

Fine Lock Cylinder

Double Acting, Single Rod

Series CLG1

ø20, ø25, ø32, ø40

How to Order

CLG1 **L** **N** **25** **100** **E**

With auto switch **CDLG1** **L** **N** **25** **100** **E** **M9BW** **C**

With auto switch
(Built-in magnet)

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
U	Rod side trunnion style
T	Head side trunnion style
D	Clevis style

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	Rc
TN	NPT

Cylinder stroke (mm)

Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
20	25, 50, 75, 100, 125, 150, 200	201 to 350
25	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 400
32	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 450
40	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 800

Number of auto switches

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

Auto switch mounting bracket ^(Note)

Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Auto switch

Nil	Without auto switch
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* For the applicable auto switch model, refer to the table below.

Lock operation

E	Spring locking (Exhaust locking)
P	Pneumatic locking (Pressure locking)
D	Spring and pneumatic locking

Cylinder symbol

Nil	Without rod boot
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Type

N	Non-lube/Rubber bumper
A	Non-lube/Air cushion

* Mounting bracket is shipped together, (but not assembled).

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDLG1FA32-100-P

* Intermediate stroke is available, too.

Made to Order
Refer to page 735 for details.

Applicable Auto Switches/Refer to pages 1893 to 2007 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model Applicable bore size		Lead wire length (m)					Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	○	○	○	○	IC circuit		
							M9PV	M9P	●	●	○	○	○	○			
		Connector		3-wire (PNP)	12 V	M9BV	M9B	●	●	○	○	○	○	○	○	—	
						—	H7C	●	●	○	○	○	○	○	○	—	
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NWX	M9NW	●	●	○	○	○	○	IC circuit	
								M9PWV	M9PW	●	●	○	○	○	○		○
		Connector		3-wire (PNP)	12 V	M9BWX	M9BW	●	●	○	○	○	○	○	○	—	
						—	—	●	●	○	○	○	○	○	○	—	
	Water resistant (2-color indication)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NAV ^{*1}	M9NA ^{*1}	○	○	○	○	○	○	IC circuit		
							M9PAV ^{*1}	M9PA ^{*1}	○	○	○	○	○	○		○	○
Connector		3-wire (PNP)		12 V	M9BAV ^{*1}	M9BA ^{*1}	○	○	○	○	○	○	○	○	—		
					—	—	●	●	○	○	○	○	○	○	○	—	
Diagnostic indication (2-color indication)		Grommet		Yes	4-wire (NPN)	5 V, 12 V	—	—	H7NF	●	●	○	○	○	○	IC circuit	
								—	—	●	●	○	○	○	○		○
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	A96V	A96	●	●	○	○	○	○	IC circuit		
							A93V ^{*2}	A93	●	●	○	○	○	○		○	○
		Connector		2-wire	24 V	12 V	A90V	A90	●	●	○	○	○	○	○	IC circuit	
							—	B54	●	●	○	○	○	○	○		○
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN equivalent)	—	—	—	—	B64	●	●	○	○	○	○	—	
								—	C73C	●	●	○	○	○	○		○
		Connector		2-wire	—	—	—	—	—	C80C	●	●	○	○	○	○	IC circuit
										—	B59W	●	●	○	○	○	

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee the 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 products of ø20 and ø25.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NV 5 m Z (Example) M9NWX
1 m M (Example) M9NVW None N (Example) H7CN
3 m L (Example) M9NWL

* Since there are other applicable auto switches than listed above, refer to page 745 for details.

* For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.

* D-A9□(V)/M9□(V)/M9□A(V) auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled at the time of shipment.)

Fine Lock Cylinder Double Acting, Single Rod **Series CLG1**

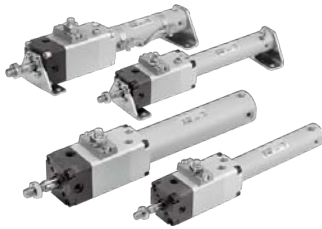
Provided with a compact lock mechanism, it is suitable for intermediate stop, emergency stop, and drop prevention.

Locking in both directions

The piston rod can be locked in either direction of its cylinder stroke.

Maximum piston speed: 500 mm/s

It can be used at 50 to 500 mm/s provided that it is within the allowable kinetic energy range.



Made to Order Specifications
(For details, refer to pages 2009 to 2152.)

Symbol	Specifications
-XA□	Change of rod end shape

Weight

(kg)

Bore size (mm)	20	25	32	40	
Basic weight	Basic style	0.61	0.97	1.06	1.35
	Axial foot style	0.72	1.10	1.22	1.57
	Flange style	0.73	1.15	1.23	1.58
	Trunnion style	0.62	0.99	1.09	1.40
	Clevis style	0.66	1.05	1.21	1.58
Rod side pivot bracket	0.11	0.13	0.20	0.27	
Head side pivot bracket	0.08	0.09	0.17	0.25	
Single knuckle joint	0.05	0.09	0.09	0.10	
Double knuckle joint (with pin)	0.05	0.09	0.09	0.13	
Additional weight per each 50 mm of stroke	0.05	0.07	0.09	0.15	
Additional weight with air cushion	0.01	0.01	0.02	0.02	
Additional weight for long stroke	0.01	0.01	0.02	0.03	

Calculation: (Example)

CLG1LA20-100 (Foot Style, ø20, 100 st)

- Basic weight.....0.72
 - Additional weight.....0.05/50 st
 - Air cylinder stroke.....100 st
 - Additional weight of air cushion.....0.01 kg
- $$0.72 + 0.05 \times 100/50 + 0.01 = 0.83 \text{ kg}$$

Model

Series	Type	Action	Cushion	Bore size (mm)	Lock operation
CLG1□□ CLG1□□A	Non-lube	Double acting	Rubber bumper	20, 25	Spring locking (Exhaust locking) Pneumatic locking (Pressure locking) Spring and pneumatic locking
			Air cushion	32, 40	

Specifications

Bore size (mm)	20	25	32	40
Fluid	Air			
Lubrication	Not required (Non-lube)			
Proof pressure	1.5 MPa			
Maximum operating pressure	1 MPa			
Minimum operating pressure	0.08 MPa			
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 500 mm/sec *			
Stroke length tolerance	Up to 1000 st $^{+1.4}_0$ mm to st $^{+1.8}_0$ mm			
Cushion	Rubber bumper, Air cushion			
Mounting **	Basic style, Axial foot style, Rod side flange style, Head side flange style, Rod side trunnion style, Head side trunnion style, Clevis style (Used when port position is changed to 90°)			

* Constraints associated with the allowable kinetic energy are imposed on the speeds at which the piston can be locked.

The maximum speed of 1000 mm/s can be accommodated if the piston is to be locked in the stationary state for the purpose of drop prevention.

** The long stroke style is applicable to the axial foot style, and the rod side flange style.

Fine Lock Specifications

Lock operation	Spring locking (Exhaust locking)	Spring and pneumatic locking	Pneumatic locking (Pressure locking)
Fluid	Air		
Maximum operating pressure	0.5 MPa		
Unlocking pressure	0.3 MPa or more	0.1 MPa or more	
Lock starting pressure	0.25 MPa or less	0.05 MPa or more	
Locking direction	Both directions		

Accessory

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

* Pin and retaining ring are shipped together with double knuckle joint.

Standard Stroke Refer to the minimum auto switch mounting stroke (page 743) for those with an auto switch.

Bore size (mm)	Standard stroke (mm)	Long stroke (mm)	Maximum manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150, 200	201 to 350	1500
	25		
32		125, 150, 200, 250, 300	
	40	250, 300	

* Intermediate stroke is available, too. Spacers are not used.

* Long strokes are applicable for the axial foot and rod side flange styles. If other mounting brackets are used or the length exceeds the long stroke limit, the maximum stroke should be determined based on the stroke selection table (technical data).

Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Refer to pages 742 to 745 for cylinders with auto switches.
<ul style="list-style-type: none"> • Minimum auto switch mounting stroke • Proper auto switch mounting position (detection at stroke end) and mounting height • Operating range • Switch mounting bracket: Part no.

CLJ2

CLM2

CLG1

CL1

MLGC

CNG

MNB

CNA2

CNS

CLS

CLQ

RLQ

MLU

MLGP

ML1C

D-□

-X□

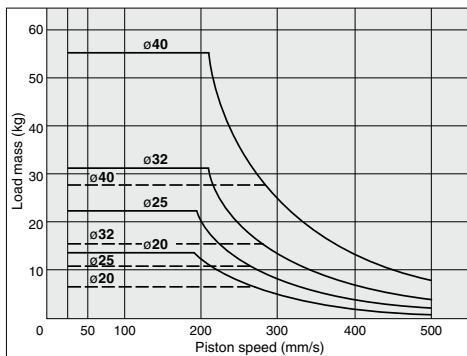
Series CLG1

⚠ Caution/Allowable Kinetic Energy when Locking

Bore size (mm)	20	25	32	40
Allowable kinetic energy (J)	0.26	0.42	0.67	1.19

- In terms of specific load conditions, the allowable kinetic energy indicated in the table above is equivalent to a 50% load ratio at 0.5 MPa, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, calculations are unnecessary.
- Apply the following formula to obtain the kinetic energy of the load.

$$Ek = \frac{1}{2} m v^2$$
 Ek: Kinetic energy of load (J)
 m: Load mass (kg)
 v: Piston speed (m/s) (Average speed x 1.2 times)
- The piston speed will exceed the average speed immediately before locking. To determine the piston speed for the purpose of obtaining the kinetic energy of load, use 1.2 times the average speed as a guide.
- The relation between the speed and the load of the respective tube bores is indicated in the diagram below. Use the cylinder in the range below the line.
- Even within a given allowable kinetic energy level, there is an upper limit to the size of the load that can be sustained. Thus, a horizontally mounted cylinder must be operated below the solid line, and a vertically mounted cylinder must be operated below the dotted line.

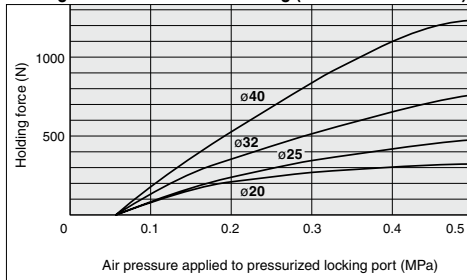


Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	20	25	32	40
Holding force (N)	196	313	443	784

Note) Holding force at piston rod extended side decreases approximately 15%.

Holding Force of Pneumatic Locking (Maximum static load)



* When selecting cylinders, refer to the Precautions and allowable kinetic energy when locking on page 702, and then select a cylinder.

⚠ Caution

Caution when Locking

Holding force (maximum static load) means the maximum capability of holding a static load that is not accompanied by vibration or impact under the condition that no load is applied. Therefore, it does not refer to a load that cannot be held constantly.

When using (selecting) this product, carefully check the following points.

- If the piston rod slips because the lock's holding force has been exceeded, the brake shoe could be damaged, resulting in a reduced holding force or shortened life.
- The upper limit of the load that is used under the conditions not associated with the kinetic energy when locking, such as drop prevention must be 35% or less of the holding force.
- Do not use the cylinder in the locked state to sustain a load that involves impact.

Stopping Accuracy (Not including tolerance of control system.) (mm)

Locking method	Piston speed (mm/s)			
	50	100	300	500
Spring locking (Exhaust locking)	±0.4	±0.5	±1.0	±2.0
Pneumatic locking (Pressure locking)	±0.2	±0.3	±0.5	±1.5
Spring and pneumatic locking				

Condition/load: 25% of thrust force at 0.5 MPa

Solenoid valve: Mounted to the lock port

⚠ Caution

Selection/Recommended Pneumatic Circuit/Caution on Handling

For detailed specifications of the fine lock cylinder, Series CLG1 mentioned above, refer to pages 702 to 705.

Operating Precautions

⚠ Warning

- 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.
- Operate within the specified cylinder speed.**
Otherwise, cylinder and seal damage may occur.
- Carefully check the cushion performance in a low speed range.**
The performance and effect at around 50 mm/s may vary depending on the individual difference of each product.
- If a cylinder is actuated at high speed when mounted with one side fastened and one side free (basic type, flange type, direct mount type), the bending moment may act on the cylinder due to vibration at the stroke end, causing damage to the cylinder. In such cases, install a mounting bracket to suppress vibration of the cylinder body, or reduce piston speed until the cylinder body does not vibrate at the stroke end. Also, use a mounting bracket when moving the cylinder body, or mounting a long stroke cylinder horizontally with one-sided fastening.**

⚠ Caution

- Install a rod boot without twisting.**
If the cylinder is installed with its bellows twisted, it could damage the bellows.
- Tighten clevis bracket mounting bolts with the following proper tightening torque.**
 ø20: 1.5N·m, ø25 to 32: 2.9N·m, ø40: 4.9N·m,
 ø50: 11.8N·m, ø63 to 80: 24.5N·m, ø100: 42.2N·m

Mounting Bracket Part No.

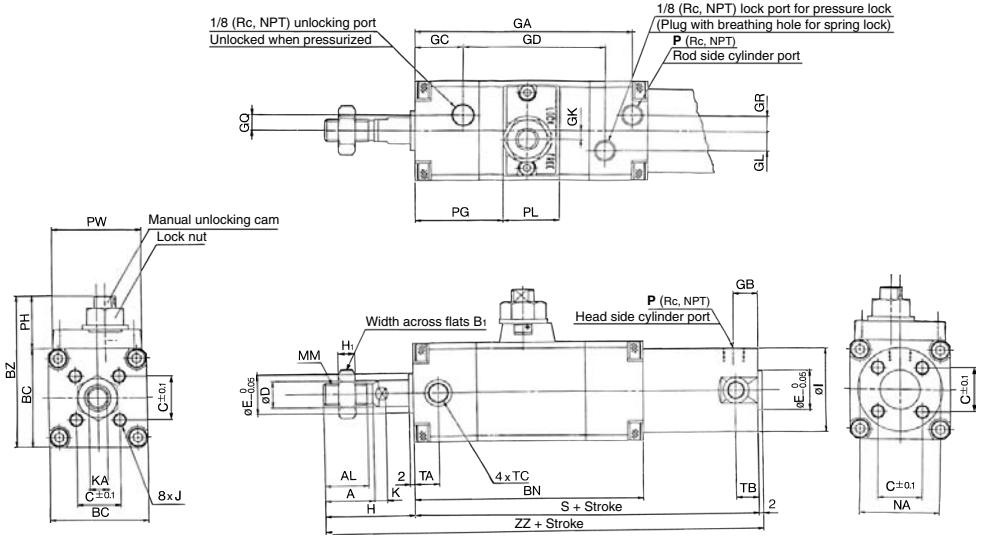
Mounting bracket	Bore size (mm)			
	20	25	32	40
Axial foot *	CNG-L020	CNG-L025	CNG-L032	CNG-L040
Flange	CNG-F020	CNG-F025	CNG-F032	CNG-F040
Trunnion pin	CG-T020	CG-T025	CG-T032	CG-T040
Clevis **	CG-D020	CG-D025	CG-D032	CG-D040
Rod side pivot bracket	CNG-020-24	CNG-025-24	CNG-032-24	CNG-040-24
Head side pivot bracket	CG-020-24A	CG-025-24A	CG-032-24A	CG-040-24A

* When ordering foot bracket, order 2 pieces per cylinder.

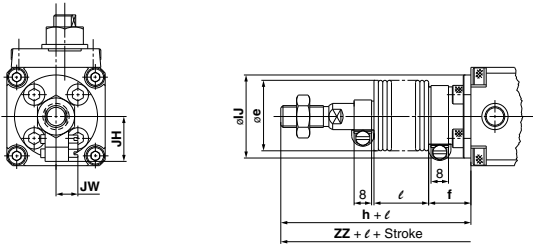
** For the clevis style, clevis pins, retaining rings and mounting bolts are included.

*** Mounting bolts are shipped together for the foot and flange styles.

Basic Style: CLG1BN



CLG1 With rod boot
(Mounting bracket: Basic style)



Bore size (mm)	Stroke range	AL	A	B ₁	BC	BN	BZ	C	D	E	GA	GB	GC	GD	GK	GL	GQ	GR	I	J	K	KA	MM
20	Up to 200	15.5	18	13	38	91	57.5	14	8	12	84	10	19	54	3.5	5.5	4	4	26	M4 x 0.7 depth 7	5	6	M8 x 1.25
25	Up to 300	19.5	22	17	45	101	69	16.5	10	14	94	10	20	62	4	9	7	7	31	M5 x 0.8 depth 7.5	5	8	M10 x 1.25
32	Up to 300	19.5	22	17	45	102	69	20	12	18	95	10	21	62	4	9	7	7	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25
40	Up to 300	27	30	19	52	111	76	26	16	25	103	10	23	67	4	11	8	7	47	M6 x 1 depth 12	6	14	M14 x 1.5

Bore size (mm)	Stroke range	H ₁	NA	P	PG	PH	PL	PW	S	TA	TB	TC	Without rod boot		With rod boot							
													H	ZZ	IJ	JH (Reference)	JW (Reference)	e	f	h	l	ZZ
20	Up to 200	5	24	1/8	33	19.5	20	38	141	11	11	M5 x 0.8	35	178	27	15.5	10.5	30	18	55	1/4 stroke	198 (206)
25	Up to 300	6	29	1/8	38	24	24	41	151	11	11	M6 x 0.75	40	193	32	16.5	10.5	30	19	62		215 (223)
32	Up to 300	6	35.5	1/8	39	24	24	41	154	11	10	M8 x 1	40	196	38	18.5	10.5	35	19	62		218 (226)
40	Up to 300	8	44	1/8	44	24	24	41	169	12	10	M10 x 1.25	50	221	48	21.5	10.5	35	19	70		241 (250)

* For long stroke refer to page 739.
** The minimum stroke for cylinders with a rod boot is 20 mm.

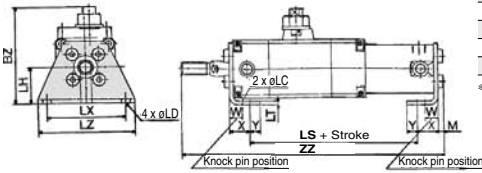
- CLJ2
- CLM2
- CLG1**
- CL1
- MLGC
- CNG
- MNB
- CNA2
- CNS
- CLS
- CLQ
- RLQ
- MLU
- MLGP
- ML1C

- D-□
- X□

Series CLG1

With Mounting Bracket

Foot style: CLG1LN

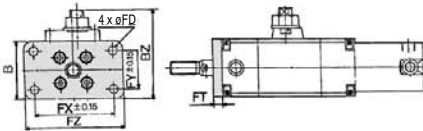


Foot Style

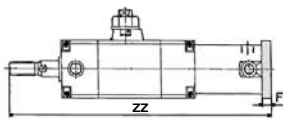
Bore size (mm)	BZ	M	W	X	Y	LC	LD	LH	LS	LT	LX	LZ	Without rod boot	With rod boot
	ZZ												ZZ	ZZ
20	63.5	3	10	15	7	4	6	25	117	3	50	62	182 + stroke	202 + 1.25 stroke
25	74.5	3.5	10	15	7	4	6	28	127	3	57	70	197.5 + stroke	219.5 + 1.25 stroke
32	74.5	3.5	10	16	8	4	7	28	128	3	60	74	200.5 + stroke	222.5 + 1.25 stroke
40	83	4	10	16.5	8.5	4	7	33	142	3	68	84	226 + stroke	246 + 1.25 stroke

* For long stroke, refer to page 630.

Rod side flange style: CLG1FN



Head side flange style: CLG1GN

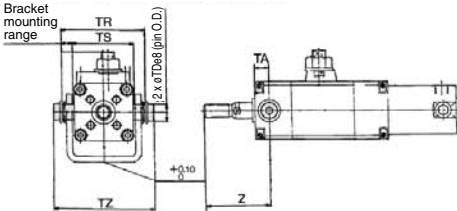


Rod Side Flange Style

Bore size (mm)	B	BZ	FD	FT	FX	FY	FZ
	ZZ						
20	38	57.5	5.5	6	52	25	65
25	45	69	5.5	7	60	30	75
32	45	69	6.6	7	60	30	75
40	52	76	6.6	8	66	36	82

* For long stroke, refer to page 630.

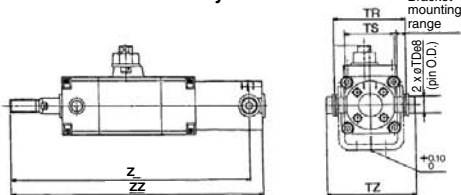
Rod side trunnion style: CLG1UN



Rod Side Trunnion Style

Bore size (mm)	TD _{es}	TR	TS	TZ	Without rod boot	With rod boot
					Z	Z
20	8 ^{+0.025} _{-0.047}	51	40	59.6	46	66 + 0.25 stroke
25	10 ^{+0.025} _{-0.047}	58	47	68	51	73 + 0.25 stroke
32	12 ^{+0.032} _{-0.059}	62.5	47	75.7	51	73 + 0.25 stroke
40	14 ^{+0.032} _{-0.059}	72.5	54	85.7	62	82 + 0.25 stroke

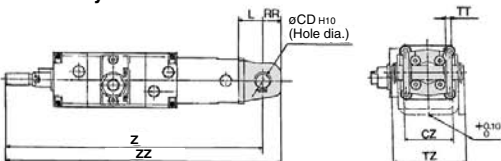
Head side trunnion style: CLG1TN



Head Side Trunnion Style

Bore size (mm)	TD _{es}	TR	TS	TZ	Without rod boot		With rod boot	
					Z	ZZ	Z	ZZ
20	8 ^{+0.025} _{-0.047}	39	28	47.6	165 + stroke	178 + stroke	185 + 1.25 stroke	198 + 1.25 stroke
25	10 ^{+0.025} _{-0.047}	43	33	53	180 + stroke	193 + stroke	202 + 1.25 stroke	215 + 1.25 stroke
32	12 ^{+0.032} _{-0.059}	54.5	40	67.7	184 + stroke	196 + stroke	206 + 1.25 stroke	218 + 1.25 stroke
40	14 ^{+0.032} _{-0.059}	65.5	49	78.7	209 + stroke	221 + stroke	229 + 1.25 stroke	241 + 1.25 stroke

Clevis style: CLG1DN



Clevis Style

Bore size (mm)	CD _{H10}	CZ	L	RR	TT	TZ
25	10 ^{+0.058} ₀	33	16	13	3.2	48
32	12 ^{+0.070} ₀	40	20	15	4.5	58.4
40	14 ^{+0.070} ₀	49	22	18	4.5	71.4

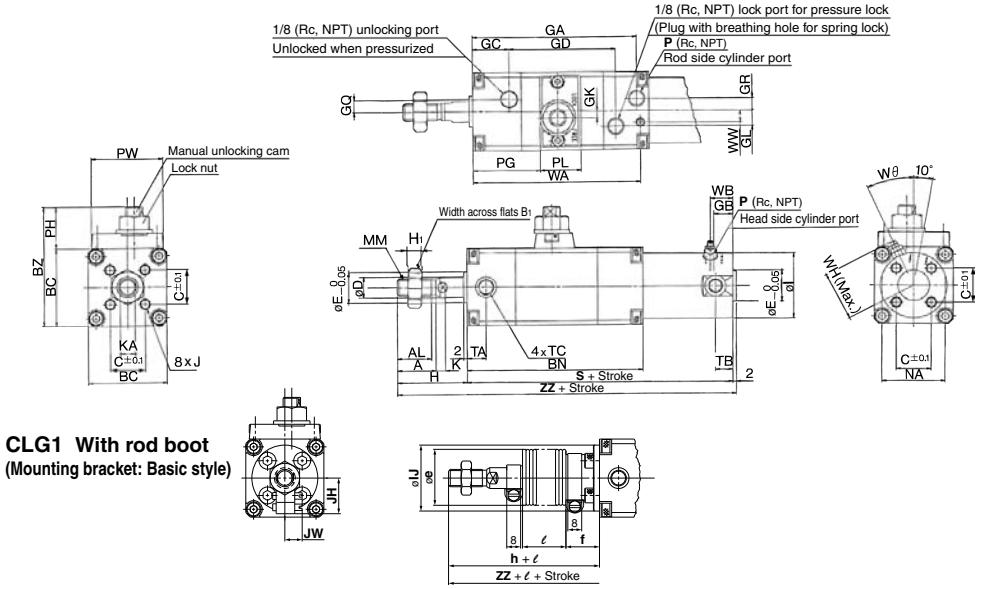
* Clevis pin and retaining ring are attached.

Bore size (mm)	Without rod boot		With rod boot	
	Z	ZZ	Z	ZZ
20	190 + stroke	201 + stroke	210 + 1.25 stroke	221 + 1.25 stroke
25	207 + stroke	220 + stroke	229 + 1.25 stroke	242 + 1.25 stroke
32	214 + stroke	229 + stroke	236 + 1.25 stroke	251 + 1.25 stroke
40	241 + stroke	259 + stroke	261 + 1.25 stroke	279 + 1.25 stroke

Fine Lock Cylinder Double Acting, Single Rod **Series CLG1**

Basic Style with Air Cushion: CLG1BA

* Refer to page 738 for mounting bracket, since the dimensions except GA, P, WA, WB, WH, WW, Wθ are the same.



CLG1 With rod boot
(Mounting bracket: Basic style)

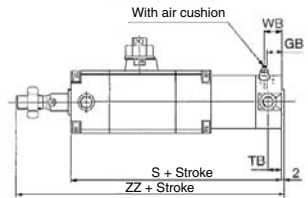
Bore size (mm)	Stroke range	AL	A	B ₁	BC	BN	BZ	C	D	E	GA	GB	GC	GD	GK	GL	GQ	GR	I	J	K	KA	MM	NA	H ₁
20	Up to 200	15.5	18	13	38	91	57.5	14	8	12	85	10	19	54	3.5	5.5	4	4	26	M4 x 0.7 depth 7	5	6	M8 x 1.25	24	5
25	Up to 300	19.5	22	17	45	101	69	16.5	10	14	95	10	20	62	4	9	7	7	31	M5 x 0.8 depth 7.5	5.5	8	M10 x 1.25	29	6
32	Up to 300	19.5	22	17	45	102	69	20	12	18	95	10	21	62	4	9	7	7	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25	35.5	6
40	Up to 300	27	30	19	52	111	76	26	16	25	103	10	23	67	4	11	8	7	47	M6 x 1 depth 12	6	14	M14 x 1.5	44	8

Bore size (mm)	Stroke range	P	PG	PH	PL	PW	S	TA	TB	TC	WA	WW	WB	WH	Wθ	Without rod boot		With rod boot							
																H	ZZ	JH	JW (Reference)	JW (Reference)	e	f	h	ℓ	ZZ
20	Up to 200	M5 x 0.8	33	19.5	20	38	141	11	11	M5 x 0.8	86	5.5	15	23	30°	35	178	27	15.5	10.5	30	18	55	198 (206)	
25	Up to 300	M5 x 0.8	38	24	24	41	151	11	11	M6 x 0.75	96	6	15	25	30°	40	193	32	16.5	10.5	30	19	62	215 (223)	
32	Up to 300	1/8	39	24	24	41	154	11	10	M8 x 1	97	6	15	28.5	25°	40	196	38	18.5	10.5	35	19	62	218 (226)	
40	Up to 300	1/8	44	24	24	41	169	12	10	M10 x 1.25	106	8	15	33	20°	50	221	48	21.5	10.5	35	19	70	241 (250)	

* The minimum stroke for cylinders with a rod boot is 20 mm.

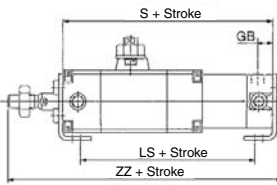
Long Stroke Refer to pages 737 to 739 for mounting dimensions except the table below.

Basic style



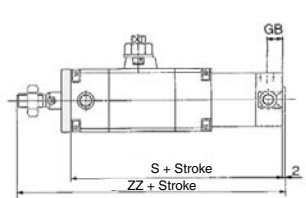
Bore size (mm)	Stroke range	GB	S	Without rod boot ZZ	With rod boot ZZ	TB	WB
20	201 to 350	12	149	186	206	11	16
25	301 to 400	12	159	201	223	11	16
32	301 to 450	12	162	204	226	11	16
40	301 to 800	13	178	230	250	12	16

Foot style



Bore size (mm)	Stroke range	GB	S	LS	Without rod boot ZZ	With rod boot ZZ
20	201 to 350	12	149	125	190	210
25	301 to 400	12	159	135	205.5	227.5
32	301 to 450	12	162	136	208.5	230.5
40	301 to 800	13	178	151	235	255

Rod side flange style



Bore size (mm)	Stroke range	GB	S	Without rod boot ZZ	With rod boot ZZ
20	201 to 350	12	149	186	206
25	301 to 400	12	159	201	223
32	301 to 450	12	162	204	226
40	301 to 800	13	178	230	250

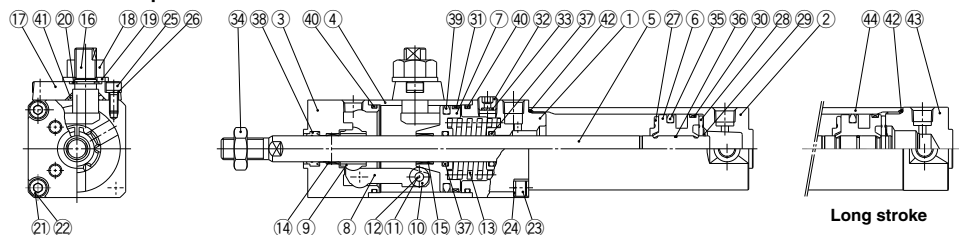
- CLJ2
- CLM2
- CLG1
- CL1
- MLGC
- CNG
- MNB
- CNA2
- CNS
- CLS
- CLQ
- RLQ
- MLU
- MLGP
- ML1C

- D-□
- X□

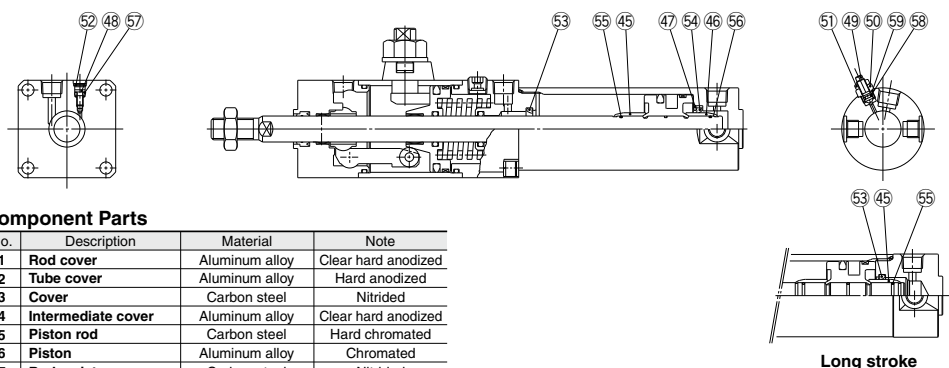
Series CLG1

Construction

With rubber bumper: CLG1BN



With air cushion: CLG1BA



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Clear hard anodized
2	Tube cover	Aluminum alloy	Hard anodized
3	Cover	Carbon steel	Nitrided
4	Intermediate cover	Aluminum alloy	Clear hard anodized
5	Piston rod	Carbon steel	Hard chromated
6	Piston	Aluminum alloy	Chromated
7	Brake piston	Carbon steel	Nitrided
8	Brake arm	Carbon steel	Nitrided
9	Brake shoe	Special friction material	
10	Roller	Carbon steel	Nitrided
11	Pin	Carbon steel	Heat treated
12	Retaining ring	Carbon tool steel	
13	Brake spring	Spring steel wire	Anti-corrosive treatment: Types C, E only
14	Bushing	Bearing alloy	
15	Bushing	Bearing alloy	
16	Manual lock release cam	Chromium molybdenum steel	Nitrided, nickel plated
17	Cam guide	Carbon steel	Nitrided, painted
18	Lock nut	Rolled steel	
19	Flat washer	Rolled steel	
20	Retaining ring	Carbon tool steel	
21	Hexagon socket head cap screw	Chromium molybdenum steel	
22	Spring washer	Steel wire	
23	Hexagon socket head cap screw	Chromium molybdenum steel	
24	Spring washer	Steel wire	
25	Hexagon socket head cap screw	Chromium molybdenum steel	
26	Spring washer	Steel wire	
27	Bumper A	Urethane	
28	Bumper B	Urethane	
29	Retaining ring	Stainless steel	
30	Wear ring	Resin	
31	Wear ring	Resin	
32	Hexagon socket head plug	Carbon steel	Type E only
33	Element	Bronze	Type E only
34	Rod end nut	Rolled steel	
35	Piston seal	NBR	
36	Piston gasket	NBR	
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Brake piston seal	NBR	
40	Intermediate cover gasket	NBR	
41	Cam gasket	NBR	

No.	Description	Material	Note
42	Cylinder tube gasket	NBR	
43	Head cover	Aluminum alloy	Clear hard anodized
44	Cylinder tube	Aluminum alloy	Hard anodized
45	Cushion ring A	Aluminum alloy	Anodized
46	Cushion ring B	Aluminum alloy	Anodized
47	Seal retaining	Rolled steel	Zinc chromated
48	Cushion valve A	Chromium molybdenum steel	Electroless nickel plated
49	Cushion valve B	Rolled steel	Electroless nickel plated
50	Valve retaining	Rolled steel	Electroless nickel plated
51	Lock nut	Rolled steel	Electroless nickel plated
52	Retaining ring	Stainless steel	
53	Cushion seal A	Urethane	
54	Cushion seal B	Urethane	
55	Cushion ring gasket A	NBR	
56	Cushion ring gasket B	NBR	
57	Valve seal A	NBR	
58	Valve seal B	NBR	
59	Valve retaining gasket	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
20	CG1N20-PS	Set of nos. above 35, 38, 42
25	CG1N25-PS	
32	CG1N32-PS	
40	CG1N40-PS	

* Since the lock section for Series CLG1 is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.

* Seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g)

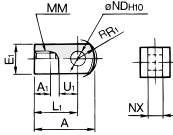
Series CLG1

Accessory Bracket Dimensions

Single Knuckle Joint

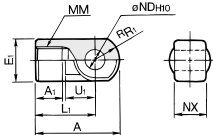
I-G02/G03

Material: Rolled steel



I-G04

Material: Cast iron

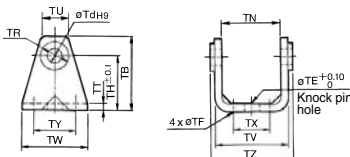


Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RPR1	U1	NDH10	NX
I-G02	20	34	8.5	16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.1} _{-0.2}
I-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}
I-G04	40	42	14	22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}

Rod Side Pivot Bracket

φ20 to φ40

Material: Rolled steel

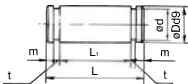


Part no.	Applicable bore size (mm)	TB	TdH9	TE	TF	TH	TN
CNG-020-24	20	42	8 ^{+0.036} ₀	10	5.5	31	40
CNG-025-24	25	48	10 ^{+0.036} ₀	10	5.5	37	47
CNG-032-24	32	53	12 ^{+0.043} ₀	10	6.6	38.5	47
CNG-040-24	40	60	14 ^{+0.043} ₀	10	6.6	42.5	55

Part no.	Applicable bore size (mm)	TR	TT	TU	TV	TW	TX	TY	TZ
CNG-020-24	20	13	3.2	21.2	47.8	42	26	28	50
CNG-025-24	25	15	3.2	21.3	54.8	42	28	28	57
CNG-032-24	32	17	4.5	25.6	57.4	48	28	28	61.4
CNG-040-24	40	21	4.5	26.3	65.4	56	36	30	71.4

Knuckle Pin

Material: Carbon steel



Part no.	Applicable bore size (mm)	Dd9	L	d	L1	m	t	Applicable retaining ring
IY-G02	20	8 ^{-0.040} _{-0.040}	21	7.6	16.2	1.5	0.9	Type C 8 for axis
IY-G03	25, 32	10 ^{-0.040} _{-0.040}	26.6	9.6	20.2	1.55	1.15	Type C 10 for axis
IY-G04	40	10 ^{-0.040} _{-0.040}	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis

* Retaining rings are included.

Clevis Pin

Material: Carbon steel



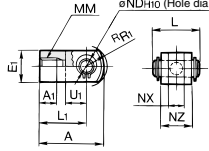
Part no.	Applicable bore size (mm)	Dd9	L	d	L1	m	t	Applicable retaining ring
CD-G02	20	8 ^{-0.040} _{-0.040}	43.4	7.6	38.6	1.5	0.9	Type C 8 for axis
CD-G25	25	10 ^{-0.040} _{-0.040}	48	9.6	42.6	1.55	1.15	Type C 10 for axis
CD-G03	32	12 ^{-0.040} _{-0.040}	59.4	11.5	54	1.55	1.15	Type C 12 for axis
CD-G04	40	14 ^{-0.040} _{-0.040}	71.4	13.4	65	2.05	1.15	Type C 14 for axis

* Retaining rings are included.

Double Knuckle Joint * Knuckle pin and retaining ring are packaged.

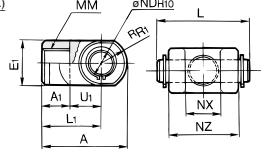
Y-G02/G03

Material: Rolled steel



Y-G04

Material: Cast iron

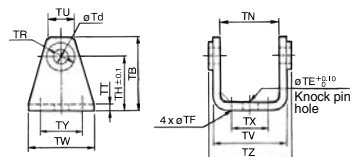


Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RPR1	U1	NDH10	NX	NZ	L	Applicable pin part no.
Y-G02	20	34	8.5	16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}	16	21	IY-G02
Y-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}	20	25.6	IY-G03
Y-G04	40	42	16	22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}	36	41.6	IY-G04

Head Side Pivot Bracket

φ20 to φ40

Material: Rolled steel

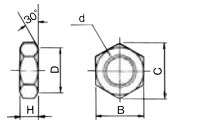


Part no.	Applicable bore size (mm)	TB	Td	TE	TF	TH	TN
CG-020-24A	20	36	8	10	5.5	25	(29.3)
CG-025-24A	25	43	10	10	5.5	30	(33.1)
CG-032-24A	32	50	12	10	6.6	35	(40.4)
CG-040-24A	40	58	14	10	6.6	40	(49.2)

Part no.	Applicable bore size (mm)	TR	TT	TU	TV	TW	TX	TY	TZ
CG-020-24A	20	13	3.2	18.1	35.8	42	16	28	38.3
CG-025-24A	25	15	3.2	20.7	39.8	42	20	28	42.1
CG-032-24A	32	17	4.5	23.6	49.4	48	22	28	53.8
CG-040-24A	40	21	4.5	27.3	58.4	56	30	30	64.6

Rod End Nut

Material: Carbon steel



Part no.	Applicable bore size (mm)	B	C	D	d	H
NT-02	20	13	15.0	12.5	M8 x 1.25	5
NT-03	25, 32	17	19.6	16.5	M10 x 1.25	6
NT-G04	40	19	21.9	18	M14 x 1.5	8

CLJ2

CLM2

CLG1

CL1

MLGC

CNG

MNB

CNA2

CNS

CLS

CLQ

RLQ

MLU

MLGP

ML1C

D-□

-X□

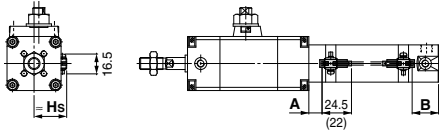
Series CLG1

Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

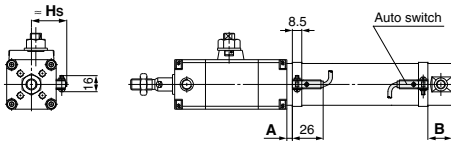
Reed auto switch

D-A9□



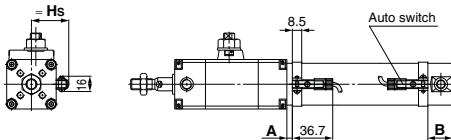
(): For D-A96

D-C7/C8



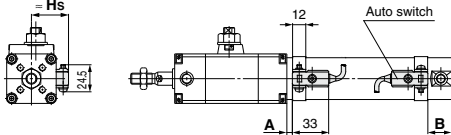
(): For D-C7C

D-C73C/C80C



(): For D-C73C

D-B5/B6/B59W



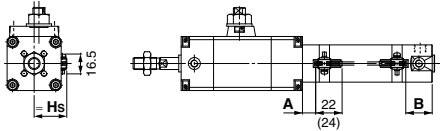
(): For D-B5/B6/B59W

Solid state auto switch

D-M9□

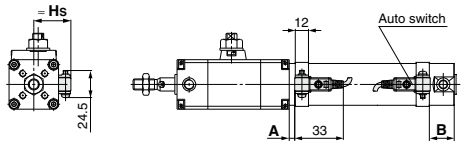
D-M9□A

D-M9□W



(): For D-M9□A

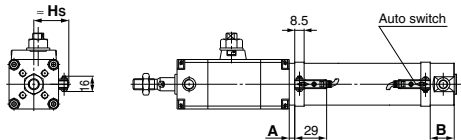
D-G5NT



(): For D-G5NT

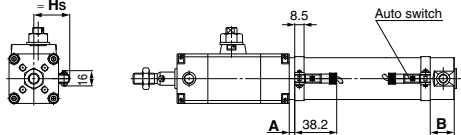
D-H7□/H7□W

D-H7NF/H7BA



(): For D-H7□/H7□W

D-H7C



(): For D-H7C

Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-C7/C8 D-C73C D-C80C		D-B5 D-B6		D-B59W		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-G5□W D-K59W D-G59F D-G5 D-K5 D-G5NT D-G5BA	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	10.5	27 (35)	6.5	23 (31)	7	23.5 (31.5)	1	17.5 (25.5)	4	20.5 (28.5)	6	22.5 (30.5)	2.5	19 (27)
25	10.5	27 (35)	6.5	23 (31)	7	23.5 (31.5)	1	17.5 (25.5)	4	20.5 (28.5)	6	22.5 (30.5)	2.5	19 (27)
32	10.5	29 (37)	6.5	25 (33)	7	25.5 (33.5)	1	19.5 (27.5)	4	22.5 (30.5)	6	24.5 (32.5)	2.5	21 (29)
40	13.5	32 (41)	9.5	28 (37)	10	28.5 (37.5)	4	22.5 (31.5)	7	25.5 (34.5)	9	27.5 (36.5)	5.5	24 (33)

* (): Values for long strokes

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

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Auto Switch Mounting Height

(mm)

Auto switch model	D-M9□(V) D-M9□W(V) D-M9□A(V)	D-C7/C8 D-H7□ D-H7□W D-H7NF D-H7BA	D-C73C D-C80C	D-B5/B6 D-B59W D-G59F D-H7C D-G5W D-G5BA
	Hs	Hs	Hs	Hs
20	25	24.5	27	27.5
25	27.5	27	29.5	30
32	31	30.5	33	33.5
40	35.5	35	37.5	38

Minimum Auto Switch Mounting Stroke

Auto switch model	n: No. of auto switches (mm)				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	15 <small>Note 1</small>	40 <small>Note 1</small>	$20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$55 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-M9□W	10	15 <small>Note 1</small>	40 <small>Note 1</small>	$20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$55 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-M9□A	10	25	40 <small>Note 1</small>	$25 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$60 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-A9□	5	15	30 <small>Note 1</small>	$15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$50 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-M9□V	5	20	35	$20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$35 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-A9□V	5	15	25	$15 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$25 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-M9□WV D-M9□AV	10	20	35	$20 + 35 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$35 + 35 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-C7□ D-C80	5	20	60	$20 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$60 + 45 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-H7□ D-H7□W D-H7BA D-H7NF	10	25	70	$25 + 45 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$70 + 45 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-C73C D-C80C D-H7C	5	30	80	$30 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$80 + 50 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-B5□ D-B64 D-G5□ D-K59□	5	25	70	$25 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$70 + 50 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>
D-B59W	10	30	75	$30 + 50 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6...)</small> <small>Note 3</small>	$75 + 50 (n-2)$ <small>(n = 2, 3, 4, 5...)</small>

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	<p>The proper auto switch mounting position is 3.5 mm inward from the switchholder edge.</p>	<p>The auto switch is mounted by slightly displacing it in a direction (cylinder tubecircumferential exterior) so that the auto switch and lead wire do not interfere with each other.</p>
D-M9□ D-M9□W	Less than 20 stroke <small>Note 2</small>	Less than 55 stroke <small>Note 2</small>
D-M9□A	Less than 20 stroke <small>Note 2</small>	Less than 60 stroke <small>Note 2</small>
D-A9□	—	Less than 50 stroke <small>Note 2</small>

Note 2) Minimum stroke for mounting auto switches in the other mounting styles mentioned in note 1.

CLJ2
CLM2
CLG1
CL1
MLGC
CNG
MNB
CNA2
CNS
CLS
CLQ
RLQ
MLU
MLGP
MLTC

D-□
-X□

Series CLG1 Auto Switch Mounting 2

Operating range

Auto switch model	Bore size (mm)			
	20	25	32	40
D-A9□	7	6	8	8
D-M9□ D-M9□W	4.5	5	4.5	5.5
D-C7□/C-80 D-C73C/C-80C	8	10	9	10
D-B5□/B64 D-B59W	8	10	9	10
D-H7□/H7□W D-H7BA/H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G5NT	4	4	4.5	5
D-G5NB	35	40	40	45

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately $\pm 30\%$ dispersion).
It may vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket: Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-M9□(V) D-M9□W(V) D-A9□(V)	Note 1) BMA3-020	Note 1) BMA3-025	Note 1) BMA3-032	Note 1) BMA3-040
D-M9□A(V)	Note 2) BMA3-020S	Note 2) BMA3-025S	Note 2) BMA3-032S	Note 2) BMA3-040S
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF D-H7BA	BMA2-020A	BMA2-025A	BMA2-032A	BMA2-040A
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BA/G59F D-G5NT D-G5NB	BA-01	BA-02	BA-32	BA-04

Note 1) Set part number which includes the auto switch mounting band (BMA2-□□□A) and the holder kit (BJ5-1/Switch bracket: Transparent).

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

Note 2) Set part number which includes the auto switch mounting band (BMA2-□□□AS/ Stainless steel screw) and the holder kit (BJ4-1/Switch bracket: White).

Note 3) For the D-M9□A (V) type auto switch, do not install the switch bracket on the indicator light.

[Mounting screw set made of stainless steel]

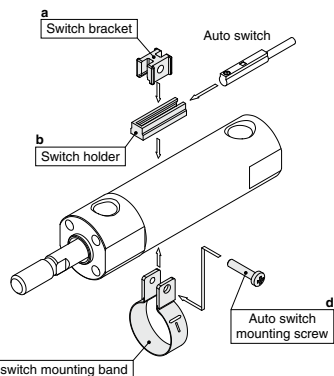
The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA3: For D-B5/B6/G5/K5 types

BBA4: For D-C7/C80/H7 types

D-H7BA/G5BA auto switches are set on the cylinder with the stainless steel screws above when shipped. When an auto switch is shipped independently, BBA3 or BBA4 is attached.







Note 4) Refer to page 1989 for the details of BBA3.



- BJ□-1 is a set of "a" and "b".
BJ4-1 (Switch bracket: White)
BJ5-1 (Switch bracket: Transparent)
- BMA2-□□□A(S) is a set of "c" and "d".
Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

Cylinder Bracket/Stroke: Auto Switch Mounting Surface

st: Stroke (mm)

Mounting bracket	Basic, Foot, Flange, Clevis			Trunnion		
	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)
No. of auto switches	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)
Switch mounting surface	Port side 	Port side 	Port side 			
Switch model						
D-A9□ D-M9□ D-M9□W	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□/C80	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-C73C/C80C/H7C	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-B5□/B64/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

- CLJ2
- CLM2
- CLG1**
- CL1
- MLGC
- CNG
- MNB
- CNA2
- CNS
- CLS
- CLQ
- RLQ
- MLU
- MLGP
- ML1C

Besides the models listed in How to Order, the following auto switches are applicable.
Refer to pages 1893 to 2007 for the detailed specifications.

Auto switch type	Part no.	Electrical entry (Fetching direction)	Features	Applicable bore size
Reed	D-B53, C73, C76	Grommet (In-line)	—	ø20 to ø40
	D-C80		Without indicator light	
Solid state	D-H7A1, H7A2, H7B		—	
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)	
	D-G5NT	With timer		

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1960 and 1961 for details.
 * Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1911 for details.
 * Wide range detection type, solid state auto switches (D-G5NB type) are also available. Refer to page 1953 for details.

- D-□
- X□