

Air Cylinder: Standard Type Double Acting, Single Rod

CG1 Series

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

RoHS

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 ø80 and ø100.
- * 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	ø20 to ø100	M5 x 0.8	ø20, ø25	
NI	NPT	ø20 to ø100	NPT*	ø32 to ø100	
TF	M5 x 0.8	ø20, ø25	G*	ø32 to ø100	
	G	ø32 to ø100			

* Not available for ø20 and ø25.

Pivot bracket

NI	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

NI	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.

Made to Order

For details, refer to page 293.

Number of auto switches

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

Auto switch

NI	Without auto switch
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- * For applicable auto switches, refer to the table below.

Suffix for cylinder (Rod boot)

NI	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.

Rod end thread

NI	Male rod end
F	Female rod end

Cylinder stroke (mm)

Refer to "Standard Strokes" on page 293.

* Refer to "Ordering Example of Cylinder Assembly" on page 294.

Applicable Auto Switches/Refer to pages 1575 to 1701 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 (NII)	1 (M)	3 (L)	5 (Z)	None (N)			
							ø20 to ø63	ø80, ø100	In-line								
Solid state auto switch	Diagnostic indication (2-color indicator)	Grommet	No	3-wire (NPN)	5 V, 12 V	—	Perpendicular	M9NV	M9N	G59	●	●	●	●	○	IC circuit	
				3-wire (PNP)			M9PV	M9P	G5P	●	●	●	●	○			
				2-wire			M9BV	M9B	G5P	●	●	●	●	○			
		Connector	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NVV	M9NV	H7C	●	●	●	●	○	IC circuit	
				3-wire (PNP)			M9PVV	M9PV	G59W	●	●	●	●	○			
				2-wire			M9BWW	M9BW	G5PW	●	●	●	●	○			
	Water resistant (2-color indicator)	Grommet	No	3-wire (NPN)	5 V, 12 V	—	M9NAV ^{*1}	M9NA ^{*1}	—	○	○	○	○	○	IC circuit		
				3-wire (PNP)			M9PAV ^{*1}	M9PA ^{*1}	—	○	○	○	○	○			
				2-wire			M9BAV ^{*1}	M9BA ^{*1}	—	○	○	○	○	○			
		With diagnostic output (2-color indicator)	Grommet	Yes	4-wire (NPN)	5 V, 12 V	—	—	H7NF	G59F	●	●	●	●	○	IC circuit	
					3-wire (Equiv. to NPN)			A96V	A96	—	●	●	●	●	○		
					—			A93V ^{*2}	A93	—	●	●	●	●	○		
Reed auto switch	Diagnostic indication (2-color indicator)	Grommet	No	2-wire	24 V	12 V	—	A90V	A90	—	●	●	●	●	○	IC circuit	
							—	—	—	—	—	—	—	—	—		—
							—	—	—	—	—	—	—	—	—		—
		Connector	Yes	—	—	—	—	—	—	—	—	—	—	—	—	Relay, PLC	
				—	—	—	—	—	—	—	—	—	—	—	—		
				—	—	—	—	—	—	—	—	—	—	—	—		
	—	Grommet	No	2-wire	24 V	—	—	C73C	—	—	●	●	●	●	○	IC circuit	
							—	C80C	—	—	—	—	—	—	—		—
							—	—	—	—	—	—	—	—	—		—
		Connector	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	
				—	—	—	—	—	—	—	—	—	—	—	—		
				—	—	—	—	—	—	—	—	—	—	—	—		

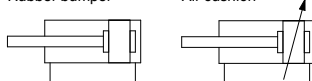
- *1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
- *2 A water-resistant type cylinder is recommended for use in an environment which requires water resistance. However, please contact SMC for water-resistant cylinder of ø20 and ø25.
- *3 1 m type lead wire is only applicable to D-A93.
- *4 Lead wire length symbols: 0.5 m..... NI (Example) M9NV 1 m..... M (Example) M9NVW 3 m..... L (Example) M9NVWL 5 m..... Z (Example) M9NVWZ None..... N (Example) H7CN
- *5 Solid state auto switches marked with "○" are produced upon receipt of order.
- *6 Since there are other applicable auto switches than listed above, refer to page 361 for details.
- *7 For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.
- *8 The D-A90□/M9□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)



Symbol

Rubber bumper

Air cushion



Made to Order: Individual Specifications
(For details, refer to page 362.)

Symbol	Specifications
-X446	PTFE grease

Made to Order

[Click here for details](#)

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)
-XB13	Low speed cylinder (5 to 50 mm/s)
-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
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-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

*1 Cylinders with rubber bumper have no bumper.

*2 Only compatible with cylinders with rubber bumper, but has no bumper.

Refer to pages 355 to 361 for cylinders with auto switches.
<ul style="list-style-type: none"> • 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



Precautions

Refer to page 362-1 before handling.

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 (No freezing) With auto switch : -10°C to 60°C							
Piston speed			50 to 1000 mm/s							50 to 700 mm/s
Stroke length tolerance			Up to 1000 st ₀ ^{+1.4} mm, Up to 1500 st ₀ ^{+1.8} 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							
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 ø80 and ø100 do not have basic (without trunnion mounting female thread), rod trunnion and head trunnion types. Foot, flange and clevis types of cylinder sizes from ø20 to ø63 do not have trunnion mounting female thread. Operate the cylinder within the allowable kinetic energy.

Accessories

Refer to page 309 for part numbers and dimensions.

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)*2	●	●	●	●	●	●	●
	Pivot bracket*1	—	—	—	—	●*3	●*3	●
	Rod boot	●	●	●	●	●	●	●

*1 Not available for ø80 and ø100.

*2 A double knuckle joint pin and retaining rings are shipped together.

*3 Stainless steel mounting brackets and accessories are also available.

Refer to page 309-1 for details.

Standard Strokes

			(mm)
Bore size	Standard stroke ^{Note 1)}	Maximum manufacturable stroke ^{Note 2)}	
20	25, 50, 75, 100, 125, 150, 200	201 to 1500	
25			
32			
40			
50, 63	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 1500	
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" on front matter pages. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

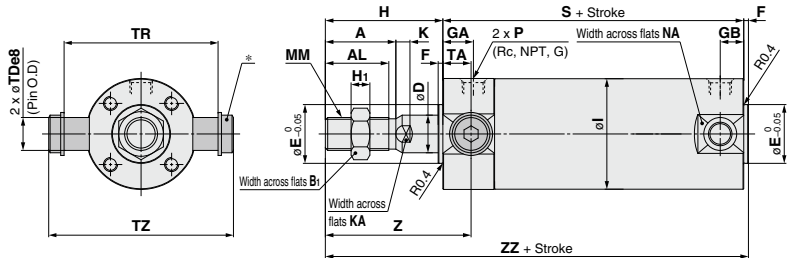
CS2

D-□

-X□

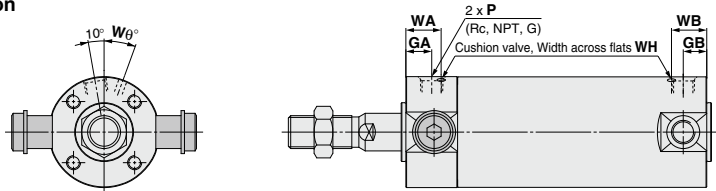
Technical Data

Rod Trunnion: CG1UN

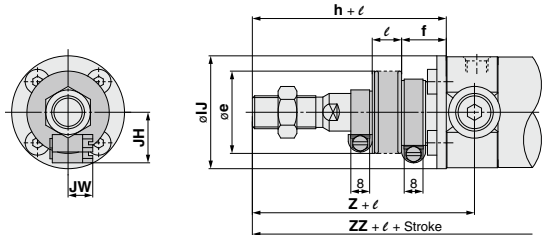


* Constructed of a trunnion pin, flat washer and hexagon socket head cap bolt.

With air cushion



With rod boot



(mm)																										
Bore size	Stroke range		Rc, NPT port			G port			A	AL	B ₁	D	E	F	H	H ₁	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)																												
With Air Cushion									(mm)									With Rod Boot							(mm)			
Bore size	TA	Td	e	f	TR	TZ	Z	ZZ	Rc, NPT port			W _A	W _B	W _G	W _H	Bore size	e	f	h	J	JH	JW	ℓ	Z	ZZ			
									GA	GB	P																GA	GB
20	11	8	-0.025 -0.047	39	47.6	46	106	(114)	20	12	10 (12)	M5 x 0.8	16	15	(16)	25°	1.5	20	30	18	52	15.5	10.5	66	126	(134)		
25	11	10	-0.047	43	53	51	111	(119)	25	12.5	10 (12.5)	M5 x 0.8	16	14.5	(16)	25°	1.5	25	30	19	62	16.5	10.5	73	133	(141)		
32	11	12	-0.059	54.5	67.7	51	113	(121)	32	12	10 (12)	1/8	16	14	(16)	25°	1.5	32	35	19	62	18	10.5	73	135	(143)		
40	12	14	-0.069	65.5	78.7	62	130	(139)	40	13	10 (13)	1/8	17	15	(17)	20°	1.5	40	35	19	70	24	11.5	82	150	(159)		
50	13	16	-0.092 -0.099	80	98.6	71	150	(162)	50	14	12 (14)	1/4	18	16	(18)	20°	3	50	40	19	78	59	14	91	170	(182)		
63	13	18	-0.092 -0.099	98	119.2	71	150	(162)	63	14	12 (14)	1/4	18	17	(18)	20°	3	63	40	20	78	72	24	10.5	91	170	(182)	