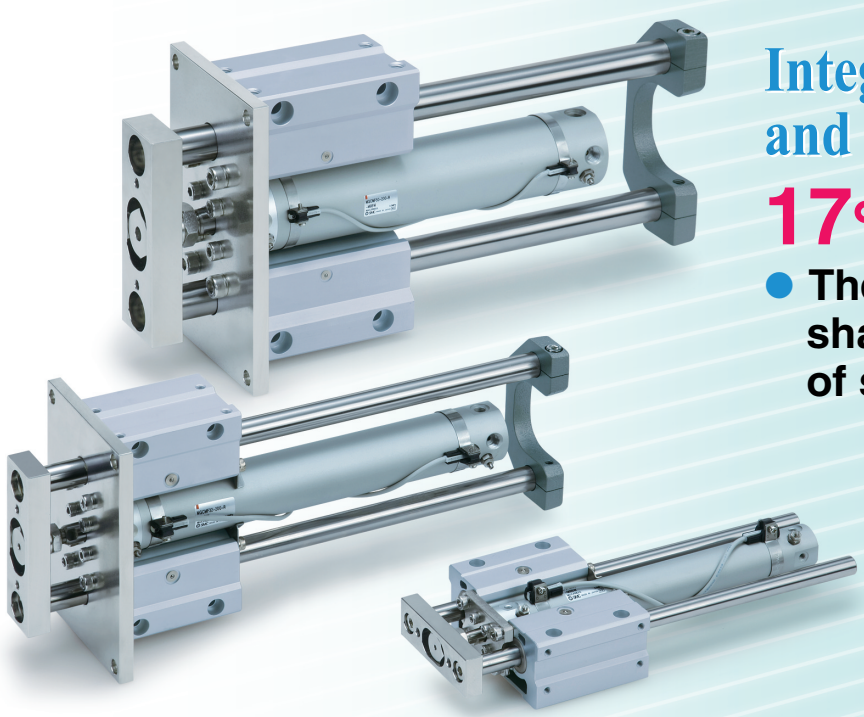
Guide Cylinders

New

Compact Type Series MGC



Integration of guide rods and a base cylinder

17% weight reduction

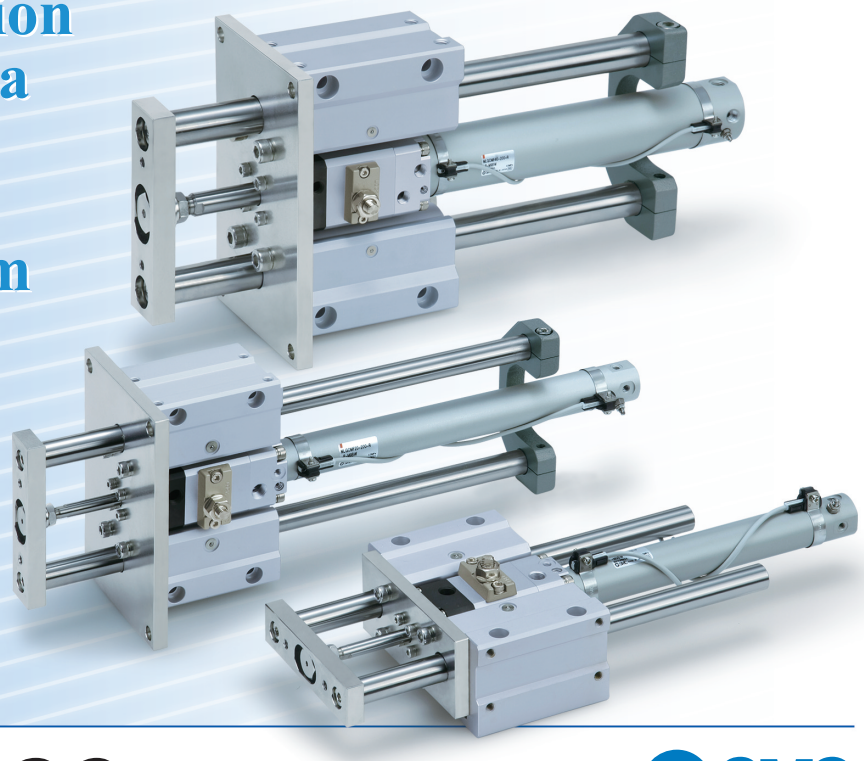
- The modified small flange shape facilitates mounting of speed controllers.

Built-in Fine Lock Cylinder Compact Type Series MLGC

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

9% weight reduction using a new guide body

- Locking mechanism can be selected from 3 types.



Series MGC/MLGC

SMC

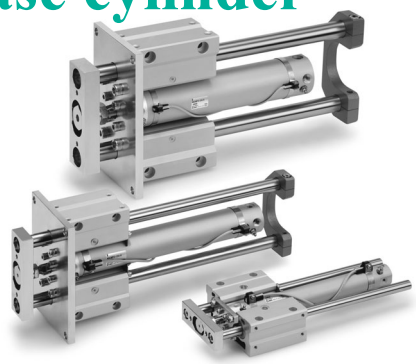
CAT.EUS20-209A-UK

Guide Cylinder/Compact Type

Series MGC

Integration of guide rods and a base cylinder

- **The modified small flange shape facilitates mounting of speed controllers.**
- **17% weight reduction**
  Achieved by making the front plate, small flange and guide body more compact.
- **The modified bracket shape allows the auto switch to be mounted in any position.**

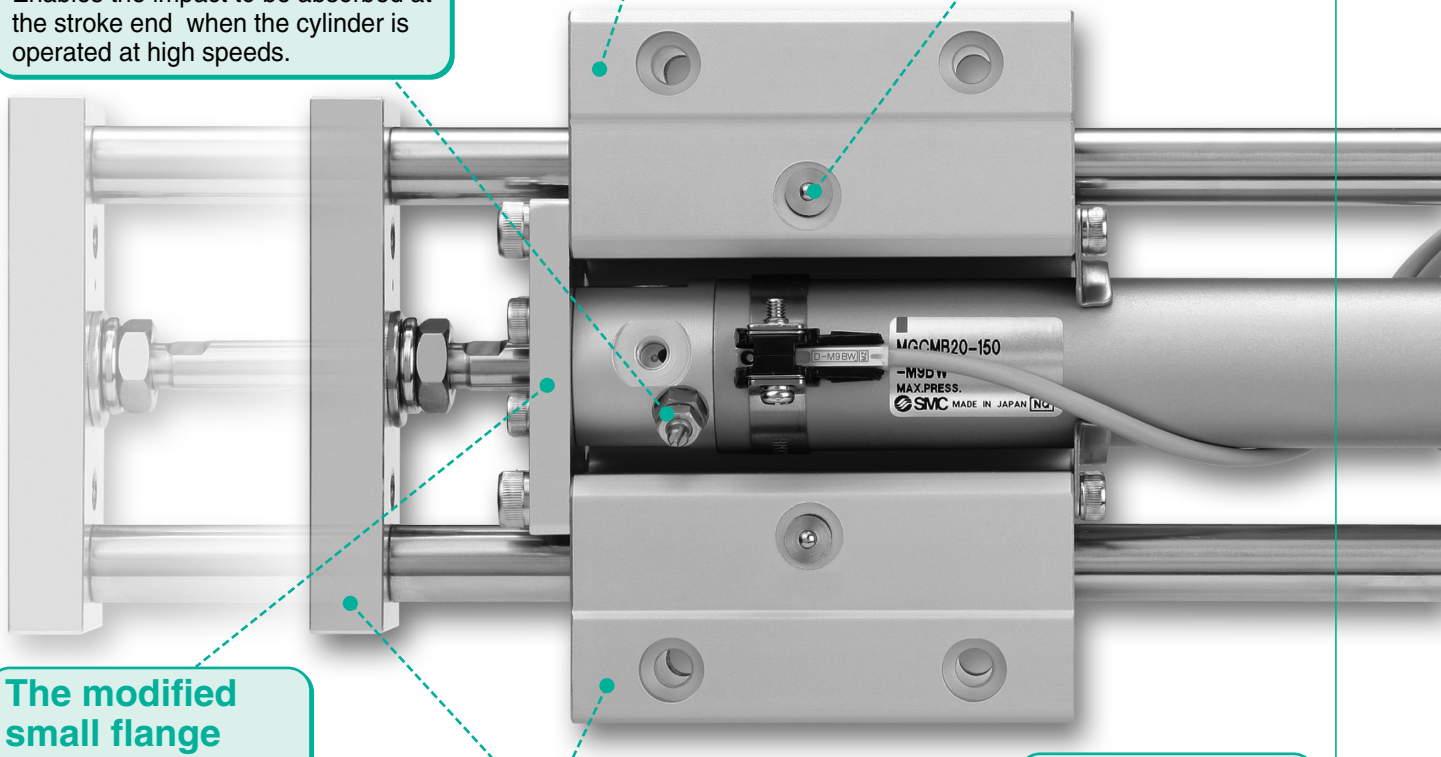


Lightweight
Weight 17% reduction
(In comparison with MGCLB20-100)

Space-saving
Length 20% shorter
Height 18% shorter
(In comparison with MGG□B32)

Grease nipple offers easy lubrication for bearings.

Air cushion is standard.
Enables the impact to be absorbed at the stroke end when the cylinder is operated at high speeds.



The modified small flange shape facilitates the mounting of fittings.

Compact front plate and guide body

Models without rear plate are available.

Variations

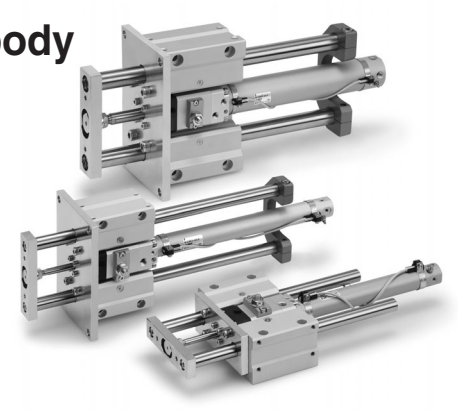
Bore size (mm)	Standard stroke (mm)						
	75	100	125	150	200	250	300
20	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●
32	●	●	●	●	●	●	●
40	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●

Long stroke

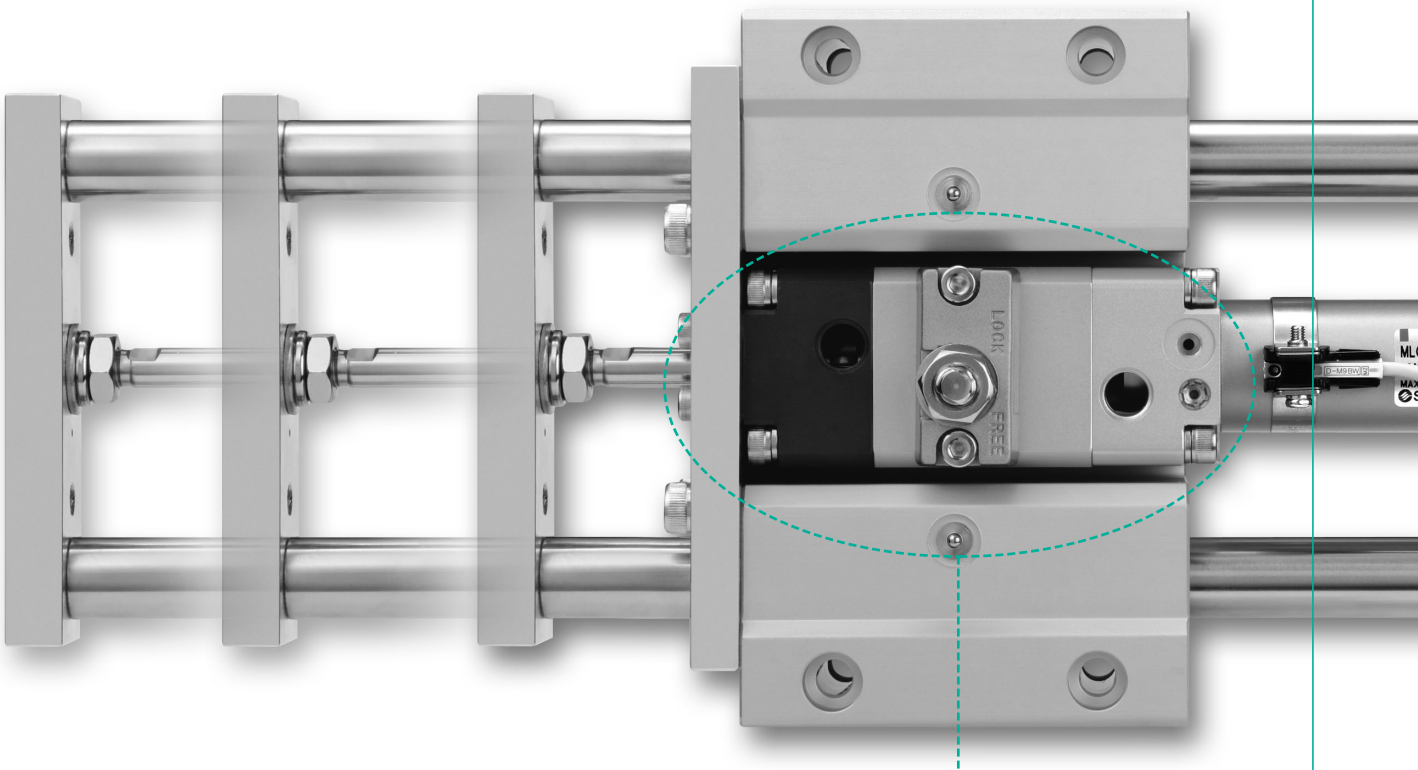
Bore size (mm)	Long stroke (mm)										
	250	300	350	400	450	500	600	700	800	900	1000
20	●	●	●	●	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●	●	●	●	●
32	●	●	●	●	●	●	●	●	●	●	●
40	●	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●	●	●	●	●

Guide Cylinder/
Built-in Fine Lock Cylinder Compact Type *Series MLGC*

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/Compact Type

Series MGC

ø20, ø25, ø32, ø40, ø50

How to Order

MGC L B 32 □ – 100 – R – M9BW □ – □

Guide Cylinder (Compact Type)

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
50	50 mm

Port thread type

—	M5 x 0.8
	Rc
TN	NPT
TF	G

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

Cylinder stroke (mm)
Refer to "Model/Stroke" in the next page.

Rear plate

—	Without rear plate
R	With rear plate

Auto switch

—	Without auto switch (Built-in magnet)

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

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Made to Order
Refer to the next page for details.

Applicable Auto Switches/Refer to Best Pneumatics for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
								Applicable bore size ø20, ø25	ø32	ø40, ø50						
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9N**	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9P**	●	●	●	○	—	○		
				2-wire		12 V		**M9B**	●	●	●	○	—	○	—	
		Connector						**H7C**	●	—	●	●	●	—		
	Diagnostic indication (2-colour indication)	Grommet		3-wire (NPN)		5 V, 12 V		**M9NW**	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PW**	●	●	●	○	—	○		
				2-wire		12 V		**M9BW**	●	●	●	○	—	○	—	
	Water resistant (2-colour indication)							**H7BA**	—	—	●	○	—	○		
	With diagnostic output (2-colour indication)			4-wire (NPN)		5 V, 12 V		**H7NF**	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96**	●	—	●	—	—	—	IC circuit	—
			None	2-wire	24 V	12 V	100 V	**A93**	●	—	●	—	—	—	—	Relay, PLC
			None				100 V or less	**A90**	●	—	●	—	—	—	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-colour indication)	Grommet	Yes			—	—	**(B59W)** **B59W**	●	—	●	—	—	—	—	

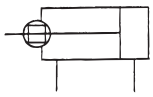
∗ Lead wire length symbols: 0.5 m ····· — (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ The D-A9□V/M9□V/M9□WV/M9□A(V) cannot be mounted.

∗ Since there are other applicable auto switches than listed, refer to page 14 for details.
∗ For details about auto switches with pre-wired connector, refer to Best Pneumatics.
∗ The D-A9□/M9□/M9□W are shipped together, (but not assembled).
(Only switch mounting brackets are 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.

JIS Symbol



Made to Order
(For details, refer to pages 27 to 39.)

Symbol	Specifications
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC4	With heavy duty scraper
-XC6□	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC11	Dual stroke cylinder/Single rod
-XC13	Auto switch rail mounting style
-XC22	Fluororubber seal
-XC35	With coil scraper
-XC37	Larger throttle diameter of connecting port
-XC56	With knock pin holes
-XC73	Built-in cylinder with lock (CDNG)
-XC74	With front plate for MGG
-XC78	Auto switch mounting special dimensions at stroke end
-XC79	Tapped hole, drilled hole, pin hole machined additionally
-X440	With piping ports for grease

Model/Specifications

Model/Stroke

Model (Bearing type)	Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
MGCM (Slide bearing) **MGCL (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
	50		350, 400, 450, 500, 600 700, 800, 900, 1000

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

Specifications

Model		MGC□□20	MGC□□25	MGC□□32	MGC□□40	MGC□□50
Base cylinder		CDG1BA Bore size Port thread type – Stroke Z– Auto switch				
Bore size (mm)		20	25	32	40	50
Action		Double acting				
Fluid		Air				
Proof pressure		1.5 MPa				
Maximum operating pressure		1.0 MPa				
Minimum operating pressure		0.15 MPa (Horizontal, No load)				
Ambient and fluid temperature		–10 to 60°C				
Piston speed		50 to 750 mm/s				
Cushion		Air cushion				
Base cylinder lubrication		Non-lube				
Stroke length tolerance		$^{+1.9}_{+0.2}$ mm				
Non-rotating accuracy∗1	**Slide bearing**	±0.07°	±0.06°	±0.06°	±0.05°	±0.04°
	Ball bushing bearing	±0.06°	±0.05°	±0.04°	±0.04°	±0.04°
Piping port size (Rc, NPT, G)∗2		M5 x 0.8		1/8		1/4

∗1 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.
∗2 For bore sizes 20 and 25, M5 x 0.8 is only available.

Theoretical Output

(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
50	**20**	OUT	1960	392	588	784	980	1180	1370	1570	1760	1960
		IN	1650	330	495	660	825	990	1160	1320	1490	1650

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

Weight

(kg)

Bore size (mm)		20	25	32	40	50
Basic weight	LB type (Ball bushing bearing/Basic)	1.04	1.55	2.07	3.32	6.45
	LF type (Ball bushing bearing/Front mounting flange)	1.7	2.35	3.02	5.02	8.58
	MB type (Slide bearing/Basic)	1.02	1.51	2.03	3.26	6.35
	MF type (Slide bearing/Front mounting flange)	1.69	2.32	2.98	4.96	8.48
Additional weight with rear plate		0.2	0.25	0.34	0.58	1.04
Additional weight per each 50 mm of stroke		0.14	0.17	0.25	0.4	0.61
Additional weight for long stroke		0.01	0.01	0.02	0.03	0.06
Additional weight with bracket		0.011	0.018	0.019	0.031	0.061

Calculation: (Example)

MGCLB32-500-R

(Ball bushing bearing/Basic, ø32/500 st., with rear plate, with bracket)

- Basic weight ····· 2.07 (LB type)
- Additional weight with rear plate ····· 0.34
- Additional stroke weight ····· 0.25/50 st
- Stroke ····· 500 st
- Additional weight for long stroke ····· 0.02
- Additional weight with bracket ····· 0.019

2.07 + 0.34 + 0.25 x 500/50 + 0.02 + 0.019 = 4.95 kg

Moving Parts Weight

(kg)

Bore size (mm)	20	25	32	40	50
Moving parts basic weight	0.34	0.53	0.69	1.2	2.45
Additional weight with rear plate	0.2	0.25	0.34	0.58	1.04
Additional weight per each 50 mm of stroke	0.11	0.14	0.2	0.33	0.51

Calculation: (Example)

MGCLB32-500-R

- Moving parts basic weight ····· 0.69
- Additional weight with rear plate ····· 0.34
- Additional stroke weight ····· 0.2/50 st.
- Stroke ····· 500 st.

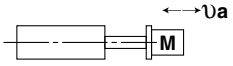
0.69 + 0.34 + 0.2 x 500/50 = 3.03 kg

Allowable Kinetic Energy by Air Cushion Mechanism

R: Rod end, H: Head end

Bore size (mm)	Effective cushion length (mm)	Allowable kinetic energy (J)
20	R: 7, H: 7.5	R: 0.35, H: 0.42
25	R: 7, H: 7.5	R: 0.56, H: 0.65
32	7.5	0.91
40	8.7	1.8
50	11.8	3.4

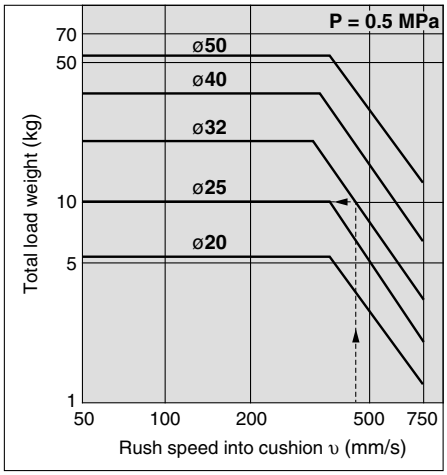
High kinetic energy generated by large loads and high speed operations can be absorbed by compressing air at the stroke end thus preventing shock and vibration being transmitted to the machine. The air cushion has not been designed to control the piston speed in the end regions of the stroke. The load kinetic energy can be obtained by the following equation:



$$Ek = \frac{M + m}{2} \upsilon^2 \qquad \upsilon = 1.4\,\upsilon a$$

Ek: Kinetic energy (J)
M: Weight of the driven object (kg)
m: Weight of moving parts of cylinder (kg)
υ: Maximum speed (m/s)
υa: Average speed (m/s)

Note) Set υa so that rush speed into cushion υ should not exceed 0.75 m/s.



Also, selection can be made by using the graph above.

Example)

Find the maximum load weight when using a cylinder with ø32, stroke 500 mm, with rear plate as a lifter at an average speed of υa 300 mm/s.

Rush speed into cushion υ is as follows:

υ = 1.4 x 300 = 420 mm/s.

Extend upward from 420 mm/s on the abscissa in the graph until crossing at the line of bore size 32. Extend leftward from the intersection to find the total load weight 10 kg.

Subtract the moving parts weight of 3.08 kg from this. (For moving parts, refer to "Moving Parts Weight".) 6.92 kg will be obtained, which is equal to the maximum load weight.

⚠ Caution

In a horizontal application, pay attention to that the load weight should not exceed the allowable end load given on pages 5 to 9.

Air-hydro

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

MGC**H** | Bearing type | Mounting | Bore size | Port thread type | – | Stroke | – | With/Without rear plate

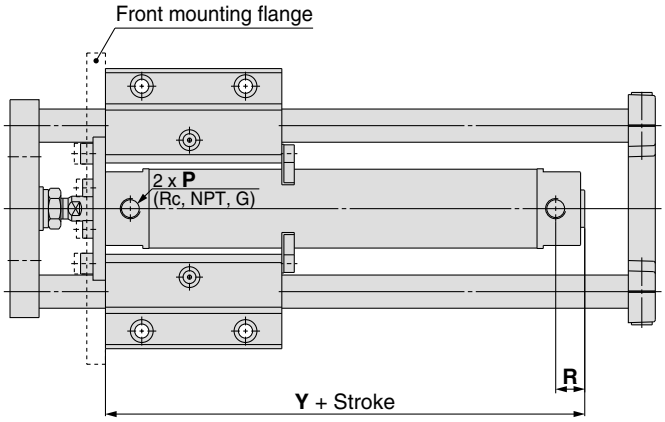
Air-hydro

Specifications

Bore size (mm)	**20, 25, 32, 40, 50**
Action	Double acting
Fluid	Turbine oil
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.18 MPa (Horizontal, No load)
Piston speed	15 to 300 mm/s
Cushion	None
Ambient and fluid temperature	+5 to 60°C
Mounting	Basic Front mounting flange

∗ For specifications other than the above, refer to page 2.
∗ Auto switch can be mounted.

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



(mm)

Bore size (mm)	**P**	**R**	**Y**
20	1/8	14	79
25	1/8	14	79
32	1/8	14	81
40	1/8	15	89
50	1/4	16	104

Copper- and Fluorine-free (For CRT manufacturing process)

To prevent the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

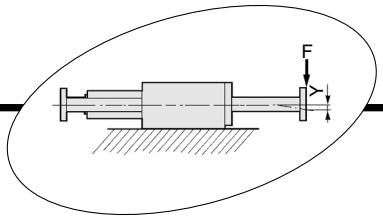
20-MGC | Bearing type | Mounting | Bore size | Port thread type | – | Stroke | – | With/Without rear plate

Copper- and fluorine-free

Specifications

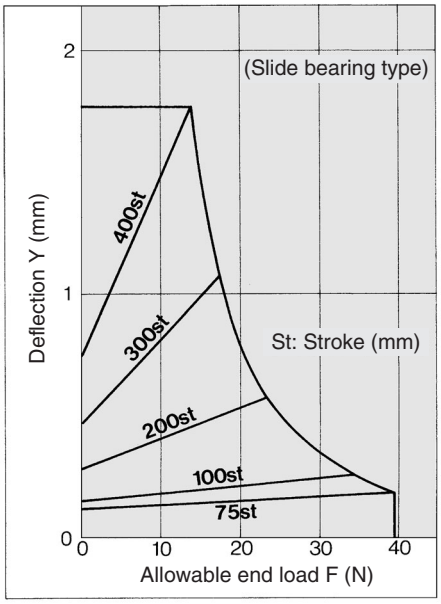
Bore size (mm)	**20, 25, 32, 40, 50**
Action	Double acting
Fluid	Air
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.15 MPa (Horizontal, No load)
Cushion	Air cushion
Mounting	Basic Front mounting flange

∗ For specifications other than the above, refer to page 2.
For dimensions, refer to pages 11 and 12.
∗ Auto switch can be mounted.

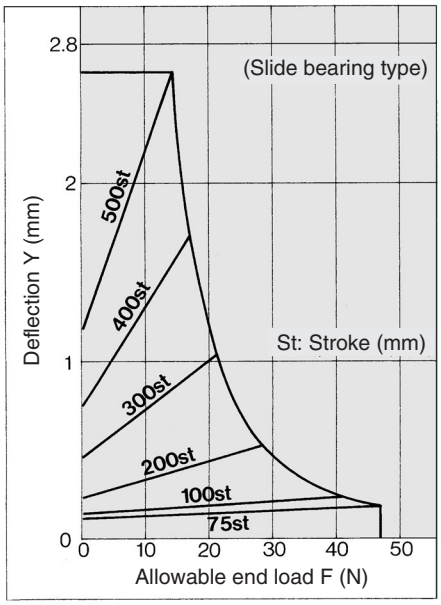


Slide Bearing
Allowable End Load and Deflection

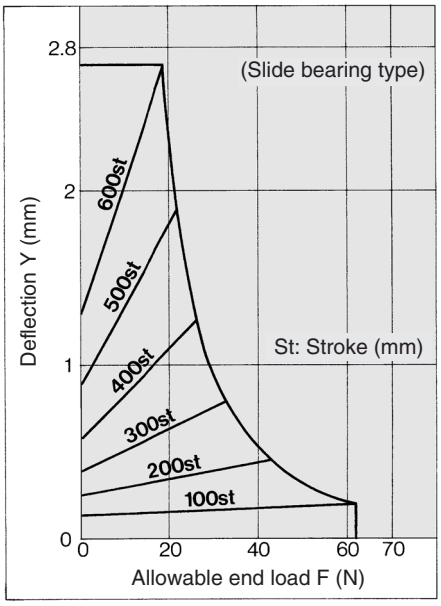
MGCM□20-Stroke-R



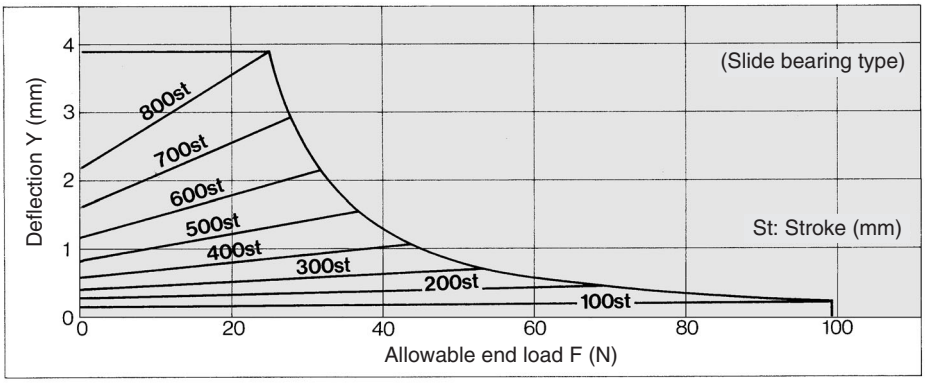
MGCM□25-Stroke-R



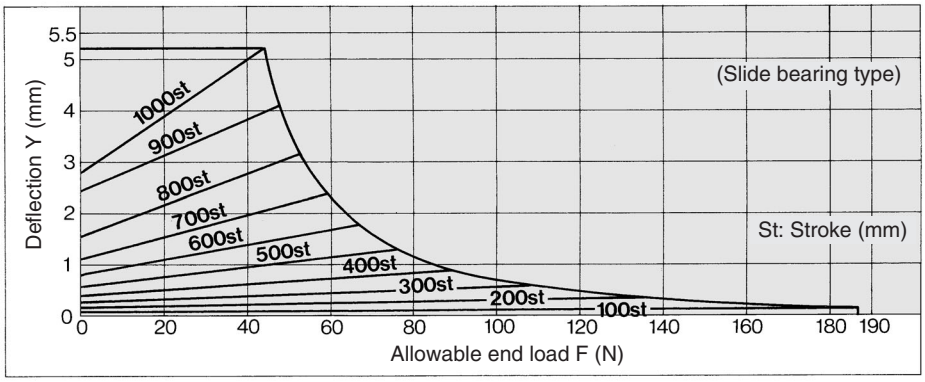
MGCM□32-Stroke-R

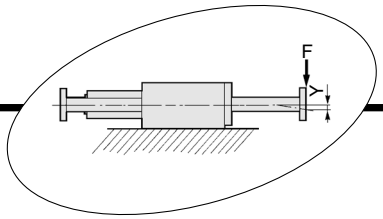


MGCM□40-Stroke-R



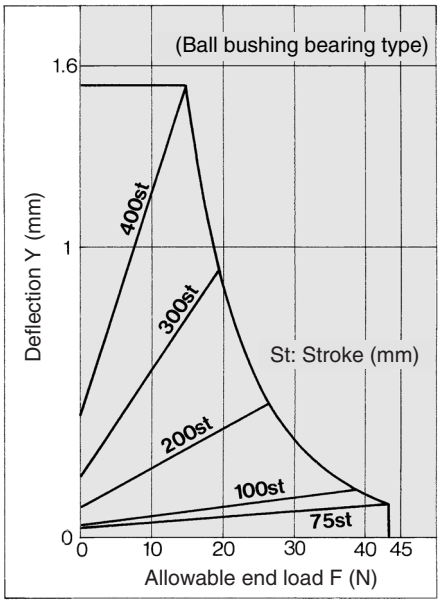
MGCM□50-Stroke-R



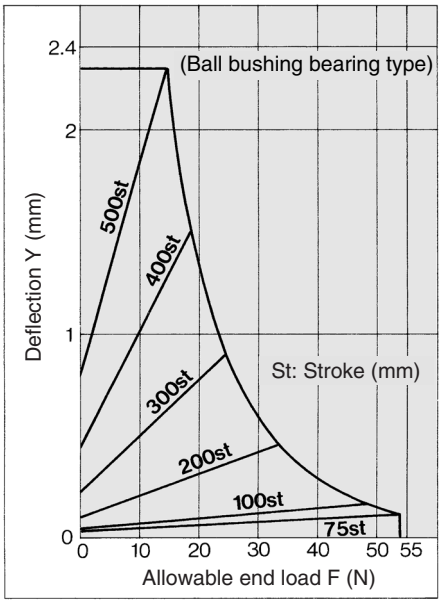


Ball Bushing Bearing
Allowable End Load and Deflection

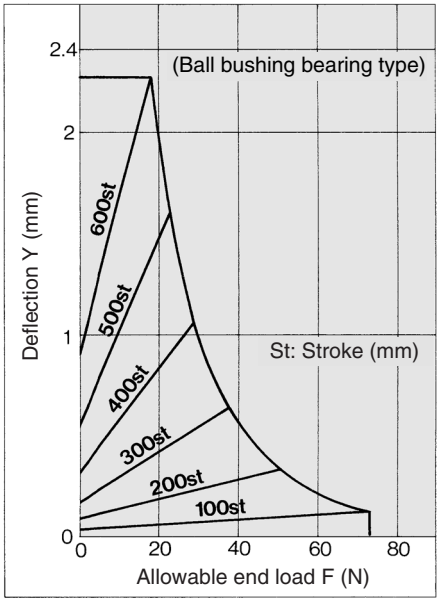
MGCL□20-Stroke-R



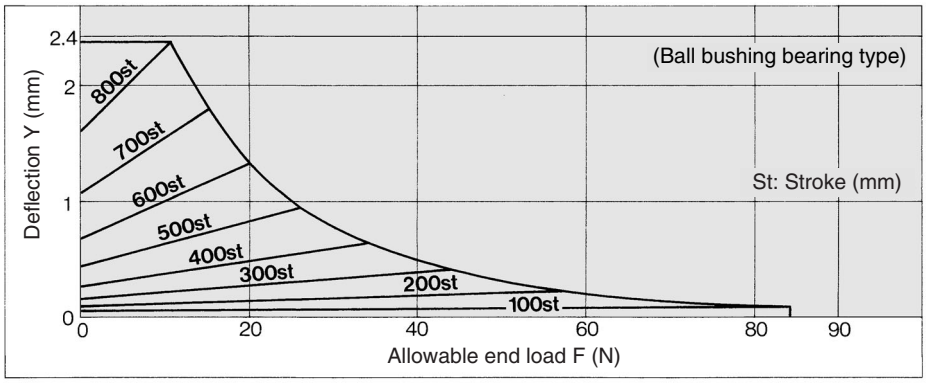
MGCL□25-Stroke-R



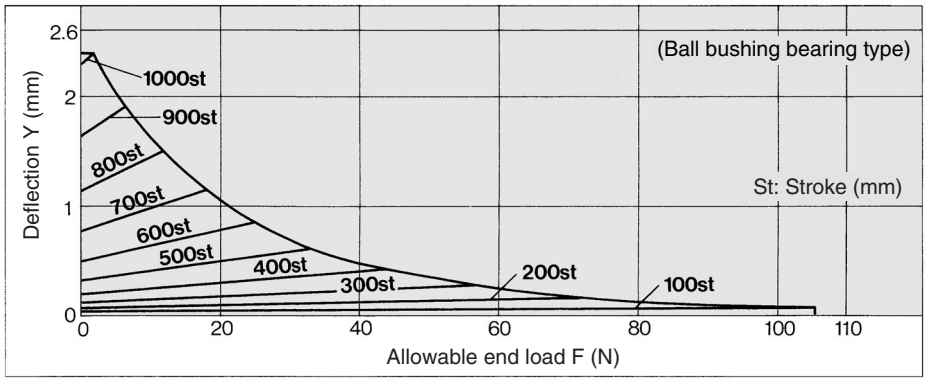
MGCL□32-Stroke-R

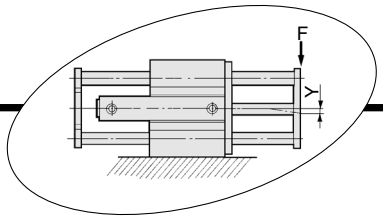


MGCL□40-Stroke-R



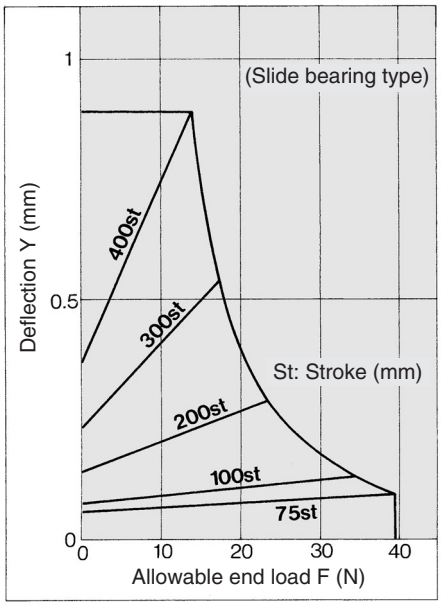
MGCL□50-Stroke-R



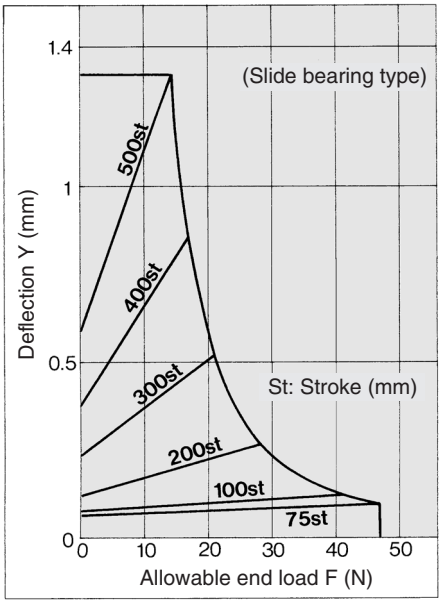


Slide Bearing
Allowable End Load and Deflection

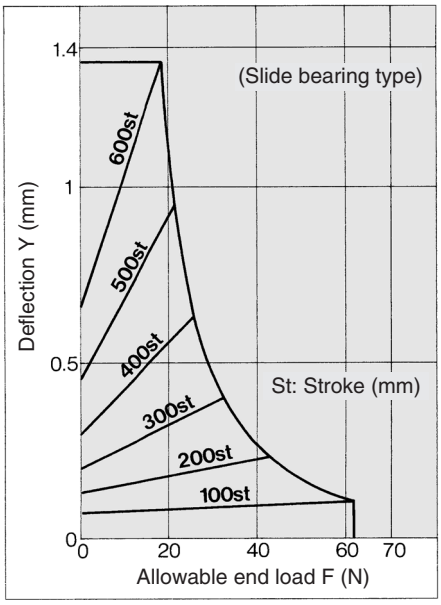
MGCM□20-Stroke-R



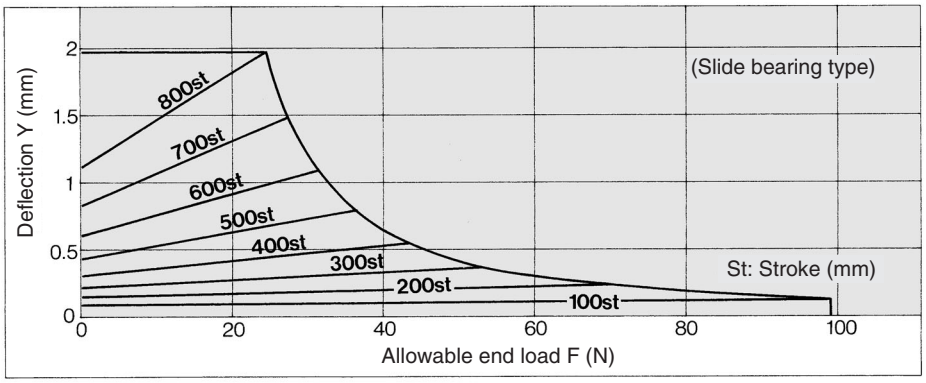
MGCM□25-Stroke-R



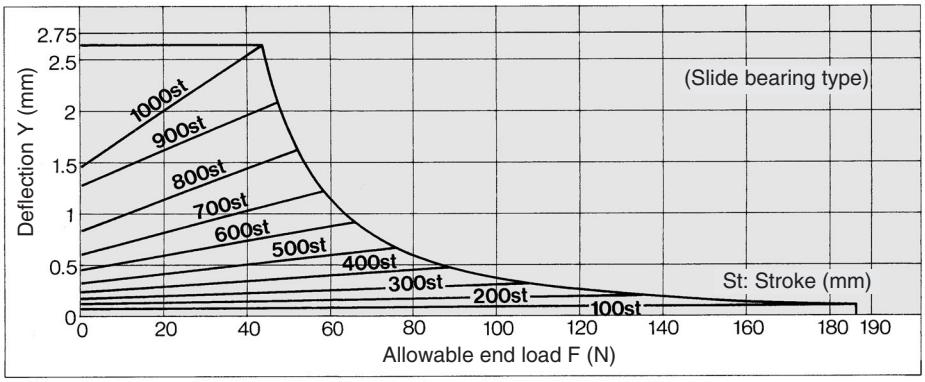
MGCM□32-Stroke-R

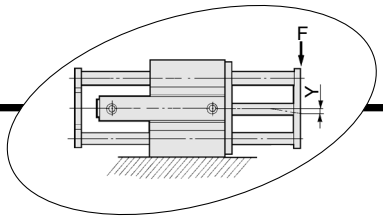


MGCM□40-Stroke-R



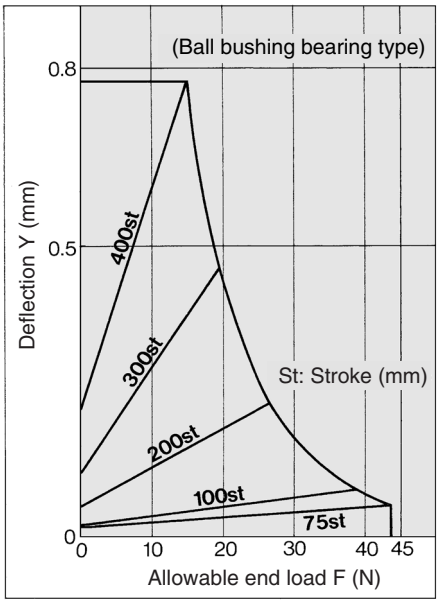
MGCM□50-Stroke-R



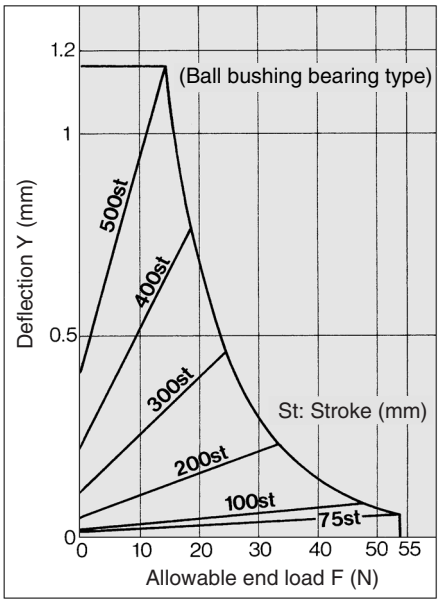


Ball Bushing Bearing
Allowable End Load and Deflection

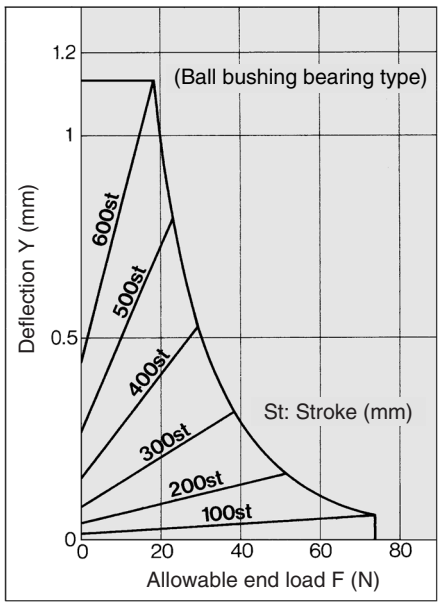
MGCL□20-Stroke-R



MGCL□25-Stroke-R



MGCL□32-Stroke-R



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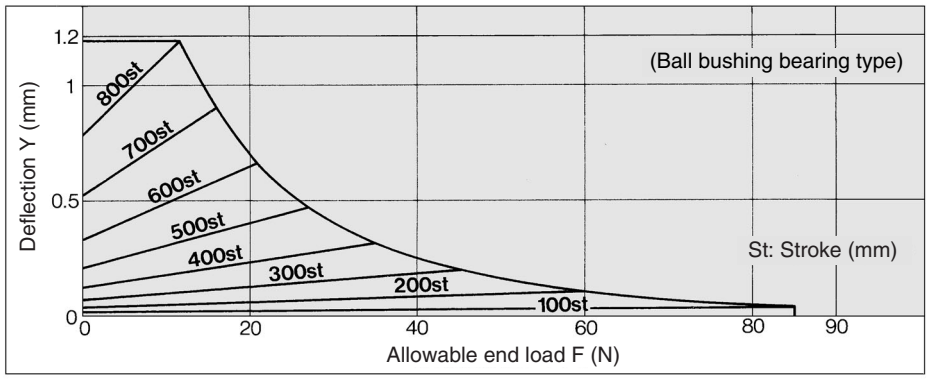
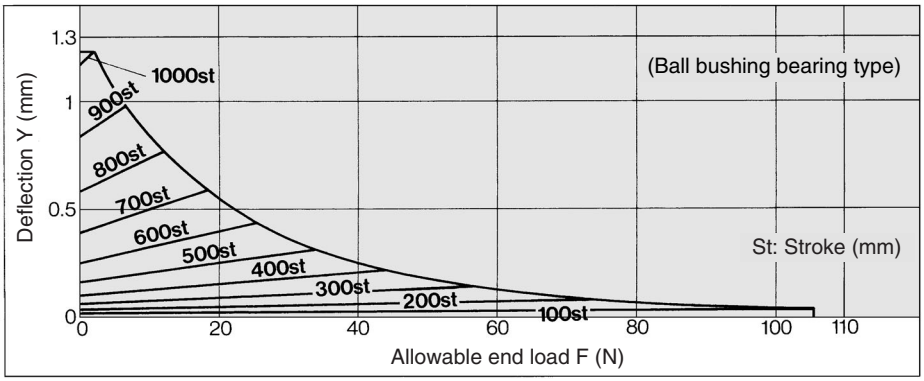
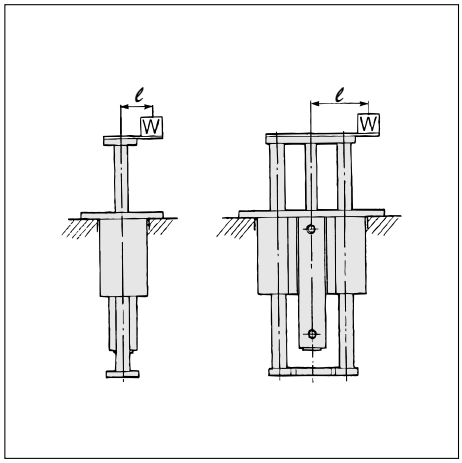


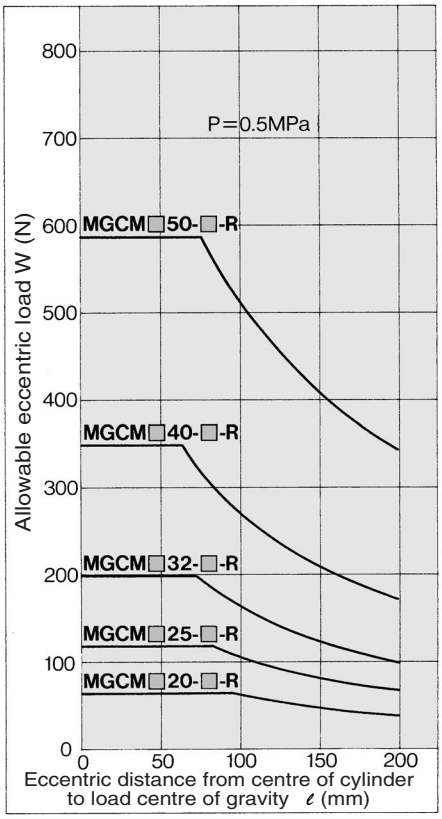
MGCL□50-Stroke-R



Allowable Eccentric Load

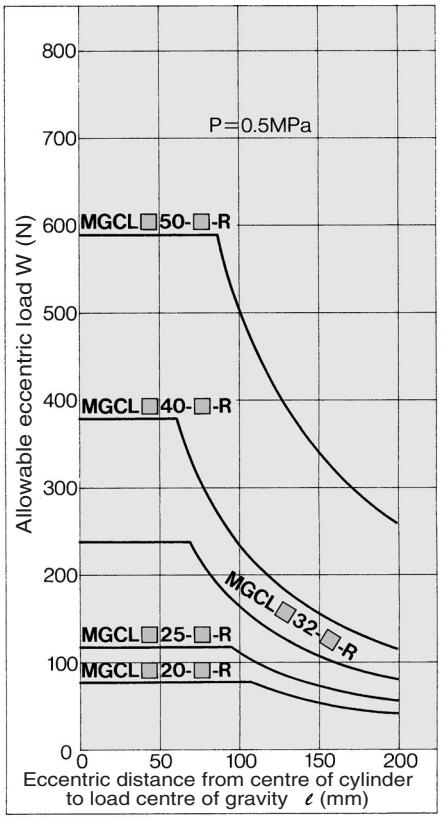


Slide Bearing/ MGCM□□-Stroke-R



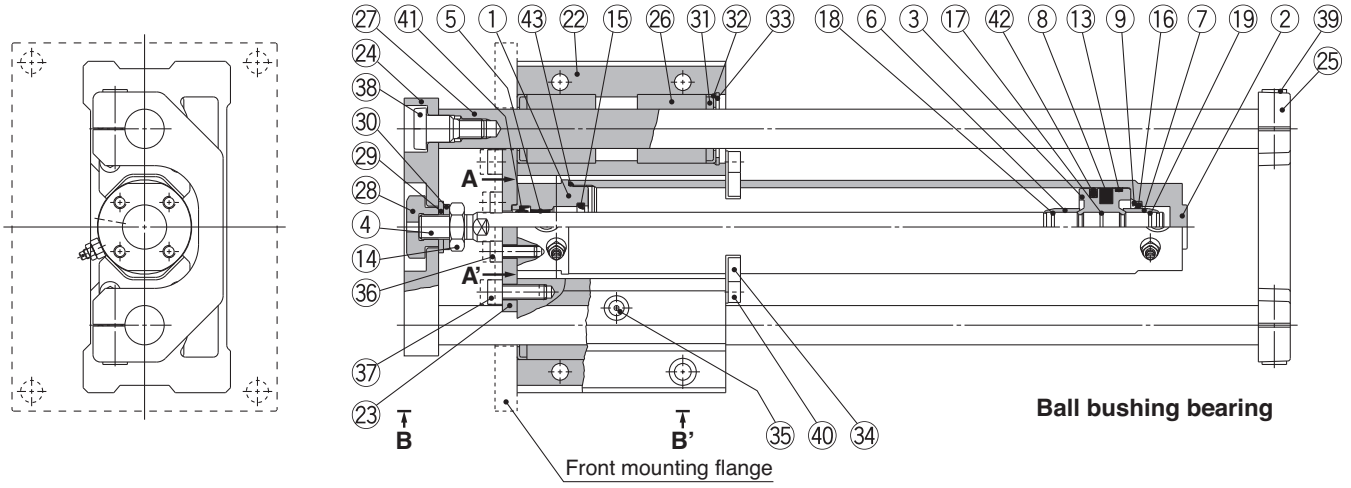
(Set the maximum allowable load so that it does not exceed the following percentages of the theoretical output: 40% for ø20, 50% for ø25 and ø32, 55% for ø40 and 60% or less for ø50, respectively.)

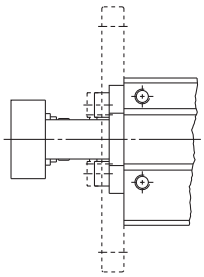
Ball Bushing Bearing/ MGCL□□-Stroke-R



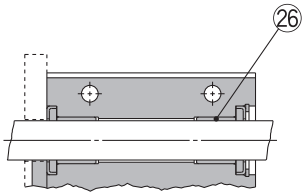
(Set the maximum allowable load so that it does not exceed the following percentages of the theoretical output: 40% for ø20, 50% for ø25 and ø32, 55% for ø40 and 60% or less for ø50, respectively.)

Construction: With Rear Plate

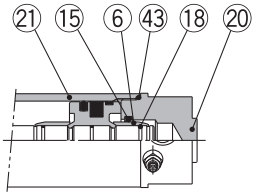




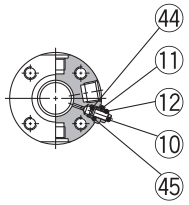
View B-B'



Slide bearing



Long stroke



View A-A'

Component Parts

No.	Description	Material	Note	
1	**Rod cover**	Aluminium alloy	Clear hard anodized	
2	**Tube cover**	Aluminium alloy	Clear hard anodized	
3	**Piston**	Aluminium alloy	Chromated	
4	**Piston rod**	Carbon steel	Hard chrome plated	ø20, ø25 are stainless steel.
5	**Bushing**	Bearing alloy		
6	**Cushion ring A**	Aluminium alloy	Anodized	
7	**Cushion ring B**	Aluminium alloy	Anodized Note 1)	
8	**Magnet**	—		
9	**Seal retainer**	Rolled steel	Nickel plated	Nothing for long stroke
10	**Cushion valve**	Rolled steel	Electroless nickel plated	
11	**Valve retainer**	Rolled steel	Electroless nickel plated	
12	**Lock nut**	Rolled steel	Nickel plated	
13	**Wear ring**	Resin		
14	**Rod end nut**	Rolled steel	Nickel plated	
15	**Cushion seal A**	Urethane		
16	**Cushion seal B**	Urethane	Note 2)	
17	**Piston gasket**	NBR		
18	**Cushion ring gasket A**	NBR		
19	**Cushion ring gasket B**	NBR	Common with cushion ring gasket A: Except standard ø20 and ø25	
20	**Head cover**	Aluminium alloy	Clear hard anodized	For long stroke
21	**Cylinder tube**	Aluminium alloy	Hard anodized	
22	**Guide body**	Aluminium alloy	Clear anodized	
23	**Small flange**	Rolled steel	Nickel plated	For basic
	Large flange			For front mounting flange
24	**Front plate**	Rolled steel	Nickel plated	
25	**Rear plate**	Cast iron	Platinum silver	
26	**Slide bearing**	Bearing alloy	For slide bearing	
	Ball bushing bearing	—	For ball bushing bearing	
27	**Guide rod**	Carbon steel	Hard chrome plated	For slide bearing
		High carbon chrome bearing steel	Quenched, hard chrome plated	For ball bushing bearing
28	**End bracket**	Carbon steel	Nickel plated	
29	**Washer**	Rolled steel	Nickel plated	
30	**Spring washer**	Steel wire	Nickel plated	

Note 1) Common with cushion ring A: Except standard ø20 and ø25
Note 2) Common with cushion seal A: Except standard ø20 and ø25
Note 3) ㉕, ㊴ are not required for without rear plate

Component Parts

No.	Description	Material	Note	
31	**Felt**	Felt		
32	**Holder**	Stainless steel		
33	**Type C retaining ring for hole**	Carbon tool steel	Nickel plated	
34	**Bracket**	Stainless steel		
35	**Nipple**	—	Nickel plated	
36	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For cylinder mounting
37	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For large/small flange mounting
38	**Guide bolt**	Chromium molybdenum steel	Nickel plated	For front plate mounting
39	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For rear plate mounting
40	**Hexagon socket head bolt**	Chromium molybdenum steel	Nickel plated	For bracket mounting
41	**Rod seal**	NBR		
42	**Piston seal**	NBR		
43	**Tube gasket**	NBR		
44	**Valve seal**	NBR		
45	**Valve retainer gasket**	NBR		

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
20	CG1N20Z-PS	Set of nos. above ㊶, ㊷, ㊸, ㊹, ㊺
25	CG1N25Z-PS	
32	CG1N32Z-PS	
40	CG1N40Z-PS	

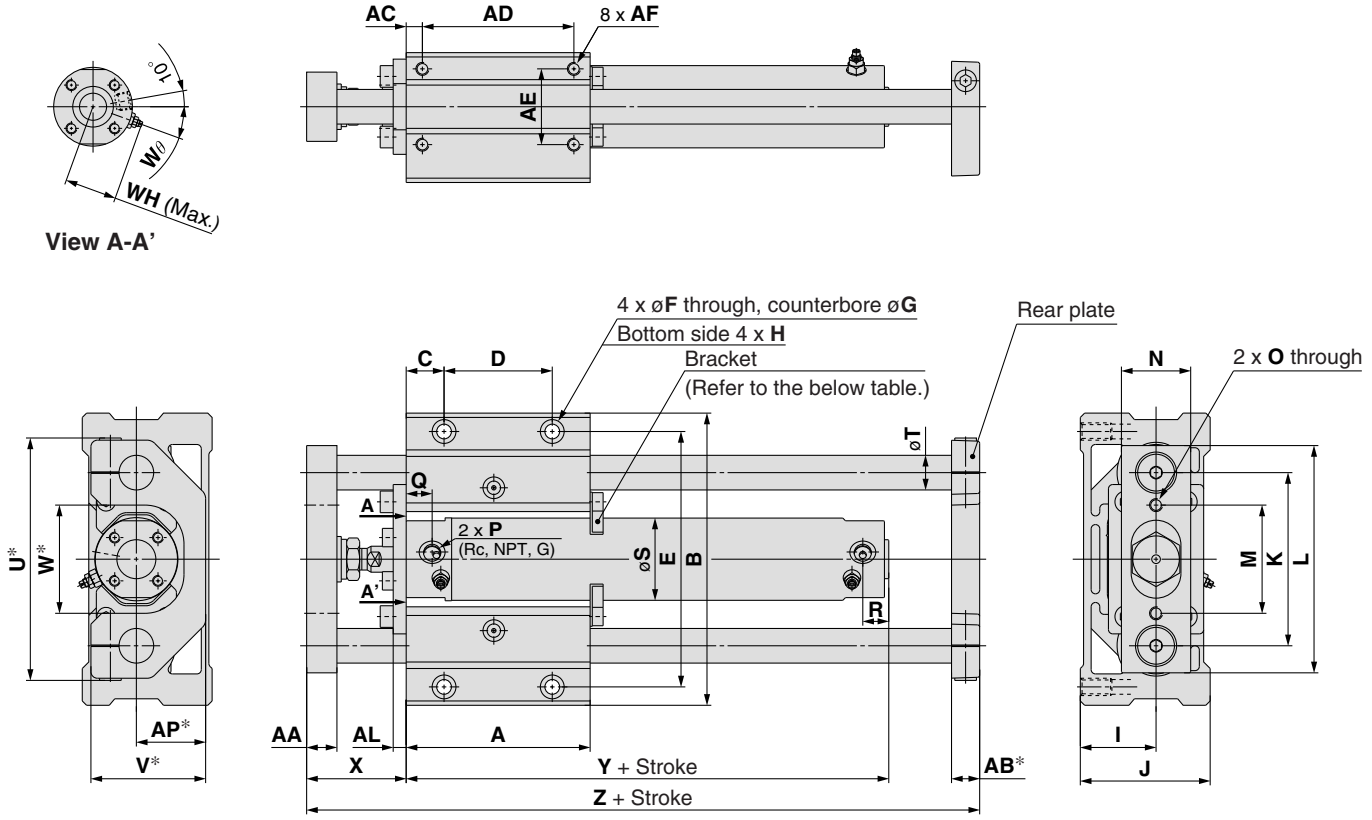
∗ Seal kit includes ㊶ to ㊺. Order the seal kit, based on each bore size.
∗ Seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g)

⚠Caution

When disassembling base cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the tube cover or the rod cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, 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. Please contact SMC when disassembly is required.)

Dimensions

Basic: With rear plate
MGC□B□□-□-R



(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB*	AC	AD	AE	AF	AL	AP*	B	C	D	E	F	G	H
20	75, 100, 125, 150, 200	75	11	13	6.5	62	25	M5 x 0.8 depth 10	6	22	106	15	45	90	5.4	9.5 depth 6	M6 x 1 depth 10
25	75, 100, 125 150, 200 250, 300	80	14	13	7.5	65	30	M6 x 1 depth 12	6	27	120	17.5	45	103	6.8	11 depth 8	M8 x 1.25 depth 14
32		85	14	13	7.5	70	35	M6 x 1 depth 12	6	32	135	17.5	50	118	6.8	11 depth 8	M8 x 1.25 depth 14
40		95	17	16	10	75	40	M8 x 1.25 depth 16	9	37	160	22.5	50	140	8.6	14 depth 10	M10 x 1.5 depth 18
50		130	23	19	10	110	45	M10 x 1.5 depth 20	9	42	194	25	80	170	10.5	17 depth 12	M12 x 1.75 depth 21

Bore size (mm)	I	J	K	L	M	N	O	P[Note 2)]	Q	R	S	T	U*	V*	W*	WH	Wθ	X	Y	Z
20	25	44	60	80	38	25	M6 x 1	M5 x 0.8	12	12	26	12	86	40	36	23	30°	39	71	140
25	30	52	70	95	46	32	M6 x 1	M5 x 0.8	12	12	31	13	98	47	44	25	30°	46	71	153
32	35	60	80	105	50	32	M6 x 1	1/8	12	12	38	16	112	53	50	28.5	25°	46	73	161
40	40	70	95	125	60	38	M8 x 1.25	1/8	13	12	47	20	132	63	60	33	20°	56	80	188
50	45	82.5	115	150	75	50	M8 x 1.25	1/4	14	14	58	25	162	73	70	40.5	20°	67	92	241

Without Rear Plate

Bore size (mm)	Z
20	119
25	131
32	136
40	156
50	202

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
20	250 to 400	14	79
25	350 to 500	14	79
32	350 to 600	14	81
40	350 to 800	15	89
50	350 to 1000	16	104

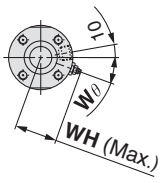
Bracket Mounting Stroke

Bore size (mm)	Bracket mounting stroke
20	100 st or more
25	125 st or more
32	150 st or more
40	200 st or more
50	250 st or more

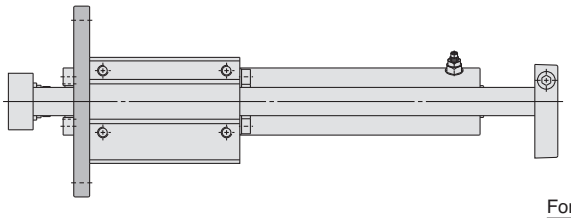
Note 1) Dimensions marked with "*" are not required for without rear plate.
Note 2) For bore size 20 and 25, M5 x 0.8 is only available. Rc, NPT and G ports are available for bore size 32 or greater.

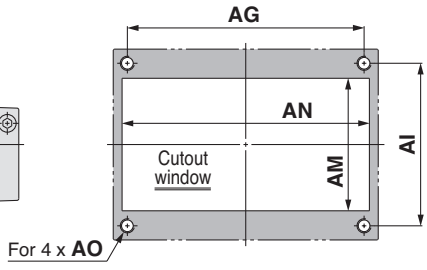
Dimensions

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

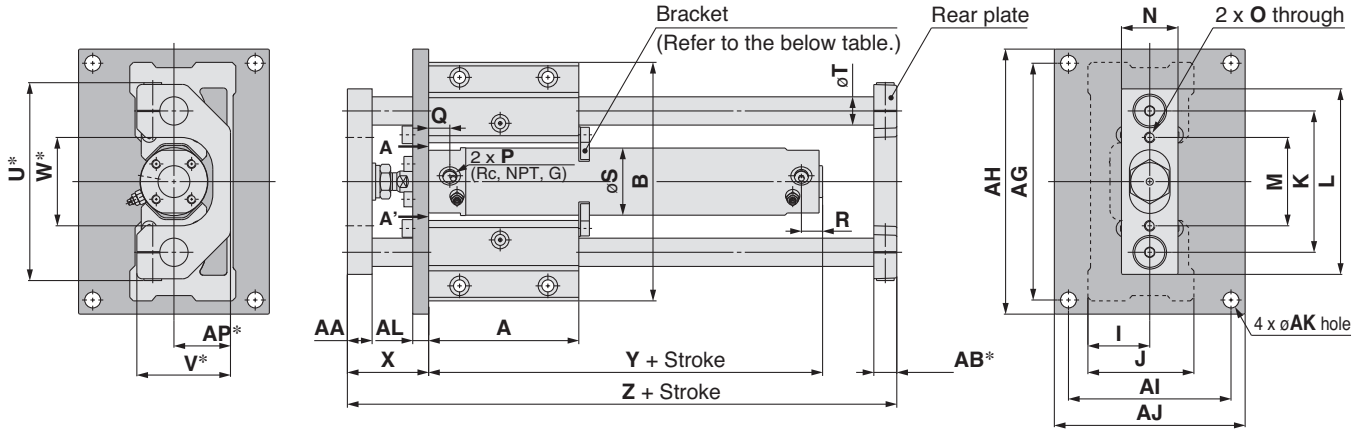


View A-A'





Mounting dimensions



(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB*	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP*	B	I	J	K	L	M	N
20	75, 100, 125, 150, 200	75	11	13	105	120	75	90	6.6	9	55	110	M6	22	106	25	44	60	80	38	25
25	75, 100, 125, 150 200, 250, 300	80	14	13	120	136	84	100	9	9	65	125	M8	27	120	30	52	70	95	46	32
32		85	14	13	134	150	92	108	9	9	75	140	M8	32	135	35	60	80	105	50	32
40		95	17	16	160	176	110	125	9	12	85	165	M8	37	160	40	70	95	125	60	38
50		130	23	19	190	210	115	135	11	12	95	200	M10	42	194	45	82.5	115	150	75	50

Bore size (mm)	O	P[Note 2)]	Q	R	*S*	T	U*	V*	W*	WH	Wθ	X	Y	Z
20	M6 x 1	M5 x 0.8	12	12	26	12	86	40	36	1.5	25°	39	71	140
25	M6 x 1	M5 x 0.8	12.5	12	31	13	98	47	44	1.5	25°	46	71	153
32	M6 x 1	1/8	12	12	38	16	112	53	50	1.5	25°	46	73	161
40	M8 x 1.25	1/8	13	12	47	20	132	63	60	1.5	20°	56	80	188
50	M8 x 1.25	1/4	14	14	58	25	162	73	70	3	20°	67	92	241

Without Rear Plate

Bore size (mm)	Z
20	119
25	131
32	136
40	156
50	202

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
20	250 to 400	14	79
25	350 to 500	14	79
32	350 to 600	14	81
40	350 to 800	15	89
50	350 to 1000	16	104

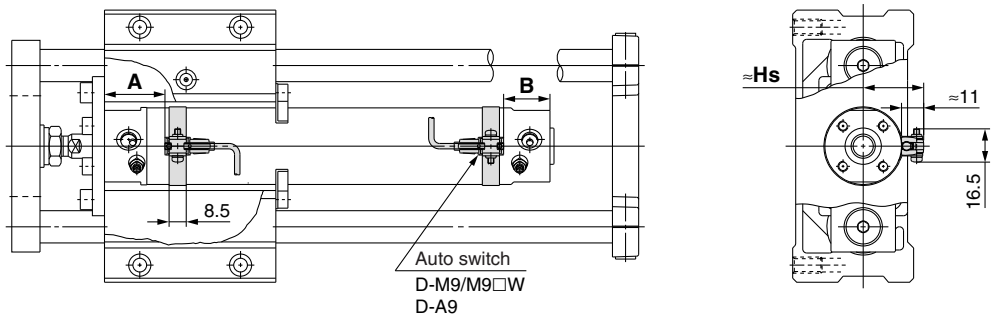
Bracket Mounting Stroke

Bore size (mm)	Bracket mounting stroke
20	100 st or more
25	125 st or more
32	150 st or more
40	200 st or more
50	250 st or more

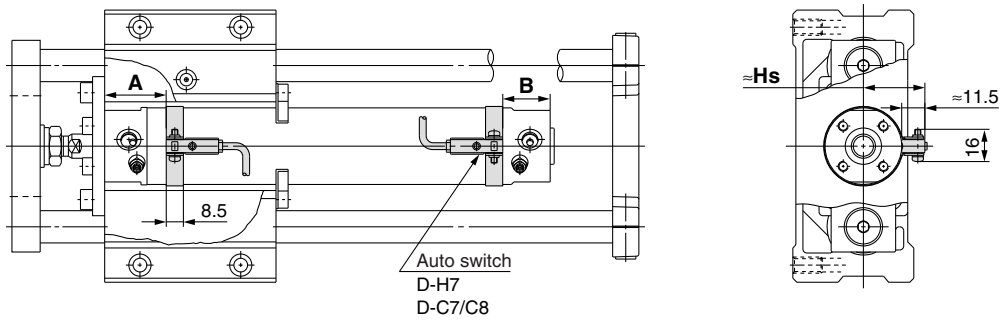
Note 1) Dimensions marked with "*" are not required for without rear plate.
Note 2) For bore size 20 and 25, M5 x 0.8 is only available. Rc, NPT and G ports are available for bore size 32 or greater.

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

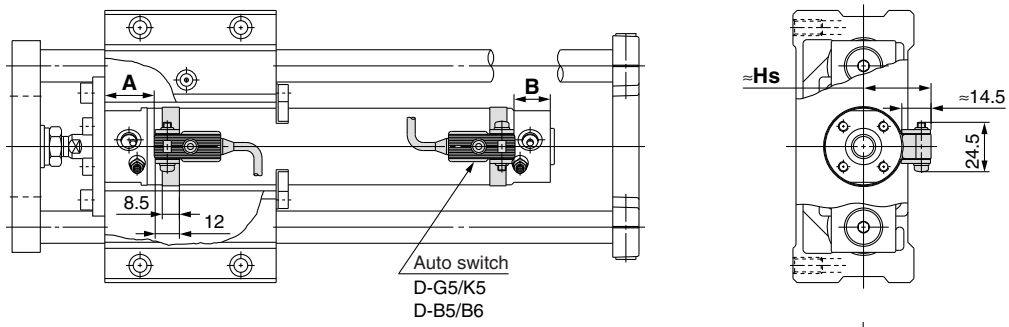
D-M9/M9□W
D-A9



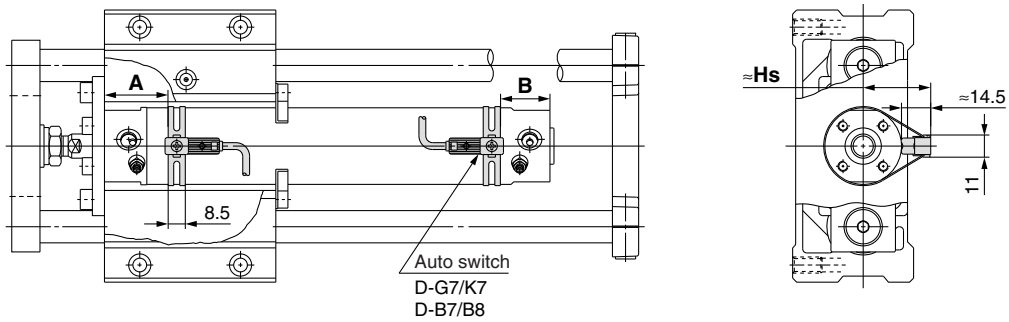
D-H7
D-C7, C8



D-G5, K5
D-B5, B6



D-G7, K7
D-B7, B8



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W		D-A9□		D-B7□/B80 D-B73C D-B80C D-G79/K79 D-K79C		D-C7□ D-C80 D-C73C D-C80C		D-B5□ D-B64		D-B59W		D-H7□W D-H7BAL D-H7□ D-H7C D-H7NF		D-G59F D-G5□W D-K59W D-G5BAL D-G5□ D-K59 D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	33	24 (32)	29	20 (28)	30.5	21.5 (29.5)	29.5	20.5 (28.5)	23.5	14.5 (22.5)	26.5	17.5 (25.5)	28.5	19.5 (27.5)	25	16 (24)
25	33	24 (32)	29	20 (28)	30.5	21.5 (29.5)	29.5	20.5 (28.5)	23.5	14.5 (22.5)	26.5	17.5 (25.5)	28.5	19.5 (27.5)	25	16 (24)
32	34	25 (33)	30	21 (29)	31.5	22.5 (30.5)	30.5	21.5 (29.5)	24.5	15.5 (23.5)	27.5	18.5 (26.5)	29.5	20.5 (28.5)	26	17 (25)
40	39	27 (36)	35	23 (32)	36.5	24.5 (33.5)	35.5	23.5 (32.5)	29.5	17.5 (26.5)	32	20.5 (29.5)	34.5	22.5 (31.5)	31	19 (28)
50	46	32 (36)	42	28 (40)	43.5	29.5 (41.5)	42.5	28.5 (40.5)	36.5	22.5 (34.5)	39.5	25.5 (37.5)	41.5	27.5 (39.5)	38	24 (36)

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W D-A9□	D-C7□/C80 D-H7□ D-H7□W D-H7NF D-H7BAL	D-C73C D-C80C	D-B7□/B80 D-B73C D-B80C D-G79/K79 D-K79C D-H7C D-G5NTL D-G5□/K59 D-G5□W D-K59W D-B5□/B64 D-B59W D-G5BAL D-G59F
	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5
25	26.5	27	29.5	30
32	30	30.5	33	33.5
40	34.5	35	37.5	38
50	40	40.5	43	43.5

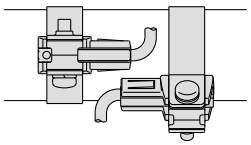
∗ ( ): Values for long stroke, double rod
Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

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)
D-C7□/C80	10	50	50 + 45 (n-2)
D-H7□/H7□W/H7BAL/H7NF	10	60	60 + 45 (n-2)
D-C73C/C80C/H7C	10	65	65 + 50 (n-2)
D-B5□/B64/G5□/K59□	10	75	75 + 55 (n-2)
D-B59W	15		
D-B7□/B80/G79/K79	10	45	50 + 45 (n-2)

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 (mm)				
	20	**25**	**32**	**40**	**50**
D-M9□/M9□W	5	5.5	5	5.5	6.5
D-A9□	7	6	8	8	8
D-B7□/B80 **D-B73C/B80C**	8	10	9	10	10
D-C7□/C80 **D-C73C/C80C**	8	10	9	10	10
D-B5□/B64	8	10	9	10	10
D-B59W	13	13	14	14	14
D-G79/K79/K79C	8	10	9	10	10
D-H7□/H7□W **D-H7BAL/H7NF**	4	4	4.5	5	6
D-H7C	7	8.5	9	10	9.5
D-G5□/K59 **D-G5□W/K59W** **D-G5NTL/G5BAL**	4	4	4.5	5	6
D-G59F	5	5	5.5	6	7
D-G5NBL	35	40	40	45	45

∗ 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.

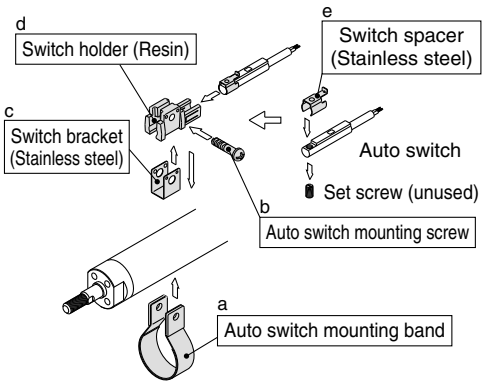
Auto Switch Mounting Bracket/Part No.

Auto switch model	Bore size (mm)				
	ø20	**ø25**	**ø32**	**ø40**	**ø50**
D-M9□ **D-M9□W** **D-A9□**	Note) ①BMA2-020 ②BJ3-1	Note) ①BMA2-025 ②BJ3-1	Note) ①BMA2-032 ②BJ3-1	Note) ①BMA2-040 ②BJ3-1	Note) ①BMA2-050 ②BJ3-1
D-C7□/C80 **D-C73C/C80C** **D-H7□/H7C** **D-H7□W** **D-H7BAL/H7NF**	BMA2-020	BMA2-025	BMA2-032	BMA2-040	BMA2-050
D-B5□/B64/B59W **D-G5□/K59** **D-G5□W/K59W** **D-G5BAL/G59F** **D-G5NTL/G5NBL**	BA-01	BA-02	BA-32	BA-04	BA-05
D-B7□/B80 **D-B73C/B80C** **D-G79/K79/K79C**	BM1-01	BM1-02	BM1-32	BM1-04	BM1-05

Note) Two types of the auto switch mounting brackets are used as a set.

[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/C8/H7 types
Note) Refer to Best Pneumatics for details of BBA3 and BBA4.

The D-H7BAL/G5BAL 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.



1. BMA2-□□□ is a set of a and b in the figures.
2. BJ3-1 is a set of c, d and e in the figures.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.
Refer to pages 1719 to 1827 of Best Pneumatics No. 3 for detailed specifications.
(Consult with SMC for the D-B7□/B80, D-B73C/B80C, D-G79/K79, D-K79C.)

Type	Model	Electrical entry	Features
Reed	D-C73, C76, B53, B73, B76	Grommet (In-line)	—
	D-C80, B80		Without indicator light
	D-B73C	Connector (In-line)	—
	D-B80C		Without indicator light
Solid state	D-H7A1, H7A2, H7B, G59, G5P, K59, G79, K79	Grommet (In-line)	—
	D-K79C	Connector (In-line)	—
	D-H7BW, H7NW, H7PW, G59W, G5PW, K59W	Grommet (In-line)	Diagnostic indication (2-colour)
	D-G5NTL		With timer

∗ With pre-wired connector is also available with solid state auto switches. Refer to Best Pneumatics for details.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. Refer to Best Pneumatics for details.
∗ Wide range detection solid state auto switches (D-G5NBL) are also available. Refer to Best Pneumatics for details.

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

How to Order

MLGC L B 32 ☐ – 100 – R – E – M9BW ☐ – ☐

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

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

Cylinder stroke (mm)
Refer to "Model/Stroke" in the next page.

Port thread type

—	M5 x 0.8
	Rc
TN	NPT

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

Rear plate

—	Without rear plate
R	With rear plate

Locking method

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

Auto switch

—	Without auto switch (Built-in magnet)

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

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Made to Order
Refer to the next page for details.

Applicable Auto Switches/Refer to Best Pneumatics for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Applicable bore size ø20, ø25	ø32	ø40	Lead wire length (m) 0.5 (—)	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	—	**M9N**			●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			**M9P**			●	●	●	○	—	○		
				2-wire	12 V		**M9B**			●	●	●	○	—	○	—	
		Connector					**H7C**			●	—	●	●	●	—		
	Diagnostic indication (2-colour indication)	Grommet		3-wire (NPN)	5 V, 12 V		**M9NW**			●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			**M9PW**			●	●	●	○	—	○		
				2-wire	12 V		**M9BW**			●	●	●	○	—	○	—	
	Water resistant (2-colour indication)						**H7BA**			—	—	●	○	—	○		
	With diagnostic output (2-colour indication)			4-wire (NPN)	5 V, 12 V		**H7NF**			●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96**		●	—	●	—	—	—	IC circuit	—
			None	2-wire	24 V	12 V	100 V	**A93**		●	—	●	—	—	—	—	Relay, PLC
			Yes				100 V or less	**A90**		●	—	●	—	—	—	IC circuit	
			None				100 V, 200 V	**(B54)**	**B54**	●	—	●	●	—	—	—	
			Yes				200 V or less	**(B64)**	**B64**	●	—	●	—	—	—		
		Connector	None				—	**C73C**		●	—	●	●	●	—		
			Yes				24 V or less	**C80C**		●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-colour indication)	Grommet	None				—	—		**(B59W)**	**B59W**	●	—	●	—	—	—	—	

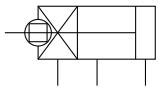
∗ Lead wire length symbols: 0.5 m ····· — (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ The D-A9□V/M9□V/M9□WV/D-M9□A(V) cannot be mounted.

∗ Since there are other applicable auto switches than listed, refer to page 22 for details.
∗ For details about auto switches with pre-wired connector, refer to Best Pneumatics.
∗ The D-A9□/M9□/M9□W 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.

JIS Symbol



Made to Order
(For details, refer to pages 27 to 28.)

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 (mm²)	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 (mm²)

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

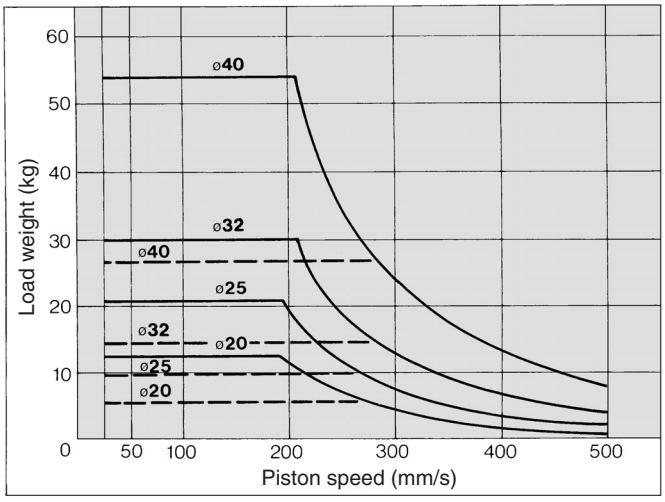
In terms of specific load conditions, the allowable kinetic energy indicated in the table above is equivalent to a 50% load ratio at 0.5 MPa, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, calculations are unnecessary.

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 weight (kg)
(Load weight + Moving parts weight)
υ: Piston speed (m/s) (Average speed x 1.2)

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 1.2 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

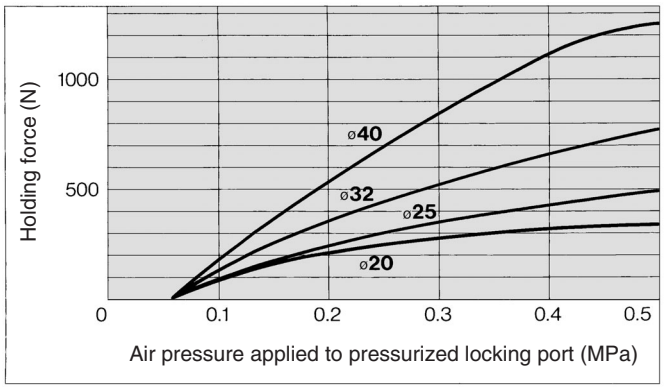
(kg)

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

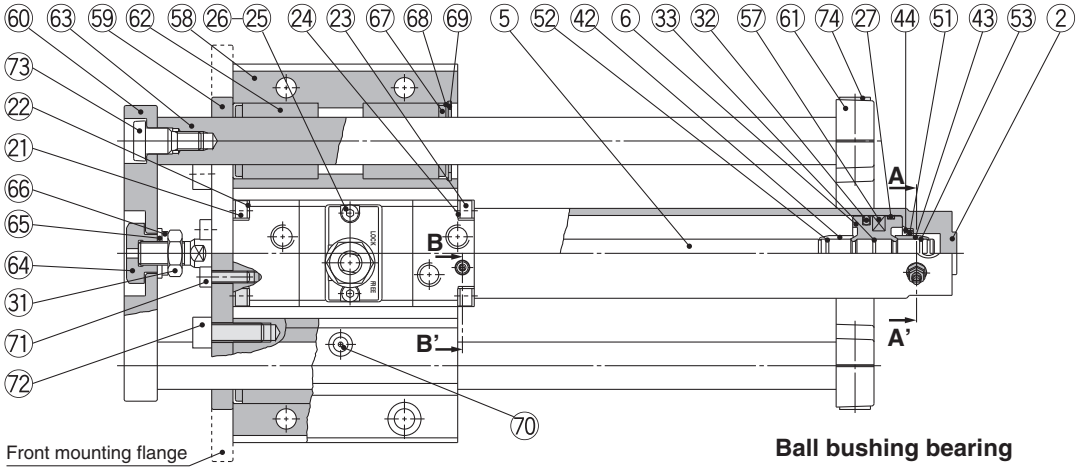
Condition/ Load: 25% of thrust force at 0.5 MPa
Solenoid valve: mounted to the lock port

⚠ Caution

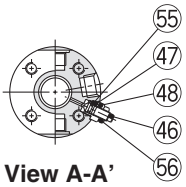
Recommended Pneumatic Circuit/Caution on Handling

For detailed specifications about the fine lock cylinder CLG1 series, refer to Best Pneumatics.

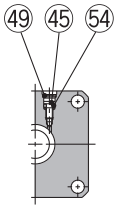
Construction: With Rear Plate



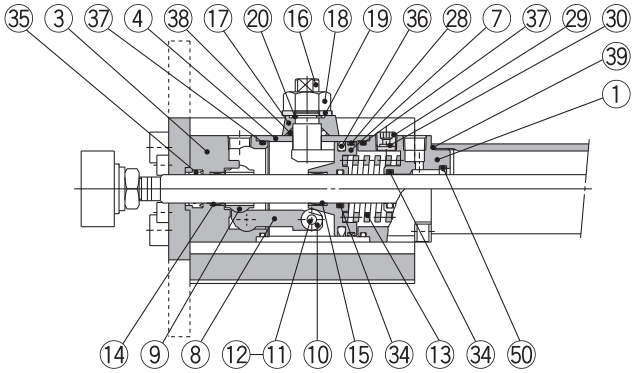
Ball bushing bearing

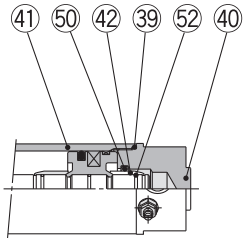


View A-A'

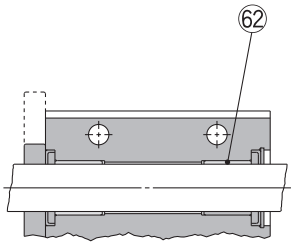


View B-B'





Long stroke



Slide bearing

Component Parts

No.	Description	Material	Note	
1	Rod cover	Aluminium alloy	Clear hard anodized	
2	Tube cover	Aluminium alloy	Hard anodized	
3	Cover	Carbon steel	Nitrided	
4	Intermediate cover	Aluminium alloy	Clear hard anodized	
5	Piston rod	Carbon steel	Hard chrome plated	ø20, ø25 are stainless steel.
6	Piston	Aluminium 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	Oil-impregnated sintered alloy		
15	Bushing	Oil-impregnated sintered 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	For spring locking
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		

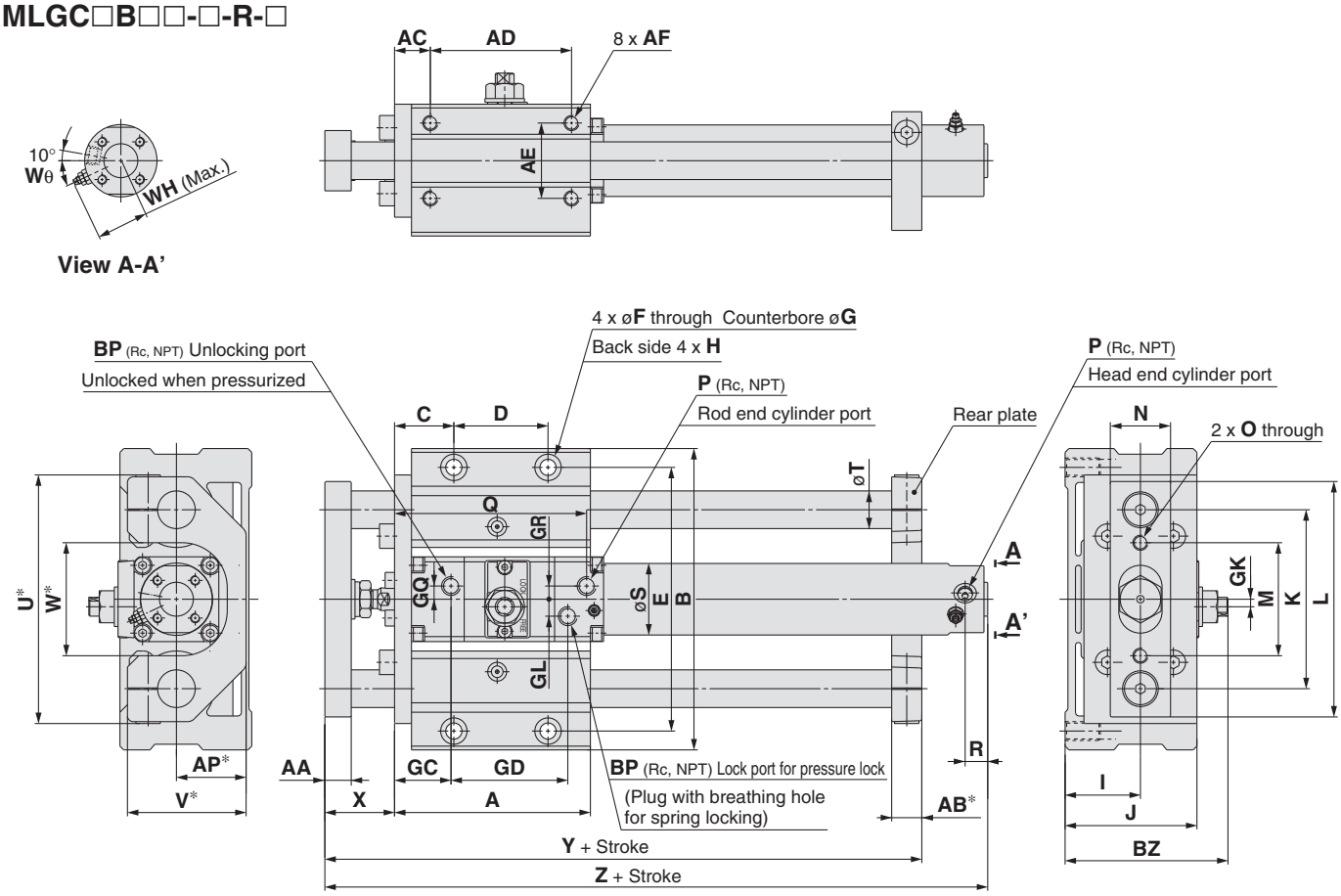
Component Parts

No.	Description	Material	Note	
39	Cylinder tube gasket	NBR		
40	Head cover	Aluminium alloy	Clear hard anodized	
41	Cylinder tube	Aluminium alloy	Hard anodized	
42	Cushion valve A	Aluminium alloy	Anodized	
43	Cushion valve B	Aluminium alloy	Anodized	
44	Seal retainer	Rolled steel	Zinc chromated	
45	Cushion ring A	Chromium molybdenum steel	Electroless nickel plated	
46	Cushion ring 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	Aluminium 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	Nickel plated	
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

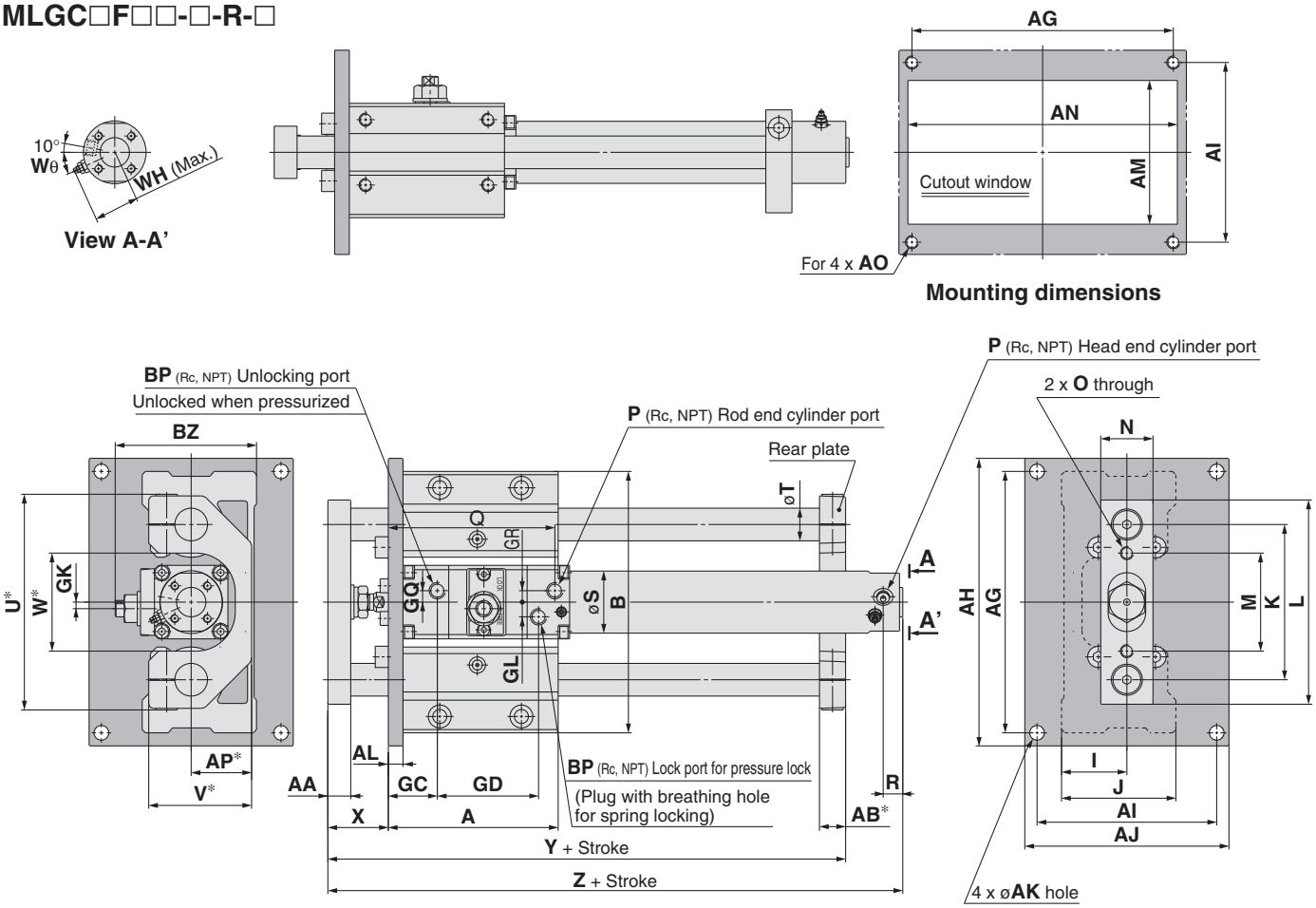
Long Stroke

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

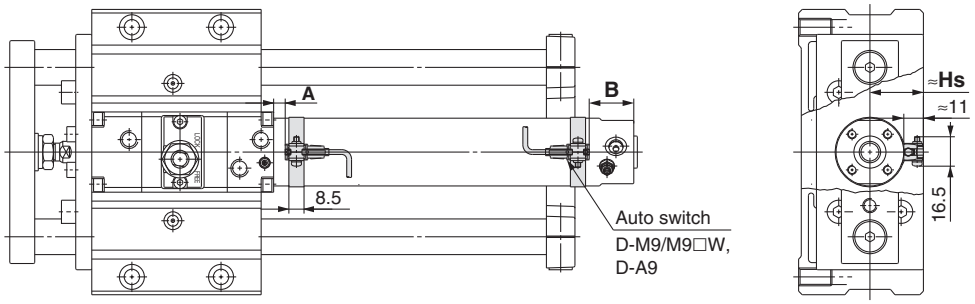
Long Stroke

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

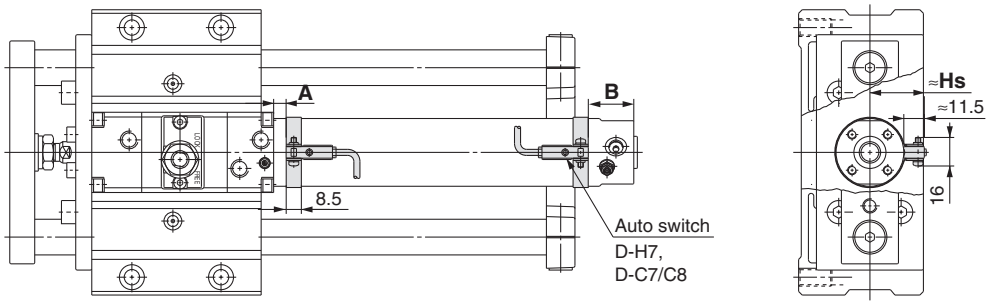
Note 1) Dimensions marked with "∗" are not required for without rear plate.
Note 2) For bore size 20 and 25, M5 x 0.8 is only available.
Rc, NPT port are available for bore size 32 or greater.
Note 3) Rc, NPT port are available.

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

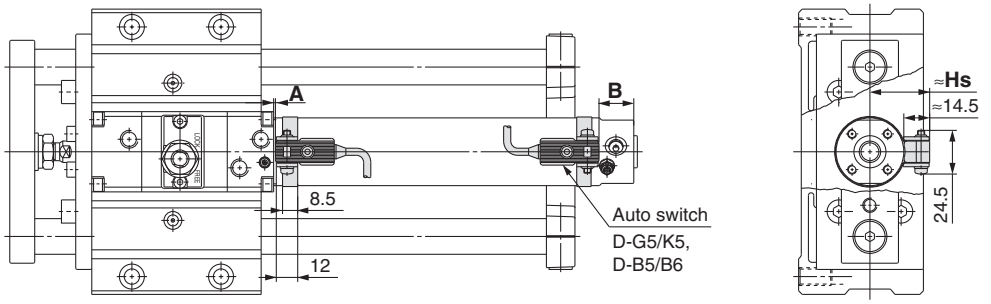
D-M9/M9□W
D-A9



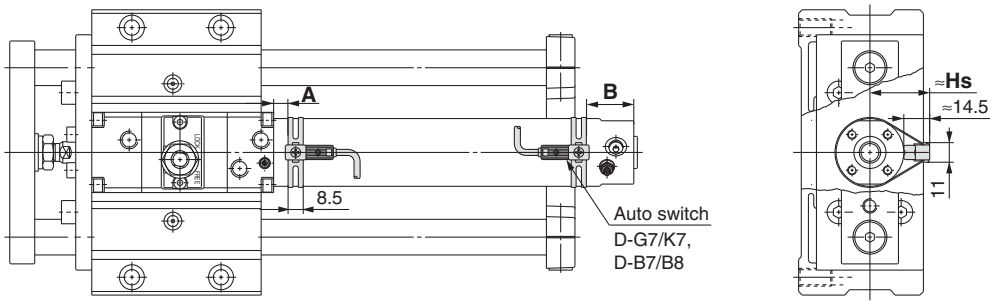
D-H7
D-C7, C8



D-G5, K5
D-B5, B6



D-G7, K7
D-B7, B8



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W		D-A9□		D-B7□ D-B80 D-B73C D-B80C D-G79 D-K79 D-K79C		D-C7□ D-C80 D-C73C D-C80C		D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF		D-B5□ D-B64		D-B59W		D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G59F D-G5BAL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	10.5	27 (35)	6.5	23 (31)	8	24.5 (32.5)	7	23.5 (31.5)	6	22.5 (30.5)	1	17.5 (25.5)	4	20.5 (28.5)	2.5	19 (27)
25	10.5	27 (35)	6.5	23 (31)	8	24.5 (32.5)	7	23.5 (31.5)	6	22.5 (30.5)	1	17.5 (25.5)	4	20.5 (28.5)	2.5	19 (27)
32	10.5	29 (37)	6.5	25 (33)	8	26.5 (34.5)	7	25.5 (33.5)	6	24.5 (32.5)	1	19.5 (27.5)	4	22.5 (30.5)	2.5	21 (29)
40	13.5	32 (41)	9.5	28 (37)	11	29.5 (38.5)	10	28.5 (37.5)	9	27.5 (36.5)	4	22.5 (31.5)	7	25.5 (34.5)	5.5	24 (33)

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W D-A9□	D-C7/C8 D-H7□ D-H7□W D-H7NF D-H7BAL	D-C73C D-C80C	D-B7/B8 D-B73C D-B80C D-G7/K7 D-K79C D-H7C D-G5□ D-K59 D-G5□W D-K59W D-G5NTL D-B5/B6 D-B59W D-G5BAL D-G59F
	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5
25	26.5	27	29.5	30
32	30	30.5	33	33.5
40	34.5	35	37.5	38

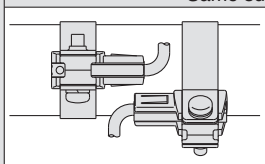
∗ ( ): Values for long stroke
Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

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)
D-C7□/C80	10	50	50 + 45 (n-2)
D-H7□/H7□W/H7BAL/H7NF	10	60	60 + 45 (n-2)
D-C73C/C80C/H7C **D-B73C/B80C/K79C**	10	65	65 + 50 (n-2)
D-B5□/B64/G5□/K59□	10	75	75 + 55 (n-2)
D-B59W	15	75	75 + 55 (n-2)
D-B7□/B80/G79/K79	10	45	50 + 45 (n-2)

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-B7□/B80 **D-B73C/B80C**	8	10	9	10
D-C7□/C80 **D-C73C/C80C**	8	10	9	10
D-B5□/B64	8	10	9	10
D-B59W	13	13	14	14
D-G79/K79/K79C	8	10	9	10
D-H7BAL **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-G5NTL/G5BAL**	4	4	4.5	5
D-G59F	5	5	5.5	6
D-G5NBL	35	40	40	45

∗ 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.

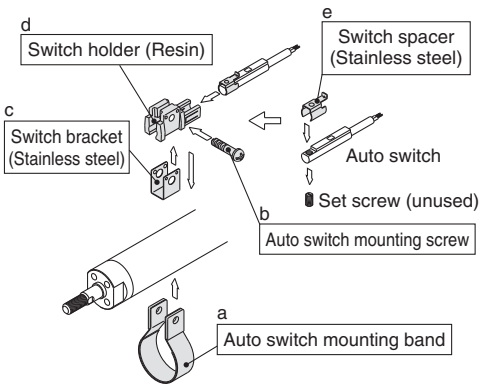
Auto switch model	Bore size (mm)			
	ø20	**ø25**	**ø32**	**ø40**
D-M9□/M9□W/A9□	Note) ①BMA2-020 ②BJ3-1	Note) ①BMA2-025 ②BJ3-1	Note) ①BMA2-032 ②BJ3-1	Note) ①BMA2-040 ②BJ3-1
D-C7□/C80/C73C/C80C **D-H7□/H7C/H7□W** **D-H7BAL/H7NF**	BMA2-020	BMA2-025	BMA2-032	BMA2-040
D-B5□/B64/B59W/G5□ **D-K59/G5□W/K59W** **D-G5BAL/G59F** **D-G5NTL/G5NBL**	BA-01	BA-02	BA-32	BA-04
D-B7□/B80/B73C/B80C **D-G79/K79/K79C**	BM1-01	BM1-02	BM1-32	BM1-04

Note) Two types of the auto switch brackets are used as a set.

[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 Best Pneumatics for details of BBA3 and BBA4.

The D-H7BAL/G5BAL 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.



1. BMA2-□□□ is a set of a and b in the figures.
2. BJ3-1 is a set of c, d and e in the figures.

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

(Consult with SMC for the D-B7□/B80, D-B73C/B80C, D-G79/K79, D-K79C.)

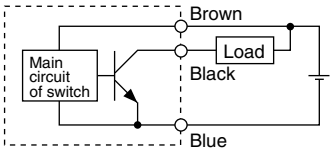
Type	Model	Electrical entry	Features
Reed	D-C73, C76, B53, B73, B76	Grommet (In-line)	—
	D-C80, B80		Without indicator light
	D-B73C	Connector (In-line)	—
	D-B80C		Without indicator light
Solid state	D-H7A1, H7A2, H7B, G59, G5P, K59, G79, K79	Grommet (In-line)	—
	D-K79C	Connector (In-line)	—
	D-H7BW, H7NW, H7PW, G59W, G5PW, K59W	Grommet (In-line)	Diagnostic indication (2-colour indication)
	D-G5NTL		With timer

∗ With pre-wired connector is also available with solid state auto switches. Refer to Best Pneumatics for details.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. Refer to Best Pneumatics for details.
∗ Wide range detection solid state auto switch (D-G5NBL) is also available. Refer to Best Pneumatics for details.

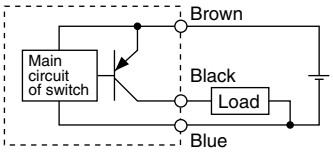
Prior to Use
Auto Switches Connection and Example

Basic Wiring

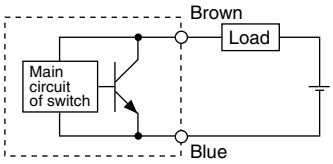
Solid state 3-wire, NPN



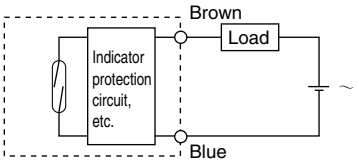
Solid state 3-wire, PNP



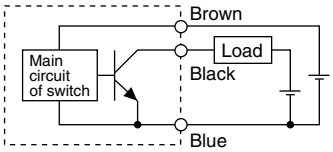
2-wire (Solid state)

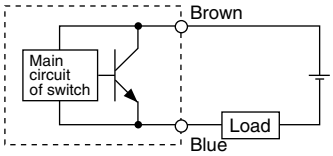


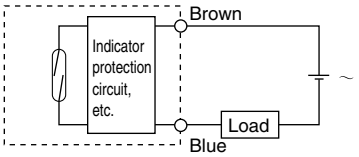
2-wire (Reed)



(Power supply for switch and load are separate.)

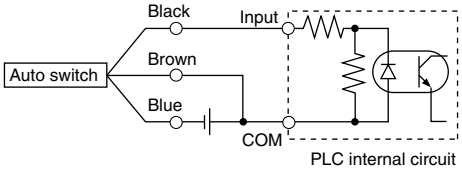




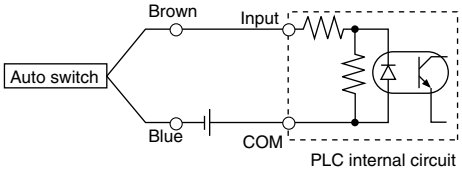


Example of Connection with PLC (Programmable Logic Controller)

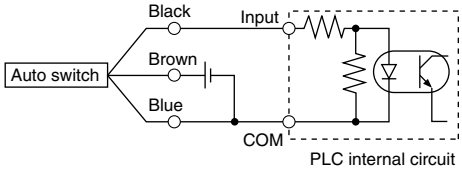
• Sink input specifications
3-wire, NPN



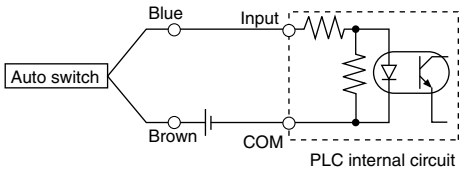
2-wire



• Source input specifications
3-wire, PNP



2-wire

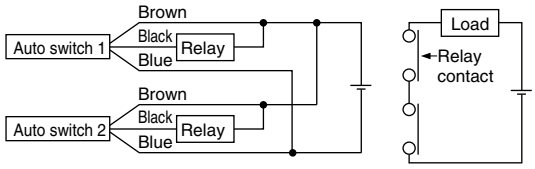


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

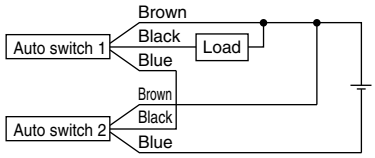
Example of AND (Series) and OR (Parallel) Connection

• 3-wire

AND connection for NPN output (Using relays)

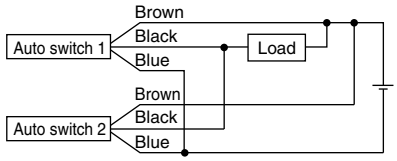


AND connection for NPN output (Performed with auto switches only)



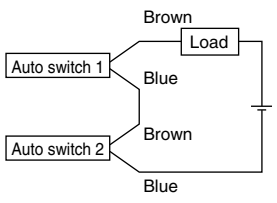
The indicator lights will light up when both auto switches are turned ON.

OR connection for NPN output



• 2-wire

2-wire with 2-switch AND connection

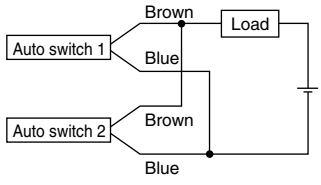


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up when both of the auto switches are in the ON state.

Load voltage at ON = Power supply voltage – Residual voltage x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

Example: Power supply is 24 VDC
Internal voltage drop in auto switch is 4 V.

2-wire with 2-switch OR connection



(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 voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

Example: Load impedance is 3 kΩ.
Leakage current from auto switch is 1 mA.

Solid State Auto Switch/ Direct Mounting Style
D-M9N/D-M9P/D-M9B

CE

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Flexibility is 1.5 times greater than the conventional model (SMC comparison).**
- **Using flexible cable as standard specification.**

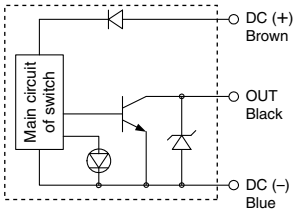
⚠Caution

Precautions

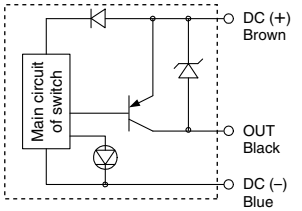
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

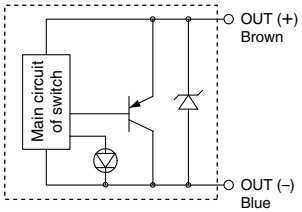
D-M9N



D-M9P



D-M9B



Auto Switch Specifications

Refer to SMC website for the details of the products conforming to the international standards.

PLC: Programmable Logic Controller

D-M9□ (With indicator light)			
Auto switch model	**D-M9N**	**D-M9P**	**D-M9B**
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)		4 V or less
Leakage current	100 μA or less at 24 VDC		0.8 mA or less
Indicator light	Red LED illuminates when turned ON.		
Standard	CE marking		

● Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9B), 3 cores (D-M9N/D-M9P)

Note 1) Refer to Best Pneumatics for solid state auto switch common specifications.

Note 2) Refer to Best Pneumatics for lead wire lengths.

Weight

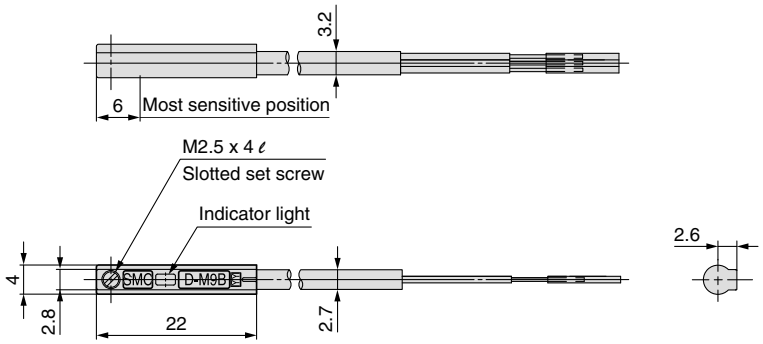
(g)

Auto switch model		D-M9N	D-M9P	D-M9B
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

Dimensions

(mm)

D-M9□



2-Colour Indication Solid State Auto Switch Direct Mounting Style
D-M9NW/D-M9PW/D-M9BW

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Flexibility is 1.5 times greater than the conventional model (SMC comparison).**
- **Using flexible cable as standard spec.**
- **The optimum operating position can be determined by the colour of the light. (Red → Green ← Red)**

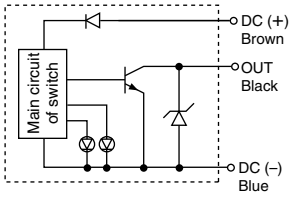
⚠Caution

Precautions

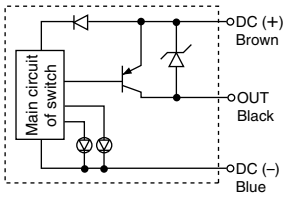
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

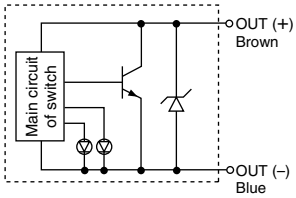
D-M9NW



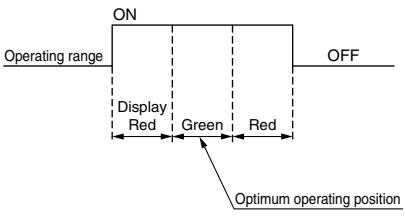
D-M9PW



D-M9BW



Indicator light/Display method



Auto Switch Specifications

Refer to SMC website for the details of the products conforming to the international standards.

PLC: Programmable Logic Controller

D-M9□W (With indicator light)			
Auto switch model	D-M9NW	D-M9PW	D-M9BW
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)		4 V or less
Leakage current	100 μA or less at 24 VDC		0.8 mA or less
Indicator light	Operating position ····· Red LED illuminates. Optimum operating position ····· Green LED illuminates.		
Standard	CE marking		

● Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9BW), 3 cores (D-M9NW/D-M9PW)

Note 1) Refer to Best Pneumatics for solid state auto switch common specifications.

Note 2) Refer to Best Pneumatics for lead wire lengths.

Weight

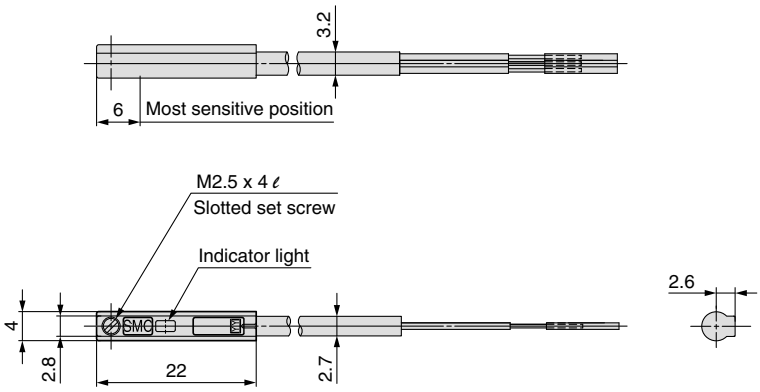
(g)

Auto switch model		D-M9NW	D-M9PW	D-M9BW
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

Dimensions

(mm)

D-M9□W



SMC

Reed Auto Switch/ Direct Mounting Style
D-A90/D-A93/D-A96

Refer to SMC website for the details of the products conforming to the international standards.

Grommet

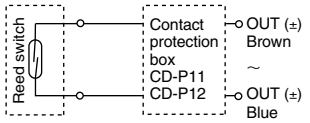
⚠Caution

Precautions

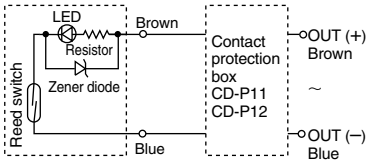
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

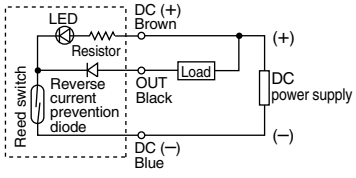
D-A90



D-A93



D-A96



Note 1) Operating load is an induction load.
Note 2) Wiring to the load is 5 m or longer.
Note 3) Load voltage is 100 VAC.
Use the contact protection box in any of the above listed situations. The contact point life may decrease. (Refer to Best Pneumatics for contact protection box.)

Auto Switch Specifications

PLC: Programmable Logic Controller

D-A90 (Without indicator light)			
Auto switch model	D-A90		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V AC/DC or less	48 V AC/DC or less	100 V AC/DC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 Ω or less (Including lead wire length of 3 m)		
Standard	CE marking		

D-A93, D-A96 (With indicator light)			
Auto switch model	D-A93		D-A96
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
Load current range and maximum load current Note 3)	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93: 2.4 V or less (up to 20 mA)/3 V or less (up to 40 mA) D-A93V: 2.7 V or less		0.8 V or less
Indicator light	Red LED illuminates when turned ON.		
Standard	CE marking		

• Lead wires
D-A90/D-A93—Oilproof heavy-duty vinyl cord, ø2.7, 0.18 mm² x 2 cores (Brown, Blue), 0.5 m
D-A96—Oilproof heavy-duty vinyl cord, ø2.7, 0.15 mm² x 3 cores (Brown, Black, Blue), 0.5 m
Note 1) Refer to Best Pneumatics for reed auto switch common specifications.
Note 2) Refer to Best Pneumatics for lead wire lengths.
Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 1 mA or more.

Weight

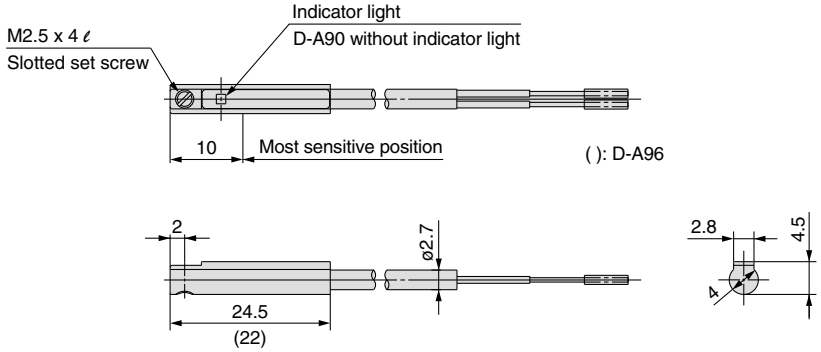
(g)

Model		D-A90	D-A93	D-A96
Lead wire length (m)	0.5	6	6	8
	3	30	30	41

Dimensions

(mm)

D-A90/D-A93/D-A96



Simple Specials/Made to Order

Please contact SMC for detailed specifications, lead times, and pricing.

■ Simple Specials

The following special specifications can be ordered as a simplified made-to-order.
There is a specification sheet available on paper and CD-ROM. Contact your SMC sales representative, if necessary.

Symbol	Specifications	Model
		MGC/MLGC
-XC79	Tapped Hole, Drilled Hole, Pin Hole Machined Additionally	●

■ Made to Order

Symbol	Specifications	Model
		MGC
-XB6	Heat Resistant Cylinder (–10 to 150°C)	●
-XB13	Low-speed Cylinder (5 to 50 mm/s)	●
-XC4	With Heavy Duty Scraper	●
-XC6□	Made of Stainless Steel	●
-XC8	Adjustable Stroke Cylinder/Adjustable Extension Type	●
-XC9	Adjustable Stroke Cylinder/Adjustable Retraction Type	●
-XC11	Dual Stroke Cylinder/Single Rod	●
-XC13	Auto Switch Rail Mounting Style	●
-XC22	Fluororubber Seal	●
-XC35	With Coil Scraper	●
-XC37	Larger Throttle Diameter of Connection Port	●
-XC56	With Knock Pin Holes	●
-XC73	Built-in Cylinder with Lock (CDNG)	●
-XC74	With Front Plate for MGG Cylinder	●
-XC78	Auto Switch Mounting Special Dimensions at Stroke End	●
-X440	With Piping Ports for Grease	●

Simple Specials

The following special specifications can be ordered as a simplified made-to-order. There is a specification sheet available on paper and CD-ROM. Contact your SMC sales representative, if necessary.

Made to Order

Symbol

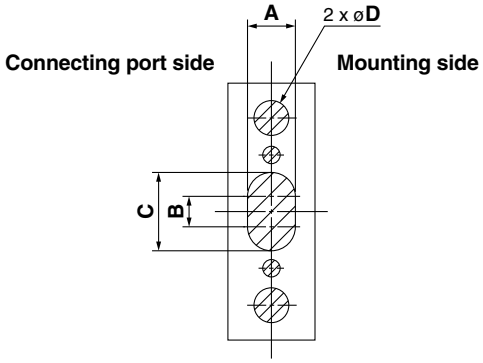
Tapped Hole, Drilled Hole, Pinned Hole Machined Additionally -XC79

This simple special is meant for machining additionally tapped hole, drilled hole, and pinned hole, as requested from customer, on parts designed largely for mounting a workpiece, etc., in the combined air cylinders.
But, for each model, since they have the portions which are impossible to machine additionally, refer to the additional machining limitation.

Limitation for Machining Additionally/Since the slanted lines denote the restricted range for machining additionally, design the dimensions, referring to below.

Series MGC/MLGC

Component parts machined additionally: Front plate Material: Iron



MGC Dimensional Range Not Possible to Machine Additionally (mm)

Bore size	A	B	C	D
20	18	10	28	12.5
25	23	13	36	12.5
32	23	13	36	19
40	27	15	42	23
50	33	19	52	28

MLGC Dimensional Range Not Possible to Machine Additionally (mm)

Bore size	A	B	C	D
20	18	10	28	16
25	23	13	36	20
32	23	13	36	20
40	27	15	42	25

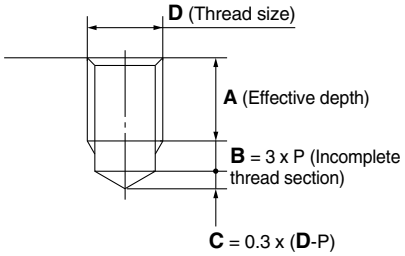
Precautions

- We cannot take any responsibility as for the intensity of holes machined additionally and the effects of decreased intensity for the product itself.
- It will not be plated again for the machined part additionally.
- Be sure to fill in “through” for through-hole, and “effective depth” for blind hole.
- When using by machining through-hole additionally, ensure that the tip of the bolt, etc., for mounting a workpiece should not stick into the cylinder side. It may result in an unexpected problem.
- Use caution not to interfere the existing mounting hole on the standard products with the hole to be machined additionally. But it is possible to drill additionally the larger size of hole at the same position as the existing hole.

Complementary Explanation/Holes which can be additionally machined are the following 3 types.

Tapped hole

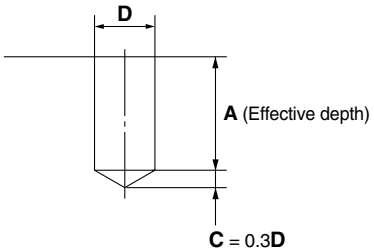
Designated nominal diameter and tapped hole of a pitch are machined additionally. (Maximum nominal thread diameter M20)
Blind hole is deep into the bottom of prepared hole which sums up A to C in the figure below in contrast to the effective depth of tapped hole. When there is a condition which does not allow through-hole, etc., leave sufficient thickness in the inner part of hole.



Note) P stands for thread pitch.

Drilled hole

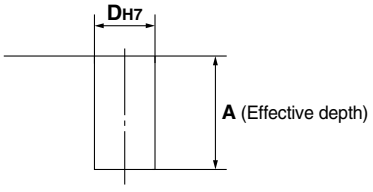
Drilled hole of a designated internal diameter is machined. (Maximum hole diameter 20 mm)
If you wish for blind hole, instruct us with effective depth. (Refer to the below figure.) Besides, dimensional accuracy for internal diameter will be ±0.2 mm.



Pinned hole

Pinned hole of a designated diameter (reamer hole) is machined. (Maximum hole diameter 20 mm) Internal dimension tolerates H7 tolerance to the designated hole diameter. (Refer to the below table.)

Hole dia.	3 or less	Over 3 to 6 or less	Over 6 to 10 or less	Over 10 to 18 or less	Over 18 to 20 or less
Tolerance	+0.01 0	+0.012 0	+0.015 0	+0.018 0	+0.021 0



Series MGC
Made to Order 1

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

1 Heat Resistant Cylinder (–10 to 150°C)

Symbol: **-XB6**

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from –10°C.

How to Order

MGC [Standard model no.] **–XB6**

XB6: Heat resistant cylinder

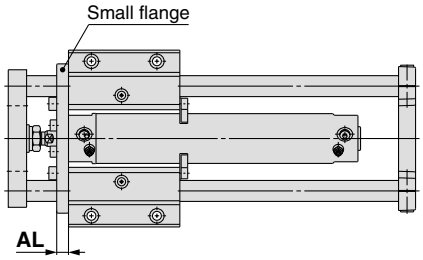
Specifications

Ambient temperature range	–10 to 150°C
Seal material	Fluororubber
Grease	Heat resistant grease
Specifications other than above	Same as standard

Note 1) Operate without lubrication from a pneumatic system lubricator.
Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. For the one with auto switch, since it will be differed depending on the series, please contact SMC.
Note 4) Piston speed is ranged from 50 to 500 mm/s.

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

Series MGC□B



(mm)

Bore size (mm)	AL
20	9
25	9
32	9
40	12
50	12

⚠ 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.

2 Low-speed Cylinder (5 to 50 mm/s)

Symbol: **-XB13**

Even if driving at lower speeds 5 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

How to Order

MGC **M** [Mounting] [Bore size] [Port thread type] – [Stroke] – [With/Without rear plate] – [Auto switch] – **XB13**

M: Slide bearing

XB13: Low-speed cylinder

Specifications

Piston speed	5 to 50 mm/s
Specifications other than above and outer dimensions	Same as standard

Note 1) Operate without lubrication from a pneumatic system lubricator.
Note 2) For speed control, use the low-speed-control speed controller (Series AS-FM/AS-M).
Note 3) With rubber bumper

⚠ 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.

3 With Heavy Duty Scraper

Symbol: **-XC4**

It is suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-casted equipment, construction machinery, or industrial vehicles.

How to Order

MGC [Standard model no.] **–XC4**

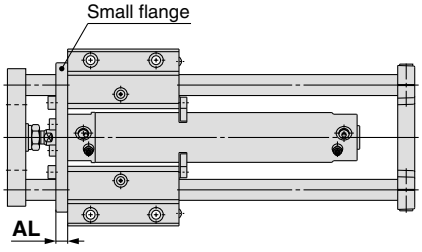
XC4: With heavy duty scraper (SCB scraper)

Specifications: Same as standard type

Note 1) Except ø20 and ø25
Note 2) Heavy duty scrapers are attached to the piston rod and guide rods (front and rear).
Note 3) Rod end heavy duty scrapers are press-fit to large and small flanges. When replacing them, replace the large and small flange assemblies.

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

Series MGC□B
ø32 to ø50



(mm)

Bore size (mm)	AL
32	9
40	12
50	12

SMC

Made to Order 2

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

4 Made of Stainless Steel

Symbol **-XC6**

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

How to Order

MGC | **Bearing type** | **Mounting** | **Bore size** | — | **Stroke** | — | **With/Without rear plate** | — | **Auto switch** | — **XC6** | □

Made of stainless steel

Suffix

—	Piston rod, rod end nut made of stainless steel
A	Stainless steel used on all standard iron parts
B	Stainless steel rod end moving parts
C	Stainless steel rod parts

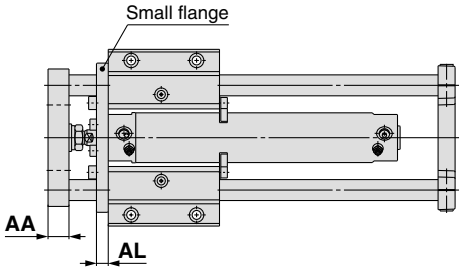
Stainless Steel Modified Parts

Symbol	Bore size (mm)	Parts no.	Note
-XC6	20, 25, 32, 40, 50	④⑭	
-XC6A	20, 25, 32, 40, 50	④⑩⑪⑫⑭㉓㉔㉕㉖㉗㉘㉙㉚㉝㊱㊲㊳㊴㊵	㉖ is L type only
-XC6B	20, 25, 32, 40, 50	④⑩⑪⑫⑭㉔㉗㉘㉙㉚㊳	
-XC6C	20, 25, 32, 40, 50	④⑩⑪⑫⑭㉗	

∗ Refer to Construction of standard type (page 10) for parts numbers.
∗ Specifications other than the above are the same as standard type.

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

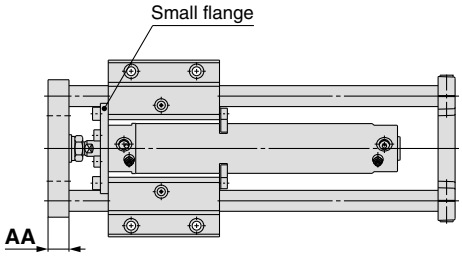
MGC□B20 to 50-□-XC6A



(mm)

Bore size (mm)	AA	AL
20	12	9
25	16	9
32	16	9
40	19	12
50	25	12

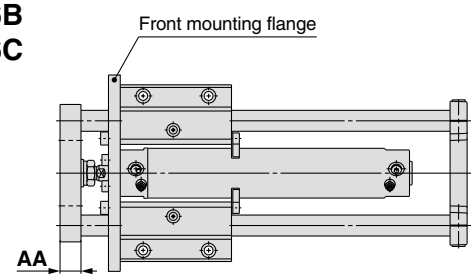
MGC□B20 to 50-□-XC6B
MGC□B20 to 50-□-XC6C



(mm)

Bore size (mm)	AA
20	12
25	16
32	16
40	19
50	25

MGC□F20 to 50-□-XC6A
MGC□F20 to 50-□-XC6B
MGC□F20 to 50-□-XC6C



(mm)

Bore size (mm)	AA
20	12
25	16
32	16
40	19
50	25

Made to Order 3

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

5 Adjustable Stroke Cylinder/Adjustable Extension Type

Symbol **-XC8**

It adjusts the extending stroke by the stroke adjustable mechanism equipped in the head end. (After the stroke is adjusted, with cushion on both ends is altered to single-sided, with cushion.)

How to Order

MGC [Bearing type] [Mounting] [Bore size] [Port thread type] — [Stroke] [Stroke adjustment symbol] — [With/Without rear plate] — [Auto Switch] — **XC8**

Adjustable stroke cylinder/Adjustable extension type

Specifications

Applicable series	Stroke adjustment symbol	Stroke adjustment range (mm)
MGC	A	0 to 25
	B	0 to 50

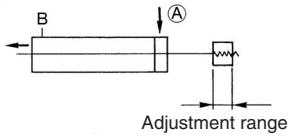
∗ Specifications other than the above are the same as standard type.

⚠Warning

Precautions

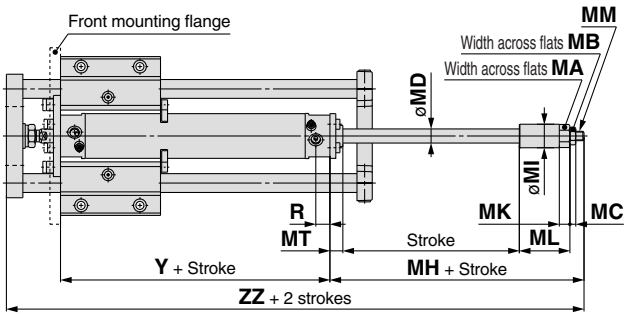
1. When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral devices. Therefore, take preventive measures as necessary, such as installing a protective cover.
2. To adjust the stroke, make sure to hold the wrench flats of the stopper bracket by a wrench, etc. before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side may loosen first.

Symbol



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

ø20 to ø50



(mm)

Bore size (mm)	R	Y	MA	MB	MC	MD	MI	MK	MM	MT	Adjustment 0 to 25 mm			Adjustment 0 to 50 mm		
											MH	ML	ZZ	MH	ML	ZZ
20	12	77	12	10	3.6	8	14	7	M6 x 1	9	63	43	179	88	68	204
25	12	77	17	13	5	10	20	9	M8 x 1.25	11	66	43	189	91	68	214
32	12	79	17	13	5	12	20	9	M8 x 1.25	11	66	43	191	91	68	216
40	13	87	19	17	6	16	25	10	M10 x 1.25	11	72	49	215	97	74	240
50	14	102	24	19	8	20	32	13	M14 x 1.5	11	85	57	254	110	82	279

∗ The piston speed for the extension side is 50 to 500 mm/s.

6 Adjustable Stroke Cylinder/Adjustable Retraction Type

Symbol **-XC9**

The retracting stroke of the cylinder can be adjusted by the adjustment bolt. (After the stroke is adjusted, with cushion on both ends is altered to single-sided, with cushion.)

How to Order

MGC [Bearing type] [Mounting] [Bore size] [Port thread type] — [Stroke] [Stroke adjustment symbol] — [With/Without rear plate] — [Auto Switch] — **XC9**

Adjustable stroke cylinder/Adjustable retraction type

Specifications

Applicable series	Stroke adjustment symbol	Stroke adjustment range (mm)
MGC	A	0 to 25
	B	0 to 50

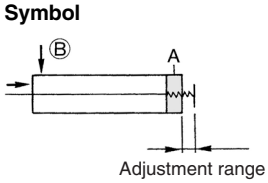
∗ Specifications other than the above are the same as standard type.

⚠Caution

Precautions

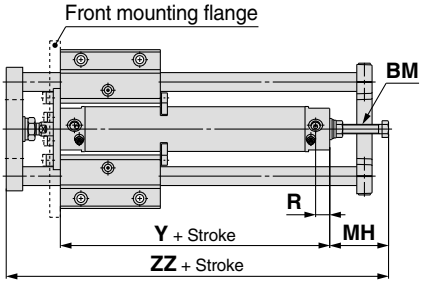
1. When air is supplied to the cylinder, if the stroke adjusting bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjusting bolt could fly out or air could be discharged, which could cause bodily injury or damage the peripheral devices.
2. Adjust the stroke when the cylinder is not pressurized.
   If it is adjusted in the pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

Symbol



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

ø20 to ø50



(mm)

Bore size (mm)	R	Y	BM	Adjustment 0 to 25 mm		Adjustment 0 to 50 mm	
				MH	ZZ	MH	ZZ
20	12	77	M6 x 1	46	162	71	187
25	12	77	M6 x 1	46	169	71	194
32	12	79	M8 x 1.25	50	175	75	200
40	13	87	M12 x 1.75	64	207	89	232
50	14	102	M12 x 1.75	62	231	87	256

∗ The piston speed for the retraction side is 50 to 500 mm/s.

Made to Order 4

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

7 Dual Stroke Cylinder/Single Rod

Symbol **-XC11**

Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.

How to Order

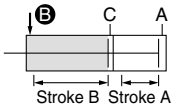
MGC [Bearing type] [Mounting] [Bore size] — [Stroke A] + [Stroke B-A] — [With/Without rear plate] — [Auto switch] — **XC11**

XC11: Dual stroke cylinder/Single rod

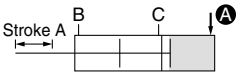
Specifications: Same as standard type

Symbol

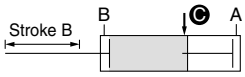
Function



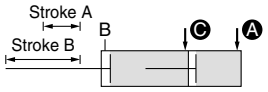
When air pressure is supplied to Port B, both A and B strokes retract.



When air pressure is supplied to Port A , the piston rod extends by the length of the A stroke.



When air pressure is supplied to Port C, the piston rod extends by the length of the B stroke.



When air pressure is supplied to both Ports A and C, the force will be doubled within the range of the A stroke.

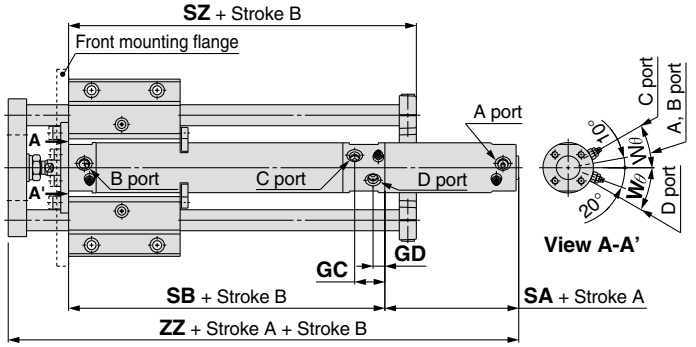
⚠ Caution

Precautions

1. Do not supply the air pressure until the product is fixed.
2. If air is supplied without securing the cylinder, the cylinder could lurch, posing the risk of bodily injury or damage to the peripheral devices.

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

ø20 to ø50



(mm)

Bore size (mm)	GC	GD	SA	SB	Wθ	SZ		ZZ	Bracket mounting stroke (Stroke A + Stroke B)	Stroke A availability
						With R	Without R			
20	21	9	50	87	30°	101	80	176	35 st or more	Up to 200
25	21	9	50	87	30°	107	85	183	60 st or more	Up to 300
32	23	9	52	91	30°	115	90	189	80 st or more	
40	24	8	59	99	20°	132	100	214	125 st or more	
50	28	12	66	117	20°	174	135	250	160 st or more	

∗ The piston speed for the B stroke retraction side is 50 to 500 mm/s.

8 Auto Switch Rail Mounting Style

Symbol **-XC13**

A cylinder on which a rail is mounted to enable auto switches, in addition to the standard method for mounting auto switches (Band mounting style).

How to Order

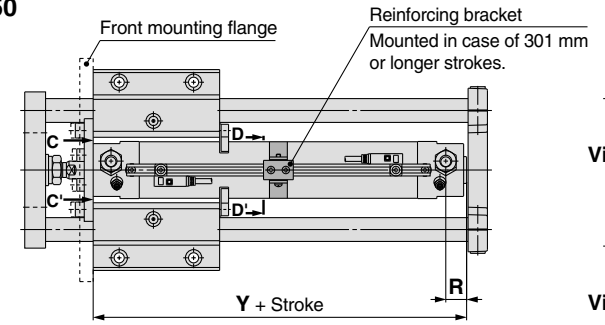
MGC [Bearing type] [Mounting] [Bore size] — [Stroke] — [With/Without rear plate] — [Auto switch] — **XC13**

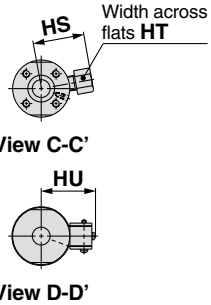
XC13: Auto switch rail mounting style

Specifications: Same as standard type

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

ø20 to ø50





(mm)

Bore size (mm)	R	Y	HS	HT	HU
20	14	99	26	7	30.7
25	14	99	28.5	7	33.2
32	14	101	34.5	14	36.5
40	15	109	39	14	41
50	16	124	49.5	17	46.2

Made to Order 5

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

8 Auto Switch Rail Mounting Style

Symbol **-XC13**

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height (ø20 to ø50)

Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size (mm)	D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL		D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV D-F7BAL/F7BAVL D-A72/A7□H/A80H D-A73C/A80C		D-F7NTL		D-A7□ D-A80		D-A79W	
	A	B	A	B	A	B	A	B	A	B
20	45.5	39.5	43	37	48	42	42.5	36.5	40	34
25	45.5	39.5	43	37	48	42	42.5	36.5	40	34
32	46.5	40.5	44	38	49	43	43.5	37.5	41	35
40	51.5	43.5	49	41	54	46	48.5	40.5	46	38
50	58.5	51.5	56	49	61	54	55.5	48.5	53	46
63	58.5	51.5	56	49	61	54	55.5	48.5	53	46
80	68.5	61.5	66	59	71	64	65.5	58.5	63	56
100	68.5	61.5	66	59	71	64	65.5	58.5	63	56

Auto Switch Mounting Height (mm)

D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL D-F7□/F79F D-J79/F7NTL D-F7□W/J79W/F7BAL D-A7□H/A80H	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W
Hs	Hs	Hs	Hs	Hs	Hs
26.5	29	31	26.5	32.5	30
29	31.5	33.5	29	35	32.5
32.5	34.5	36.5	32	38.5	32.5
37	39	41	36.5	43	40
42	44.5	46.5	42	48	45.5
49	51.5	53.5	49	55	52.5
58	60.5	62.5	58	64	61.5
69	71	73	68.5	74.5	72

Note 1) Adjust the auto switch after confirming the operating conditions in the actual setting.
Note 2) For dimensions other than the auto switch proper mounting position and height, refer to standard type.

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches mounted		
	1	2 Same surface	n (n: Number of auto switches) Same surface
D-M9□/M9□V D-F7□V D-J79C	5	5	10 + 10 (n–2) (n = 4, 6···)
D-M9□WV D-M9□AVL D-F7□WV D-F7BAVL D-A79W	10	15	10 + 15 (n–2) (n = 4, 6···)
D-M9□W D-M9□AL	10	15	15 + 15 (n–2) (n = 4, 6···)
D-F7□ D-J79	5	5	15 + 15 (n–2) (n = 4, 6···)
D-F7□W/J79W D-F7BAL D-F79F/F7NTL	10	15	15 + 20 (n–2) (n = 4, 6···)
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	10	15 + 10 (n–2) (n = 4, 6···)
D-A7□H D-A80H	5	10	15 + 15 (n–2) (n = 4, 6···)

Operating Range

(mm)

Auto switch model	Bore size (mm)				
	20	**25**	**32**	**40**	**50**
D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	4	4	5	4	5.5
D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV D-F7BAL/F7BAVL D-F7NTL	4.5	4	4.5	5	5
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	9	9	10	11	11
D-A79W	11	11	13	14	14

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

Auto Switch Mounting Bracket/Part No.

Auto switch model	Bore size (mm)
	ø20 to ø50
D-M9□/M9□V D-M9□W/M9□WV	BQ2-012
D-M9□AL/M9□AVL	BQ2-012S

Note 1) When adding the D-M9□(V)/D-A9□W(V), order a set of auto switch mounting brackets BQ-1 and BQ2-012 for the CDQ2 series (ø12 to ø25) separately.
When ordering the auto switches other than D-M9□□□ mentioned on the left and D-F7BA(V)L, order auto switch mounting brackets BQ-1 separately.
Note 2) When adding the D-M9□A(V)L, order a stainless steel screw set BBA2 together with BQ2-012S separately. When adding the D-F7BA(V)L, order a stainless steel screw set BBA2 separately.

Made to Order 6

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

9 Fluororubber Seal

Symbol: **-XC22**

How to Order

MGC [Standard model no.] **—XC22**

XC22: Fluororubber seal

Specifications

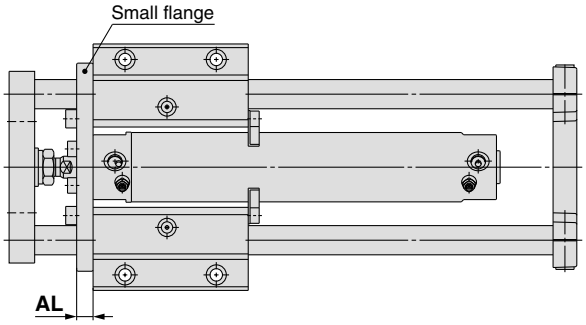
Seal material	Fluororubber
Specifications other than above	Same as standard type

Note 1) Please confirm with SMC, as the type of chemical and the operating temperature may not allow the use of this product.

Note 2) Auto switch related parts (auto switch units, mounting brackets, built-in magnets) are the same as standard products. Before using these, please contact SMC regarding their suitability for the operating environment.

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

Series MGC□B



(mm)

Bore size (mm)	AL
20	9
25	9
32	9
40	12
50	12

10 With Coil Scraper

Symbol: **-XC35**

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

How to Order

MGC [Standard model no.] **—XC35**

XC35: With coil scraper

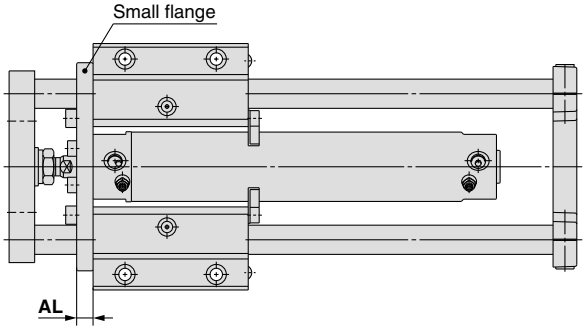
Specifications: Same as the standard type

Note 1) Except ø20 and ø25

Note 2) Coil scrapers are attached to the piston rod and guide rods (front and rear).

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

Series MGC□B
ø32 to ø50



(mm)

Bore size (mm)	AL
32	9
40	12
50	12

Made to Order 7

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

11 Larger Throttle Diameter of Connection Port

Symbol **-XC37**

This is a cylinder with a piping port larger than standard type.

How to Order

MGC [Bearing type] [Mounting] [Bore size] — [Stroke] — [With/Without rear plate] — [Auto switch] — **XC37**

XC37: Larger throttle diameter of connecting port

Specifications: Same as standard type

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

(mm)

Bore size (mm)	Throttle dia. (ø)	Standard type (ø)
20	3	(2.1)
25	3.5	(2.5)
32	6	(3.3)
40	7	(3.9)
50	9	(4.5)

12 With Knock Pin Holes

Symbol **-XC56**

Cylinder with knock positioning pin hole.

How to Order

MGC [Bearing type] **B** [Bore size] [Port thread type] — [Stroke] — [With/Without rear plate] — [Auto switch] — **XC56**

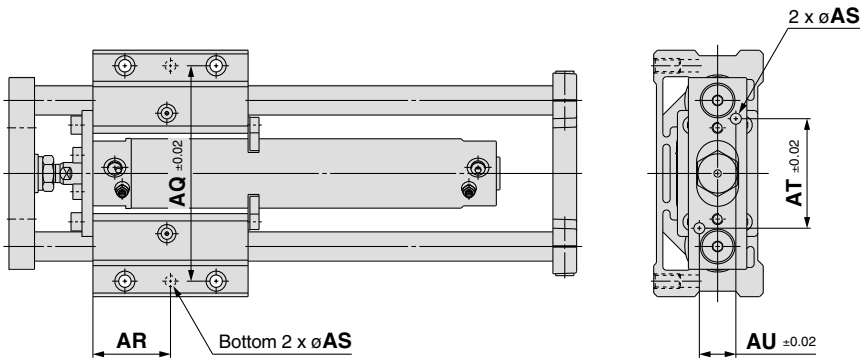
B: Basic type

XC56: With knock pin holes

Specifications: Same as standard type

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

ø20 to ø50



(mm)

Bore size (mm)	AQ	AR	AS	AT	AU
20	90	37.5	$5^{H7\ +0.012}_{\ 0}$ depth 6	45	15
25	103	40	$6^{H7\ +0.012}_{\ 0}$ depth 8	55	20
32	118	42.5	$6^{H7\ +0.012}_{\ 0}$ depth 8	60	20
40	140	47.5	$8^{H7\ +0.015}_{\ 0}$ depth 11	70	22
50	170	65	$8^{H7\ +0.015}_{\ 0}$ depth 11	85	30

Made to Order 8

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

13 Built-in Cylinder with Lock (CDNG)

Symbol **-XC73**

This type has a built-in cylinder with lock, which accommodates intermediate stops, emergency stops and drop prevention, etc.

How to Order

MGC | Bearing type | Mounting | Bore size | – | Stroke | – | With/Without rear plate | – | Auto switch | – **XC73**

Built-in cylinder with lock

Specifications

Bore size (mm)		20	25	32	40
Base cylinder		CDNGBA	Bore size – Stroke – D – Auto switch		
Minimum operating pressure		0.2 MPa (Horizontal, No load)			
Piston speed		50 to 750 mm/s Note)			
Non-rotating accuracy ∗2	**Slide bearing**	±0.06°	±0.05°		±0.04°
	Ball bushing bearing	±0.04°	±0.04°		±0.04°

Note) When the piston is locked, the load weight is limited by the mounting orientation and the operating pressure. For lock specifications and others, refer to Best Pneumatics.

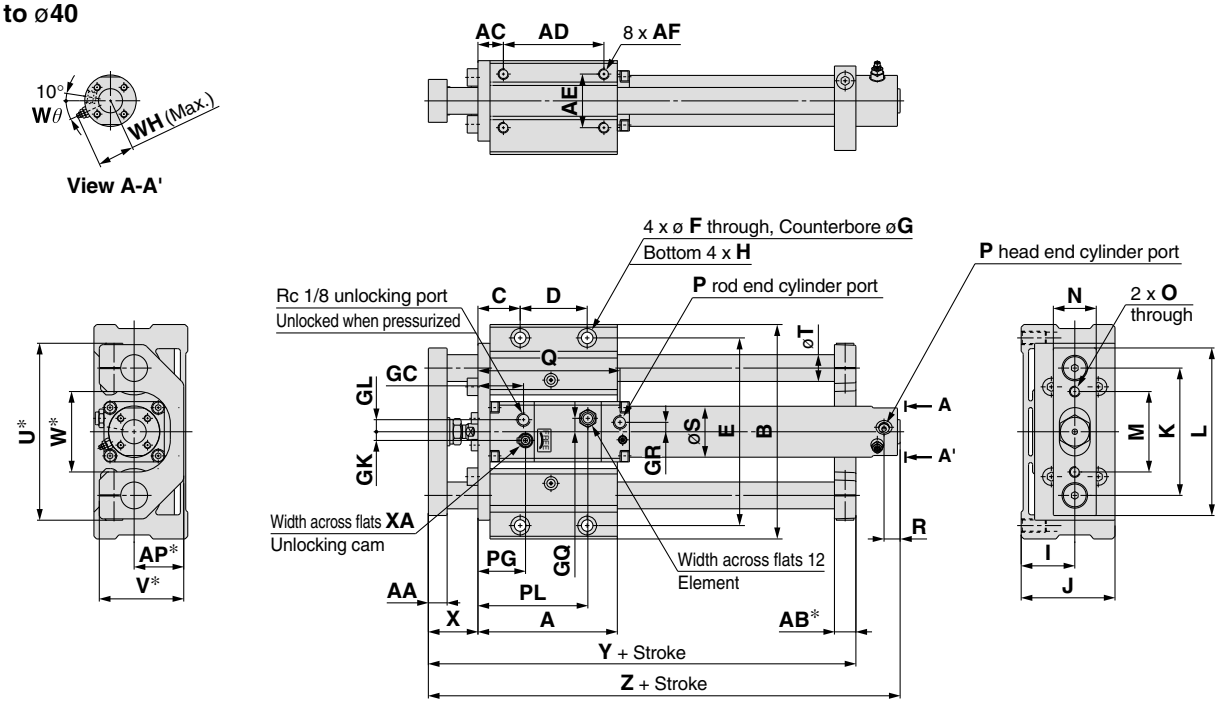
∗1 Specifications other than shown on the left are the same as standard type.

∗2 Non-rotating rod accuracy must be below the values shown in the table at the retraction of the cylinder (initial value), and without loads or the conditions excluding the deflection of the guide rods.

Dimensions

Basic/MGC□B

ø20 to ø40



Standard Stroke

(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB∗	AC	AD	AE	AF	AP∗	B	C	D	E	F	G	GC	GK	GL	GQ	GR	H	I	J	K
20	75, 100, 125, 150, 200	94	12	13	16.5	70	35	M6 x 1 depth 12	32	135	26.5	50	118	6.8	11 depth 8	27	5.5	6	8	4	M8 x 1.25 depth 14	35	60	80
25	75, 100, 125	104	16	16	19	75	40	M8 x 1.25 depth 16	37	160	31.5	50	140	8.6	14 depth 10	34	6.5	9	10	7	M10 x 1.5 depth 18	40	70	95
32	150, 200	104	16	16	19	75	40	M8 x 1.25 depth 16	37	160	31.5	50	140	8.6	14 depth 10	34	6.5	9	10	7	M10 x 1.5 depth 18	40	70	95
40	250, 300	142	19	19	22	110	45	M10 x 1.5 depth 20	42	194	37	80	170	10.5	17 depth 12	38	7	11	12	7	M12 x 1.75 depth 21	45	82.5	115

Bore size (mm)	L	M	N	O	P	PG	PL	Q	R	S	T	U∗	V∗	W∗	WH	Wθ	X	XA	Y	Z
20	105	50	25	M6 x 1	M5 x 0.8	30.5	74	96	12	26	16	112	53	50	23	30°	30	3	148	182
25	125	60	32	M8 x 1.25	M5 x 0.8	35.5	82	106	12	31	20	132	63	60	25	30°	37	3	169	199
32	125	60	32	M8 x 1.25	Rc1/8	35.5	82	106	12	38	20	132	63	60	28.5	25°	37	3	169	202
40	150	75	38	M8 x 1.25	Rc1/8	40	93	116	12	47	25	162	73	70	33	20°	44	4	210	227

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
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) Dimensions marked with "∗" are not required for without rear plate.

Made to Order 9

Please contact SMC for detailed specifications, lead times, and pricing.

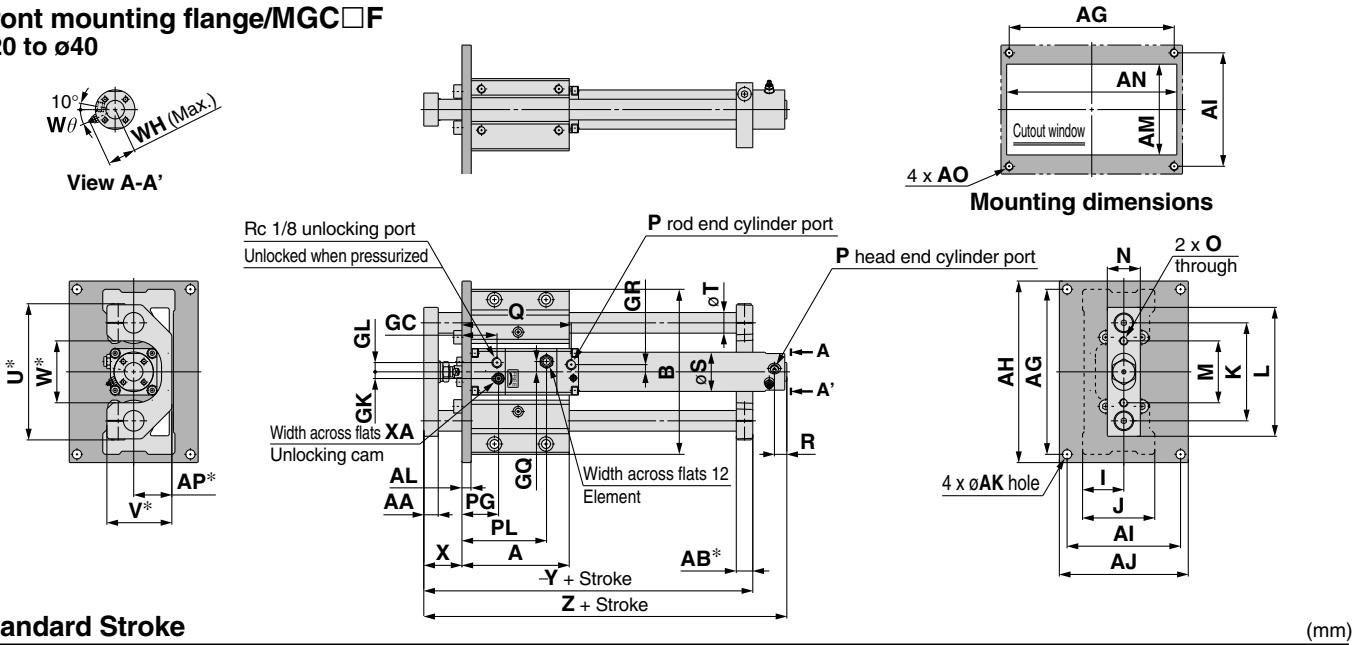
Made to Order

13 Built-in Cylinder with Lock (CDNG)

Symbol **-XC73**

Dimensions

Front mounting flange/MGC□F
ø20 to ø40



Standard Stroke

(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB*	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP*	B	GC	GK	GL	GQ	GR	I	J	K	L	M	N
20	75, 100, 125, 150, 200	94	12	13	134	150	92	108	9	9	75	140	M8	32	135	27	5.5	6	8	4	35	60	80	105	50	25
25	75, 100, 125 150, 200, 250 300	104	16	16	160	176	110	125	9	9	88	165	M8	37	160	34	6.5	9	10	7	40	70	95	125	60	32
32		104	16	16	160	176	110	125	9	9	88	165	M8	37	160	34	6.5	9	10	7	40	70	95	125	60	32
40		142	19	19	190	210	115	135	11	12	96	200	M10	42	194	38	7	11	12	7	45	82.5	115	150	75	38

Bore size (mm)	O	P	PG	PL	Q	R	S	T	U*	V*	W*	WH	Wθ	X	XA	Y	Z
20	M6 x 1	M5 x 0.8	30.5	74	96	12	26	16	112	53	50	23	30°	30	3	148	182
25	M8 x 1.25	M5 x 0.8	35.5	82	106	12	31	20	132	63	60	25	30°	37	3	169	199
32	M8 x 1.25	Rc1/8	35.5	82	106	12	38	20	132	63	60	28.5	25°	37	3	169	202
40	M8 x 1.25	Rc1/8	40	93	116	12	47	25	162	73	70	33	20°	44	4	210	227

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
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) Dimensions marked with "∗" are not required for without rear plate.

14 With Front Plate for MGG Cylinder

Symbol **-XC74**

This type uses a front plate equivalent to the MGG series.

How to Order

MGC | **Standard model no.** | **–XC74**

With front plate for MGG

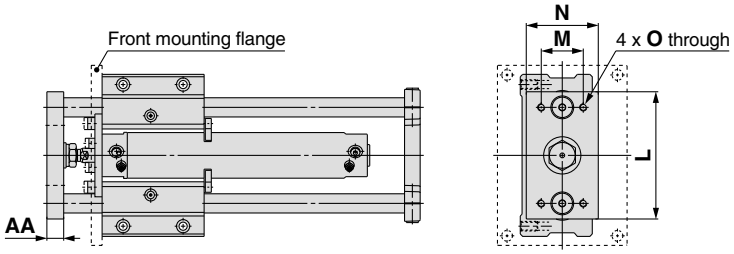
Specifications

Bore size (mm)	20, 25, 32, 40, 50
Fluid	Air
Minimum operating pressure	0.15 MPa (Horizontal, No load)
Piston speed	50 to 750 mm/s
Auto switch	Mountable

∗ Specifications other than above are the same as standard type.

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

ø20 to ø50



(mm)

Bore size (mm)	L	M	N	O	AA
20	80	25	45	M6 x 1	11
25	100	35	54	M6 x 1	14
32	106	35	60	M6 x 1	14
40	134	50	75	M8 x 1.25	17
50	152	56	90	M10 x 1.5	23

Made to Order 10

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

15 Auto Switch Mounting Special Dimensions at Stroke End

Symbol **-XC78**

Auto switch mounting position at stroke end is assembled like below.

How to Order

MGC | **Standard model no.** | **−XC78**

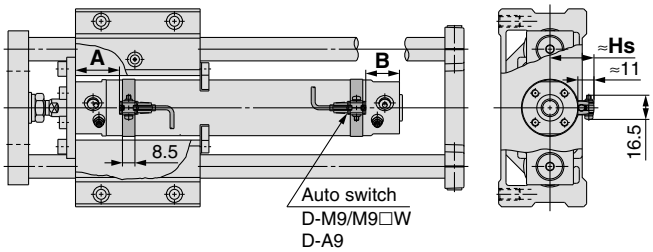
Auto switch mounting special dimensions at stroke end

Specifications

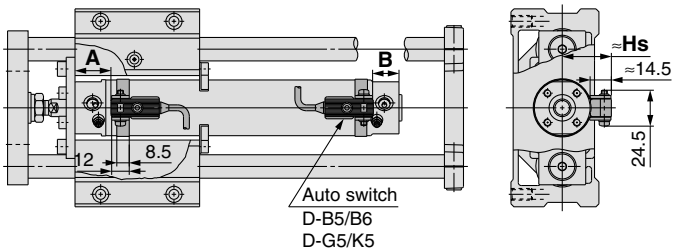
Bore size (mm)	20, 25, 32, 40, 50
Applicable cylinder	Guide cylinder
Specifications other than above	Same as standard type

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

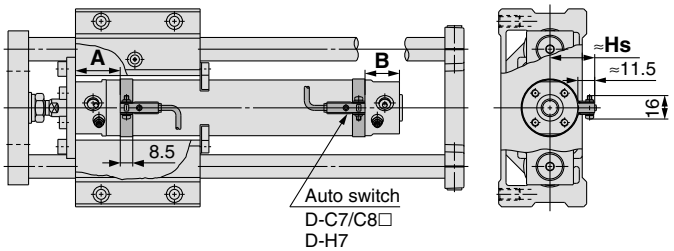
D-M9/M9□W
D-A9



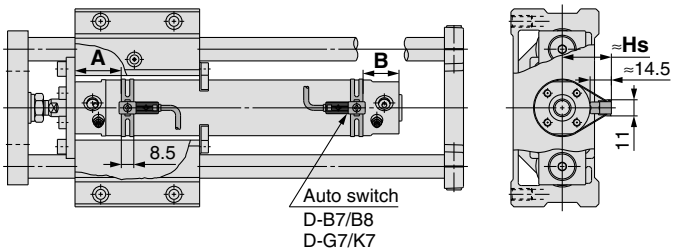
D-B5/B6
D-G5/K5



D-C7/C8
D-H7



D-B7/B8
D-G7/K7



Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W		D-A9□		D-B7/B8 D-B73C D-B80C D-G7/K7 D-K79C		D-C7□ D-C80 D-C73C D-C80C		D-B5□ D-B64		D-B59W		D-H7□ D-H7C D-H7NF D-H7□W D-H7BAL		D-G59F/G5□ D-K59 D-G5□W D-K59W D-G5NTL D-G5BAL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	33	24 (32)	29	20 (28)	30.5	21.5 (29.5)	29.5	20.5 (28.5)	23.5	15.5 (22.5)	26.5	17.5 (25.5)	28.5	19.5 (27.5)	25	16 (24)
25	33	24 (32)	29	20 (28)	30.5	21.5 (29.5)	29.5	20.5 (28.5)	23.5	15.5 (22.5)	26.5	17.5 (25.5)	28.5	19.5 (27.5)	25	16 (24)
32	34	25 (33)	30	21 (29)	31.5	22.5 (30.5)	30.5	21.5 (29.5)	24.5	15.5 (23.5)	27.5	18.5 (26.5)	29.5	20.5 (28.5)	26	17 (25)
40	39	27 (36)	35	23 (32)	36.5	24.5 (33.5)	35.5	23.5 (32.5)	29.5	19 (26.5)	32	20.5 (29.5)	34.5	22.5 (31.5)	31	19 (28)
50	46	32 (36)	42	28 (40)	43.5	29.5 (41.5)	42.5	28.5 (40.5)	36.5	22.5 (34.5)	39.5	25.5 (37.5)	41.5	27.5 (39.5)	38	24 (36)

Auto Switch Mounting Height (mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□W D-A9□	D-C7□/C80 D-H7□ D-H7□W D-H7NF D-H7BAL	D-C73C D-C80C	D-B7□/B80 D-B73C D-B80C D-G79/K79 D-K79C D-H7C D-G5NTL D-G5□/K59 D-G5□W D-K59W D-B5□/B64 D-B59W D-G5BAL D-G59F
	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5
25	26.5	27	29.5	30
32	30	30.5	33	33.5
40	34.5	35	37.5	38
50	40	40.5	43	43.5

∗ ( ): Values for long stroke, double rod

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

Made to Order 11

Please contact SMC for detailed specifications, lead times, and pricing.

Made to Order

16 With Piping Ports for Grease

Symbol **-X440**

This type is equipped with Rc 1/8 piping ports for grease on both sides of the guide body.

How to Order

MGC [**Standard model no.**] **−X440**

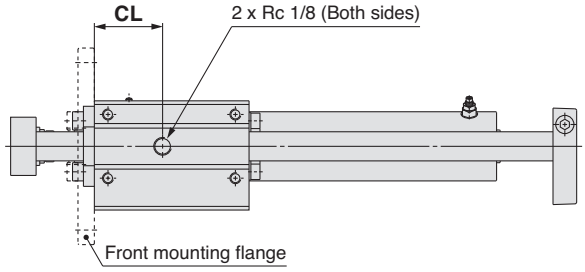
With piping port for grease

Specifications

Bore size (mm)	20, 25, 32, 40, 50
Fluid	Air
Minimum operating pressure	0.15 MPa (Horizontal, No load)
Piston speed	50 to 750 mm/s
Auto switch	Mountable
Specifications other than above	Same as standard type

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

ø20 to ø50



(mm)

Series	MGC
Bore size (mm)	**CL**
20	33
25	35
32	37.5
40	42.5
50	58.5

∗ The standard grease supply port has a hexagon socket head set screw.

Series MGC/MLGC
Specific Product Precautions

Be sure to read before handling.
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Actuators and Auto Switches Precautions.

Installations/Adjustment

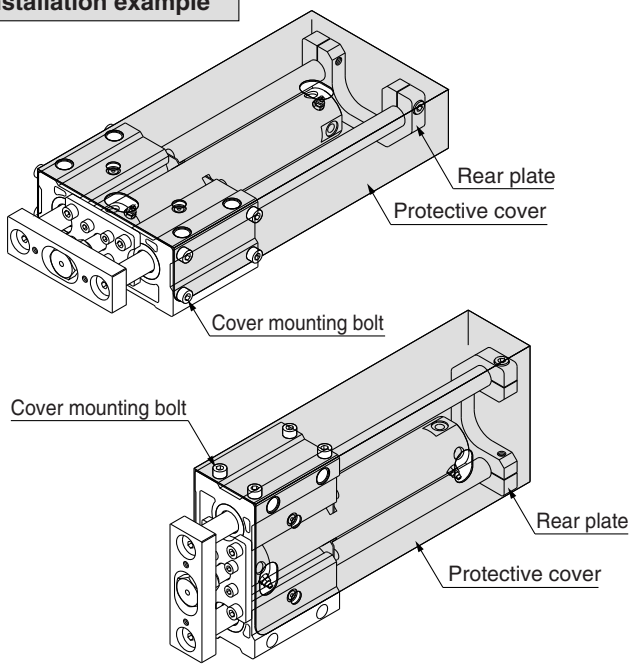
⚠ Warning

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

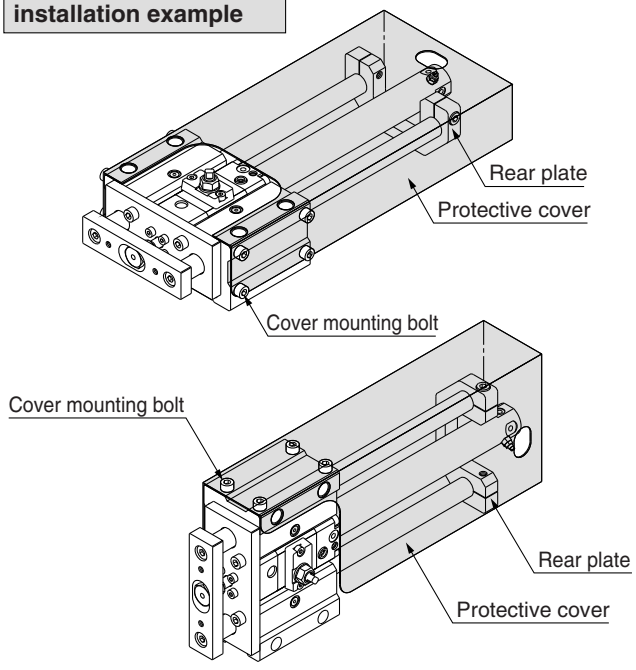
During mounting, handling and operation, the rear plate makes reciprocating movements. Therefore, pay careful attention not to insert your hand, etc., between the cylinder and the rear plate.

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

MGC Protective cover installation example



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. Mount in locations where maintenance will be easy.

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

4. 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.

5. 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.

6. 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.

7. 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.

Caution on Handling the Fine Lock Cylinder

⚠ Caution

1. For details, make sure to refer to "Fine Lock Cylinder (CLG1 series)" of Best Pneumatics.

⚠ 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)*1), and other safety regulations.

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

*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.

⚠ 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 catalogue 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.**
   1. 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.
   3. 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 catalogue.
   3. 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.

⚠ Caution

1. **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

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*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.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue 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

1. 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.

⚠ Safety Instructions | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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