# Air Cylinder ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100





### Air Cylinder CG1 Series

### Stroke Variations

Stroke Variations [mm]													
Poro cizo	Standard stroke												
Dore Size	25	50	75	100	125	150	200	250	300	stroke			
20						-				-			
25		-0	-0		-0		-0	<b>_</b>		-			
32	<b>—</b>	<b>—</b>	<b>_</b>	<b>_</b>	<b>_</b>	<b>_</b>	<b>—</b>	<b>_</b>	<b>—</b>	-			
40	<b>—</b>	<b>— (</b>	<b>— —</b>	<b>_</b>	<b>_</b>	_ <b>_</b>	<b>— —</b>	<b>_</b>	<b>— — —</b>	1000			
50	<b>—</b>	<b>—</b>	_ <b>_</b>	_ <b>_</b>	<b>—</b>	_ <b>_</b>	<b>—</b>	<b>—</b>	•	1000			
63	<b>—</b>	<b>— —</b>	_ <b>_</b>	_ <b>_</b>	_ <b>_</b>	<b>_</b>	<b>_</b>	_ <b>_</b>	<b>— — —</b>	-			
80	<b>—</b>	<b>—</b>	<b>— — —</b>	<b>_</b>	<b>_</b>	<b>_</b>	<b>—</b>	<b>—</b>	<b>—</b>	-			
100	<b>_</b>	<b>(</b>	-0	<b>(</b>	<b>_</b>	-0	<b>_</b>	<b>(</b>	<b>_</b>				

Series Variations \* For details about the clean series, refer to the "Pneumatic Clean Series" (CAT.E02-23).

Series	Action	Tuno	Quahian	Bore size [mm]		14/2	Variations		Domo								
Series	ACLION	туре	Cushion	20	25	32	40	50	63	80	100	rod b	n / oot h	vdro	clean series	Page	
New Standard CG1-Z1	Double acting	Single rod	Rubber bumper	•	•	•	•	•	•	•	•	$\neg$		F		3	
Standard CG1-Z	Double	Single	Rubber bumper	•	•	•	•	•	•	•	•	-	)	•	•	Web Catalog	
and the second s	acting	100	Air cushion	•	•	•	•	•	•	•	•	-	)	-			
and it	Double	Double rod	Rubber bumper	•	•	•	•	•	•	•	•	-	)	•	•	Web Catalog	
ar the set	acting		Air cushion	•	•	•	•	•	•	•	•	-	-	-			
and the	Single acting	Single rod (Spring return/ extend)	Rubber bumper	•	•	•	•	+	+	-	-	_		-		Web Catalog	
Non-rotating rod CG1K-Z	Double	Single	Rubber bumper	•	•	•	•	•	•	+	+	_		-		Web Catalog	
	acting	rod	Air cushion		+	-	•	•	•	-	+	_		-		Web Oatalog	
al the	Double acting	Double rod	Rubber bumper	•	•	•	•	•	•	_	-	_		-		Web Catalog	
Direct mount CG1R-Z	Double	Single	Rubber bumper	•	•	•	•	•	•	_	_	_		-		Web Osteler	
48	acting	rod	Air cushion	•	•	•	•	•	•	_	_	_		-		web Catalog	
Direct mount, Non-rotating rod	Double acting	Single rod	Rubber bumper	•	•	•	•	•	•	_	_	_		-		Web Catalog	
With end lock CBG1	Double	Single	Rubber bumper	•	•	•	•	•	•	•	•	-	-	-			
67. ET .	acting	rod	Air cushion	•	•	•	•	•	•	•	•	-	-	-		Web Catalog	
Smooth Cylinder CG1Y-Z	Double acting	Single rod	Rubber bumper	•	•	•	•	•	•	•	•	_		-		Web Catalog	
Low friction CG1 Q	Us	e the new	"CG1Y	Serie	es Sr	noot	h Cy (F	<b>linde</b> Refer t	er" to o the V	realize <b>Neb C</b>	both- atalog	directi I.)	on low	frictio	n and lo	w-speed operation.	
CG3 series																	
Short type Standard CG3	Double acting	Single rod	Rubber bumper	•	•	•	•	•	•	•	•					Web Catalog	

**SMC** 

### 1



\*1 Trunnion bracket type can be mounted to the CG1 Z (with trunnion mounting female thread).

### Part numbers for products with a rod end bracket and/or a pivot bracket

It is not necessary to order a bracket for the applicable cylinder separately.

\* Mounting brackets are shipped together with the product but do not come assembled.

# Example) CDG1 D N20-50Z1- N W -M9BW

Mounting



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ade to Order Common Specifications
Special Port Location
With Heavy Duty Scraper
Made of Stainless Steel
Head Cover Axial Port
Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel $\cdots \cdot p.25$
Double Knuckle Joint with Spring Pin
With Coil Scraper
Grease for Food Processing Equipment
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Interchangeable for Long Strokes for Existing Bore Size



the product but do not come assembled. The cylinder for L, F, G, and D mounting types is B:

В

**Z**\*

F

G

U\*1

**T**\*1

D

Basic (Without trunnion mounting female thread).

The presence of the trunnion mounting female thread (B, Z) is different from the existing product. Choose Z (with trunnion mounting female thread) when mounting the trunnion afterward.

Nil No bracket Ν Pivot bracket Only for D, U, and T mounting types

The pivot bracket is shipped together with the product but does not come assembled.

#### Made to order For details 🖒 p. 4

∗ For the ordering example of cylinder assembly ⇒ p. 5

Nil No bracket								
V Single knuckle joint								
W	Double knuckle joint							
Q Rod end								
No bracket is provided for the female rod end								

The rod end bracket is shipped together with the product but does not come assembled.

A knuckle joint pin is not provided with the single knuckle joint.

For details on auto switch mounting ip p. 15 to 19

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

Nil

S

n

Number of auto switches

Solid state auto switches marked with "O" are

produced upon receipt of order.

2

1

n

- Minimum Stroke for Auto Switch Mounting · Auto Switch Mounting Brackets/Part Nos.
- Operating Range · Cylinder Mounting Bracket, by Stroke/Auto Switch Mounting Surfaces

Applicable Auto Switches/Refer to the Web Catalog for further information on auto switches.

		Load voltage						lel	Leac	l wire	e ler	ngth	[m]						
Type	Special	Electrical	ţ	Wiring				Арр	licable bore s	lze				5		Pre-wired	Appli	cable	
11.	function	entry	dic	(Output)	DC AC		ø20 to	0.ø63	ø80, ø100	0.5	1	3	5	None	connector	l lo	ad		
			르			-		Perpendicular	In-line	In-line	(NII)	(M)	(L)	(Z)	(N)				
				3-wire (NPN)				M9NV	M9N			$\bullet$		0	—	0			
ч				0 1110 (1111)		5 V 12 V		—	—	G59		—	$\bullet$	0	—	0	IC		
		Grommet		3-wire (PNP)		5 V, 12 V		M9PV	M9P			$\bullet$		0	—	0	circuit		
		aronninet						—	—	G5P		—	$\bullet$	0	—	0			
								M9BV	M9B				۲	0	—	0			
it				2-wire		12 V		_	—	K59		—	$\bullet$	0	—	0	—		
SW		Connector					[	_	H7C	—		-		۲		—			
ğ		Va			2 wire (NDN)				M9NWV	M9NW	—		$\bullet$	۲	0	—	0		
aut			Vaa	S-WIE (INFIN)	04.14	EV 10 V			_	G59W		-	۲	0	—	0	IC	Relay,	
ē	Diagnostic indication		res	Quuine (DND)	24 V	5 V, 12 V	_	M9PWV	M9PW			$\bullet$	۲	0	—	0	circuit F	PLC	
itat	(2-color indicator)			3-wire (PINP)					_	G5PW		—	٠	0	-	0			
ő				2 wire		10.1/	1	M9BWV	M9BW	—		$\bullet$	۲	0	—	0			
ē		Grommet		2-wire		12 V		—	—	K59W			•	0	-	0	_		
s				3-wire (NPN)		EV 10 V		M9NAV*1	M9NA*1	—	0	0	۲	0	—	0	IC		
	Water resistant			3-wire (PNP)		5 V, 12 V		M9PAV*1	M9PA*1	_	0	0	۲	0	-	0	circuit		
	(2-color indicator)			0				M9BAV*1	M9BA*1		0	0	$\bullet$	0	—	0			
				∠-wire		12 V		_	_	G5BA*1	—	—	•	0	—	0	-		
	With diagnostic output (2-color indicator)	1		4-wire (NPN)		5 V, 12 V		_	H7NF	G59F		—	۲	0	-	0	IC circuit		
ſ			V	3-wire (Equiv. to NPN)	_	5 V	—	A96V	A96	_		—	$\bullet$	_	-	—	IC circuit	—	
tc			res				100 V	A93V*2	A93			$\bullet$	۲	۲	—	—	—		
Ň		Grommet	No				100 V or less	A90V	A90	_		—	۲	—	—	—	IC circuit		
ő			Yes			10.1/	100 V, 200 V	_	B	54		—	۲	۲	—	—		Delay	
aut			No	2-wire	24 V	12 V	200 V or less	_	B	64		—	۲	_	—	—		Relay,	
D		Connector	Yes				_	_	C73C			—	۲			—		PLU	
lee		Connector	No				24 V or less	_	C80C —			—			$\bullet$		IC circuit		
ш <u>с</u>	Diagnostic indication (2-color indicator)	Grommet	Yes			_	—		B5	9W		—		—	—	—	—		

\*1 Water-resistant type auto switches can be mounted on the above models, but 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 ø20 and ø25.

\*2 The 1 m lead wire is only applicable to the D-A93.
 \* Lead wire length symbols: 0.5 m. Nil (Example) M9NW

1 m······ M (Example) M9NWM 3 m····· L (Example) M9NWL

There are applicable auto switches other than those listed above. For details  $\Rightarrow$  p. 19

5 m······ Z (Example) M9NWZ

None None N (Example) H7CN

**GSMC** 

For details on auto switches with pre-wired connectors ⇔ Refer to the **Web Catalog**. The D-A9□□/M9□□□ auto switches are shipped together with the product but do not come assembled. (Only the auto switch mounting brackets are assembled before shipment.)



#### Symbol

unde to





Order	Made to Order Common Specifications (For details ⇔ p. 21 to 27)
Symbol	Specifications
-XA🗆	Change of rod end shape
-XC3	Special port location
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC20	Head cover axial port
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper
-XC85	Grease for food processing equipment
-X446	PTFE grease
-X3252	Interchangeable for long strokes for existing bore size

### **Specifications**

Bore size [m	ım]	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	g pressure				1.0	MPa					
Minimum operating	pressure				0.05	MPa					
Ambient and fluid temperatures		Without auto switch: $-10^{\circ}C$ to $70^{\circ}C$ (No freezing) With auto switch : $-10^{\circ}C$ to $60^{\circ}C$									
Piston speed		50 to 1000 mm/s							00 mm/s		
Stroke length toler	ance*1	Up to 1000 st <sup>+1.4</sup> mm									
Cushion		Rubber bumper									
Mounting*2	Basic (Without trunnion mounting female thread), Basic (With trunnion mounting female thread), Axial foot, Rod flange, Head flange, Rod trunnion, Head trunnion, Clevis										
Allowable kinetic	Male rod end	0.28	0.41	0.66	1.20	2.00	3.40	5.90	9.90		
energy [J]	Female rod end	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54		

- \*1 Does not include the amount of bumper change
- \*2 Cylinder sizes ø80 and ø100 do not have basic (with 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.
- \* For the allowable rod end lateral load, refer to the "Air Cylinders Model Selection" in the Web Catalog.

#### Accessories/For part numbers and dimensions ⇒ p. 13, 14

	Basic	Axial foot	Rod flange	Head flange	Rod trunnion	Head trunnion	Clevis	
Standard	Rod end nut*3	•	•	•	•	•	•	•
Standard	Clevis pin*3	_	_	—	—	—	_	•
	Single knuckle joint*3	•	•	•	•	•		•
Ontion	Double knuckle joint (with pin) <sup>*2, *3</sup>	•	•	•	•	•	•	•
Option	Rod end	•	•	•	•	•	•	•
	Pivot bracket*1	_	_	_	_	●*1	●* <sup>1</sup>	•
	Rod boot	•	•	•	•	•	•	•

\*1 Not available for ø80 and ø100

\*2 A double knuckle joint pin and retaining rings are shipped together with the product.

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

For details ⇒ p. 14

### **Standard Strokes**

		[mm]
Bore size	Standard stroke*1	Maximum manufacturable stroke*2
20	25, 50, 75, 100, 125, 150, 200	201 to 1000
25		
32		
40	25, 50, 75, 100, 125,	201 to 1000
50, 63	150, 200, 250, 300	301 10 1000
80		
100		

\*1 Intermediate strokes not listed above are produced upon receipt of order. The manufacturing of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)

\*2 The maximum manufacturable stroke shows the long stroke.

\* Applicable strokes should be confirmed according to the usage. For details, refer to the "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to deflection, etc.





### Ordering Example of Cylinder Assembly



### Mounting Brackets/Part Nos.

Mounting	Order		Contento							
bracket	qty.	20	25	32	40	50	63	80	100	Coments
Axial foot	2* <sup>1</sup>	CG-L020	CG-L025	CG-L032	CG-L040	CG-L050	CG-L063	CG-L080	CG-L100	2 foot brackets, 8 mounting bolts
Flange	1	CG-F020	CG-F025	CG-F032	CG-F040	CG-F050	CG-F063	CG-F080	CG-F100	1 flange, 4 mounting bolts
Trunnion pin	1	CG-T020	CG-T025	CG-T032	CG-T040	CG-T050	CG-T063	—	—	2 trunnion pins, 2 trunnion bolts, 2 flat washers
Clevis	1	CG-D020	CG-D025	CG-D032	CG-D040	CG-D050	CG-D063	CG-D080	CG-D100	1 clevis, 4 mounting bolts, 1 clevis pin, 2 retaining rings
Pivot bracket	1	CG-020-24A	CG-025-24A	CG-032-24A	CG-040-24A	CG-050-24A	CG-063-24A	CG-080-24A	CG-100-24A	1 pivot bracket

\*1 Order two foot brackets per cylinder.

\* Stainless steel mounting brackets and accessories are also available. For details 🖒 p. 14

### Mounting Brackets, Accessories/Material, Surface Treatment

Segment	Descrip	otion	Material	Surface treatment		
	Foot		Carbon steel	Nickel plating		
	Flongo		Carbon steel (ø20 to ø63)	Nickel plating		
	Flange		Cast iron (ø80, ø100)	Nickel plating		
Mounting	Clavia		Carbon steel (ø20 to ø63)	Nickel plating		
brackets	Cievis		Cast iron (ø80, ø100)	Nickel plating		
		Trunnion pin	Carbon steel	Salt-bath nitrocarburizing		
	Trunnion pin	Trunnion bolt	Carbon steel	Nickel plating		
		Flat washer	Carbon steel	Nickel plating		
	Rod end nut		Carbon steel	Zinc chromating		
	Single knuekle jejn	+	Carbon steel (ø20 to ø32)	Nickel plating		
		L	Cast iron (ø40 to ø100)	Zinc chromating		
	Double knuckle isir	at	Carbon steel (ø20 to ø32)	Nickel plating		
		п	Cast iron (ø40 to ø100)	Zinc chromating		
Accessories	Rod end		Carbon steel	Zinc plating		
Accessories	Knuckle pin		Carbon steel	—		
	Clevis pin		Carbon steel	—		
	Divet breeket		Carbon steel (ø20 to ø63)	Nickel plating		
	PIVOI DIACKEI		Cast iron (ø80, ø100)	Nickel plating		
	Mounting bolt		Carbon steel	Nickel plating		
	Retaining ring		Carbon tool steel	Phosphate coating		

### **Mounting Procedure**

#### Mounting procedure for trunnion

Follow the procedures below when mounting a pivot bracket on the trunnion. Ø20 to Ø63 \_\_\_\_\_\_ Cylinder body possible



#### Mounting procedure for clevis

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Follow the procedures below when mounting a pivot bracket on the clevis.



For the proper tightening torque of the trunnion and clevis ⇔ Refer to the Specific Product Precautions on page 28.

### Air Cylinder: Standard Type Double Acting, Single Rod **CG1** Series

### Weight

									[kg]
	Bore size [mm]	20	25	32	40	50	63	80	100
ght	Basic: Without trunnion mounting female thread (B)	0.11	0.17	0.25	0.45	0.80	1.09	2.07	3.16
	Basic: With trunnion mounting female thread (Z)	0.11	0.17	0.24	0.44	0.79	1.06	—	—
Ň	Axial foot	0.21	0.29	0.40	0.67	1.26	1.77	3.04	4.91
	Flange	0.18	0.26	0.38	0.65	1.16	1.64	2.78	4.44
Bas	Trunnion	0.12	0.19	0.28	0.49	0.88	1.20	—	—
	Clevis	0.17	0.25	0.39	0.68	1.19	1.78	2.77	4.44
Pivot b	racket	0.08	0.09	0.17	0.25	0.44	0.80	0.98	1.75
Single	knuckle joint	0.05	0.09	0.09	0.10	0.22	0.22	0.39	0.57
Double	knuckle joint (with pin)	0.05	0.09	0.09	0.13	0.26	0.26	0.64	1.31
Rod en	d	0.05	0.07	0.07	0.16	0.30	0.30	0.49	0.67
Additio	nal weight per 50 mm of stroke	0.05	0.07	0.09	0.14	0.21	0.25	0.35	0.50
Additio	nal weight for switch magnet	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04
Weight	reduction for female rod end	-0.01	-0.02	-0.02	-0.05	-0.10	-0.10	-0.19	-0.27

Calculation (Example): CDG1FN20-100Z1

(Built-in magnet, Flange, ø20, 100 mm stroke)

Basic weight ......0.18 kg (Flange, ø20)
 Additional weight for stroke.....0.05 kg/50 mm

Additional weight for switch magnet......0.01 kg

0.18 + 0.05 x (100/50) + 0.01 = 0.29 kg

### Construction



#### **Component Parts**

No.	Description	Material
1	Rod seal	NBR
2	Piston seal	NBR
3	Tube gasket	NBR

#### **Replacement Parts: Seal Kit**

Bore size [mm]	Kit no.	Contents			
20	CG1N20Z-PS				
25	CG1N25Z-PS				
32	CG1N32Z-PS				
40	CG1N40Z-PS				

\* As sizes ø50 and larger cannot be disassembled, the seal cannot be replaced.

∗ For disassembly/replacement ⇒ Refer to the Specific Product Precautions on page 28. Order with the kit number according to 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 number: GR-S-010 (10 g)

### **Dimensions: Basic**



### With trunnion mounting female thread/C□G1Z



#### Female rod end





																			[mm]
Bore size	Α	AL	B1	С	D	Е	F	Н	H1	I	J	К	KA	ММ	NA	S	TA	тв	ZZ
20	18	15.5	13	14	8	12	2	35	5	26	M4 x 0.7 depth 7	5	6	M8 x 1.25	24	69	11	11	106
25	22	19.5	17	16.5	10	14	2	40	6	31	M5 x 0.8 depth 7.5	5.5	8	M10 x 1.25	29	69	11	11	111
32	22	19.5	17	20	12	18	2	40	6	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25	35.5	71	11	10	113
40	30	27	19	26	16	25	2	50	8	47	M6 x 1 depth 12	6	14	M14 x 1.5	44	78	12	10	130
50	35	32	27	32	20	30	2	58	11	58	M8 x 1.25 depth 16	7	18	M18 x 1.5	55	90	13	12	150
63	35	32	27	38	20	32	2	58	11	72	M10 x 1.5 depth 16	7	18	M18 x 1.5	69	90	13	12	150
80	40	37	32	50	25	40	3	71	13	89	M10 x 1.5 depth 22	10	22	M22 x 1.5	86	108	—	—	182
100	40	37	41	60	30	50	3	71	16	110	M12 x 1.75 depth 22	10	26	M26 x 1.5	106	108	—	_	182

						[mm]				
Bore	Rc,	NPT p	oort	G port						
size	GA	GB	Ρ	GA	GB	Р				
20	11.5	11.5	1/8	11.5	11.5	M5 x 0.8				
25	11.5	11.5	1/8	12	12	M5 x 0.8				
32	11.5	11.5	1/8	10.5	10.5	1/8				
40	13	13	1/8	13	13	1/8				
50	14	14	1/4	14	14	1/4				
63	14	14	1/4	14	14	1/4				
80	20	16	3/8	20	16	3/8				
100	16	16	1/2	16	16	1/2				

Female Rod End [m												
Bore size	<b>A</b> 1	н	ММ	zz								
20	8	13	M4 x 0.7	84								
25	8	14	M5 x 0.8	85								
32	12	14	M6 x 1	87								
40	13	15	M8 x 1.25	95								
50	18	16	M10 x 1.5	108								
63	18	16	M10 x 1.5	108								
80	21	19	M14 x 1.5	130								
100	25	22	M16 x 1.5	133								

TC Thread											
Bore size	тс	TD	TE	TF	ТG						
20	M5 x 0.8	8 +0.08	4	0.5	5.5						
25	M6 x 0.75	10 +0.08	5	1	6.5						
32	M8 x 1.0	12 +0.08	5.5	1	7.5						
40	M10 x 1.25	14 <sup>+0.08</sup>	6	1.25	8.5						
50	M12 x 1.25	16 <sup>+0.08</sup>	7.5	2	10						
63	M14 x 1.5	18 <sup>+0.08</sup>	11.5	3	14.5						
80	_	—	_	_	—						
100	—	—	_	—	—						

 Cylinder sizes ø80 and ø100 do not have trunnion mounting female thread on the width across flats NA.



### **Dimensions: Axial Foot**

### C□G1L





#### Female rod end



 $\ast~$  Stainless steel mounting brackets and accessories are also available. For details  $\leftrightarrows$  p. 14

																[mm]
Bore size	В	С	J	LC	LD	LH	LS	LT	LX	LZ	М	W	X	Y	Z	ZZ
20	34	14	M4 x 0.7	4	6	20	45	3	32	44	3	10	15	7	47	110
25	38.5	16.5	M5 x 0.8	4	6	22	45	3	36	49	3.5	10	15	7	52	115.5
32	45	20	M5 x 0.8	4	7	25	45	3	44	58	3.5	10	16	8	53	117.5
40	54.5	26	M6 x 1	4	7	30	51	3	54	71	4	10	16.5	8.5	63.5	135
50	70.5	32	M8 x 1.25	5	10	40	55	4.5	66	86	5	17.5	22	11	75.5	157.5
63	82.5	38	M10 x 1.5	5	12	45	55	4.5	82	106	5	17.5	22	13	75.5	157.5
80	101	50	M10 x 1.5	6	11	55	60	4.5	100	125	5	20	28.5	14	95	188.5
100	121	60	M12 x 1.75	6	14	65	60	6	120	150	7	20	30	16	95	192

Female Rod End [m									
Bore size	Z	ZZ							
20	25	88							
25	26	89.5							
32	27	91.5							
40	28.5	100							
50	33.5	115.5							
63	33.5	115.5							
80	43	136.5							
100	46	143							

### **Dimensions: Flange**





н

Female rod end

\*1 End boss is machined on the flange for øE.



									[mm]
Bore size	В	С	E	F	FD	FT	FX	Н	J
20	40	14	12	2	5.5	6	28	35	M4 x 0.7
25	44	16.5	14	2	5.5	7	32	40	M5 x 0.8
32	53	20	18	2	6.6	7	38	40	M5 x 0.8
40	61	26	25	2	6.6	8	46	50	M6 x 1
50	76	32	30	2	9	9	58	58	M8 x 1.25
63	92	38	32	2	11	9	70	58	M10 x 1.5
80	104	50	40	3	11	11	82	71	M10 x 1.5
100	128	60	50	3	14	14	100	71	M12 x 1.75

Female Ro	[mm]	
Bore size	Н	
20	13	
25	14	
32	14	
40	15	
50	16	
63	16	
80	19	
100	22	

### Head flange/C□G1G





\*1 End boss is machined on the flange for øE.

Female rod end



	ZZ + Stroke												
Bore size	В	С	Е	F	FD	FT	FX	J	S	ZZ			
20	40	14	12	2	5.5	6	28	M4 x 0.7	69	112			
25	44	16.5	14	2	5.5	7	32	M5 x 0.8	69	118			
32	53	20	18	2	6.6	7	38	M5 x 0.8	71	120			
40	61	26	25	2	6.6	8	46	M6 x 1	78	138			
50	76	32	30	2	9	9	58	M8 x 1.25	90	159			
63	92	38	32	2	11	9	70	M10 x 1.5	90	159			
80	104	50	40	3	11	11	82	M10 x 1.5	108	193			
100	128	60	50	3	14	14	100	M12 x 1.75	108	196			

Female Ro	Female Rod End						
Bore size	ZZ						
20	90						
25	92						
32	94						
40	103						
50	117						
63	117						
80	141						
100	147						



### **Dimensions: Trunnion**

### Rod trunnion/C□G1U





The part marked with an asterisk (\*) is constructed of a trunnion pin, flat washer, and hexagon socket head cap screw.

#### Female rod end



						[mm]
Bore size	TA	ТС	TDe8	TR	TZ	Z
20	11	8	8-0.025 -0.047	39	47.6	46
25	11	8	10 <sup>-0.025</sup> -0.047	43	53	51
32	11	10.5	$12^{-0.032}_{-0.059}$	54.5	67.7	51
40	12	12	14 -0.032	65.5	78.7	62
50	13	14.5	$16^{-0.032}_{-0.059}$	80	98.6	71
63	13	17.5	18 <sup>-0.032</sup> -0.059	98	119.2	71

Female Ro	d End [mm]
Bore size	Z
20	24
25	25
32	25
40	27
50	29
63	29

.

#### Head trunnion/C□G1T



The part marked with an asterisk (\*) is constructed of a trunnion pin, flat washer, and hexagon socket head cap screw.

#### Female rod end



						[mm]
Bore size	ТВ	ТС	TDe8	TR	TZ	Z
20	11	8	8-0.025 -0.047	39	47.6	93
25	11	8	10 <sup>-0.025</sup> -0.047	43	53	98
32	10	10.5	12 <sup>-0.032</sup> -0.059	54.5	67.7	101
40	10	12	14 <sup>-0.032</sup> -0.059	65.5	78.7	118
50	12	14.5	16 <sup>-0.032</sup> -0.059	80	98.6	136
63	12	17.5	18 <sup>-0.032</sup> -0.059	98	119.2	136

Female Ro	d End [mm]
Bore size	Z
20	71
25	72
32	75
40	83
50	94
63	94

### **Dimensions: Clevis**







Female rod end



											[mm]
Bore size	С	CD	CZ	J	L	L2	RR	TT	TZ	Z	ZZ
20	14	8	29	M4 x 0.7	14	38.6	11	3.2	43.4	118	129
25	16.5	10	33	M5 x 0.8	16	42.6	13	3.2	48	125	138
32	20	12	40	M5 x 0.8	20	54	15	4.5	59.4	131	146
40	26	14	49	M6 x 1	22	65	18	4.5	71.4	150	168
50	32	16	60	M8 x 1.25	25	79.6	20	6	86	173	193
63	38	18	74	M10 x 1.5	30	97.8	22	8	105.4	178	200

Female Ro	[mm]					
Bore size	Bore size Z					
20	96	107				
25	99	112				
32	105	120				
40	115	133				
50	131	151				
63	136	158				

### C□G1D (ø80, ø100)





#### Female rod end

CD

18

22

С

50

60



								[mm]	remale Ro	a Ene
СХ	CZ	J	L	RR	ΤZ	V	Z	ZZ	Bore size	Z
28	56	M10 x 1.5	35	18	64	26	214	232	80	16
32	64	M12 x 1.75	43	22	72	32	222	244	100	17

**SMC** 

L



Bore size

80

100

### With Pivot Bracket

### Rod Trunnion (U) with Pivot Bracket







[mm] ZZ

92

99

111

126

131

93

Z 71

72

75 83

94

94

**Female Thread** 

Bore size 20

25

32

40

50

63

### **Male Thread**

Male Thread										[mm]		
Bore size	В	TE	TF	TH	TS	TT	TV	TW	ТХ	TY	Z	ZZ
20	38	10	5.5	25	28	3.2	35.8	42	16	28	93	114
25	45.5	10	5.5	30	33	3.2	39.8	42	20	28	98	119
32	54	10	6.6	35	40	4.5	49.4	48	22	28	101	125
40	63.5	10	6.6	40	49	4.5	58.4	56	30	30	118	146
50	79	20	9	50	60	6	72.4	64	36	36	136	168
63	96	20	11	60	74	8	90.4	74	46	46	136	173

#### **Clevis (D) with Pivot Bracket** ø20 to ø63



#### Malo Throad

Bore size	В	TE	TF	TH	TT	TV	TW	ТХ	TY	Z	ZZ
20	38	10	5.5	25	3.2	35.8	42	16	28	118	139
25	45.5	10	5.5	30	3.2	39.8	42	20	28	125	146
32	54	10	6.6	35	4.5	49.4	48	22	28	131	155
40	63.5	10	6.6	40	4.5	58.4	56	30	30	150	178
50	79	20	9	50	6	72.4	64	36	36	173	205
63	96	20	11	60	8	90.4	74	46	46	178	215





Female Thr	[mm]	
Bore size	Z	ZZ
20	96	117
25	99	120
32	105	129
40	115	143
50	131	163
63	136	173



Female Thre	[mm]	
Bore size	Z	ZZ
80	162	220.5
100	173	249.5

# CG1 Series **Dimensions of Accessories**

### Single Knuckle Joint

I-G02, Material:	-G02, G03 Material: Carbon steel						I-G04, G05, G08, G10 Material: Cast iron					
		<u>IDH10</u>		]								
-						-	<u>A</u>		4	[mm]		
Part no.	Applicable bore size [mm]	A	<b>A</b> 1	E1	L1	мм	R1	<b>U</b> 1	NDн10	[mm] NX		
Part no.	Applicable bore size [mm] 20	<b>A</b> 34	<b>A</b> 1 8.5	<b>E</b> 1 □16	<b>L</b> 1 25	<b>MM</b> M8 x 1.25	<b>R</b> 1 10.3	<b>U</b> 1 11.5	<b>ND</b> н10 8 <sup>+0.058</sup>	[mm] NX 8 <sup>-0.2</sup> -0.4		
Part no. I-G02 I-G03	Applicable bore size [mm] 20 25, 32	<b>A</b> 34 41	<b>A</b> 1 8.5 10.5	<b>E</b> 1 □16 □20	<b>L</b> 1 25 30	MM M8 x 1.25 M10 x 1.25	<b>R</b> 1 10.3 12.8	<b>U</b> 1 11.5 14	<b>ND</b> H10 8 <sup>+0.058</sup> 0 10 <sup>+0.058</sup>	[mm] NX 8 <sup>-0.2</sup> -0.4 10 <sup>-0.2</sup>		
Part no. I-G02 I-G03 I-G04	Applicable bore size [mm] 20 25, 32 40	<b>A</b> 34 41 42	<b>A</b> 1 8.5 10.5 14	<b>E</b> 1 □16 □20 ø22	L1 25 30 30	MM M8 x 1.25 M10 x 1.25 M14 x 1.5	<b>R</b> 1 10.3 12.8 12	<b>U</b> 1 11.5 14 14	NDH10 8 <sup>+0.058</sup> 10 <sup>+0.058</sup> 10 <sup>+0.058</sup> 10 <sup>+0.058</sup>	[mm] NX 8 <sup>-0.2</sup> -0.4 10 <sup>-0.2</sup> 18 <sup>-0.3</sup> 18 <sup>-0.3</sup>		
Part no. I-G02 I-G03 I-G04 I-G05	Applicable bore size [mm] 20 25, 32 40 50, 63	<b>A</b> 34 41 42 56	<b>A</b> 1 8.5 10.5 14 18	E1 116 20 ø22 ø28	L1 25 30 30 40	MM M8 x 1.25 M10 x 1.25 M14 x 1.5 M18 x 1.5	<b>R</b> 1 10.3 12.8 12 16	<b>U</b> 1 11.5 14 14 20	NDH10 8 <sup>+0.058</sup> 10 <sup>+0.058</sup> 10 <sup>+0.058</sup> 10 <sup>+0.058</sup> 14 <sup>+0.070</sup> 14 <sup>+0.070</sup>	[mm] <b>NX</b> 8 <sup>-0.2</sup> -0.4 10 <sup>-0.2</sup> 10 <sup>-0.2</sup> 18 <sup>-0.3</sup> 22 <sup>-0.3</sup> 22 <sup>-0.3</sup>		
Part no. I-G02 I-G03 I-G04 I-G05 I-G08	Applicable bore size [mm] 20 25, 32 40 50, 63 80	<b>A</b> 34 41 42 56 71	<b>A</b> 1 8.5 10.5 14 18 21	<b>E</b> 1 □16 □20 ø22 ø28 ø38	L1 25 30 30 40 50	MM M8 x 1.25 M10 x 1.25 M14 x 1.5 M18 x 1.5 M22 x 1.5	<b>R</b> 1 10.3 12.8 12 16 21	<b>U</b> 1 11.5 14 14 20 27	NDH10 8 <sup>+0.058</sup> 10 <sup>+0.058</sup> 10 <sup>+0.058</sup> 14 <sup>+0.070</sup> 18 <sup>+0.070</sup> 18 <sup>+0.070</sup>	[mm] <b>NX</b> 8 -0.2 -0.4 10 -0.2 10 -0.2 10 -0.2 10 -0.2 -0.4 18 -0.5 22 -0.3 28 -0.3 28 -0.3 28 -0.5		

### **Knuckle Pin**

		_	
n m		М	79
m_[]]	L2	Γ	m
Z	L1	T,	K t

t

Material: Carbon steel										
Part no.	Applicable bore size [mm]	Dd∍	Lı	d	L2	m	t	Included retaining ring		
IY-G02	20	8-0.040	21	7.6	16.2	1.5	0.9	Type C8 for axis		
IY-G03	25, 32	$10^{-0.040}_{-0.076}$	25.6	9.6	20.2	1.55	1.15	Type C10 for axis		
IY-G04	40	10 <sup>-0.040</sup> -0.076	41.6	9.6	36.2	1.55	1.15	Type C10 for axis		
IY-G05	50, 63	$14^{-0.050}_{-0.093}$	50.6	13.4	44.2	2.05	1.15	Type C14 for axis		
IY-G08	80	18-0.050	64	17	56.2	2.55	1.35	Type C18 for axis		
IY-G10	100	22 -0.065 -0.117	72	21	64.2	2.55	1.35	Type C22 for axis		

\* Retaining rings are included.

### **Clevis Pin**

-			
		Ш	7.9
			e g
m 🗍	L2		m
Z	Li	IК	K t

Material: Carbon steel

Part no.	Applicable bore size [mm]	Dd∍	L1	d	L2	m	t	Included retaining ring
CD-G02	20	8-0.040	43.4	7.6	38.6	1.5	0.9	Type C8 for axis
CD-G25	25	$10^{-0.040}_{-0.076}$	48	9.6	42.6	1.55	1.15	Type C10 for axis
CD-G03	32	$12^{-0.050}_{-0.093}$	59.4	11.5	54	1.55	1.15	Type C12 for axis
CD-G04	40	14 <sup>-0.050</sup> -0.093	71.4	13.4	65	2.05	1.15	Type C14 for axis
CD-G05	50	$16^{-0.050}_{-0.093}$	86	15.2	79.6	2.05	1.15	Type C16 for axis
CD-G06	63	18 <sup>-0.050</sup> -0.093	105.4	17	97.8	2.45	1.35	Type C18 for axis

\* Retaining rings are included.

\* A clevis pin and a knuckle pin are common for bore sizes ø80 and ø100.

∗ Stainless steel mounting brackets and accessories are also available. For details ⇒ p. 14

### **Double Knuckle Joint**

RI

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U1

L1

Y-G02, G03

ММ

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**A**1



i uit	hore size	Δ	Δ	E1	1.	ММ	<b>B</b> ₁	114	ND	NY	NI7		nin
no.	[mm]	~	A	<b>L</b> 1	<b>L</b> 1		nı	01			INZ.	•	part no.
Y-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8	8 +0.4 +0.2	16	21	IY-G02
Y-G03	25, 32	41	10.5	□20	30	M10 x 1.25	12.8	14	10	$10^{+0.4}_{+0.2}$	20	25.6	IY-G03
Y-G04	40	42	16	ø22	30	M14 x 1.5	12	14	10	$18^{+0.5}_{+0.3}$	36	41.6	IY-G04
Y-G05	50, 63	56	20	ø28	40	M18 x 1.5	16	20	14	$22^{+0.5}_{+0.3}$	44	50.6	IY-G05
Y-G08	80	71	23	ø38	50	M22 x 1.5	21	27	18	$28^{+0.5}_{+0.3}$	56	64	IY-G08
Y-G10	100	79	24	ø44	55	M26 x 1.5	24	31	22	$32^{+0.5}_{+0.3}$	64	72	IY-G10

\* A knuckle pin and retaining rings are included.

### **Rod End Nut**



Material: Carbon steel [n										
Part no.	Applicable bore size [mm]	d	H <sub>1</sub>	<b>B</b> 1	С	D				
NT-02	20	M8 x 1.25	5	13	(15)	12.5				
NT-03	25, 32	M10 x 1.25	6	17	(19.6)	16.5				
NT-G04	40	M14 x 1.5	8	19	(21.9)	18				
NT-05	50, 63	M18 x 1.5	11	27	(31.2)	26				
NT-08	80	M22 x 1.5	13	32	(37.0)	31				
NT-10	100	M26 x 1.5	16	41	(47.3)	39				

[mm]

### Rod End

**KJD** Material: Carbon steel



															[11111]		
Model	Applicable bore size [mm]	<b>d</b> н7	d3	<b>B</b> <sup>+0</sup> <sub>-0.12</sub>	C1	d2	d4	d5	h1	L3 min	L4	L5	L7	w	$\alpha_{\circ}$	Allowable radial static load [KN]	Weight [kg]
KJ8D	20	8	M8 x 1.25	12	9	24	12.5	16	36	16	48	5	13	14	14	12	0.05
KJ10D	25, 32	10	M10 x 1.25	14	10.5	28	15	19	43	20	57	6.5	15	17	13	14	0.07
KJ14D	40	14	M14 x 1.5	19	13.5	36	20	25	57	25	75	8	19	22	15	36	0.16
KJ18D	50, 63	18	M18 x 1.5	23	16.5	46	25	31	71	32	94	10	25	27	15	51	0.30
KJ22D	80	22	M22 x 1.5	28	20	54	30	37	84	37	111	12	29	32	15	75	0.49
KJ26D	100	25	M26 x 1.5	31	22	60	33.5	42	94	48	124	12	32	36	15	85	0.67

. The allowable radial load shows the allowable value of a single rod end. When the rod end is used for connecting to a cylinder, the allowable radial load conforms to the cylinder specifications.

### Material Stainless Steel Mounting Brackets, Rod End Brackets/Part Nos.

Bore size [mm]	Foot bracket	Single knuckle joint	Double knuckle joint <sup>*1</sup>	Knuckle joint pin <sup>*1</sup>	Rod end nut
20	—	I-G02SUS	Y-G02SUS	IY-G02SUS	NT-02SUS
25	—		V COSCUE	IY-G03SUS	NT OPELLE
32	CG-L032SUS	1-003505	1-003505		NI-03505
40	CG-L040SUS	I-G04SUS	Y-G04SUS	11-004505	NT-G04SUS
50	CG-L050SUS		V COFCUE		
63	CG-L063SUS	1-005505	1-005505	11-005505	NI-05505
80	CG-L080SUS	I-G08SUS	Y-G08SUS	IY-G08SUS	NT-08SUS
100	CG-L100SUS	I-G10SUS	Y-G10SUS	IY-G10SUS	NT-10SUS

\*1 A knuckle pin and retaining rings are included with the double knuckle joint. Retaining rings are included with the knuckle joint pin.

#### Dimensions

The single knuckle joint, double knuckle joint, knuckle pin, and rod end nut are the same as the standard type.

#### Foot bracket



\* []: Same as the standard type

Supplied with 4 mounting screws

# CG1 Series Auto Switch Mounting

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

#### Solid state auto switch D-M9□/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, D-H7C ø20 to ø63



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.





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, D-C73C/C80C ø20 to ø63



### D-B5/B6/B59W ø20 to ø100



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

Auto Switch	Switch Proper Mounting Position [mm]													
Auto switch model	Auto switch model D-M9 V D-M9 W D-M9 WV D-M9 WV D-M9 A D-M9 AV		D-A9□ D-A9□\	D-A9 D-A9 D-A9 D-A9 V D-H7 D-H7 D-H7 D-H7C			D-C7□ D-C80 D-C73C D-C80C		D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-G5BA		D-B5⊡ D-B64		D-B59W	I
Bore size	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В	Α	В
20	29.5	27.5	25.5	23.5	25	23	26	24	21.5	19.5	20	19	23	21
25	29	28	25	24	24.5	23.5	25.5	24.5	21	20	19.5	19.5	22.5	21.5
32	29.5	29.5	25.5	25.5	25	25	26	26	21.5	21.5	20	20	23	23
40	33	33	29	29	28.5	28.5	29.5	29.5	25	25	23.5	23.5	26.5	26
50	39.5	38.5	35.5	34.5	35	34	36	35	31.5	30.5	30	29	33	32
63	39.5	38.5	35.5	34.5	35	34	36	35	31.5	30.5	30	29	33	32
80	_	—	_	_	_	_	_	_	43	37	41.5	35.5	44.5	38.5
100	_	_	_	_	_	_	_	—	41	39	39.5	37.5	42.5	40.5

\* Adjust the auto switch after confirming the operating conditions in the actual setting.

### **Auto Switch Mounting Height**

Auto Switch	Auto Switch Mounting Height [mm]												
Auto switch model	D-M9 (V) D-M9 W(V) D-M9 A(V) D-A9 (V) D-A9 (V)	D-C73C D-C80C	D-G5/K5 D-G5□W D-G5□W D-K59W D-K59W D-B5/B6 D-B5/B6 D-G5BA										
Bore size	Hs	Hs	Hs										
20	26.5	27	27.5										
25	29	29.5	30										
32	32.5	33	33.5										
40	37	37.5	38										
50	42.5	43	43.5										
63	49.5	50	50.5										
80	_	—	59										
100	—	—	69.5										

### Minimum Stroke for Auto Switch Mounting

	n: Number of auto switches [mm]								
			Number of auto switches	s					
Auto switch model	With 1 pc	With	2 pcs.	With	n pcs.				
	<b>W</b> ith 1 po.	Different surfaces	Same surface	Different surfaces	Same surface				
<b>D-M</b> 9□	5	15*1	40*1	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	55 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊡W	10	15 <sup>*1</sup>	40*1	$20 + 35 \frac{(n-2)}{2}$ $(n = 2, 4, 6\cdots)^{*3}$	55 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊡A	10	25	40*1	$25 + 35 \frac{(n-2)}{2}$ $(n = 2, 4, 6\cdots)^{*3}$	60 + 35 (n - 2) (n = 2, 3, 4, 5…)				
<b>D-A9</b> □	5	15	30*1	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	50 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊡V	5	20	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*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)*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)*3	35 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-C7⊡ D-C80	5	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6)*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)*3	60 + 45 (n - 2) (n=2, 3, 4, 5…)				
D-H7C D-C73C D-C80C	5	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6)* <sup>3</sup>	65 + 50 (n - 2) (n = 2, 3, 4, 5…)				
D-G5 D-K59 D-B5 D-B64	5	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	75 + 55 (n – 2) (n = 2, 3, 4, 5…)				
D-B59W	10	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	75 + 55 (n - 2) (n = 2, 3, 4, 5…)				

\*1 Auto switch mounting

\*3 When "n" is an odd number, an even number that is one larger than the odd number is to be used for the calculation.



\*2 Minimum stroke for auto switch mounting in types other than those mentioned in \*1



## Auto Switch Mounting CG1 Series

### Auto Switch Mounting Brackets/Part Nos.

				Bore siz	ze (mm)			
Auto switch model	20	25	32	40	50	63	80	100
D-M9□(V) D-M9□W(V) D-A9□(V)	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)	_	_
D-M9□A(V)*2	BMA3-020S (A set of b, c, d, e)	BMA3-025S (A set of b, c, d, e)	BMA3-032S (A set of b, c, d, e)	BMA3-040S (A set of b, c, d, e)	BMA3-050S (A set of b, c, d, e)	BMA3-063S (A set of b, c, d, e)	—	_
		a Tr e W	witch bracket (Resi ansparent (Nylon) hite (PBT) b Switch I	holder	Auto switch	<b>d</b> ch crew		
		*	Band (c) is mount on the internal sic	ted so that the pro le (contact side w	pjected part is ith the tube).			
D-H7□ D-H7□W D-H7NF D-C7□/C80 D-C73C/C80C	BMA2-020A (A set of band and screw)	BMA2-025A (A set of band and screw)	BMA2-032A (A set of band and screw)	BMA2-040A (A set of band and screw)	BMA2-050A (A set of band and screw)	BMA2-063A (A set of band and screw)	_	_
D-H7BA	BMA2-020AS (A set of band and screw)	BMA2-025AS (A set of band and screw)	BMA2-032AS (A set of band and screw)	BMA2-040AS (A set of band and screw)	BMA2-050AS (A set of band and screw)	BMA2-063AS (A set of band and screw)	_	_
D-G5□/K59 D-G5□W/K59W D-G5BA/G59F D-G5NT D-B5□/B64 D-B59W	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)
D-G5BA/G59F D-G5NT D-B5□/B64 D-B59W *1 Since the switc	(A set of band and screw)	(A set of band and screw) of nylon) is affect	(A set of band and screw) red in an environn	(A set of band and screw)	(A set of band and screw)	(A set of band and screw)	(A set of band and screw)	(A set of band and screw)

\*1 Since the switch bracket (made of nylon) is 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.

\*2 As the indicator LED is projected from the switch unit, the indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

#### Band Mounting Brackets Set Part Nos.

Set part no.	Contents
BMA2-DDA(S) * S: Stainless steel screw	<ul> <li>Auto switch mounting band (c)</li> <li>Auto switch mounting screw (d)</li> </ul>
BJ4-1	<ul> <li>Switch bracket (White/PBT) (e)</li> <li>Switch holder (b)</li> </ul>
BJ5-1	<ul> <li>Switch bracket (Transparent/Nylon) (a)</li> <li>Switch holder (b)</li> </ul>

#### [Stainless Steel Mounting Screw]

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: D-B5/B6/G5/K5 types \* Refer to the **Web Catalog** for details on the BBA3.

When the D-G5BA type auto switch is shipped independently, the BBA3 is attached.

### **Operating Range**

								[mm]	
	Bore size								
Auto switch model	20	25	32	40	50	63	80	100	
D-M9□(V) D-M9□W(V) D-M9□A(V)	4.5	5	4.5	5.5	5	5.5	_	_	
D-A9□	7	6	8	8	8	9	_	_	
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	

\* Values which include hysteresis are for reference purposes only. They are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

### Cylinder Mounting Bracket, by Stroke/Auto Switch Mounting Surfaces

						st: Stroke [mm]
	Ba	sic, Foot, Flange, Cle	vis		Trunnion	
Auto switch model	With 1 pc.	With 2 pcs.	With 2 pcs.	With 1 pc.	With 2 pcs.	With 2 pcs.
	(Nou cover side)	(Different surfaces)	(Same sunace)	(Hou cover side)	(Different surfaces)	(Same sunace)
Auto switch mounting surface	Port surface	Port surface	Port surface	R	R	A.
Auto switch model						
D-M9□(V) D-M9□W(V) D-M9□A(V) D-A9□	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-H7C/C73C/C80C	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-G5/K5/B5/B6 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 type is not available for ø80 and ø100.

Adjust the auto switch mounting angle according to the customer's application.

Other than the applicable auto switches listed in "How to Order," the following auto switches are also mountable. Refer to the Web Catalog for detailed specifications.

Туре	Model	Electrical entry	Features	Applicable bore size	
	D-H7A1, H7A2, H7B		—		
Solid state	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indicator)	ø20 to ø63	
	D-H7BA	]	Water resistant (2-color indicator)		
	D-G5NT	Grommet (In-line)	With timer	ø20 to ø100	
	D-C73, C76		_	ø20 to ø63	
Reed	D-C80		Without indicator light		
	D-B53	1	_	ø20 to ø100	



Ъ

# **Prior to Use Auto Switch Connections and Examples**

Source Input Specifications

### Sink Input Specifications



Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

### Examples of AND (Series) and OR (Parallel) Connections

When two auto switches are

connected in series, a load

may malfunction because

the load voltage will decline when in the ON state.

The indicator lights will light

up when both of the auto

switches are in the ON state.

Auto switches with a load

voltage less than 20 V cannot

be used. Please contact SMC

if using AND connection for a

heat-resistant solid state auto

switch or a trimmer switch.

When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid. Depending on the operating environment, the product may not operate properly.

### 3-wire AND connection for NPN output



### 3-wire AND connection for PNP output (Using relays)



#### 2-wire AND connection



Example) Load voltage at ON Power supply voltage: 24 VDC Internal voltage drop: 4 V

Load voltage at ON = Power supply voltage -Internal voltage drop x 2 pcs. = 24 11 4 V x 2 pcs.

#### = 16 V

#### (Performed with auto switches only)



(Performed with auto switches only) Brown Black Auto switch 1 Blue Brown Black Load

#### 2-wire OR connection

Blue

Auto switch 2



(Solid state) When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

#### (Reed)

Because there is no current leakage, the load voltage will not increase when turned OFF However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

Load impedance: 3 k $\Omega$ Load voltage at OFF = Leakage current x 2 pcs. x Load impedance = 1 mA x 2 pcs. X 3 kΩ

= 6 V

SMC

### 3-wire OR connection for NPN output



#### 3-wire OR connection for PNP output



**CG1** Series Simple Specials/Made to Order Common Specifications

Please contact SMC for detailed specifications, delivery times, and prices.

### Made to Order

## **Simple Specials** The following special specifications can be ordered as a simplified made-to-order. Please contact your local sales representative for more details.

		CG1 (Standard)		
Symbol	Specifications	Double acting	Symbol	Page
		Single rod		
		Rubber		
-XA0 to 30	Change of rod end shape	•	-XA0 to 30	22

### ■ Made to Order Common Specifications

		CG1 (Standard)		
Symbol	Specifications	Double acting	Symbol	Page
		Single rod		
		Rubber		
-XC3	Special port location	•	-XC3	24
-XC4	With heavy duty scraper	<b>├</b> ────	-XC4	24
-XC6	Made of stainless steel	<b>├</b> ────	-XC6	24
-XC20	Head cover axial port	<b>├</b> ────	-XC20	25
-XC27	Double clevis and double knuckle joint pins made of stainless steel	<b>├</b> ────	-XC27	25
-XC29	Double knuckle joint with spring pin	<b>├</b> ────	-XC29	25
-XC35	With coil scraper	<b>├</b> ────	-XC35	26
-XC85	Grease for food processing equipment	<b>├</b> ────	-XC85	26
-X446	PTFE grease	<b>├</b> ────	-X446	27
-X3252	Interchangeable for long strokes for existing bore size	<b>├</b> ────	-X3252	27

CG1 Series Simple Specials

Please contact your local sales representative for more details.

Symbol

-XA0 to XA30

The following changes are dealt with through the Simple Specials System.

### 1 Change of Rod End Shape

Series		Action	Symbol for change of rod end shape	Note	
Standard CG1		Double acting, Single rod	XA0 to 30	Excludes cylinders with a rod end bracket	





CG1 Series Made to Order Common Specifications



Please contact SMC for detailed dimensions, specifications, and delivery times.

#### Symbol Special Port Location -XC3 The locations of the connection port of the rod/head cover are different than those of the standard type. Applicable Series Description Series Model Action Note CG1 Standard CG1-Z1 Double acting, Single rod How to Order Standard model no. XC3 В Head port location viewed from the rod side Special port Specifications: Rod port location viewed from the rod side location \* For port locations, refer to the following diagrams and select either A, B, C, or D. Same as those of the standard type Port Locations Corresponding symbol of mounting bracket (Positional relationships) Positional relationship between clevis and port Port Port \* Viewed from the rod side, with Viewed from the rod side. the clevis positioned as shown the ports are rendered A, B, C, and D, in the clockin the diagram, the ports are wise direction. rendered A, B, C, and D, in the clockwise direction.

### 2 With Heavy Duty Scraper

With the heavy duty scraper on the wiper ring, this cylinder is suitable for use in environments where die-cast equipment or construction machinery is exposed to dirt or sand, or in environments with significant amounts of dust.

#### **Applicable Series**

Series	Description	Model	Action	Note
CG1 Air cylinder		CG1-Z1	Double acting, Single rod	Applicable to ø32 to ø63

### 

#### Heavy duty scrapers cannot be replaced.

 Since heavy duty scrapers are press-fit, please contact SMC to replace them.

### How to Order



With heavy duty scraper

XC4

### **Dimensions** (Dimensions other than those below are the same as those of the standard type.)



									[mm]
Bore	Ea	EV	ED	м	In	ŀ	4	Z	Z
size		FA	ГВ		12	Male thread	Female thread	Male thread	Female thread
32	17	8	3	5	38	48	28	121	101
40	21	8	3	3.5	47	58	29	138	109
50	26	9	3	4.5	58	66	30	158	122
63	26	9	3	5.5	72	66	30	158	122

\* On the axial foot type and the rod flange type, the mounting bracket is wedged and bolted between the cylinder and the scraper at the time of shipment. On other types, it is placed in the same package but does not come assembled.

Symbol	
-XC6	

Symbol

-XC4

### 3 Made of Stainless Steel

Suitable for cases in which rust is likely to be generated due to immersion in water or in which corrosion is likely to occur

- XC6

#### Applicable Series

Series	Description	Model	Action	Note
CG1	Air cylinder	CG1-Z1	Double acting, Single rod	

#### How to Order

Standard model no.

Made of stainless steel

### Specifications

•	
Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than the above and dimensions	Same as those of the standard type

Stainless steel mounting brackets and rod end brackets (foot bracket, single knuckle joint, double knuckle joint) are also available. For details ⇔ p. 14

							Symbol
4 He	ead Cover	' Axial	Port				-XC20
Head side	e port position	is change	d to the axial directior	n. (Standard hea	ad side port is plugged with hexagon socket h	nead screw.)	
Applic	cable Ser	ies			How to Order		
Series	Description	Model	Action	Note	Standard model no		- xC20
CG1	Air cylinder	CG1-Z1	Double acting, Single rod			-	<u> </u>
					н	lead cover axia	al port 🜢
					Specifications: Same as thos	se of the sta	indard type
					<ul> <li>Operate within the maximum piston s energy.</li> <li>* Be sure to use the speed controller sind</li> </ul>	speed and the a	allowable kinetic t has no throttle.
Dimen	sions (Dime	nsions otl	ner than those below	are the same as	those of the standard type.)		
		_	- 1	~	Axial piping port	Bore size [mm]	Port size
	_		Ψ			20, 25, 32, 40	Rc1/8
						50, 63	Rc1/4
	╙━┫┛╉	╶┸╚╩┈╢┎		$\vdash$		80	Rc3/8
						100	Rc1/2

# **5** Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel -XC27

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

#### **Applicable Series**

Beechpilon Model / Model	Note
CG1 Standard CG1-Z1 Double acting, Singl	le rod*1

\*1 Excludes cylinders with double knuckle joint bracket in How to Order

#### Specifications

Mounting type	Double clevis type (D), double knuckle joint onl		
Pin and retaining ring material	Stainless steel 304		
Specifications other than the above	Same as those of the standard type		

#### How to Order



6 Double Knuckle Joint with Spring Pin

To prevent loosening of the double knuckle joint of standard air cylinder (CM2/CA2 series)

#### Applicable Series

Series	Description	Model	Action	Note
CG1	Air cylinder	CG1-Z1	Double acting, Single rod*1	

\*1 Excludes cylinders with rod end bracket in How to Order

#### How to Order



Symbol

-XC29

**Specifications: Same as those of the standard type** \* For mounting bracket, pin is shipped together.

### Dimensions: Same as those of the standard type

## Made to Order Common Specifications CG1 Series

7	With	Coil	Scraper

It gets rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and protects the seals, etc.

### **Applicable Series**

Series	Description	Model	Action	Note
CG1	Air cylinder	CG1-Z1	Double acting, Single rod	

#### How to Order

Standard model no.

With coil scraper

Symbol -XC35

XC35

Symbol

XC85

### Specifications: Same as those of the standard type

#### Dimensions (Dimensions other than those below are the same as those of the standard type.)



							[mm]
Bore	E۸	Н			М	ZZ	
size	ГА	Male thread	Female thread	12	IVI	Male thread	Female thread
20	6	39	27	26	4	110	98
25	6	44	28	31	5	115	99
32	6	44	28	38	5	117	101
40	7	54	29	47	3.5	134	109
50	7	62	30	58	4.5	154	122
63	7	62	30	72	5.5	154	122

\* Other dimensions are the same as those of the double acting, single rod, standard type.

\* On the axial foot type and the rod flange type, the mounting bracket is wedged and bolted between the cylinder and the scraper at the time of shipment. On other types, it is placed in the same package but does not come assembled.

 For details on the maximum stroke that can be used for each mounting bracket, refer to the stroke selection table (Web Catalog).



· XC85

Food grade grease (certified by NSF-H1) is used as lubricant.

#### Applicable Series

Series	Description	Model	Action	Note
CG1	Air cylinder	CG1-Z1	Double acting, Single rod	

### How to Order

Standard model no.

Grease for food processing equipment

#### **Specifications**

Seal material	Nitrile rubber	
Grease	Grease for food processing equipmen	
Auto switch	Mountable	
Dimensions	Same as those of the standard type	
Specifications other than the above	Same as those of the standard type	

### ⚠️ Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

#### <Not installable>

Food zone	An environment where food which will be sold as merchandize,
	directly touches the cylinder's components
Splash zone	An environment where food which will not be sold as merchandize, directly touches the cylinder's components
<installable> Non-food zone·······</installable>	An environment where there is no contact with food



- Avoid using this product in the food zone. (Refer to the figure above.)
   When the product is used in an area of liquid splash, or a water
- resistant function is required for the product, please consult SMC. \* Operate without lubrication from a pneumatic system lubricator.
- Use the following grease pack for the maintenance work. GR-H-010 (Grease: 10 g)
- Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

9 PTFE Grease		

Applicable to environments incompatible with mineral oil. PTFE grease (fluorine grease) is used as the lubricating grease.

.....

#### **Applicable Series**

Series	Description	Model	Action	Note
CG1	Standard	CG1-Z1	Double acting, Single rod	
	Olandara	00121	Bouble douling, olingie rod	

### How to Order

Standard model no.

	- X446
PTFE g	rease

# Specifications: Same as those of the standard type Dimensions: Same as those of the standard type

Symbol -X446

Symbol

-X3252

 When grease is necessary for maintenance, a grease pack is available. Please order it separately.
 GR-F-005 (Grease: 5 g)

# 10 Interchangeable for Long Strokes for Existing Bore Size

Same length as the long strokes of exiting CG1-Z series

#### How to Order



Interchangeable for long strokes for existing bore size

### Specifications

Stroke	20	201 to 1000
	25 to 100	301 to 1000
Specifications other than the above		Same as those of the standard type





					[mm]
Bore size	Stroke range [mm]	F	Н	S	ZZ
20	201 to 1000	2	35	77	114
25		2	40	77	119
32	301 to 1000	2	40	79	121
40		2	50	87	139
50		2	58	102	162
63		2	58	102	162
80		3	71	122	196
100		3	71	122	196

Female Ro	[mm]	
Bore size	Н	ZZ
20	13	92
25	14	93
32	14	95
40	15	104
50	16	120
63	16	120
80	19	144
100	22	147



## CG1 Series Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smcworld.com

Handling

## **M**Warning

1. Operate within the specified cylinder speed and kinetic energy.

Otherwise, cylinder and seal damage may occur.

2. When a cylinder is operated with one end fixed and the other free (basic or flange types), a bending moment may act on the cylinder due to the vibration generated at the stroke end, which can damage the cylinder. In such a case, install a mounting bracket to suppress the vibration of the cylinder body or reduce the piston speed so that the cylinder does not vibrate. Also, use a mounting bracket to suppress vibrations when moving the cylinder body or when a cylinder is operated horizontally and fixed at one end at a high speed and frequency.

# **∧**Caution

1. Do not apply excessive lateral load to the piston rod.

Easy checking method

Minimum operating pressure after the cylinder is mounted to the equipment [MPa] = Minimum operating pressure of cylinder [MPa] + {Load mass [kg] x 9.8 x Friction coefficient of guide/Sectional area of cylinder [mm<sup>2</sup>]}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

- **2.** Do not use the air cylinder as an air-hydro cylinder. This may result in oil leakage.
- 3. Refer to the torque shown in the table below when tightening the foot bracket, flange, or clevis to the cylinder.

Tightening Torqu	le	Unit: N⋅m
Bore size [mm]	Foot bracket Flange Clevis	Trunnion
20	1.5	1.5 to 2.2
25	2.9	2.5 to 3.5
32	2.9	6.0 to 8.6
40	4.9	10.8 to 14.6
50	11.8	19 to 25
63	24.5	30 to 40
80	24.5	—
100	42.2	_

- 4. The oil stuck to the cylinder is grease.
- 5. There is a possibility that the base oil of grease seeps out. The installation of the protective cover is recommended.

**Disassembly/Replacement** 

## 

1. Only people who have sufficient knowledge and experience are allowed to replace seals.

The person who disassembles and reassembles the cylinder is responsible for the safety of the product. Repeatedly disassembling and reassembling the product may cause wearing or deformation of the screws as well as a decline in screw tightening strength. When reassembling the product, be sure to check the cover and tubing screws for wear, deformities, or any other abnormalities. Operating the product with damaged screws may result in the cover or tubing coming off during operation, which could lead to a serious accident. Caution must be taken to avoid such incidents.

## **≜**Caution

- 1. Bushings cannot be replaced.
- 2. To replace a seal, apply the specified 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. Cylinders with Ø50 or larger bore sizes cannot be disassembled.

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the rod cover or the head cover with a vise and loosen the other side with a wrench or a monkey 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. If disassembly is required, please contact SMC.)

4. When replacing seals, take care not to hurt your hand or finger on the corners of parts.

### ▲ 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)<sup>\*1</sup>, and other safety regulations.

- 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** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### **A**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 catalog 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.
  - 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.
  - 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 catalog.
- 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.

- \*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.

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 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.

### 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

- 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.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog 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**

- 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.

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### 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.

A Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.