Air Cylinder: Standard Type
Double Acting, Single Rod

Series CG1

RoHS

ø 20, ø 25, ø 32, ø 40, ø 50, ø 63, ø 80, ø 100

How to Order

	CG1	B	N	20		–	100			Z	–			–					
With auto switch	CDG1	B	N	20		–	100			Z	–			–	M9BW		–		

With auto switch
(Built-in magnet)

Mounting

B	Basic
Z*	Basic (without trunnion mounting female thread)
L	Axial foot
F	Rod flange
G	Head flange
U*	Rod trunnion
T*	Head trunnion
D	Clevis

* Not available for ø 80 and ø 100.
* Mounting bracket is shipped together with the product, but not assembled.
* The cylinder for F, G, L, D mounting types is Z: Basic (without trunnion mounting female thread).

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

Type

N	Rubber bumper
A	Air cushion

Port thread type

	Rubber bumper		Air cushion	
—	Rc	ø 20 to ø 100	M5 x 0.8	ø 20, ø 25
			Rc	ø 32 to ø 100
TN	NPT	ø 20 to ø 100	NPT*	ø 32 to ø 100
TF	M5 x 0.8	ø 20, ø 25	G*	ø 32 to ø 100
	G	ø 32 to ø 100		

* Not available for ø 20 and ø 25.

Cylinder stroke [mm]
Refer to "Standard Strokes" on page 6.

Pivot bracket

—	None
N	Pivot bracket is shipped together with the product, but not assembled

* Only for D, U, T mounting types
* Pivot bracket is shipped together with the product, but not assembled.

Rod end bracket

—	None
V	Single knuckle joint
W	Double knuckle joint

* No bracket is provided for the female rod end.
* Rod end bracket is shipped together with the product, but not assembled.
* A knuckle joint pin is not provided with the single knuckle joint.

Rod end thread

—	Male rod end
F	Female rod end

Made to Order
For details, refer to page 6.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

—	Without auto switch

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

Suffix for cylinder (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 flange as a bracket, those parts are to be assembled at the time of shipment.
* For female rod end, no rod boot is provided.

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 DC	Load voltage AC	Auto switch model: Applicable bore size ø 20 to ø 63 Perpendicular	Auto switch model: Applicable bore size ø 20 to ø 63 In-line	Auto switch model: Applicable bore size ø 80, ø 100 In-line	Lead wire length [m] 0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	—	●	●	●	○	—	○	IC circuit	Relay, PLC
							—	—	G59	●	—	●	○	—	○		
				3-wire (PNP)			M9PV	M9P	—	●	●	●	○	—	○		
							—	—	G5P	●	—	●	○	—	○		
				2-wire	12 V		M9BV	M9B	—	●	●	●	○	—	○	—	
							—	—	K59	●	—	●	○	—	○		
		Connector					—	H7C	—	●	—	●	●	●	—		
	Diagnostic indication (2-colour indication)	Grommet		3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	—	●	●	●	○	—	○	IC circuit	
							—	—	G59W	●	—	●	○	—	○		
				3-wire (PNP)			M9PWV	M9PW	—	●	●	●	○	—	○		
							—	—	G5PW	●	—	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	—	●	●	●	○	—	○	—	
							—	—	K59W	●	—	●	○	—	○		
	Water resistant (2-colour indication)			3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	—	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	—	○	○	●	○	—	○		
				2-wire	12 V		M9BAV***	M9BA***	—	○	○	●	○	—	○	—	
							—	—	G5BA***	—	—	●	○	—	○		
	With diagnostic output (2-colour indication)			4-wire (NPN)	5 V, 12 V		—	H7NF	G59F	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	—	A96V	A96	—	●	—	●	—	—	—	IC circuit	—
			Yes	2-wire	24 V	12 V	100 V	A93V	A93	—	●	—	●	●	—	—	—	Relay, PLC
			No				100 V or less	A90V	A90	—	●	—	●	—	—	—	IC circuit	
			Yes				100 V, 200 V	—	B54		●	—	●	●	—	—	—	
			No				200 V or less	—	B64		●	—	●	—	—	—	—	
		Connector	Yes				—	—	C73C	—	●	—	●	●	●	—		
			No				24 V or less	—	C80C	—	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-colour indication)	Grommet	Yes		—	—	—	—	B59W		●	—	●	—	—	—	—	

*** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
A water-resistant type cylinder is recommended for use in an environment which requires water resistance. However, please contact SMC for water-resistant cylinder of ø 20 and ø 25.

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

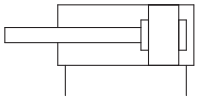
* Solid state auto switches marked with "○" are produced upon receipt of order.

* Since there are other applicable auto switches than listed above, refer to page 74 for details.
* For details about auto switches with pre-wired connector, refer to **Auto Switch Guide.**
* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

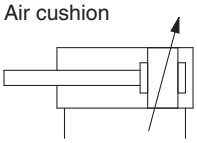
SMC

Symbol

Rubber bumper



Air cushion



Made to Order

Made to Order

(For details, refer to pages 77 to 93.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150 °C)*1
-XB7	Cold resistant cylinder (–40 to 70 °C)*2
-XB9	Low speed cylinder (10 to 50 mm/s)*3
-XB13	Low speed cylinder (5 to 50 mm/s)*3
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC12	Tandem cylinder*3
-XC13	Auto switch rail mounting
-XC20	Head cover axial port*3
-XC22	Fluororubber seal*1
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper
-XC37	Larger throttle diameter of connection port
-XC42	Built-in shock absorber in head cover side
-XC85	Grease for food processing equipment
-X446	PTFE grease*3

∗1 Cylinders with rubber bumper have no bumper.
∗2 Only compatible with cylinders with rubber bumper, but has no bumper.
∗3 Only compatible with cylinders with rubber bumper.

Refer to pages 68 to 74 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range
- Cylinder mounting bracket, by stroke/Auto switch mounting surfaces

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			0.05 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			50 to 1000 mm/s						50 to 700 mm/s	
Stroke length tolerance			Up to 1000 st $^{+1.4}_{0}$ mm, Up to 1500 st $^{+1.8}_{0}$ mm							
Cushion			Rubber bumper, Air cushion							
Mounting**			Basic, Basic (without trunnion mounting female thread), Axial foot, Rod flange, Head flange, Rod trunnion, Head trunnion, Clevis (used for changing the port location by 90°)							
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
		Female rod end	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54
	Air cushion	**Male rod end**	R: 0.35 H: 0.42	R: 0.56 H: 0.65	0.91	1.80	3.40	4.90	11.80	16.70
		Female rod end	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54

∗ R: Rod side, H: Head side
∗∗ Cylinder sizes ø 80 and ø 100 do not have basic (without trunnion mounting female thread), rod trunnion and head trunnion types. Foot, flange and clevis types of cylinder sizes from ø 20 to ø 63 do not have trunnion mounting female thread. Operate the cylinder within the allowable kinetic energy.

Accessories

Mounting		Basic	Axial foot	Rod flange	Head flange	Rod trunnion	Head trunnion	Clevis
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	—	●
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)**	●	●	●	●	●	●	●
	Pivot bracket*	—	—	—	—	●*	●*	●
	Rod boot	●	●	●	●	●	●	●

∗ Not available for ø 80 and ø 100.
∗∗ A double knuckle joint pin and retaining rings are shipped together.

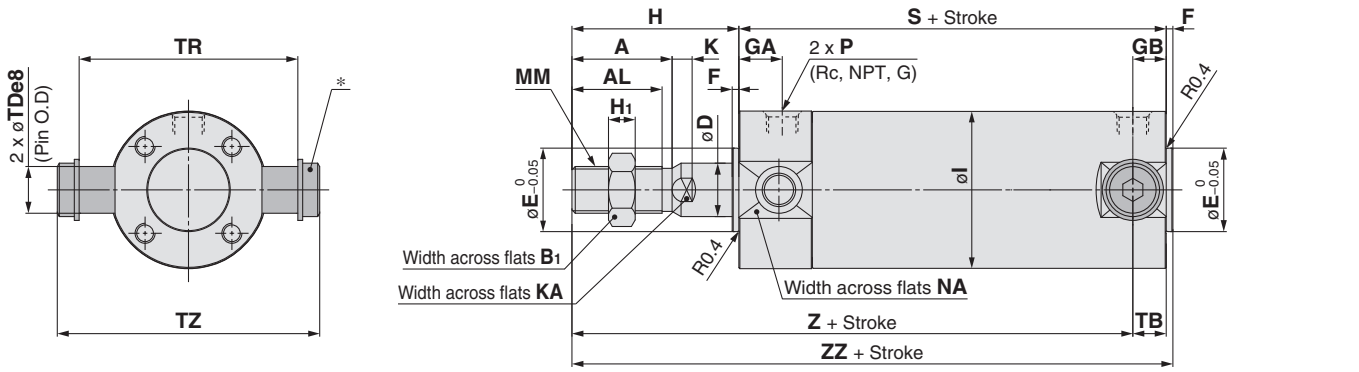
Standard Strokes

[mm]

Bore size	Standard stroke Note1)	Maximum manufacturable stroke Note 2)
20	25, 50, 75, 100, 125, 150, 200	201 to 1500
25	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 1500
32		
40		
50, 63		
80		
100		

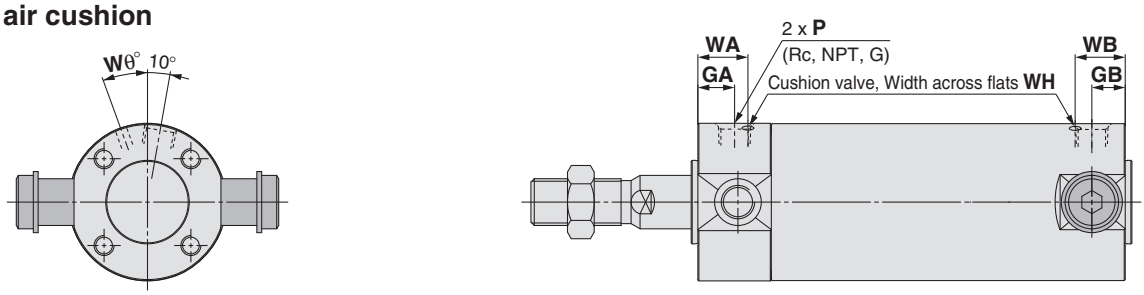
Note 1) Intermediate strokes not listed above are produced upon receipt of order. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
Note 2) The maximum manufacturable stroke shows the long stroke.
Note 3) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection". In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Head Trunnion: CG1TN

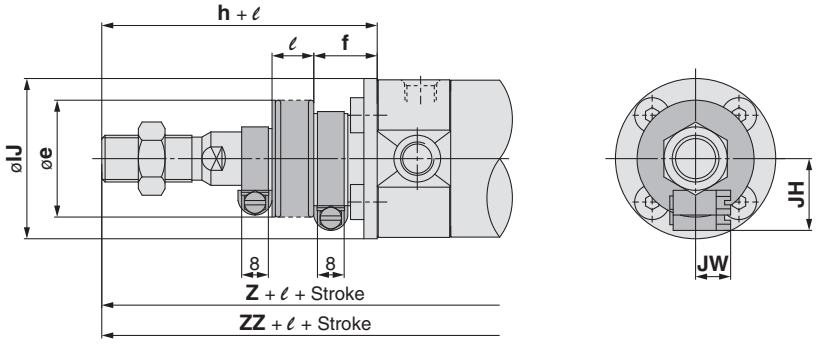


* Constructed of a trunnion pin, flat washer and hexagon socket head cap bolt.

With air cushion



With rod boot



[mm]

Bore size	Stroke range		Rc, NPT port			G port			A	AL	B1	D	E	F	H	H1	I	K	KA	MM	NA	S
	Standard	Long stroke	GA	GB	P	GA	GB	P														
20	Up to 200	201 to 1500	12	10 (12)	1/8	12	10 (12)	M5 x 0.8	18	15.5	13	8	12	2	35	5	26	5	6	M8 x 1.25	24	69 (77)
25	Up to 300	301 to 1500	12	10 (12)	1/8	12.5	10 (12.5)	M5 x 0.8	22	19.5	17	10	14	2	40	6	31	5.5	8	M10 x 1.25	29	69 (77)
32	Up to 300	301 to 1500	12	10 (12)	1/8	10.5	10 (10.5)	1/8	22	19.5	17	12	18	2	40	6	38	5.5	10	M10 x 1.25	35.5	71 (79)
40	Up to 300	301 to 1500	13	10 (13)	1/8	13	10 (10)	1/8	30	27	19	16	25	2	50	8	47	6	14	M14 x 1.5	44	78 (87)
50	Up to 300	301 to 1500	14	12 (14)	1/4	14	12 (14)	1/4	35	32	27	20	30	2	58	11	58	7	18	M18 x 1.5	55	90 (102)
63	Up to 300	301 to 1500	14	12 (14)	1/4	14	12 (14)	1/4	35	32	27	20	32	2	58	11	72	7	18	M18 x 1.5	69	90 (102)

[mm]

Bore size	TB	TDe8	TR	TZ	Z	ZZ
20	11	$8^{-0.025}_{-0.047}$	39	47.6	93 (101)	106 (114)
25	11	$10^{-0.025}_{-0.047}$	43	53	98 (106)	111 (119)
32	10 (11)	$12^{-0.032}_{-0.059}$	54.5	67.7	101 (108)	113 (121)
40	10 (12)	$14^{-0.032}_{-0.059}$	65.5	78.7	118 (125)	130 (139)
50	12 (13)	$16^{-0.032}_{-0.059}$	80	98.6	136 (147)	150 (162)
63	12 (13)	$18^{-0.032}_{-0.059}$	98	119.2	136 (147)	150 (162)

With Air Cushion

[mm]

Bore size	Rc, NPT, G			WA	WB	Wθ	WH
	GA	GB	P				
20	12	10 (12)	M5 x 0.8	16	15 (16)	25°	1.5
25	12.5	10 (12.5)	M5 x 0.8	16	14.5 (16)	25°	1.5
32	12	10 (12)	1/8	16	14 (16)	25°	1.5
40	13	10 (13)	1/8	17	15 (17)	20°	1.5
50	14	12 (14)	1/4	18	16 (18)	20°	3
63	14	12 (14)	1/4	18	17 (18)	20°	3

With Rod Boot

[mm]

Bore size	e	f	h	IJ	JH Reference	JW Reference	ℓ	Z	ZZ
20	30	18	55	27	15.5	10.5	1/4 stroke	113 (121)	126 (134)
25	30	19	62	32	16.5	10.5		120 (128)	133 (141)
32	35	19	62	38	18.5	10.5		123 (130)	135 (143)
40	35	19	70	48	21.5	10.5		138 (145)	150 (159)
50	40	19	78	59	24	10.5		156 (167)	170 (182)
63	40	20	78	72	24	10.5		156 (167)	170 (182)

* Refer to the basic type for the female rod end.
Note) ( ): Denotes the dimensions for long stroke.

* The minimum stroke with rod boot is 20 mm.