Standard: Double Acting Single Rod

Series CG1

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

How to Order

Standard CG1 L N 25 — 100 ☐

With auto switch CDG1 L N 25 — 100 ☐ — B53 ☐

With auto switch (magnet)

Mounting

B	Basic
L	Axial foot
F	Front flange
G	Rear flange
U*	Front trunnion
T*	Rear trunnion
D	Clevis

* Not available for bore sizes ø80 and ø100.
** Mounting brackets are included, not mounted.

Cushion

N	Rubber bumper
A	Air cushion

Bore size

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

Cylinder stroke (mm)

Refer to p.1.7-3 for Standard Stroke Table.

Rod boot (at one side)

—	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

* Foot brackets and front flanges are fitted when rod boots are mounted.

Auto switch

—	Without auto switch (Built-in magnet)

* Refer to the table below for selecting applicable auto switches.

Number of auto switches

—	2
S	1
n	n

Applicable Auto Switches/ Refer to p.5.3-2 for further information on auto switch.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Applicable bore size ø20 to ø63	Auto switch model: Applicable bore size ø20 to ø100	Lead wire (m)* 0.5 (–)	3 (L)	5 (Z)	None (N)	Applicable load	
Reed switch	—	Grommet	Yes	3 wire (NPN)	—	5V	—	**C76**	—	●	●	—	—	IC	—
				2 wire	24V	12V	—	—	**B53**	●	●	●	—	—	PLC
							200V or less	—	**B54**	●	●	●	—	—	Relay PLC
			No					—	**B64**	●	●	—	—	—	
			Yes			12V	100V	**C73**	—	●	●	●	—	—	
			No			5V, 12V	100V or less	**C80**	—	●	●	—	—	IC	
		Connector	Yes			12V	—	**C73C**	—	●	●	●	●	—	
			No			5V, 12V	24V or less	**C80C**	—	●	●	●	●	IC	
	Diagnostic indication (2 color)	Grommet	Yes			—	—	—	**B59W**	●	●	—	—	—	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**H7A1**	**G59**	●	●	○	—	IC	
				3 wire (PNP)				**H7A2**	**G5P**	●	●	○	—		
				2 wire		12V		**H7B**	**K59**	●	●	○	—	—	
		Connector						**H7C**	—	●	●	●	●		
	Diagnostic indication (2 color)	Grommet		3 wire (NPN)		5V, 12V		**H7NW**	**G59W**	●	●	○	—	IC	
				3 wire (PNP)				**H7PW**	**G5PW**	●	●	○	—		
				2 wire		12V		**H7BW**	**K59W**	●	●	○	—	—	
	Water resistant (2 color)							**H7BA**	**G5BA**	—	●	○	—		
	With timer			3 wire (NPN)		5V, 12V		—	**G5NT**	—	●	○	—	IC	
	Diagnostic output (2 color)			4 wire (NPN)				**H7NF**	**G59F**	●	●	○	—		
	Latch with diagnostic output (2 color)					—		**H7LF**	—	●	●	○	—	—	

* Lead wire length 0.5m·····– e.g.) C73C 5m·····Z e.g.) C73CZ
3m·····L C73CL None·····N C73CN

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

Substantially shorter length:

ø20 to ø40: –15 to –30mm
(in comparison with CM2 Series)
ø40 to ø63: –17 to –28mm
(in comparison with CA1 Series)
ø80 to ø100: –9 to –33mm
(in comparison with CA1 Series)

High speed operation: 1000mm/s

(ø80 and ø100 operate at 700mm/s)

Provided with an air cushion as standard

Two cushions are available:
an air cushion or rubber bumper

Weight reduction of 10 to 50%

(50mm stroke, in-house comparison)

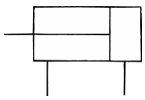
Highly accurate mounting brackets

(Axial foot, front flange)

Standard stroke

JIS symbol

Double acting



Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting/Single rod							
Lubrication	Non-lube							
Fluid	Air							
Proof pressure	1.5MPa							
Max. operating pressure	1.0MPa							
Min. operating pressure	0.05MPa							
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 1000mm/s						50 to 700mm/s	
Stroke tolerance	Up to 1000 $^{+1.4}_{0}$ mm, Up to 1200 $^{+1.8}_{0}$ mm						Up to 1000 $^{+1.4}_{0}$ mm Up to 1500 $^{+1.8}_{0}$ mm	
Thread tolerance	JIS class 2							
Cushion	Rubber bumper/Air cushion							
Mounting*	Basic, Axial foot, Front flange, Rear flange, Front trunnion, Rear trunnion, Clevis (Used for changing the port location by 90° degrees.)							

Front/Rear trunnion styles are not available for bore sizes ø80 and ø100.

Accessories

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

* Pivot bracket is not available for bore sizes ø80 and ø100.
** Pins and snap rings for double knuckle joint are included, not mounted.

Stroke

Bore size (mm)	Standard stroke (1) (mm)	Long stroke (2) (mm)	Max 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) Other intermediate strokes can be manufactured upon receipt of order. Spacers are not used for the intermediate strokes. Refer to p.1.7-8 to 1.7-10 for dimensions.
Note 2) Long stroke applies to the axial foot and the front flange style. If other mounting brackets are used or the length exceeds the stroke limit, the stroke should be determined based on the stroke selection table in the technical data.

Minimum Strokes for Auto Switch Mounting

Auto switch model	Number of switches	
	2	1
D-C7/C8 **D-B5/B6** **D-H7** **D-G5/K5**	15mm	10mm
D-B59W	20mm	15mm
D-H7LF	20mm	10mm

Rod Boot Materials

Symbol	Material	Max. operating temp
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*

* Maximum ambient temperature for the rod boot only.

Made to Order

Refer to p.5.4-1 for made to order products of series CG1.

Mounting Bracket

Refer to p.1.7-4 for part numbers for the mounting brackets.

Auto Switch Mounting Band

Refer to p.1.7-4 for part numbers for the mounting bands.

Built-in One-touch Fitting

CG1 | Mounting | N | Bore size | F — Stroke

Built-in One-touch fitting

A style in which One-touch fittings are built into the cylinder. It dramatically reduces the piping labour and installation space.

Specifications

Bore size (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double acting/Single rod
Fluid	Air
Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Piston speed	50 to 750mm/s
Cushion	Rubber bumper
Mounting	Basic, Axial foot, Front flange, Rear flange, Front trunnion, Rear trunnion, Clevis (Used for changing the port location by 90° degrees.)

Applicable Tube O.D./I.D.

∗ Auto switch can be mounted.

Bore size (mm)	ø20	ø25	ø32	ø40	ø50	ø63
Applicable tube (mm)	ø6/4	ø6/4	ø6/4	ø8/6	ø10/7.5	ø10/7.5
Applicable tube material	Nylon, Soft nylon, Polyurethane					

∗ Refer to p.1.7-3 for other specifications.

Clean Series

10-CG1 | Mounting | N | Bore size — Stroke

Clean series (with relief port)

The rod portion of the actuator has a double seal construction, and a relief port is provided to discharge the exhaust air directly outside of the clean room. Thus, it is a style that can be used in a Class 100 clean room.

Specifications

Bore size (mm)	ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100
Action	Double acting/Single rod
Fluid	Air
Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Cushion	Rubber bumper
Piston speed	50 to 400mm/s
Relief port size	M5
Mounting	Basic, Axial foot, Front flange, Rear flange

∗ Auto switch can be mounted.

Air-hydro

CG1 | Mounting | H | Bore size — Stroke

Air-hydro

A low hydraulic pressure cylinder used at a pressure of 1.0MPa or below. Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speed or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.

Specifications

Style	Air-hydro Cylinder
Bore size (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double acting/Single rod
Fluid	Turbine oil
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.18MPa
Piston speed	15 to 300mm/s
Cushion	None
Ambient and fluid temperature	+5 to 60°C
Thread tolerance	JIS class 2
Stroke tolerance	Up to 1000 $^{+1.4}_{0}$mm, Up to 1200 $^{+1.8}_{0}$mm
Mounting	Basic, Axial foot, Front flange, Rear flange, Front trunnion, Rear trunnion, Clevis (Used for changing the port location by 90° degrees.)

∗ Auto switch can be mounted.

Copper Free

20-CG1 | Mounting | Cushion | Bore size — Stroke

Copper free

This cylinder eliminates any influences of copper ions or fluororesins on colour CRTs. Copper materials have been nickel plated or replaced with non-copper materials to prevent the generation of copper ions.

Specifications

Bore size (mm)		ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100
Action		Double acting/Single rod
Fluid		Air
Max. operating pressure		1.0MPa
Min. operating pressure		0.05MPa
Cushion	N	Rubber bumper
	A	Air cushion
Piston speed	ø20 to 63	50 to 1000mm/s
	ø80/100	50 to 700mm/s
Mounting∗		Basic, Axial foot, Front flange, Rear flange, Front trunnion, Rear trunnion, Clevis (Used for changing the port location by 90° degrees.)

∗ Front/Rear trunnion styles are not available for bore sizes ø80 and ø100. Refer to p.1.7-8 for dimensions.
∗ Auto switch can be mounted.

Water Resistant

CDG1 [Mounting] [Style] [Bore size] [R] — [Stroke] — [G5BAL] [-XC6]

- With auto switch (built-in magnet)
- Made to order
- Solid state switch (Water resistant/ 2 color indicator)
- Water resistant

R	Seal: NBR (Nitrile rubber)
V	Seal: FKM (Fluorine rubber)

Ideal for use in a machine tool environment exposed to coolant mist. Also suited for use in areas in which water splashes, such as food processing equipment or car washers.

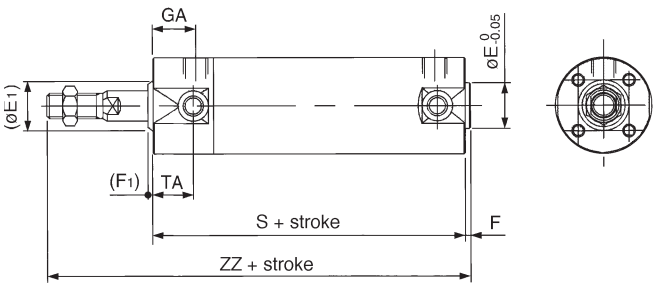
Specifications

Action	Double acting/Single rod
Bore size (mm)	ø32, ø40, ø50, ø63, ø80, ø100
Cushion	Rubber bumper/Air cushion
Auto switch mounting method	Band mounting
Made to order	Material of the piston rod and rod end nut is stainless steel. (-XC6)

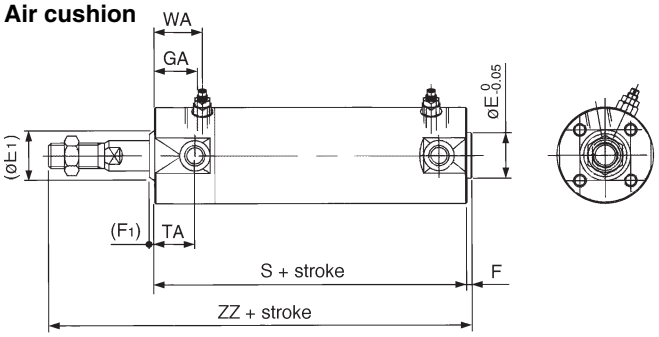
∗ Other specifications are the same as the standard model.

Dimensions

Rubber bumper



Air cushion



(mm)

Bore (mm)	(E1)	E*	(F1)	F*	GA	S	TA	WA	ZZ
32	17	18	2	2	18	77 (85)	17	20	119 (127)
40	21	25	2	2	19	84 (93)	18	21	136 (145)
50	26	30	2	2	21	97 (109)	20	23	157 (169)
63	26	32	2	2	21	97 (109)	20	23	157 (169)
80	32	40	3	3	28	116 (130)	—	30	190 (204)
100	37	50	3	3	29	117 (131)	—	31	191 (205)

* These dimensions and other dimensions not indicated here are the same as standard.
Note) ( ): Long stroke

⚠ Precautions

Be sure to read before handling.
Refer to p.0-39 to 0-46 for Safety Instructions and common precautions.

Precautions on handling

⚠ Warning

① **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.

② **Operate within the specified cylinder speed.**
- Failure to do so will damage the cylinder and the seals.

⚠ Caution

① **Do not use the air cylinder as an air-hydro cylinder. This will cause an oil leak.**

② **Install without twisting the bellows.**
- If the cylinder is installed with its bellows twisted, it could damage the bellows.

Disassembly/Replacement

⚠ Caution

① **Do not replace the bushings or the cushion seals.**
- The bushings and the cushion seals are press-fit. To replace them, they must be replaced together with the cover assembly.

② **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.

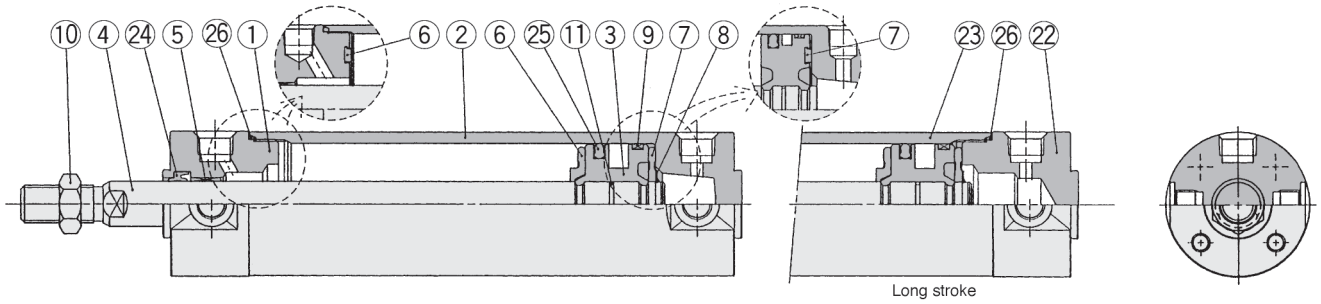
③ **Do not replace One-touch fittings.**
- Because pipe fittings are press-fit, they must be replaced together with the cover assembly.

④ **Those with a bore of ø50 or more cannot be disassembled.**
- When disassembling a cylinder with a bore of ø20 to ø 40, use a vise or the like to hold the wrench flats portion of the tube cover or the rod cover on one side, while placing a wrench or an adjustable wrench on the other side to loosen and remove the cover. To replace, tighten it an additional 2… from the installed position. (Those with a bore of ø50 or more cannot be disassembled because they have been tightened with greater torque. If they must be disassembled, contact SMC.

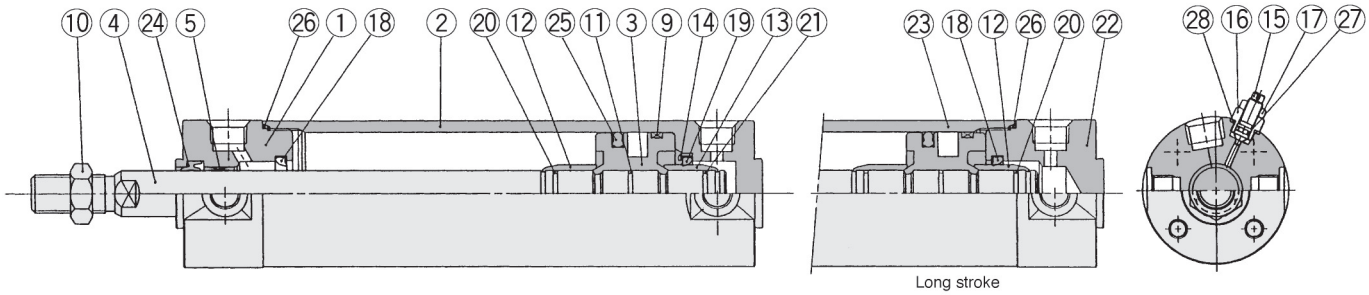
Construction

With rubber bumper

ø80, ø100 ø80, ø100



With air cushion



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	White hard anodized
②	Tube cover	Aluminum alloy	White hard anodized
③	Piston	Aluminum alloy	Chromated
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Bushing	Oil impregnated sintered alloy	ø40 or larger: Lead bronze cast
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	ø40 or larger: the same as damper A
⑧	Snap ring	Stainless steel	Except for ø80 and ø100
⑨	Wear ring	Resin	
⑩	Rod end nut	Rolled steel	Nickel plated
⑪	Piston gasket	NBR	
⑫	Cushion ring A	Brass	
⑬	Cushion ring B	Brass	ø32 or more: the same as A
⑭	Seal retainer	Rolled steel	Nickel plated/Except for long stroke
⑮	Cushion valve	Rolled steel	Electroless nickel plated
⑯	Valve retainer	Rolled steel	Electroless nickel plated
⑰	Lock nut	Rolled steel	Nickel plated
⑱	Cushion seal A	Urethane	
⑲	Cushion seal B	Urethane	ø32 or larger: the same as A *
⑳	Cushion ring gasket A	NBR	
㉑	Cushion ring gasket B	NBR	ø32 or larger: the same as A
㉒	Head cover	Aluminum alloy	White hard anodized
㉓	Cylinder tube	Aluminum alloy	Hard anodized

Note) A magnet is equipped on the piston of the cylinder with auto switch.
* The material is stainless steel on auto switch equipped styles ø20 and ø25.

Replacement Parts/With rubber bumper

No.	Description	Material	Bore size (mm)/Part No.							
			ø20	**ø25**	**ø32**	**ø40**	**ø50**	**ø63**	**ø80**	**ø100**
㉔	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-16Z	PDU-20Z	PDU-20Z	PDU-25Z	PDU-30Z
㉕	Piston seal	NBR	PPD-20	PPD-25-19	PPD-32	PPD-40	PPD-50	PPD-63	PPD-80	PPD-100
㉖	Tube gasket	NBR	CM-020-16-123	CM-025-16-124	CM-032-16-126	CM-040-16-127	CM-050-16-128	CM-063-16-129	CM-080-16-152	CM-100-16-153

With air cushion (Parts ㉔ to ㉖ are the same as rubber bumper style.)

㉗	Valve seal	NBR	O ring ø4.5 X ø2.5 X ø1	O ring ø5.5 X ø3.5 X ø1	O ring ø6.5 X ø4.5 X ø1
㉘	Gasket for valve retainer	NBR	O ring ø6.4 X ø5.2 X ø0.6	O ring ø7.4 X ø5.8 X ø0.8	O ring ø11.4 X ø9.4 X ø1