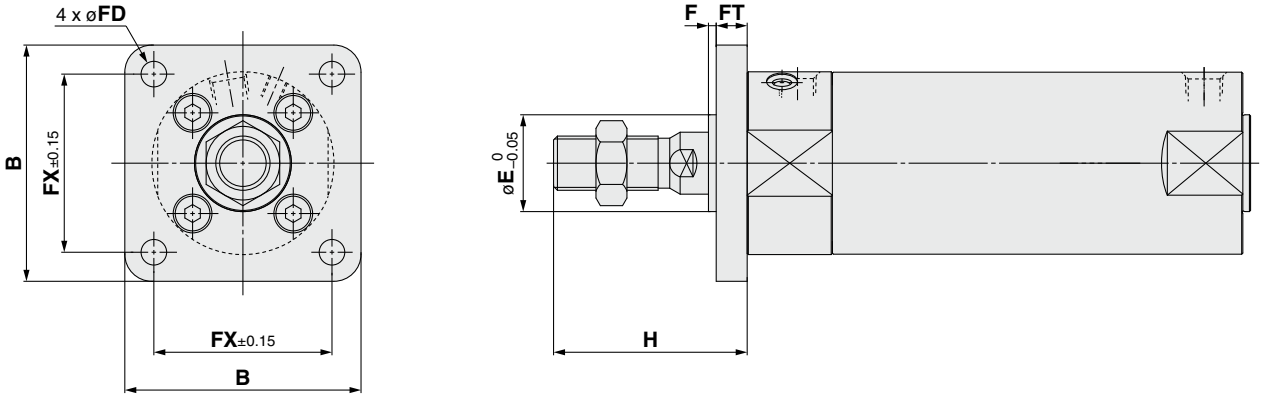
(mm)

Bore size	B	LC	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ
20	34	4	6	20	53 (61)	3	32	44	3	10	15	7	47	118 (126)
25	38.5	4	6	22	53 (61)	3	36	49	3.5	10	15	7	52	123.5 (131.5)
32	45	4	7	25	53 (61)	3	44	58	3.5	10	16	8	53	125.5 (133.5)
40	54.5	4	7	30	51 (60)	3	54	71	4	10	16.5	8.5	63.5	135 (144)
50	70.5	5	10	40	55 (67)	4.5	66	86	5	17.5	22	11	75.5	157.5 (169.5)
63	82.5	5	12	45	55 (67)	4.5	82	106	5	17.5	22	13	75.5	157.5 (169.5)
80	101	6	11	55	60 (74)	4.5	100	125	5	20	28.5	14	95	188.5 (202.5)
100	121	6	14	65	60 (74)	6	120	150	7	20	30	16	95	192 (206)

∗ Other dimensions are the same as basic style.
∗ For female rod end, since the wrench flap (K and KA portions) will be inside of the bracket when the piston rod is retracted at the stroke end, extend the piston rod to tighten the nut using a tool, and mount a workpiece on the rod end.
∗ Refer to the basic style for the female rod end.
Note) ( ): Denotes the dimensions for long stroke.

Rod side flange style (F) / $^{10\text{-}}_{11\text{-}}$CG1F, $^{21\text{-}}_{22\text{-}}$CG1F

With rubber bumper



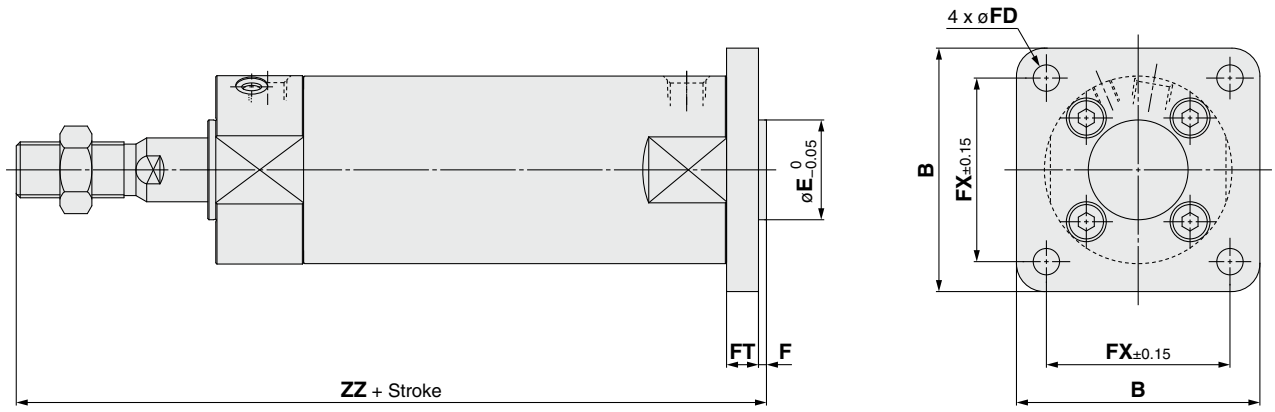
(mm)

Bore size	B	E	F	FX	FD	FT
20	40	12	2	28	5.5	6
25	44	14	2	32	5.5	7
32	53	18	2	38	6.6	7
40	61	25	2	46	6.6	8
50	76	30	2	58	9	9
63	92	32	2	70	11	9
80	104	40	3	82	11	11
100	128	50	3	100	14	14

Note) End boss is machined on the flange for øE.
∗ Other dimensions are the same as basic style.
∗ Refer to the basic style for the female rod end.

Head side flange style (G) / 10-11-CG1G, 21-22-CG1G

With rubber bumper



(mm)

Bore size	B	E	F	FX	FD	FT	ZZ
20	40	12	2	28	5.5	6	120 (128)
25	44	14	2	32	5.5	7	126 (134)
32	53	18	2	38	6.6	7	128 (136)
40	61	25	2	46	6.6	8	138 (147)
50	76	30	2	58	9	9	159 (171)
63	92	32	2	70	11	9	159 (171)
80	104	40	3	82	11	11	193 (207)
100	128	50	3	100	14	14	196 (210)

Note) End boss is machined on the flange for øE.
∗ Other dimensions are the same as basic style.
∗ Refer to the basic style for the female rod end.
Note) ( ): Denotes the dimensions for long stroke.