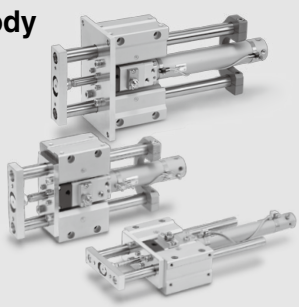
Guide Cylinder

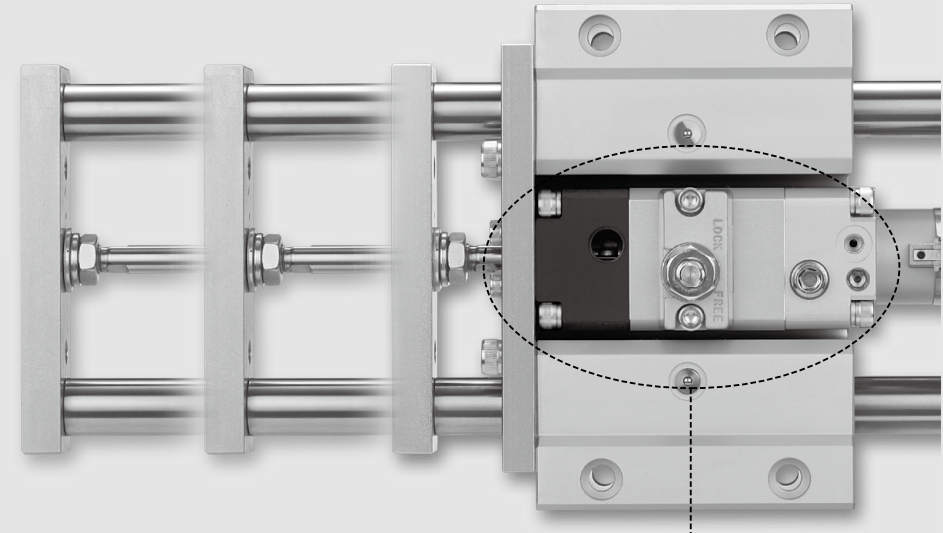
MLGC Series

Built-in Fine Lock Cylinder Compact Type

Compact integration of guide rods and a fine lock cylinder with a built-in locking mechanism

- **9% weight reduction using a new guide body**
  (In comparison with MLGCLB20-100)
- **Locking in both directions is possible.**
  Locking in either side of cylinder stroke is possible, too.
- **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.
- **Air cushion is standard.**
  Enables the impact to be absorbed at the stroke end when the cylinder is operated at high speeds.
- **Cylinder position can be detected.**
  Built-in magnet for auto switches is provided in all models.





Three-types of locking mechanism

Locking method	Spring locking	Pneumatic locking	Spring and pneumatic locking
Features	● Discharging the unlocking air causes the lock to operate.	● Supplying a pressure to the pressurized locking port enables the change of holding force as desired.	● Supplying a pressure to the pressurized locking port enables the change of holding force as desired. ● Discharging the unlocking air causes the lock to operate.

Guide Cylinder/Built-in Fine Lock Cylinder
Compact Type
MLGC Series
ø20, ø25, ø32, ø40

How to Order

MLGC L B 32 [ ] – 100 – R – E – M9BW [ ] – C – [ ]

Bearing type

M	Slide bearing
L	Ball bushing bearing

Mounting

B	Basic
F	Front mounting flange

Bore size

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

Guide Cylinder
(Built-in Fine Lock Cylinder Compact Type)

Port thread type

Nil	M5 x 0.8
	Rc
TN	NPT

∗ For bore size 20 and 25, M5 x 0.8 is only available.

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 1011.

Rear plate

Nil	Without rear plate
R	With rear plate

Locking method

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

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 (Built-in magnet)

∗ For applicable auto switch models, refer to the below table.

Made to Order
For details, refer to page 1011.

Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular ø20 to ø40	Auto switch model: In-line ø20, ø25	In-line ø32	In-line ø40	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V,12 V	—	M9NV	M9N			●	—	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P			●	—	●	○	—	○		
				2-wire	12 V		M9BV	M9B			●	—	●	○	—	○	—	
		Connector					—	H7C			●	—	●	●	●	—		
	Diagnostic indication (2-color indicator)	Grommet		3-wire (NPN)	5 V,12 V		M9NWV	M9NW			●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW			●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW			●	●	●	○	—	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)	5 V,12 V		M9NAV∗1	M9NA∗1			○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1			○	○	●	○	—	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1			○	○	●	○	—	○	—	
	With diagnostic output (2-color indicator)			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	—
			None	2-wire	12 V	100 V	A93V	A93			●	●	●	●	—	○∗2	—	Relay, PLC
						100 V or less	A90V	A90			●	●	●	●	—	○∗2	IC circuit	
			Yes			100 V, 200 V	—	(B54)		B54	●	—	●	●	—	—	—	
			None			200 V or less	—	(B64)		B64	●	—	—	—	—	—		
		Connector	Yes			—	—	C73C			●	—	●	●	●	—		
			None			24 V or less	—	C80C			●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indicator)	Grommet			—	—	—	(B59W)		B59W	●	—	●	—	—	—	—	

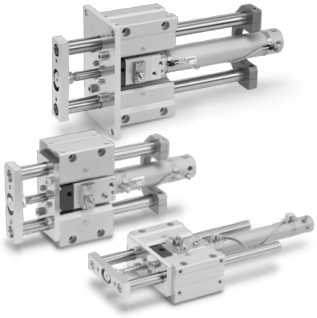
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 The load voltage used is 24 VDC.

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

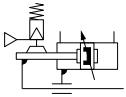
∗ Auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page 1017 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
∗ The D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) are shipped together, (but not assembled). (Only switch mounting bracket is assembled at the time of shipment.)

⚠Caution
When using auto switches shown inside ( ), stroke end detection may not be possible depending on the One-touch fitting or speed controller model. Please contact SMC in this case.



Symbol
Air cushion



Made to Order

Made to Order
Click here for details

Symbol	Specifications
-XC79	Tapped hole, drilled hole, pin hole machined additionally

Model/Specifications

Model/Stroke

Model (Bearing type)	Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
MLGCM (Slide bearing) **MLGCL (Ball bushing bearing)**	**20**	75, 100, 125, 150, 200	250, 300, 350, 400
	25	75, 100, 125, 150 200, 250, 300	350, 400, 450, 500
	32		350, 400, 450, 500, 600
	40		350, 400, 450, 500, 600, 700, 800

∗ Intermediate strokes and short strokes other than the above are produced upon receipt of order.

Specifications

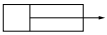
Model		**MLGC□□20**	**MLGC□□25**	**MLGC□□32**	**MLGC□□40**
Base cylinder		**CDLG1BA** Bore size – Thread type – Stroke – Locking method – Auto switch			
Bore size (mm)		**20**	**25**	**32**	**40**
Action		Double acting			
Fluid		Air			
Proof pressure		1.5 MPa			
Maximum operating pressure		1.0 MPa			
Minimum operating pressure		0.2 MPa (Horizontal, No load)			
Ambient and fluid temperature		–10 to 60°C			
Piston speed∗1		50 to 500 mm/s			
Cushion		Air cushion			
Base cylinder lubrication		Non-lube			
Stroke length tolerance		$^{+1.9}_{+0.2}$ mm			
Non-rotating accuracy ∗2	**Slide bearing**	±0.06°	±0.05°	±0.05°	±0.04°
	Ball bushing bearing	±0.04°	±0.04°	±0.04°	±0.04°
Piping port size (Rc, NPT) ∗3	**Cylinder port**	M5 x 0.8		1/8	
	Lock port	1/8			
Locking method		■Spring locking (Exhaust locking) ■Pneumatic locking (Pressure locking) ■Spring and pneumatic locking			

∗1 Constraints associated with the allowable kinetic energy are imposed on the speeds at which the piston can be locked. The maximum speed of 750 mm/s can be accommodated if the piston is to be locked in the stationary state for the purpose of drop prevention.
∗2 When the cylinder is retracted (initial value), the non-rotating accuracy without loads or deflection of the guide rods will be below the values shown in the above table as a guideline.
∗3 For bore size 20 and 25, M5 x 0.8 is only available.

Fine Lock Specifications

Locking method	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 less
Locking direction	Both directions		

Theoretical Output



Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
20	**8**	OUT	314	62.8	94.2	126	157	188	220	251	283	314
		IN	264	52.8	79.2	106	132	158	185	211	238	264
25	**10**	OUT	491	98.2	147	196	246	295	344	393	442	491
		IN	412	82.4	124	165	206	247	288	330	371	412
32	**12**	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	**16**	OUT	1260	252	378	504	630	756	882	1010	1130	1260
		IN	1060	212	318	424	530	636	742	848	954	1060

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	LB type (Ball bushing bearing/Basic)	2.52	3.92	4.04	7.16
	LF type (Ball bushing bearing/ Front mounting flange)	3.24	4.89	5.01	8.65
	MB type (Slide bearing/Basic)	2.48	3.86	3.98	7.06
	MF type (Slide bearing/Front mounting flange)	3.2	4.83	4.95	8.56
Additional weight with rear plate		0.32	0.53	0.53	0.88
Additional weight per each 50 mm of stroke		0.21	0.32	0.34	0.54
Additional weight for long stroke		0.01	0.01	0.02	0.03

Calculation: (Example)
MLGCLB32-500-R-D
(Ball bushing bearing/Basic, ø32/500 st., with rear plate)
- Basic weight····· 4.04 (LB type)
- Additional weight with rear plate····· 0.53
- Additional stroke weight····· 0.34/50 st
- Stroke····· 500 st
- Additional weight for long stroke····· 0.02

4.04 + 0.53 + 0.34 x 500/50 + 0.02 = 7.99 kg

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.

1. Apply the following formula to obtain the kinetic energy of the load.

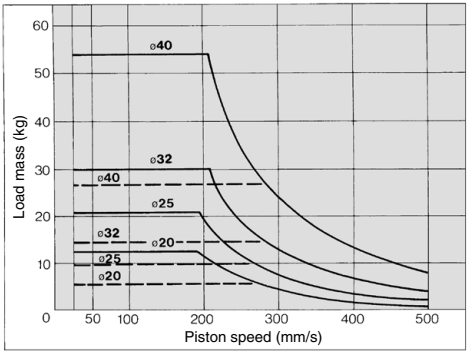
$E_K = \frac{1}{2} m\upsilon^2$

E_K: Kinetic energy of load (J)
m: Load mass (kg) (Load mass + Moving parts weight)
υ: Piston speed (m/s) (Average speed x 1.4)

2. 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 1.4 times the average speed as a guide.

3. 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.

4. In order to insure the proper braking force, even within a given allowable kinetic energy level, there is an upper limit to the size of the load. 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 (Max. 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%.

Moving Parts Weight

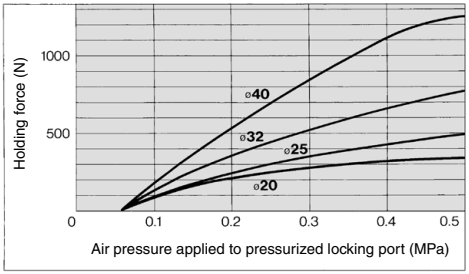
(kg)

Bore size (mm)	20	25	32	40
Moving parts basic weight	0.57	1.0	1.03	1.97
Additional weight with rear plate	0.32	0.53	0.53	0.88
Additional weight per each 50 mm of stroke	0.18	0.28	0.29	0.46

Calculation: (Example)
MLGCLB32-500-R-D
- Moving parts basic weight····· 1.03
- Additional weight with rear plate····· 0.53
- Additional stroke weight····· 0.29/50 st
- Stroke····· 500 st

1.03 + 0.53 + 0.29 x 500/50 = 4.46 kg

Holding Force of Pneumatic Locking (Max. static load)



1. The holding force is the lock's ability to hold a static load that does not involve vibrations or shocks, after it is locked without a load. Therefore, to use the cylinder near the upper limit of the constant holding force, be aware of the following:
- If the piston rod slips because the lock's holding force has been exceeded, the brake shoe could become damaged, resulting in a reduced holding force or shortened life.
- To use the lock for drop prevention purposes, the load to be attached to the cylinder must be within 35% of the cylinder's 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) Spring and pneumatic locking	±0.2	±0.3	±0.5	±1.5

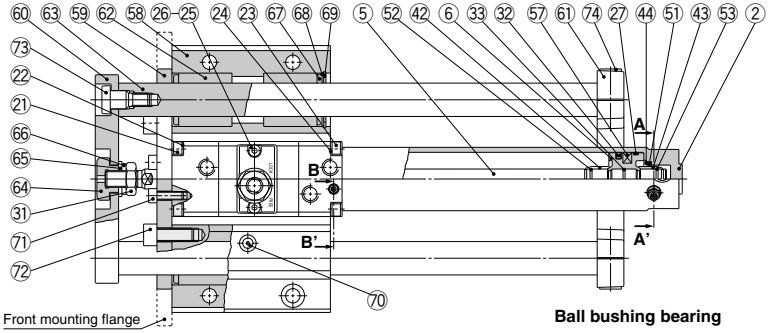
Condition/ Load: 25% of thrust force at 0.5 MPa
Solenoid valve: mounted to the lock port

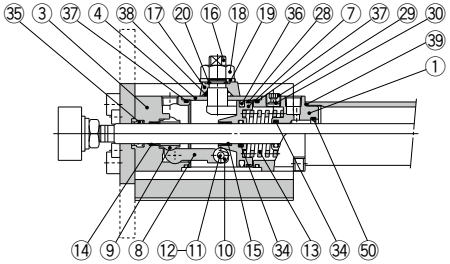
⚠ Caution

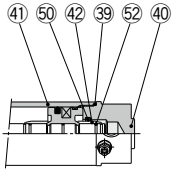
Recommended Pneumatic Circuit/Caution on Handling

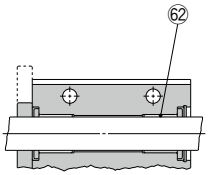
For detailed specifications about the fine lock cylinder, refer to pages 1004 to 1007.

Construction: With Rear Plate









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 chrome plated ø20, ø25 are stainless steel.	
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**	Stainless steel		
13	**Brake spring**	Spring steel wire	Dacrodized	For spring locking, spring/ pneumatic locking
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	Nickel plated	
19	**Flat washer**	Rolled steel	Nickel plated	
20	**Retaining ring**	Stainless steel		
21	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	
22	**Spring washer**	Steel wire	Nickel plated	
23	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	
24	**Spring washer**	Steel wire	Nickel plated	
25	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	
26	**Spring washer**	Steel wire	Nickel plated	
27	**Wear ring**	Resin		
28	**Wear ring**	Resin		
29	**Hexagon socket head plug**	Carbon steel	Nickel plated	Type E only
30	**Element**	Bronze		
31	**Rod end nut**	Rolled steel	Nickel plated	
32	**Piston seal**	NBR		
33	**Piston gasket**	NBR		
34	**Rod seal A**	NBR		
35	**Rod seal B**	NBR		
36	**Brake piston seal**	NBR		
37	**Intermediate cover gasket**	NBR		
38	**Cam gasket**	NBR		

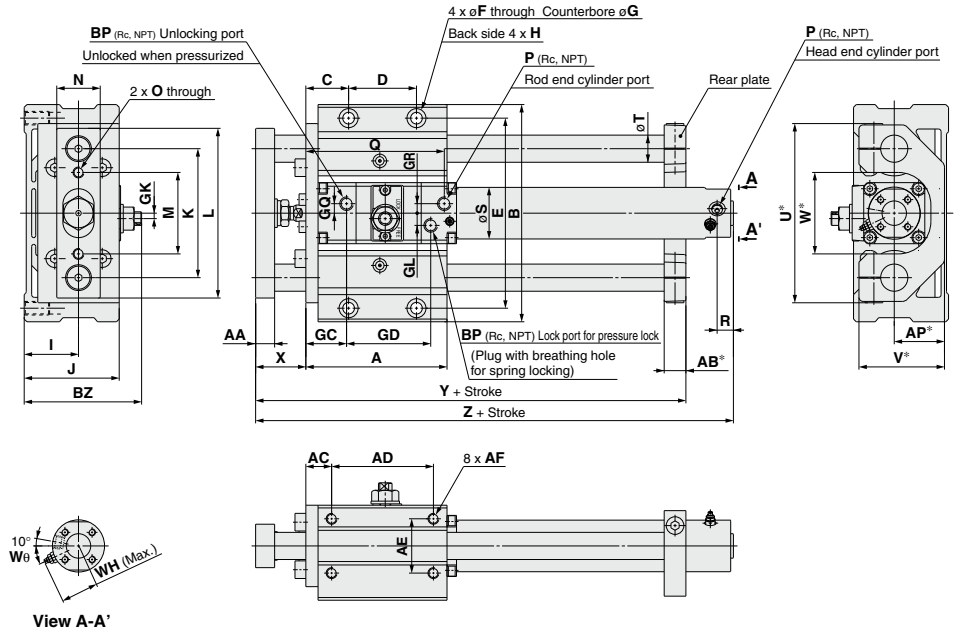
Component Parts

No.	Description	Material	Note	
39	**Cylinder tube gasket**	NBR		
40	**Head cover**	Aluminum alloy	Clear hard anodized	
41	**Cylinder tube**	Aluminum alloy	Hard anodized	
42	**Cushion ring A**	Aluminum alloy	Anodized	
43	**Cushion ring B**	Aluminum alloy	Anodized	
44	**Seal retainer**	Rolled steel	Zinc chromated	
45	**Cushion valve A**	Chromium molybdenum steel	Electroless nickel plated	
46	**Cushion valve B**	Rolled steel	Electroless nickel plated	
47	**Valve retainer**	Rolled steel	Electroless nickel plated	
48	**Lock nut**	Rolled steel	Nickel plated	
49	**Retaining ring**	Stainless steel		
50	**Cushion seal A**	Urethane		
51	**Cushion seal B**	Urethane		
52	**Cushion ring gasket A**	NBR		
53	**Cushion ring gasket B**	NBR		
54	**Valve seal A**	NBR		
55	**Valve seal B**	NBR		
56	**Valve retainer gasket**	NBR		
57	**Magnet**	—		
58	**Guide body**	Aluminum alloy	Clear anodized	
59	**Small flange**	Rolled steel	Nickel plated	For basic
	Large flange			For front mounting flange
60	**Front plate**	Rolled steel	Nickel plated	
61	**Rear plate**	Cast iron	Platinum silver	
62	**Slide bearing**	Bearing alloy	For slide bearing	
	Ball bushing bearing	—	For ball bushing bearing	
63	**Guide rod**	Carbon steel	Hard chrome plated	For slide bearing
		High carbon chrome bearing steel	Quenched, Hard chrome plated	For ball bushing bearing
64	**End bracket**	Carbon steel	Nickel plated	
65	**Washer**	Rolled steel	Nickel plated	
66	**Spring washer**	Steel wire	Nickel plated	
67	**Felt**	Felt		
68	**Holder**	Stainless steel		
69	**Type C retaining ring for hole**	Carbon tool steel	Phosphate coated	
70	**Grease nipple**	—	Nickel plated	
71	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For cylinder mounting
72	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For large/small flange mounting
73	**Guide bolt**	Chromium molybdenum steel	Nickel plated	For front plate mounting
74	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For rear plate mounting

Note) ⑥1, ⑦4 are not required for without rear plate.

Dimensions

Basic: With rear plate
MLGC□B□□-□-R-□



Standard Stroke

(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB*	AC	AD	AE	AF	AP*	B	BP Note 3)	BZ	C	D	E	F	G	GC
20	75, 100, 125, 150, 200	94	11	13	16.5	70	35	M6 x 1 depth 12	32	135	1/8	73.5	26.5	50	118	6.8	11 depth 8	28
25	75, 100, 125 150, 200, 250 300	104	14	16	19	75	40	M8 x 1.25 depth 16	37	160	1/8	86.5	31.5	50	140	8.6	14 depth 10	29
32		104	14	16	19	75	40	M8 x 1.25 depth 16	37	160	1/8	86.5	31.5	50	140	8.6	14 depth 10	30
40		142	17	19	22	110	45	M10 x 1.5 depth 20	42	194	1/8	95	37	80	170	10.5	17 depth 12	35

Bore size (mm)	GD	GK	GL	GQ	GR	H	I	J	K	L	M	N	O	P Note 2)	Q	R	S
20	54	3.5	5.5	4	4	M8 x 1.25 depth 14	35	60	80	105	50	25	M6 x 1	M5 x 0.8	94	12	26
25	62	4	9	7	7	M10 x 1.5 depth 18	40	70	95	125	60	32	M8 x 1.25	M5 x 0.8	104	12	31
32	62	4	9	7	7	M10 x 1.5 depth 18	40	70	95	125	60	32	M8 x 1.25	1/8	104	12	38
40	67	4	11	8	7	M12 x 1.75 depth 21	45	82.5	115	150	75	38	M8 x 1.25	1/8	115	12	47

Bore size (mm)	T	U*	V*	W*	WH	Wθ	X	Y	Z
20	16	112	53	50	23	30°	30	146	182
25	20	132	63	60	25	30°	37	167	199
32	20	132	63	60	28.5	25°	37	167	202
40	25	162	73	70	33	20°	44	210	227

Without Rear Plate

Bore size (mm)	Y
20	129
25	146
32	146
40	191

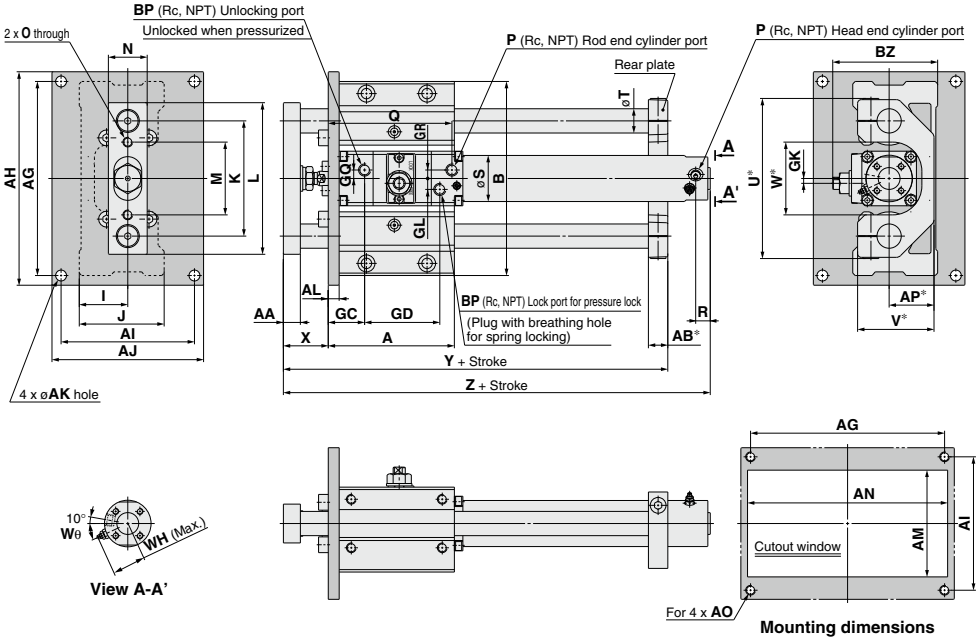
Long Stroke

Bore size (mm)	Stroke range (mm)	R	Z
20	250 to 400	14	190
25	350 to 500	14	207
32	350 to 600	14	210
40	350 to 800	15	236

Note 1) Dimensions marked with "*" are not required for without rear plate.
Note 2) For bore size 20 and 25, M5 x 0.8 is only available.
Rc, NPT port are available for bore size 32 or greater.
Note 3) Rc, NPT port are available.

Dimensions

Front mounting flange: With rear plate
MLGC□F□□-□-R-□



Standard Stroke

(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB*	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP*	B	BP Note 3)	BZ	GC	GD	GK
20	75, 100, 125, 150, 200	94	11	13	134	150	92	108	9	9	75	140	M8	32	135	1/8	73.5	28	54	3.5
25	75, 100, 125 150, 200, 250 300	104	14	16	160	176	110	125	9	9	88	165	M8	37	160	1/8	86.5	29	62	4
32		104	14	16	160	176	110	125	9	9	88	165	M8	37	160	1/8	86.5	30	62	4
40		142	17	19	190	210	115	135	11	12	96	200	M10	42	194	1/8	95	35	67	4

Bore size (mm)	GL	GQ	GR	I	J	K	L	M	N	O	P Note 2)	Q	R	S	T	U*	V*	W*
20	5.5	4	4	35	60	80	105	50	25	M6 x 1	M5 x 0.8	94	12	26	16	112	53	50
25	9	7	7	40	70	95	125	60	32	M8 x 1.25	M5 x 0.8	104	12	31	20	132	63	60
32	9	7	7	40	70	95	125	60	32	M8 x 1.25	1/8	104	12	38	20	132	63	60
40	11	8	7	45	82.5	115	150	75	38	M8 x 1.25	1/8	115	12	47	25	162	73	70

Bore size (mm)	WH	Wθ	X	Y	Z
20	23	30°	30	146	182
25	25	30°	37	167	199
32	28.5	25°	37	167	202
40	33	20°	44	210	227

Without Rear Plate

Bore size (mm)	Y
20	129
25	146
32	146
40	191

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Z
20	250 to 400	14	190
25	350 to 500	14	207
32	350 to 600	14	210
40	350 to 800	15	236

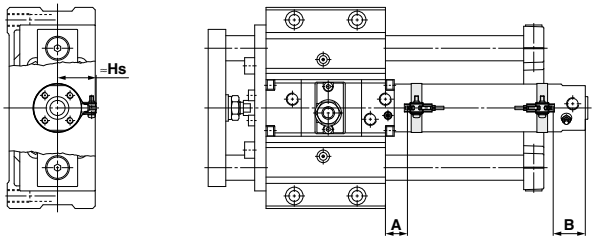
Note 1) Dimensions marked with "*" are not required for without rear plate.
Note 2) For bore size 20 and 25, M5 x 0.8 is only available.
Rc, NPT port are available for bore size 32 or greater.
Note 3) Rc, NPT port are available.

Auto Switch Mounting

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

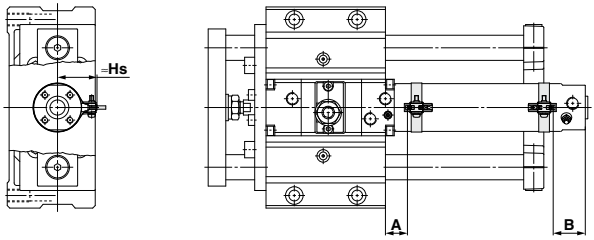
D-M9□/M9□W
D-M9□A

D-A9□



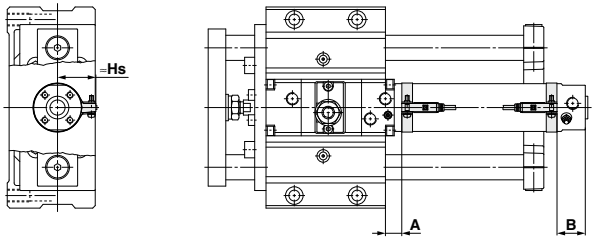
D-M9□V/M9□WV
D-M9□AV

D-A9□V



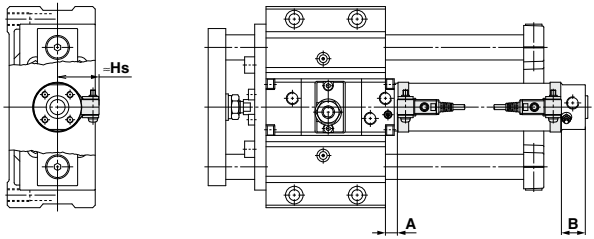
D-H7□/H7□W
D-H7NF/H7BA
D-H7C

D-B5/B6/B59W



D-G5/K5/G5□W/G5BA
D-K59W
D-G59F
D-G5NT

D-C7/C8
D-C73C/C80C



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	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)

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V) D-A9□(V)	D-C7/C8 D-H7□□ D-H7□W D-H7NF D-H7BA	D-C73C D-C80C	D-B5/B6 D-B59W D-G5/K5 D-G5□W D-K59W D-G5NT D-G59F D-H7C 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

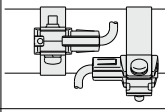
∗ ( ): Values for long stroke
Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted		
	1 pc.	2 pcs.	"n" pcs.
		Same surface	Same surface
D-M9□/M9□W/A9□	10	45 Note)	45 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-C7□/C80	10	50	50 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7□/H7□W/H7BA/H7NF	10	60	60 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-C73C/C80C/H7C	10	65	65 + 50 (n – 2) (n = 2, 3, 4, 5···)
D-B5□/B64/G5□/K59□	10	75	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-B59W	15	75	75 + 55 (n – 2) (n = 2, 3, 4, 5···)

Note) Mounting of auto switches

Auto switch model	With 2 auto switches Same surface
	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-M9□/M9□W	Less than 45 to 55 strokes
D-A93	Less than 45 to 50 strokes

Operating Range

(mm)

Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-M9□/M9□W	5	5.5	5	5.5
D-A9□	7	6	8	8
D-C7□/C80 D-C73C/C80C	8	10	9	10
D-B5□/B64	8	10	9	10
D-B59W	13	13	14	14
D-H7BA D-H7□/H7□W D-H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G5□/K59 D-G5□W/K59W D-G5NT/G5BA	4	4	4.5	5
D-G59F	5	5	5.5	6

∗ Since this is a guideline including hysteresis, not meant to be guaranteed (assuming approximately ±30% dispersion). There may be the case it will vary substantially depending on the ambient environment.

Auto Switch Mounting Bracket/Part No.

Auto switch model	Bore size (mm)			
	20	**25**	**32**	**40**
D-M9□(V)/M9□W(V) D-A9□(V)	Note 1) BMA3-020 (A set of a, b, c, d)	Note 1) BMA3-025 (A set of a, b, c, d)	Note 1) BMA3-032 (A set of a, b, c, d)	Note 1) BMA3-040 (A set of a, b, c, d)
D-M9□A(V) Note 2)	BMA3-020S (A set of b, c, e, f)	BMA3-025S (A set of b, c, e, f)	BMA3-032S (A set of b, c, e, f)	BMA3-040S (A set of b, c, e, f)
D-H7□/D-H7□W/D-H7NF D-C7□/C80 D-C73C/C80C	BMA2-020A (A set of c and d)	BMA2-025A (A set of c and d)	BMA2-032A (A set of c and d)	BMA2-040A (A set of c and d)
D-H7BA	BMA2-020AS (A set of c and f)	BMA2-025AS (A set of c and f)	BMA2-032AS (A set of c and f)	BMA2-040AS (A set of c and f)
D-B5□/B64/D-B59W D-G5□/K59/D-G5□W/K59W D-G5BA/G59F/D-G5NT	BA-01 (A set of c and d)	BA-02 (A set of c and d)	BA-32 (A set of c and d)	BA-04 (A set of c and d)

Note 1) 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) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

[Mounting screws set made of stainless steel]

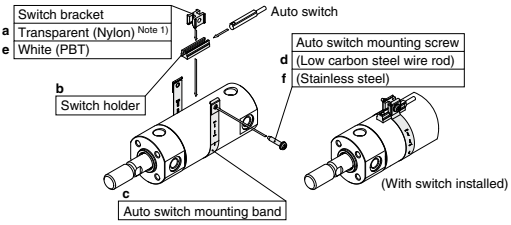
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

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

BBA4: For D-C7/C8/H7 types

Note) Refer to page 1439 for details of BBA3.

The D-H7BA/G5BA 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.



∗ Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. Refer to pages 1341 to 1435 for detailed specifications.

Type	Model	Electrical entry	Features
Reed	D-C73, C76, B53	Grommet (In-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B, G59, G5P, K59	Grommet (In-line)	—
	D-H7BW, H7NW, H7PW, G59W, G5PW, K59W		Diagnostic indication (2-color indicator)
	D-G5BA		Water resistant
	D-G5NT		With timer

∗ With pre-wired connector is also available with solid state auto switches. Refer to pages 1410 and 1411 for details.

∗ Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. Refer to page 1360 for details.

MLGC Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

Installations/Adjustment

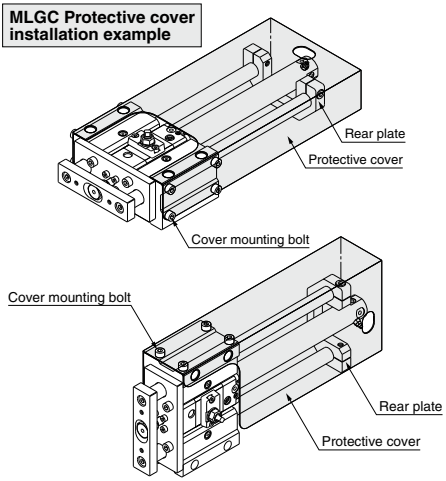
⚠ Warning

1. Installing a protective cover (In the case of rear plate)

During mounting, handling and operation, the rear plate makes reciprocating movements. Therefore, pay careful attention not to insert your hand, etc., between the cylinder and the rear plate.

When you are going to fit this product to the outside of your equipment, take preventative measures such as installing a protective cover.

MLGC Protective cover installation example



⚠ Caution

1. Use caution that no scratch or dent will be given to the slide part of the guide rod.

Because the outer circumference of the guide rod is manufactured with precise tolerances, even a slight deformation, scratch, or gouge can lead to faulty operation or reduced durability.

2. When fitting the guide body, use the guide body which has high flatness of the fitting surface.

If the guide rod has twisted, operation resistance will become abnormally higher and the bearing will wear at an early stage, thereby resulting in poor performance.

3. Be sure that the piston rods are retracted when mounting workpieces on the plate.

If workpieces are mounted on the plate when the piston rods are extended, it can lead to distortion of the guide part, resulting in a malfunction.

4. Mount in locations where maintenance will be easy.

Ensure enough clearance around the cylinder to allow for unobstructed maintenance and inspection work.

5. Do not adjust the rod stroke by moving the rear plates,

as doing so will cause the rear plates to come into direct contact with the guide body or the bracket mounting bolt. The resulting impact cannot be absorbed easily, the stroke position cannot be maintained, and faulty operation may result.

6. Lubrication

When you are going to oil the bearings, do so by using a nipple so that no foreign matter will be mixed.

For the grease, we recommended using high-quality lithium soap-based grease no. 2.

7. Mounting orientation

For ceiling mounting (the opening of the rear plate is downward.), the rear plate may interfere with the basic cylinder head end due to the deflection of guide rods. Please consult with SMC.

8. Fixing of base cylinder

When the product is mounted and operated in a location with low rigidity, bending moment may be applied to the base cylinder by vibrations generated at the stroke end, causing damage to the cylinder. In such cases, install a support bracket to suppress the vibration of the body of the base cylinder or reduce the piston speed until the body does not vibrate at the stroke end.