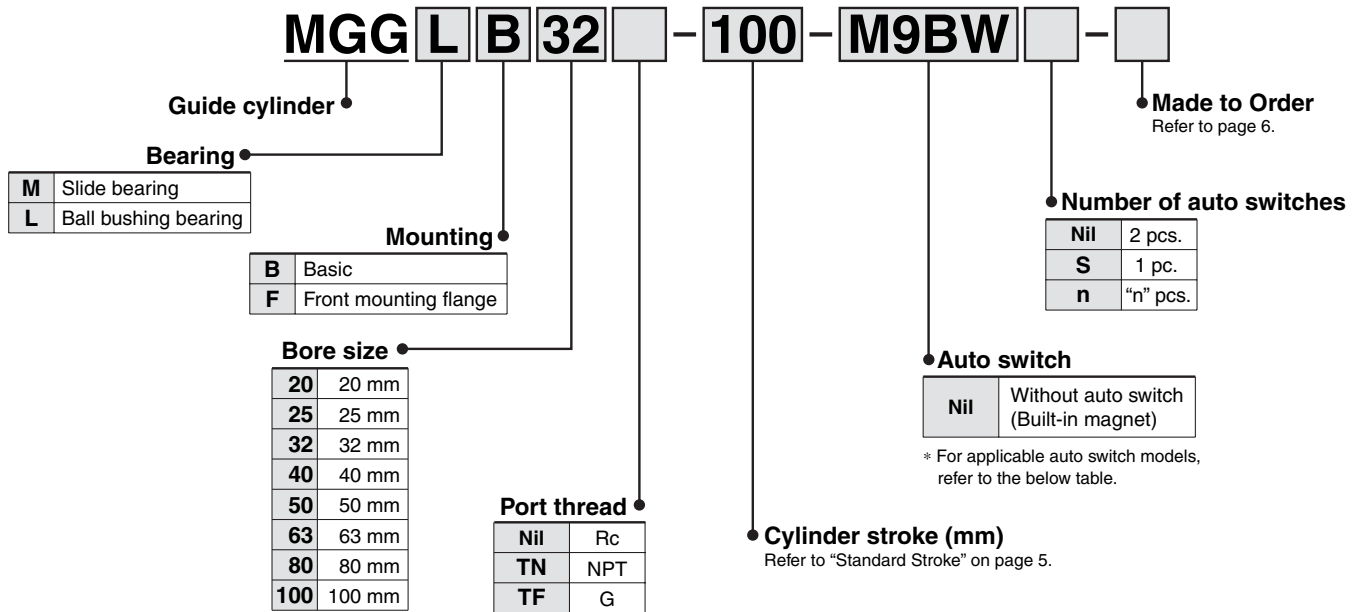


Guide Cylinder

Series MGG

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

How to Order



Applicable Auto Switches / For detailed auto switch specifications, refer to page 56 through to 70.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model					Lead wire length (m)					Pre-wired connector	Applicable load						
					DC	AC	Applicable tubing I.D.					0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC					
							ø20, ø25	ø32	ø40 to ø63	ø80, ø100														
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96					●	—	●	—	—	—	IC circuit	—				
								100 V					A93					—	●	—	●	—	—	—
								100 V or less					A90					—	●	—	●	—	—	—
		Connector		Yes	2-wire	24 V	12 V	100 V, 200 V		(B54)		B54			●	—	●	●	—	—	—	Relay, PLC		
								200 V or less		(B64)		B64			●	—	●	—	—	—				
								—		C73C			—	●	—	●	●	●	—	—				
	Diagnostic indication (2-color indication)	Grommet	Yes	—	—	—	—	(B59W)		B59W			●	—	●	—	—	—	—	—				
Grommet								Yes	3-wire (NPN)	5 V, 12 V	M9N		G59			●	—	●	○	—	○	IC circuit	—	
											3-wire (PNP)		M9P			G5P			●	—	●			○
Solid state switch	—	Connector	Yes	2-wire	12 V	—	M9B		K59			●	—	●	○	—	○	—	—					
							H7C		—			●	—	●	●	●	—			—				
							M9NW		—			●	●	●	○	—	○			—	○			
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—		G59W			●	—	●	○	—	○	IC circuit	Relay, PLC				
								M9PW		—			●	●	●	○	—	○						
								—		G5PW			●	—	●	○	—	○						
								M9BW		—			●	●	●	○	—	○						
Water resistant (2-color indication)	Grommet	Yes	2-wire	12 V	—	—	—		K59W			●	—	●	○	—	○	—	—					
							H7BA		G5BA			—	—	●	○	—	○							
With diagnostic output (2-color indication)	Grommet	Yes	4-wire (NPN)	5 V, 12 V	—	—	—		G59F			●	—	●	○	—	○	IC circuit	—					
							H7NF		—			●	—	●	○	—	○							

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
 1 m M (Example) M9NWM
 3 m L (Example) M9NWL
 5 m Z (Example) M9NWX
 None N (Example) H7CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * D-A9□, M9□, M9□W, and D-F9BA cannot be mounted.

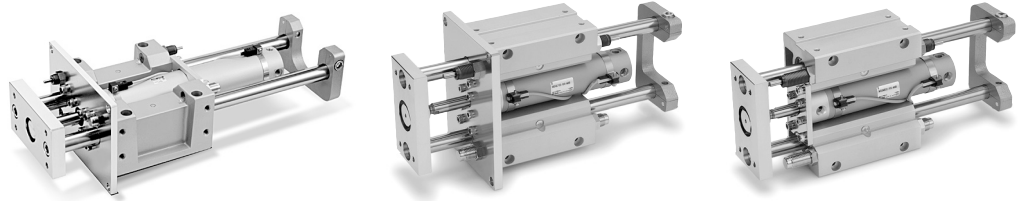
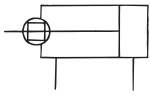
* Since there are other applicable auto switches than listed, refer to page 36 for details.
 * For details about auto switches with pre-wired connector, refer to "Best Pneumatics 2004" Vol. 8 catalog.
 * D-A9□, M9□, M9□W are shipped together (but not assembled).
 (Only switch mounting bracket is assembled 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.

Model / Specifications

JIS Symbol



Standard Stroke

Model (Bearing type)	Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
MGGM (Slide bearing) MGGL (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
	63		350, 400, 450, 500, 600, 700, 800, 900, 1000, 1100
	80		350, 400, 450, 500, 600, 700, 800, 900, 1000, 1100, 1200
	100		350, 400, 450, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300

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

Specifications

Model	MGG□□20	MGG□□25	MGG□□32	MGG□□40	MGG□□50	MGG□□63	MGG□□80	MGG□□100
Basic cylinder	CDG1BN Bore size Port thread – Stroke – Auto switch							
Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting							
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.15 MPa (Horizontal with no load)							
Ambient and fluid temperature	–10 to 60°C							
Piston speed	50 to 1000 mm/s						50 to 700 mm/s	
Cushion	Basic cylinder	Rubber bumper						
	Guide unit	Built-in shock absorbers (2 pcs.)						
Stroke adjusting range (One side) [Built-in adjusting bolts (2 pcs.)]	0 to –10 mm	0 to –15 mm						
Base cylinder lubrication	Non-lube							
Thread tolerance	JIS Class 2							
Stroke length tolerance	+1.9 mm (1000 st or less), +2.3 mm (1001 st or more)							
Non-rotating accuracy*	Slide bearing	±0.07°	±0.06°	±0.06°	±0.05°	±0.04°	±0.04°	±0.03°
	Ball bushing bearing	±0.06°	±0.05°	±0.04°	±0.04°	±0.04°	±0.03°	±0.02°
Piping port size (Rc, NPT, G)	1/8				1/4		3/8	1/2

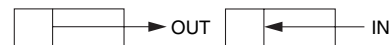
* When the cylinder is retracted (initial value), with no load or without deflection of the guide rod, the non-rotating accuracy shall be the value in the table or less.

Shock Absorber Specifications

Shock absorber model	RB1007	RB1412	RB2015	RB2725	
Applicable guide cylinder	MGG□□20	MGG□□25, 32	MGG□□40, 50, 63	MGG□□80, 100	
Maximum energy absorption (J)	5.88	19.6	58.8	147	
Stroke absorption (mm)	7	12	15	25	
Maximum collision speed (m/s)	5				
Max. operating frequency (cycle/min [*])	70	45	25	10	
Ambient temperature range (°C)	–10 to 80				
Spring force (N)	Extended	4.22	6.86	8.34	8.83
	Retracted	6.86	15.98	20.5	20.01

* It denotes the values at the maximum energy absorption per cycle. Therefore, the operating frequency can be increased according to the energy absorption.

Theoretical Output



Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
20	8	OUT	314	62.8	94.2	126	157	188	220	251	283	314
		IN	264	52.8	79.2	106	132	158	185	211	238	264
25	10	OUT	491	98.2	147	196	246	295	344	393	442	491
		IN	412	82.4	124	165	206	247	288	330	371	412
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1260	252	378	504	630	756	882	1010	1130	1260
		IN	1060	212	318	424	530	636	742	848	954	1060
50	20	OUT	1960	392	588	784	980	1180	1370	1570	1760	1960
		IN	1650	330	495	660	825	990	1160	1320	1490	1650
63	20	OUT	3120	624	936	1250	1560	1870	2180	2500	2810	3120
		IN	2800	560	840	1120	1400	1680	1960	2240	2520	2800
80	25	OUT	5030	1010	1510	2010	2520	3020	3520	4020	4530	5030
		IN	4540	908	1360	1820	2270	2720	3180	3630	4090	4540
100	30	OUT	7850	1570	2360	3140	3930	4710	5500	6280	7070	7850
		IN	7150	1430	2150	2860	3580	4290	5010	5720	6440	7150

(Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

Weight

Bore size (mm)		20	25	32	40	50	63	80	100
Basic weight	LB type (Ball bushing bearing / Basic)	1.72	2.82	3.84	7.19	11.63	16.6	26.32	37.46
	LF type (Ball bushing bearing / Front mounting flange)	2.44	3.79	4.87	9.38	14.17	20.58	33	45.98
	MB type (Slide bearing / Basic)	1.71	2.79	3.36	7.17	11.36	16.22	25.61	36.36
	MF type (Slide bearing / Front mounting flange)	2.42	3.75	4.39	9.37	13.89	20.2	32.29	44.89
Additional weight per each 50 mm of stroke		0.14	0.17	0.25	0.4	0.61	0.82	1.11	1.48
Additional weight for long stroke		0.01	0.01	0.02	0.03	0.06	0.1	0.19	0.26
Additional weight with bracket		0.011	0.018	0.019	0.031	0.061	0.269	0.384	0.548

Calculation: (Example) **MGGLB32-500**
(Ball bushing bearing / Basic, ø32/500 st., With bracket)

- Basic weight..... 3.84 (LB type)
 - Additional stroke weight..... 0.25/50 st
 - Stroke..... 500 st
 - Additional weight for long stroke..... 0.02
 - Additional weight with bracket..... 0.019
- 3.84 + 0.25 x 500/50 + 0.02 + 0.019 = 6.379 kg

Moving Parts Weight

Bore size (mm)	20	25	32	40	50	63	80	100
Moving parts basic weight	0.69	1.14	1.61	3.09	5.23	8.29	13.09	18.58
Additional weight per each 50 mm of stroke	0.109	0.135	0.203	0.326	0.509	0.679	0.948	1.265

- Calculation: (Example) **MGGLB32-500**
- Moving parts basic weight..... 1.61
 - Additional stroke weight..... 0.203/50 st
 - Stroke..... 500 st
- 1.61 + 0.203 x 500/50 = 3.64 kg



Made to Order
(For details, refer to page 71.)

Symbol	Specifications
XB6	Heat resistant cylinder (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 type
XC13	Auto switch rail mounting
XC22	Fluoro rubber seals
XC35	With coil scraper
XC37	Larger throttle diameter of connecting port
XC56	With knock pin hole
XC71	Helical insert thread specifications
XC72	Without built-in auto switch magnet
XC73	Cylinder with lock (CDNG)
XC79	Machining tapped hole, drilled hole, and pin hole additionally
XC83	Cylinder with lock (MDNB)
X440	With piping ports for grease
X772	Auto switch rail mounting style/ With piping ports for grease

Air-hydro

Low pressure hydraulic cylinder of 1.0 MPa or less
When used together with the CC series air-hydro unit, constant and low speed actuation, and intermediate stopping similar to hydraulic units are possible with the use of valves and other pneumatic equipment.

MGGH Bearing Mounting Bore size Port thread - Stroke

•Air-hydro

Specifications

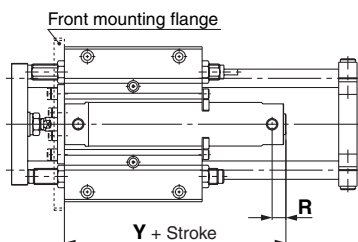
Bore size (mm)	20, 25, 32, 40, 50, 63	
Action	Double acting	
Fluid	Turbine oil	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.18 MPa (Horizontal with no load)	
Piston speed	15 to 300 mm/s	
Cushion	Basic cylinder	Without
	Guide unit	Built-in shock absorbers (2 pcs.)
Ambient and fluid temperature	+5 to 60°C	
Thread tolerance	JIS Class 2	
Mounting	Basic, Front mounting flange	

* For specifications other than the above, refer to page 5.

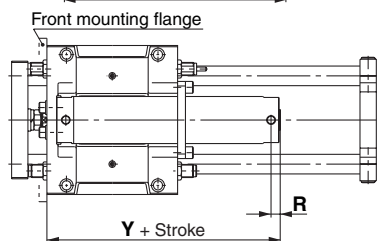
* Auto switch can be mounted.

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

ø20 to ø50



ø63



Bore size (mm)	20	25	32	40	50	63
R	14	14	14	15	16	16
Y	79	79	81	89	104	119

(mm)

Copper-free / Fluoro-free (For CRT production 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-MGG Bearing Mounting Bore size Port thread - Stroke

•Copper-free / Fluoro-free

Specifications

Bore size (mm)	20, 25, 32, 40, 50, 63, 80, 100	
Action	Double acting	
Fluid	Air	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.15 MPa (Horizontal with no load)	
Cushion	Basic cylinder	Rubber bumper
	Guide unit	Built-in shock absorbers (2 pcs.)
Mounting	Basic, Front mounting flange	

* For specifications other than the above, refer to page 5.

For dimensions, refer to page 20 through to 23.

* Auto switch can be mounted.

Water Resistant

The installation of a special scraper in front of the rod seal on the base cylinder protects against the entry of liquids from the environment into the cylinder. This type can be used in environments with machine tool coolants, and with water spray such as food processing and car washing equipment.

MGGM Mounting Bore size Port thread R - Stroke - G5BAL

•Slide bearing

•Water resistant 2-color indication solid state switch

•Water resistant cylinder

R	NBR seals (Nitrile rubber)
V	FKM seals (Fluoro rubber)

Specifications

Bore size (mm)	32, 40, 50, 63, 80, 100	
Action	Double acting	
Fluid	Air	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.15 MPa (Horizontal with no load)	
Bearing	Slide bearing	
Cushion	Basic cylinder	Rubber bumper
	Guide unit	Built-in shock absorbers (2 pcs.)
Mounting	Basic, Front mounting flange	

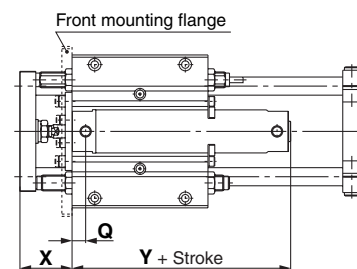
* For specifications other than the above, refer to page 5.

* Auto switch capable (water resistant type)

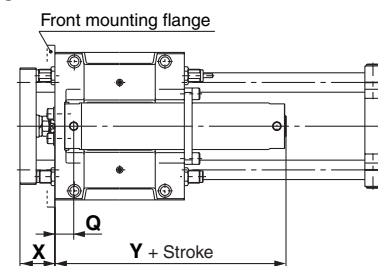
Note) The RBL (coolant resistant type) shock absorbers are used.

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

ø32 to ø50



ø63 to ø100



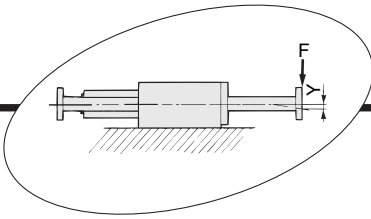
(mm)

Bore size (mm)	Q	X	Y
32	16	48	77 (85)
40	17	58	84 (93)
50	19	69	97 (109)
63	34	56	112 (124)
80	46	68	137 (151)
100	47	68	138 (152)

* (): Dimensions for long stroke.

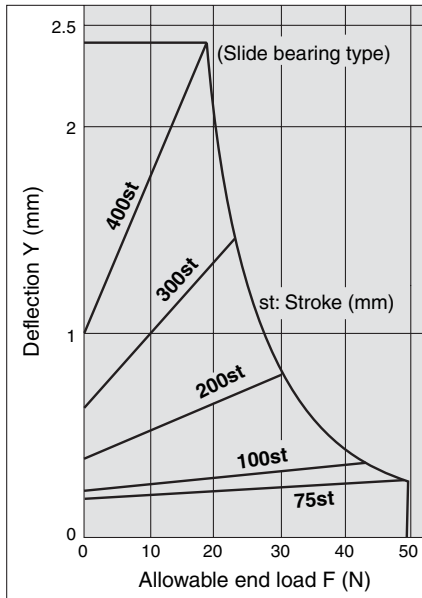
For details, refer to the catalog (CAT.E244-B) separately (except ø63 to ø100).

Series MGG

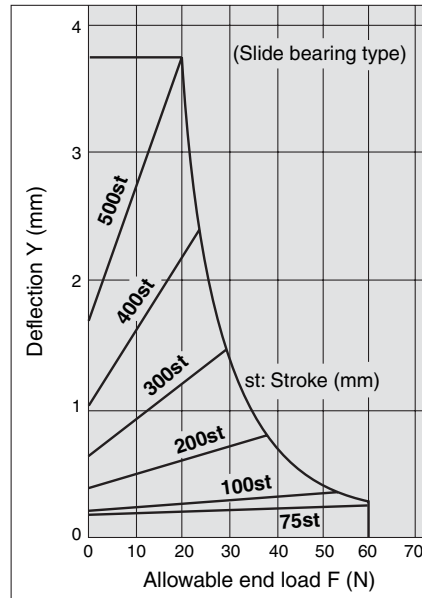


Slide Bearing Allowable End Load and Deflection

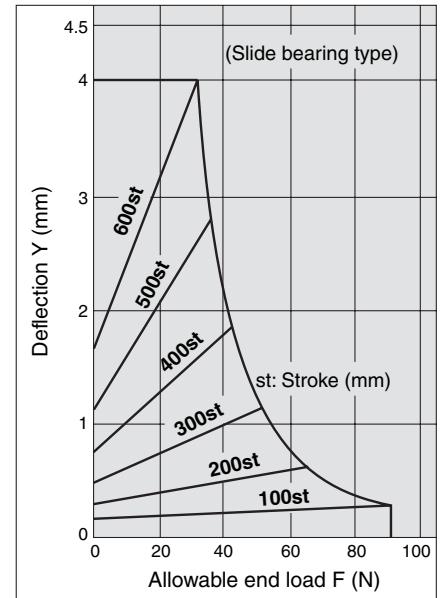
MGGM 20-Stroke



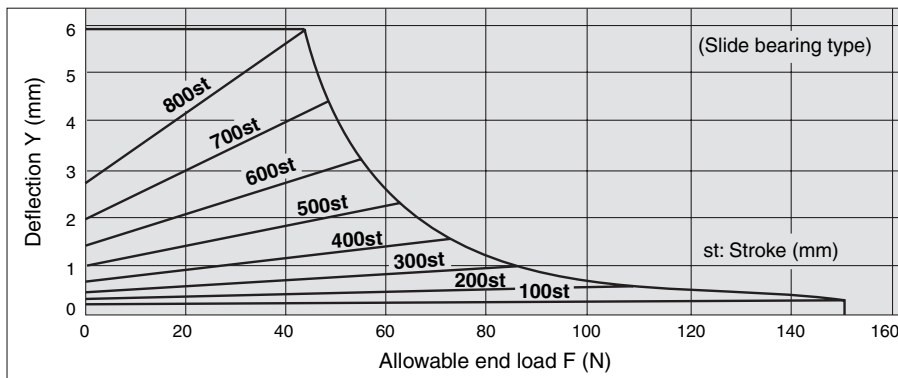
MGGM 25-Stroke



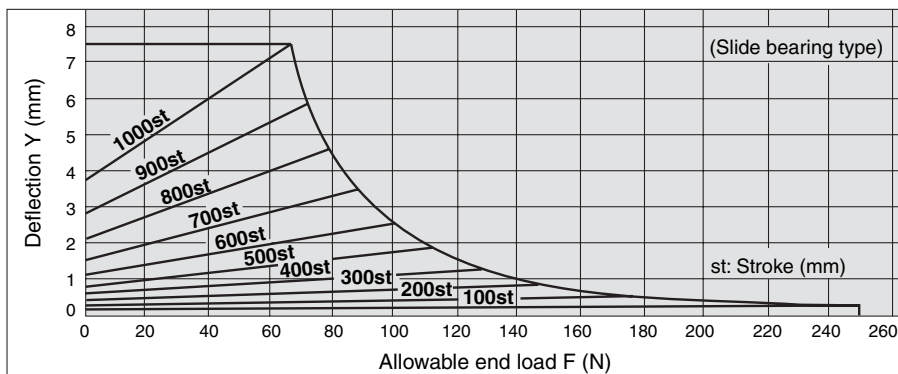
MGGM 32-Stroke



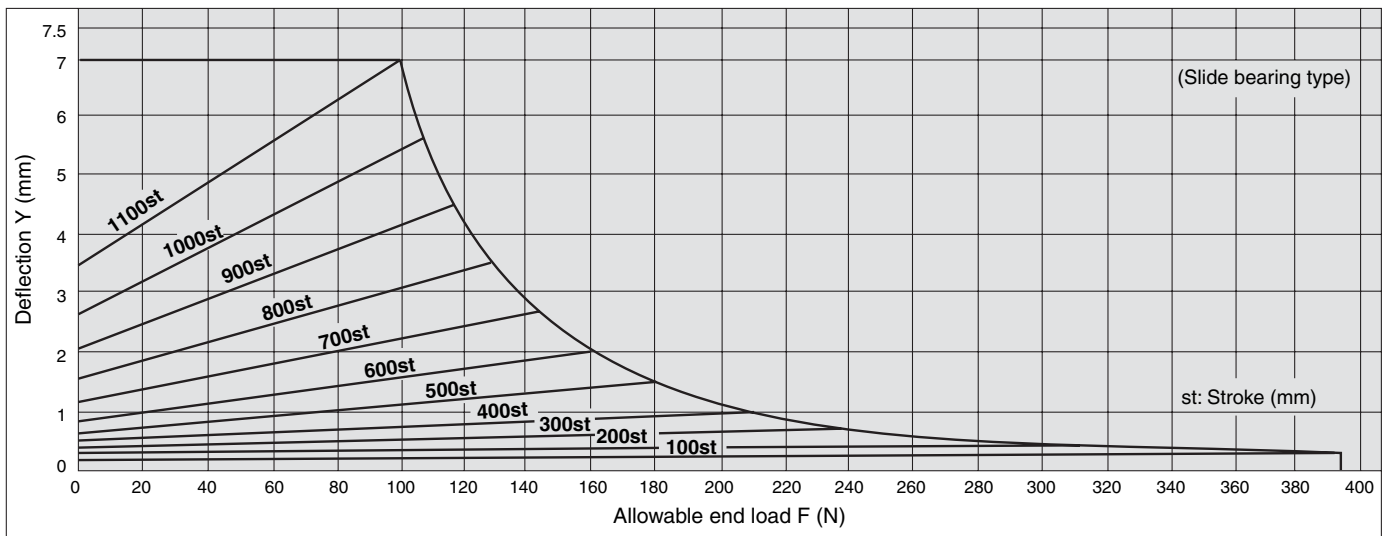
MGGM 40-Stroke



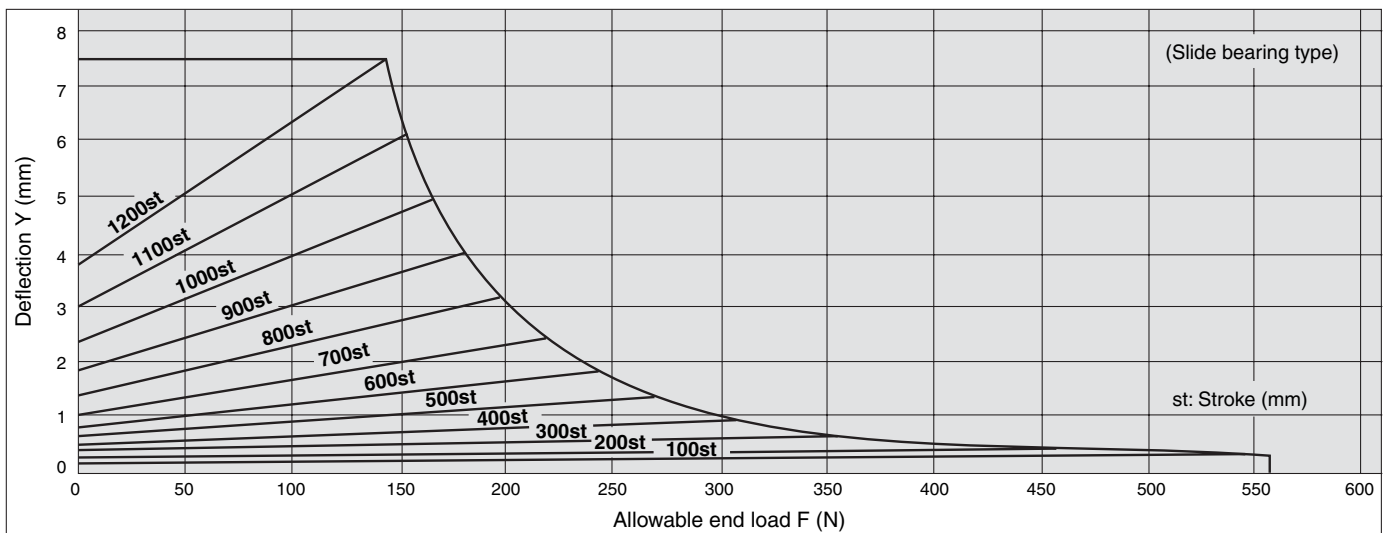
MGGM 50-Stroke



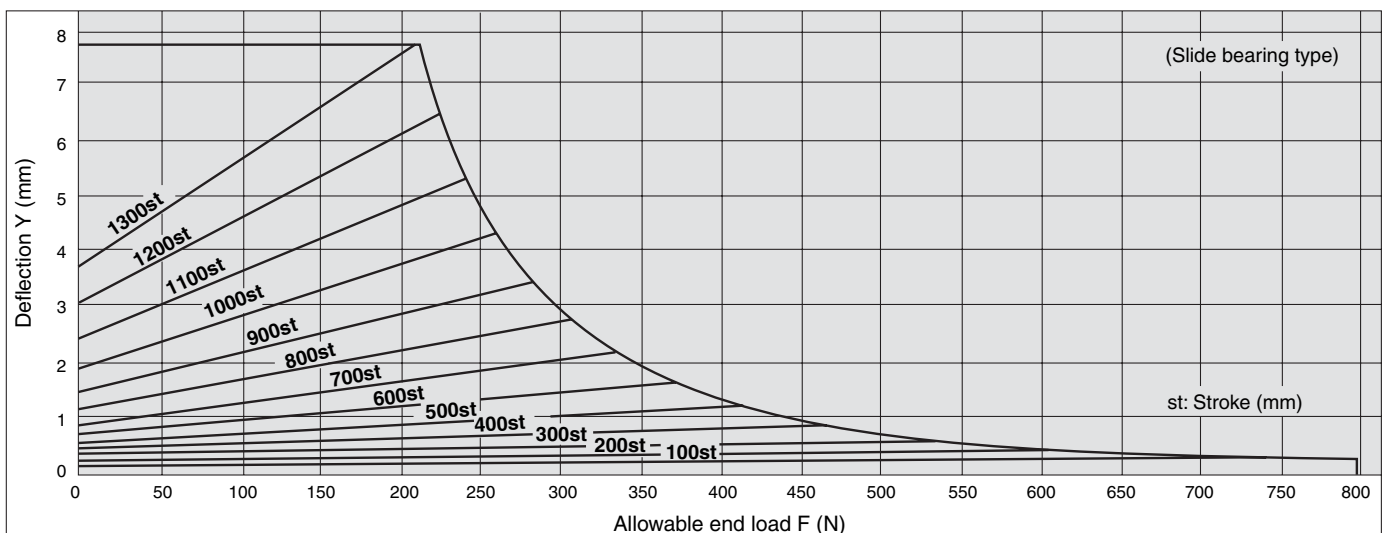
MGGM 63-Stroke



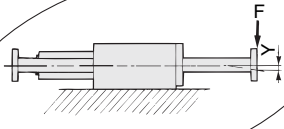
MGGM 80-Stroke



MGGM 100-Stroke

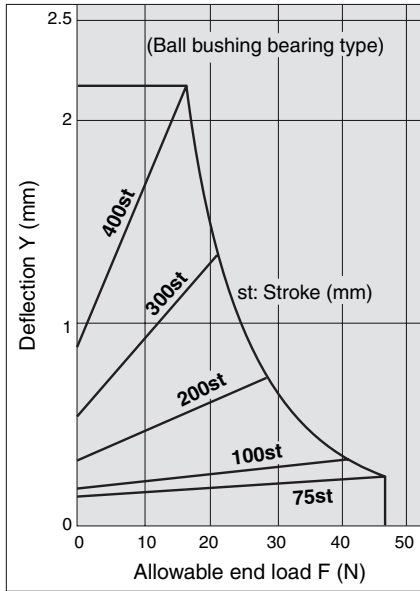


Series MGG

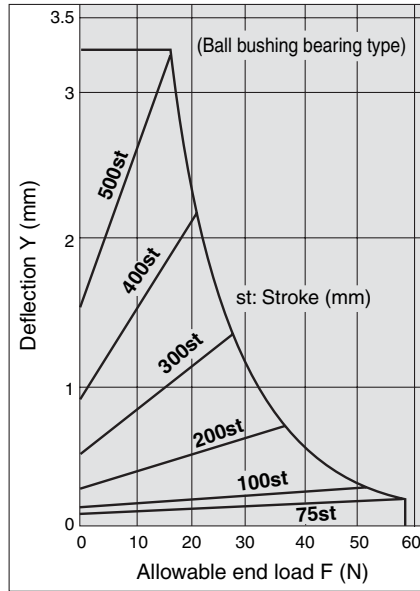


Ball Bushing Bearing Allowable End Load and Deflection

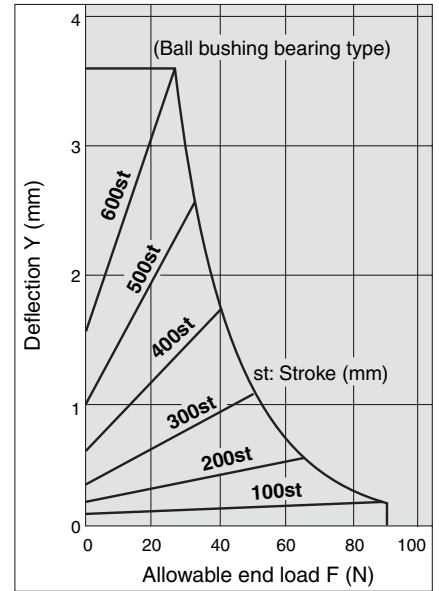
MGGL 20-Stroke



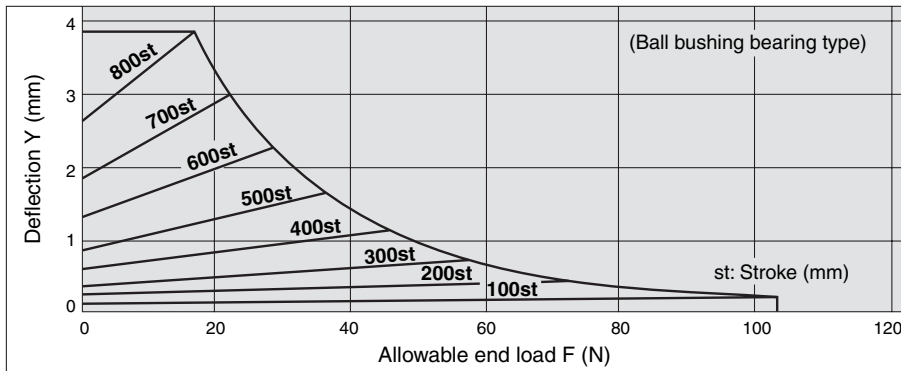
MGGL 25-Stroke



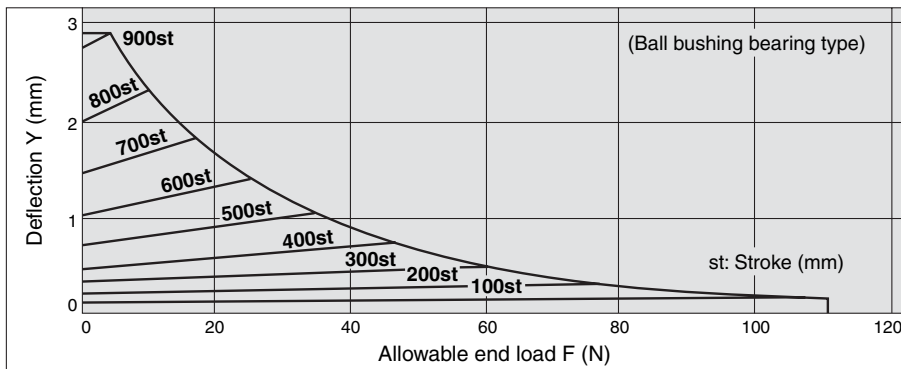
MGGL 32-Stroke



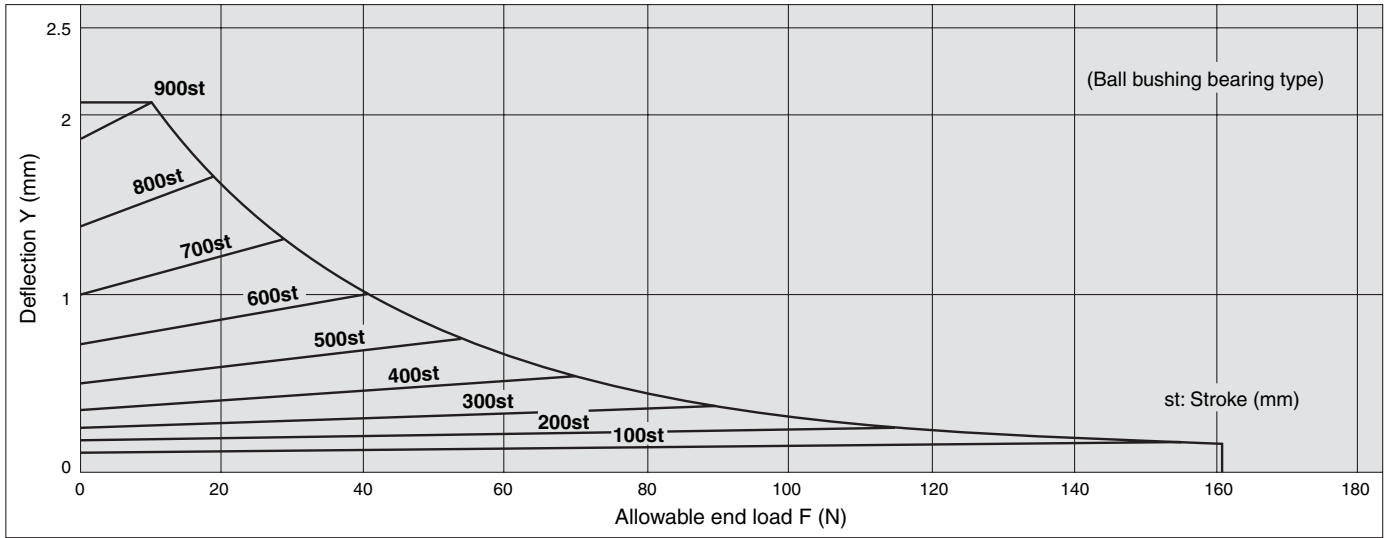
MGGL 40-Stroke



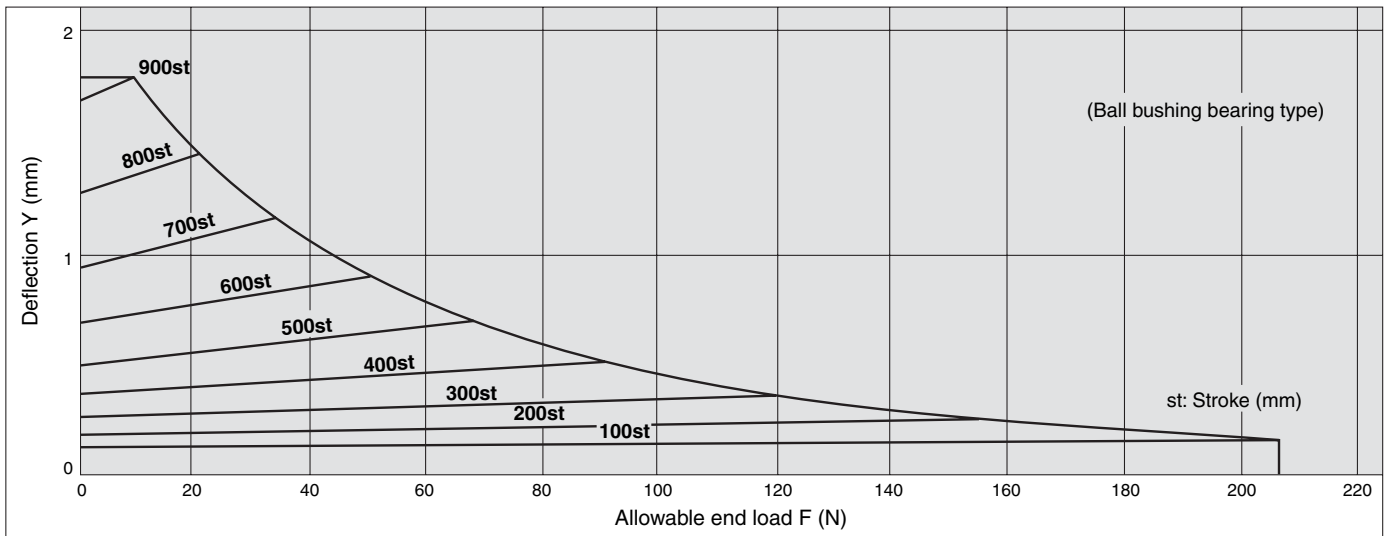
MGGL 50-Stroke



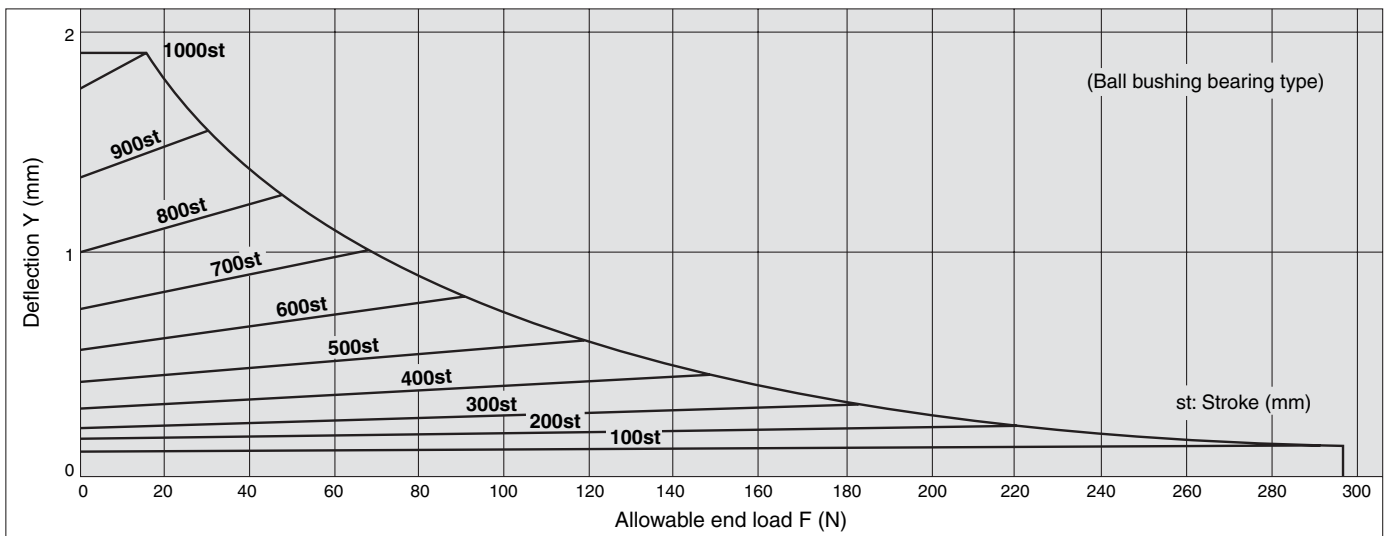
MGGL 63-Stroke



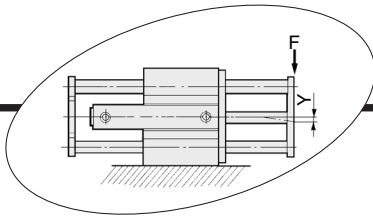
MGGL 80-Stroke



MGGL 100-Stroke

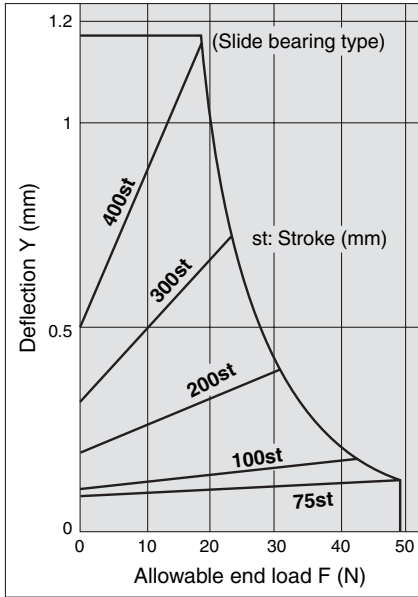


Series MGG

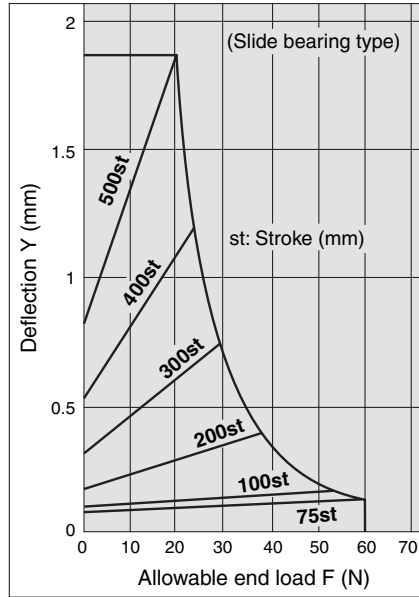


Slide Bearing Allowable End Load and Deflection

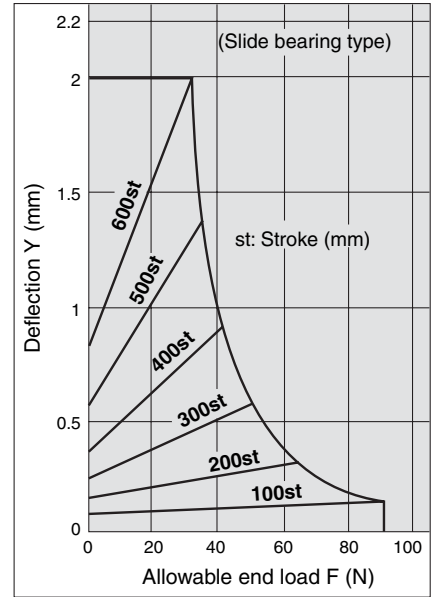
MGGM 20-Stroke



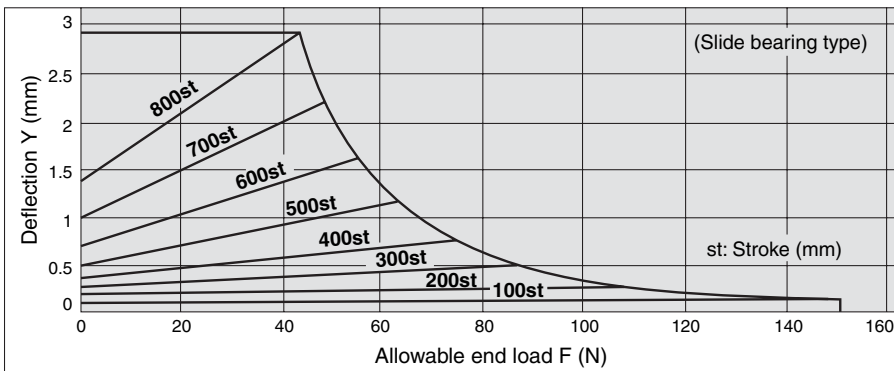
MGGM 25-Stroke



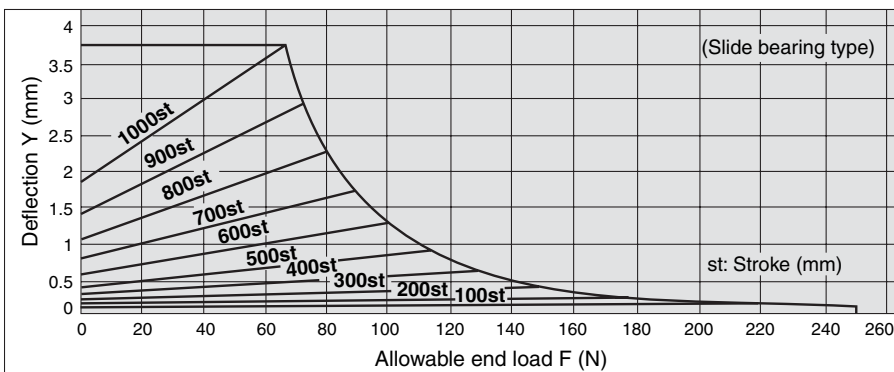
MGGM 32-Stroke



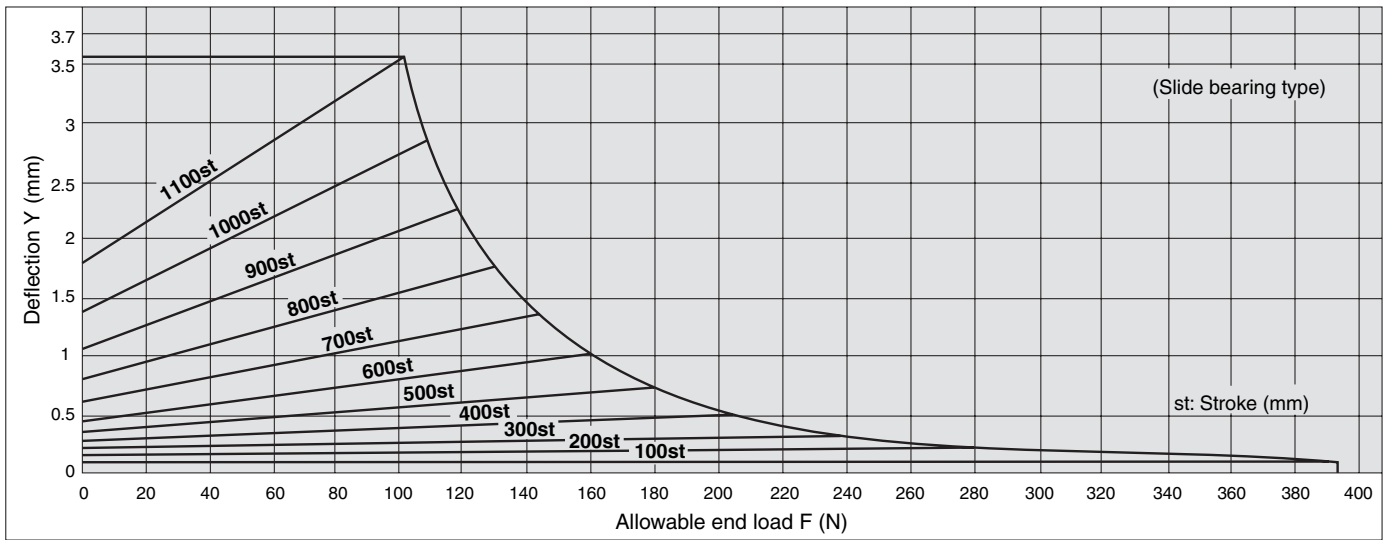
MGGM 40-Stroke



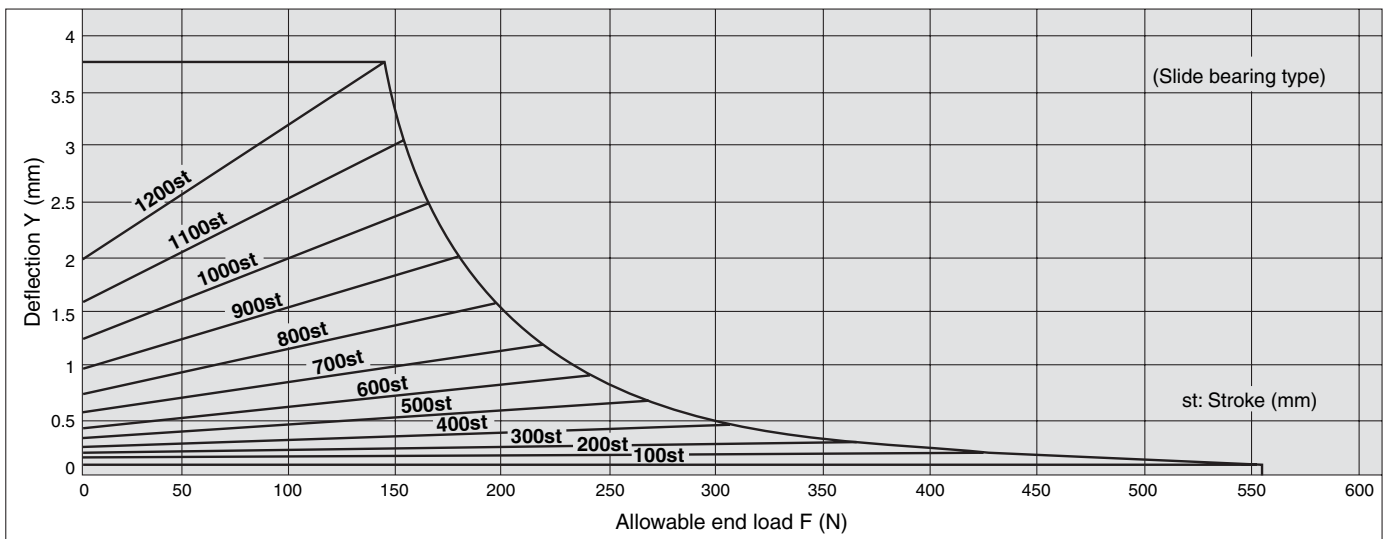
MGGM 50-Stroke



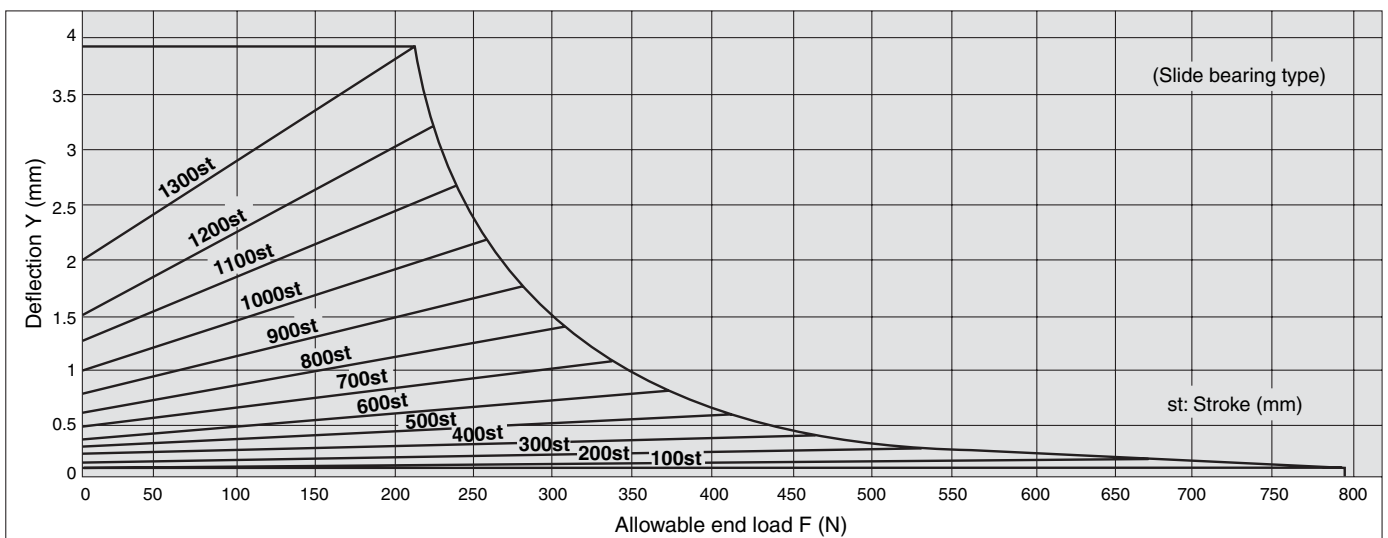
MGM 63-Stroke



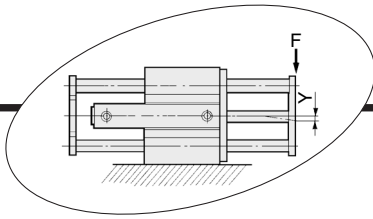
MGM 80-Stroke



MGM 100-Stroke

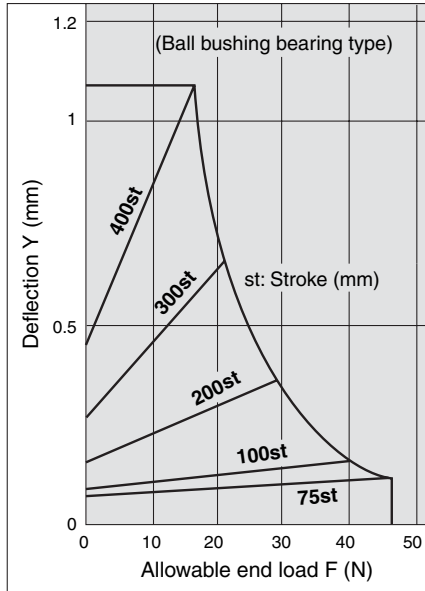


Series MGG

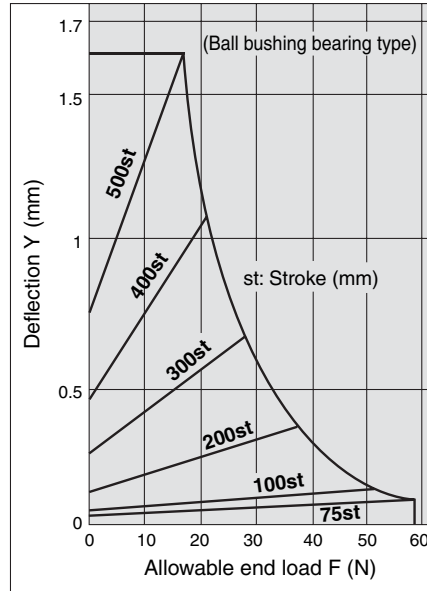


Ball Bushing Bearing Allowable End Load and Deflection

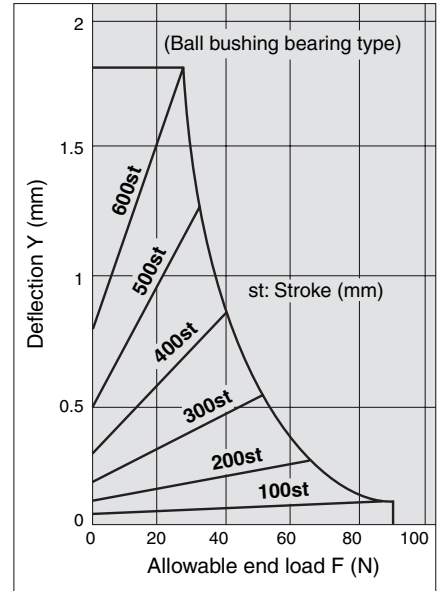
MGGL 20-Stroke



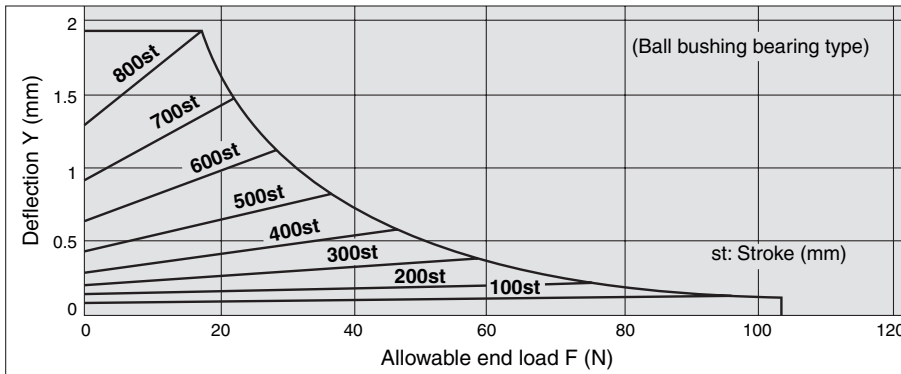
MGGL 25-Stroke



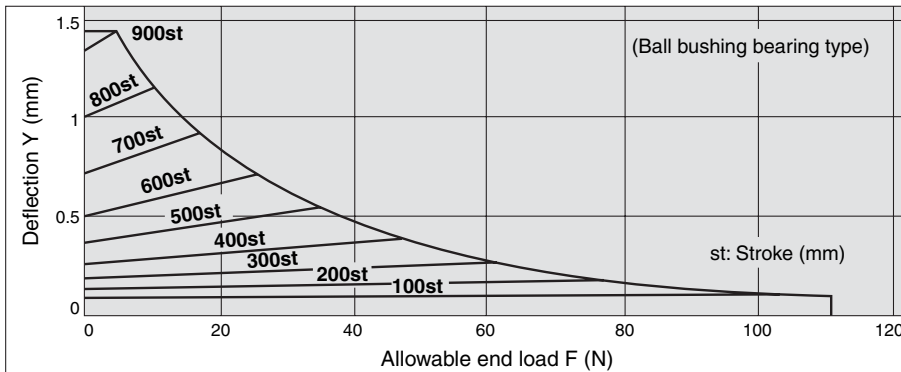
MGGL 32-Stroke



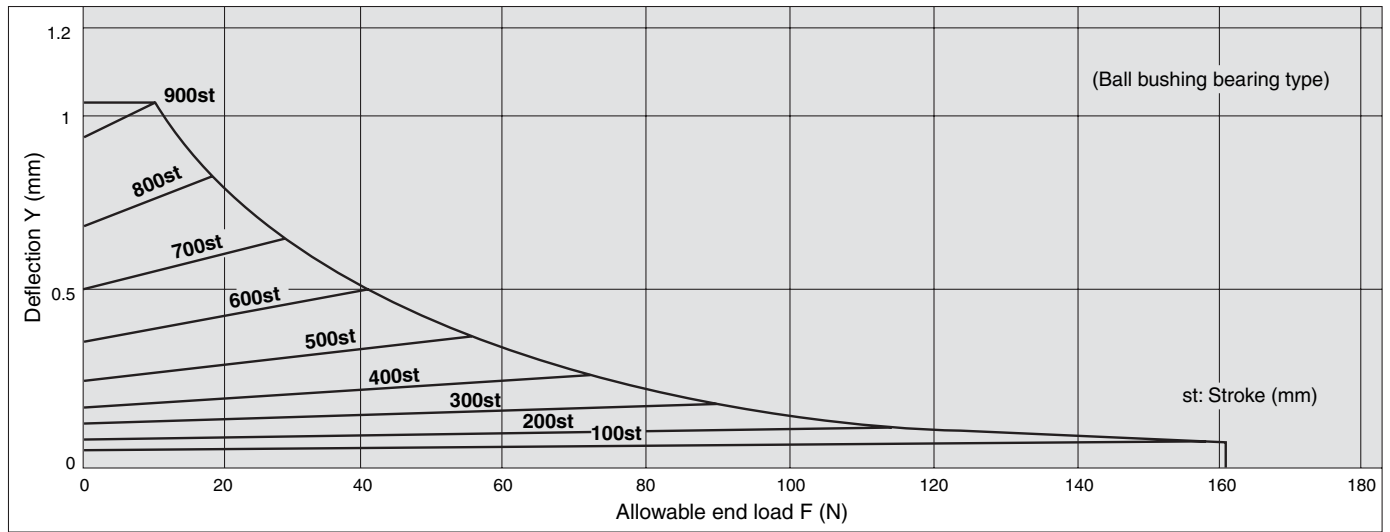
MGGL 40-Stroke



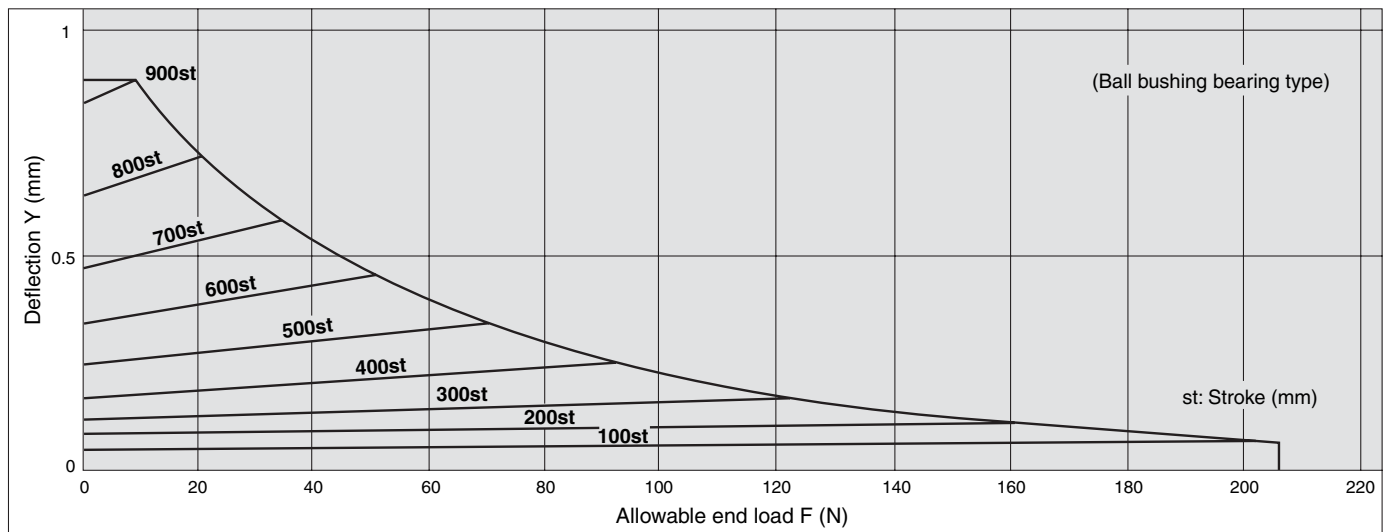
MGGL 50-Stroke



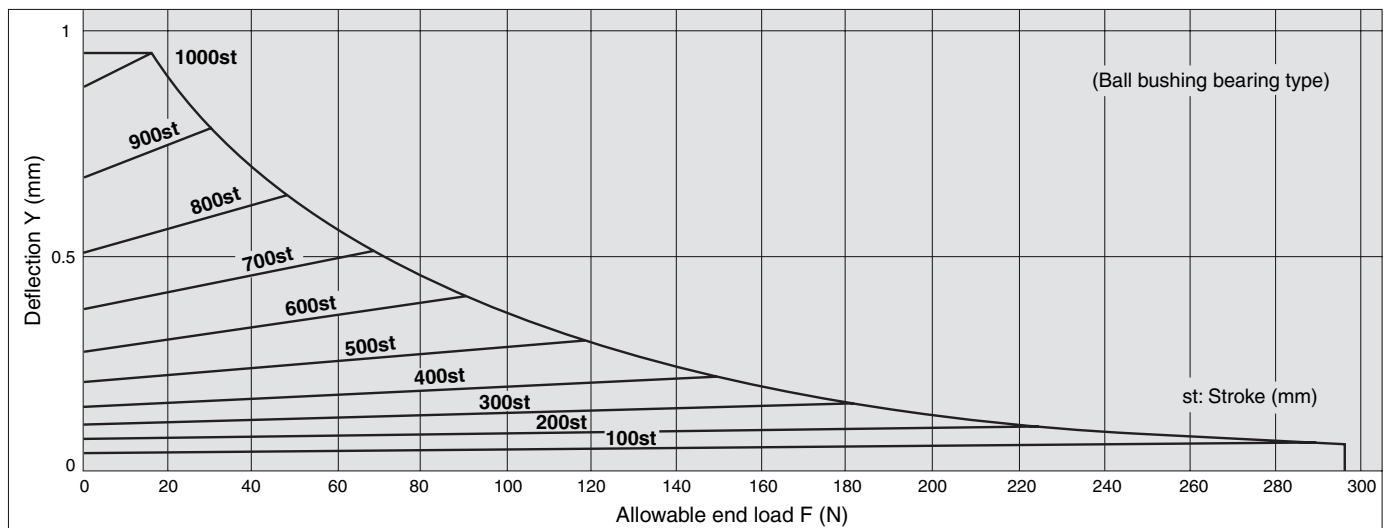
MGGL **63** - Stroke



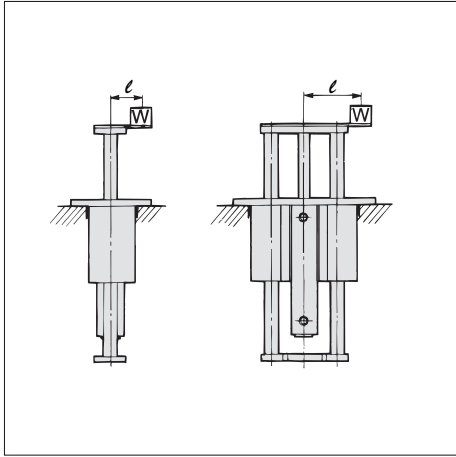
MGGL **80** - Stroke



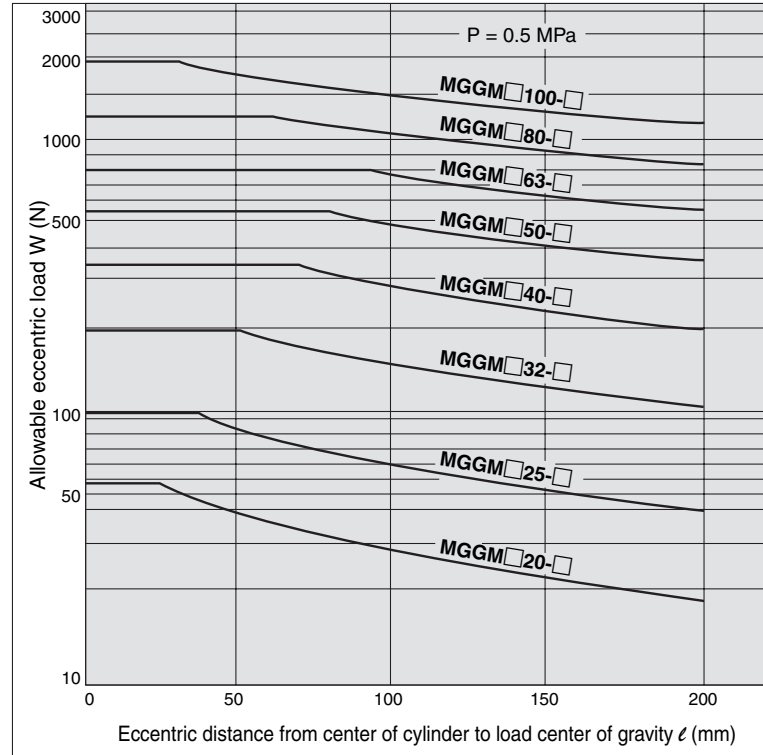
MGGL **100** - Stroke



Allowable Eccentric Load

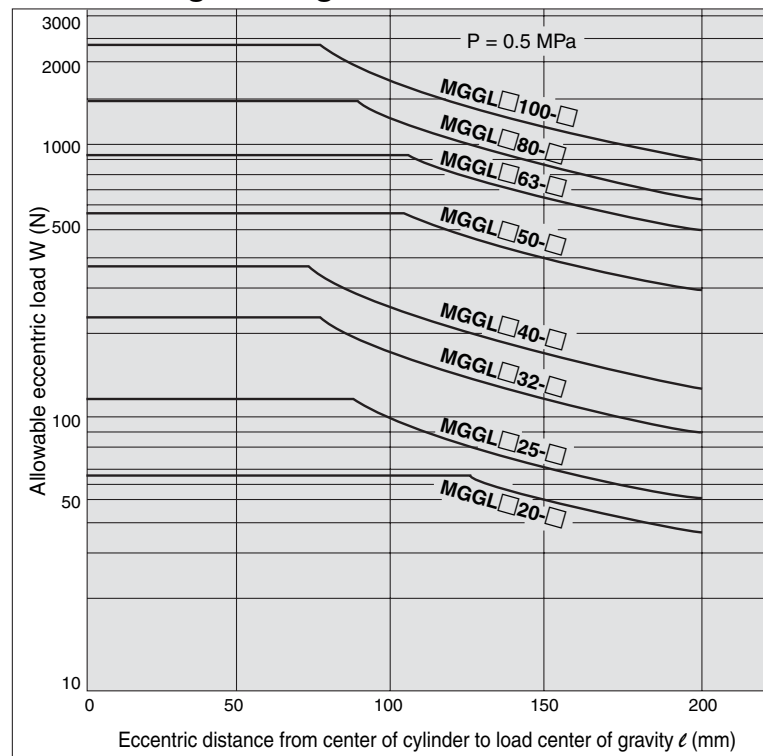


Slide Bearing: MGGM □□ - Stroke



(Set the maximum allowable load so that it does not exceed the following percentages of the theoretical output: 35% for $\phi 20$, 40% for $\phi 25$, 50% for $\phi 32$, 55% for $\phi 40$ and $\phi 50$, and 50% for $\phi 63$, $\phi 80$ and $\phi 100$.)

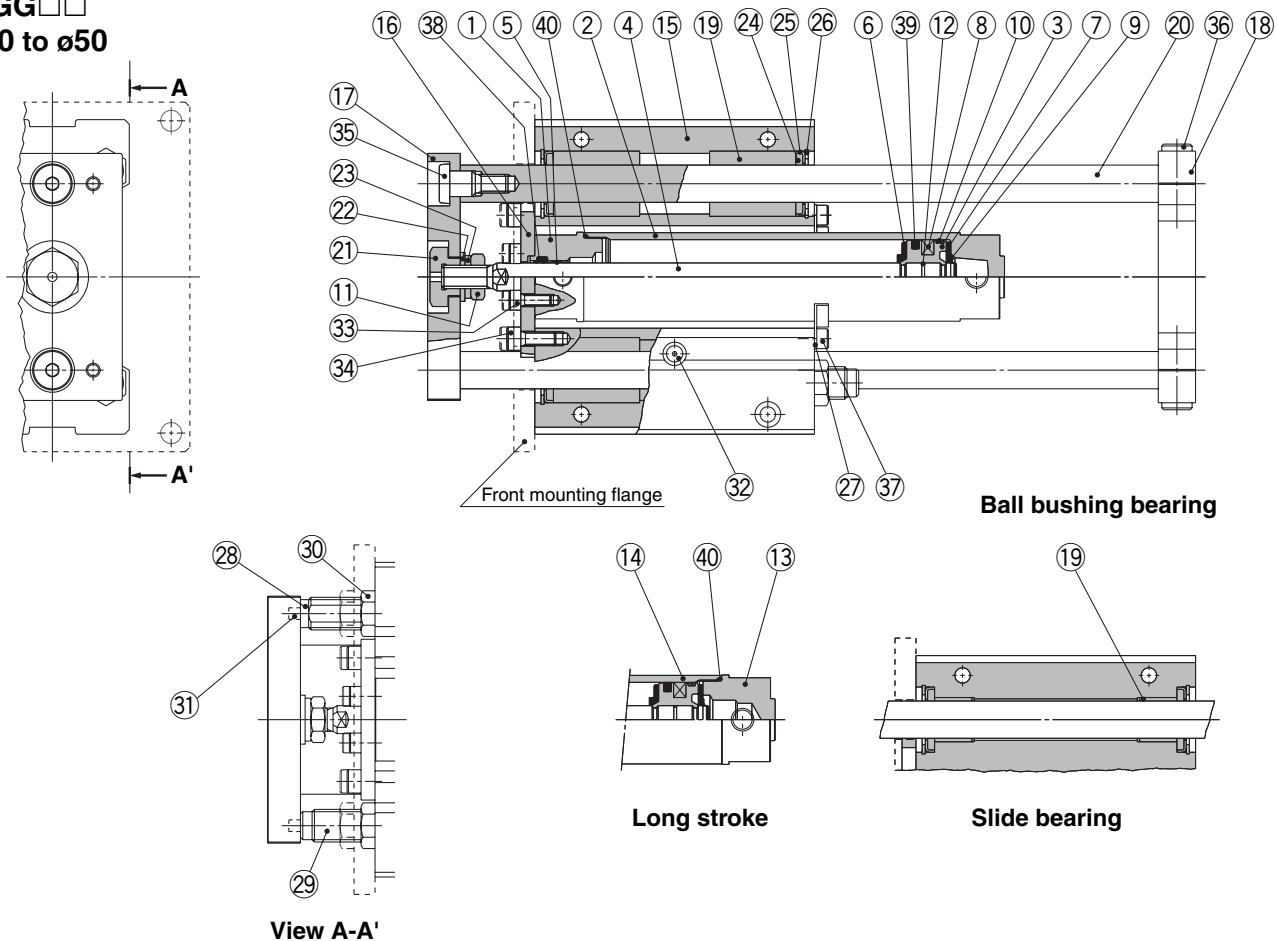
Ball Bushing Bearing: MGGL □□ - Stroke



(Set the maximum allowable load so that it does not exceed the following percentages of the theoretical output: 40% for $\phi 20$, 50% for $\phi 25$, and 60% for $\phi 32$, $\phi 40$, $\phi 50$, $\phi 63$, $\phi 80$ and $\phi 100$.)

Construction

MGG□□
ø20 to ø50



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	White hard anodized
2	Tube cover	Aluminum alloy	White hard anodized
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated ø20, ø25 are stainless steel
5	Bushing	Bearing alloy	
6	Bumper A	Urethane	
7	Bumper B	Urethane	ø40 and larger are the same as bumper A
8	Magnet	—	
9	Snap ring	Stainless steel	
10	Wear ring	Resin	
11	Rod end nut	Rolled steel	Nickel plated
12	Piston gasket	NBR	
13	Head cover	Aluminum alloy	White hard anodized For long stroke
14	Cylinder tube	Aluminum alloy	Hard anodized
15	Guide body	Aluminum alloy	White anodized
16	Small flange	Rolled steel	Basic
16	Large flange		Nickel plated Front mounting flange
17	Front plate	Rolled steel	Flat nickel plated
18	Rear plate	Cast iron	Metallic gold
19	Slide bearing	Bearing alloy	For slide bearing
19	Ball bushing bearing	—	For ball bushing bearing
20	Guide rod	Carbon steel	Hard chrome plated For slide bearing
20	Guide rod	High carbon chrome bearing steel	Quenched, hard chrome plated For ball bushing bearing
21	End bracket	Carbon steel	Nickel plated
22	Plain washer	Rolled steel	Nickel plated
23	Spring washer	Steel wire	Nickel plated
24	Felt	Felt	
25	Holder	Stainless steel	
26	C-type snap ring for hole	Carbon tool steel	Nickel plated
27	Bracket	Stainless steel	
28	Shock absorber	—	

Component Parts

No.	Description	Material	Note
29	Adjusting bolt	Rolled steel	Nickel plated
30	Nut	Rolled steel	Nickel plated
31	Parallel pin	High carbon chrome bearing steel	Nickel plated
32	Grease nipple	—	Nickel plated
33	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For cylinder mounting
34	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For large/small flange mounting
35	Guide bolt	Chromium molybdenum steel	Nickel plated For front plate mounting
36	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For rear plate mounting
37	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For bracket mounting
38	Rod seal	NBR	
39	Piston seal	NBR	
40	Tube gasket	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
20	CG1N20-PS	Set of nos. above ⑳, ㉑, ㉒.
25	CG1N25-PS	
32	CG1N32-PS	
40	CG1N40-PS	

* Seal kit includes ㉓ to ㉕. Order the seal kit, based on each bore size.

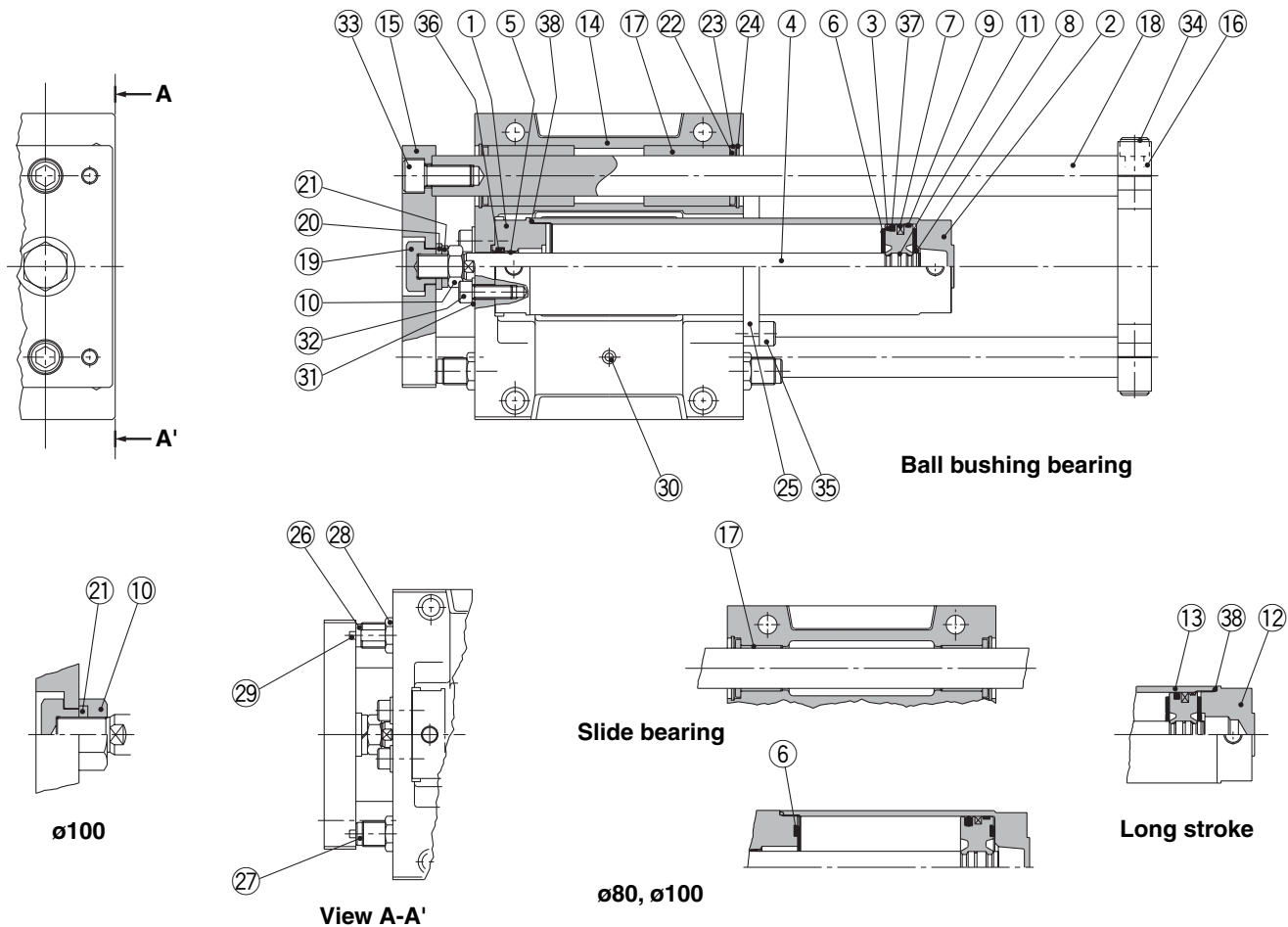
Caution

When disassembling basic cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

Series MGG

Construction

MGG□B
 ø63 to ø100



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	White hard anodized
2	Tube cover	Aluminum alloy	White hard anodized
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated
5	Bushing	Bearing alloy	
6	Bumper	Urethane	
7	Magnet	—	
8	Snap ring	Stainless steel	Not required for ø80 and ø100
9	Wear ring	Resin	
10	Rod end nut	Rolled steel	Nickel plated ø100 is carbon steel
11	Piston gasket	NBR	
12	Head cover	Aluminum alloy	White hard anodized For long stroke
13	Cylinder tube	Aluminum alloy	Hard anodized For long stroke
14	Guide body	Aluminum alloy	Platinum silver
15	Front plate	Rolled steel	Flat nickel plated
16	Rear plate	Cast iron	Platinum silver
17	Slide bearing	Bearing alloy	For slide bearing
17	Ball bushing bearing	—	For ball bushing
18	Guide rod	Carbon steel	Hard chrome plated For slide bearing
18	Guide rod	High carbon chrome bearing steel	Quenched, hard chrome plated For ball bushing bearing
19	End bracket	Carbon steel	Flat nickel plated
20	Plain washer	Rolled steel	Nickel plated Not required for ø100
21	Spring washer	Steel wire	Nickel plated
22	Felt	Felt	
23	Holder	Rolled steel	Nickel plated
24	C-type snap ring for hole	Carbon tool steel	Nickel plated

Component Parts

No.	Description	Material	Note
25	Bracket	Aluminum alloy	White anodized
26	Shock absorber	—	
27	Adjusting bolt	Rolled steel	Nickel plated
28	Nut	Rolled steel	Nickel plated
29	Parallel pin	High carbon chrome bearing steel	Nickel plated
30	Grease nipple	—	Nickel plated
31	Flat washer	Carbon steel	Nickel plated
32	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For cylinder mounting
33	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For front plate mounting
34	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For rear plate mounting
35	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For bracket mounting
36	Rod seal	NBR	
37	Piston seal	NBR	
38	Tube gasket	NBR	

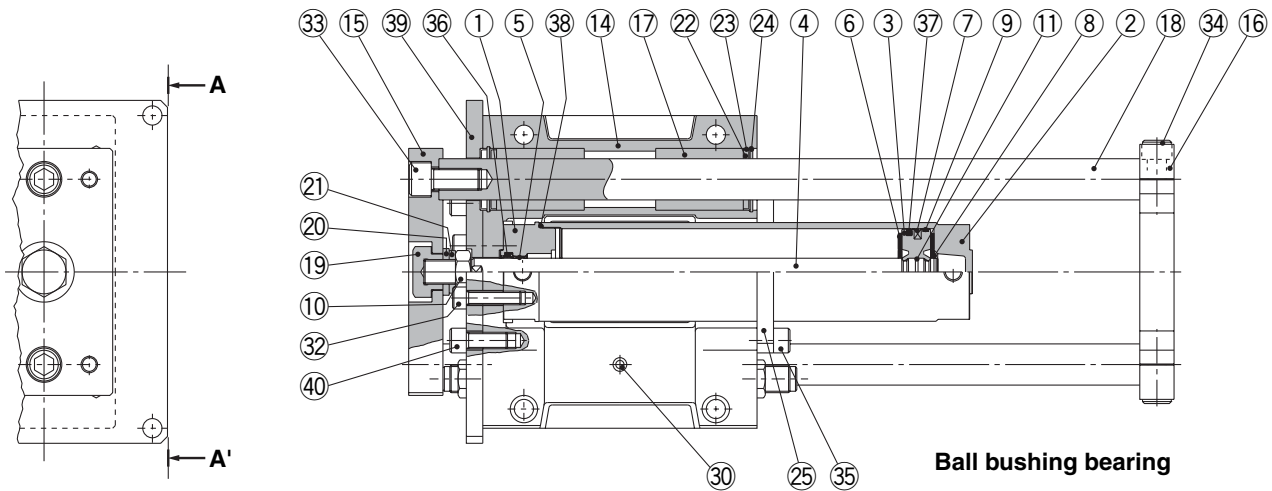
⚠ Caution

Basic cylinders with ø50 or larger bore sizes cannot be disassembled.

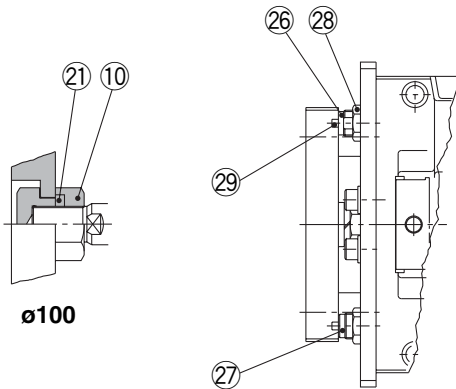
(Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

Construction

MGG□F
ø63 to ø100

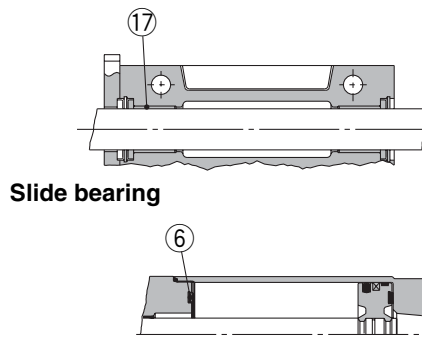


Ball bushing bearing

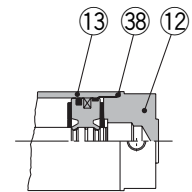


ø100

View A-A'



Slide bearing



Long stroke

ø80, ø100

Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	White hard anodized
2	Tube cover	Aluminum alloy	White hard anodized
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated
5	Bushing	Bearing alloy	
6	Bumper	Urethane	
7	Magnet	—	
8	Snap ring	Stainless steel	Not required for ø80 and ø100
9	Wear ring	Resin	
10	Rod end nut	Rolled steel	Nickel plated ø100 is carbon steel
11	Piston gasket	NBR	
12	Head cover	Aluminum alloy	White hard anodized For long stroke
13	Cylinder tube	Aluminum alloy	Hard anodized
14	Guide body	Aluminum alloy	Platinum silver
15	Front plate	Rolled steel	Flat nickel plated
16	Rear plate	Cast iron	Platinum silver
17	Slide bearing	Bearing alloy	For slide bearing
	Ball bushing bearing	—	For ball bushing
18	Guide rod	Carbon steel	Hard chrome plated For slide bearing
		High carbon chrome bearing steel	Quenched, hard chrome plated For ball bushing bearing
19	End bracket	Carbon steel	Flat nickel plated
20	Plain washer	Rolled steel	Nickel plated Not required for ø100
21	Spring washer	Steel wire	Nickel plated
22	Felt	Felt	
23	Holder	Rolled steel	Nickel plated
24	C-type snap ring for hole	Carbon tool steel	Nickel plated
25	Bracket	Aluminum alloy	White anodized

Component Parts

No.	Description	Material	Note
26	Shock absorber	—	Nickel plated
27	Adjusting bolt	Rolled steel	Nickel plated
28	Nut	Rolled steel	Nickel plated
29	Parallel pin	High carbon chrome bearing steel	Nickel plated
30	Grease nipple	—	
31	—	—	
32	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For cylinder mounting
33	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For front plate mounting
34	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For rear plate mounting
35	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For bracket mounting
36	Rod seal	NBR	
37	Piston seal	NBR	
38	Tube gasket	NBR	
39	Large flange	Rolled steel	Flat nickel plated
40	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated For large flange mounting

⚠ Caution

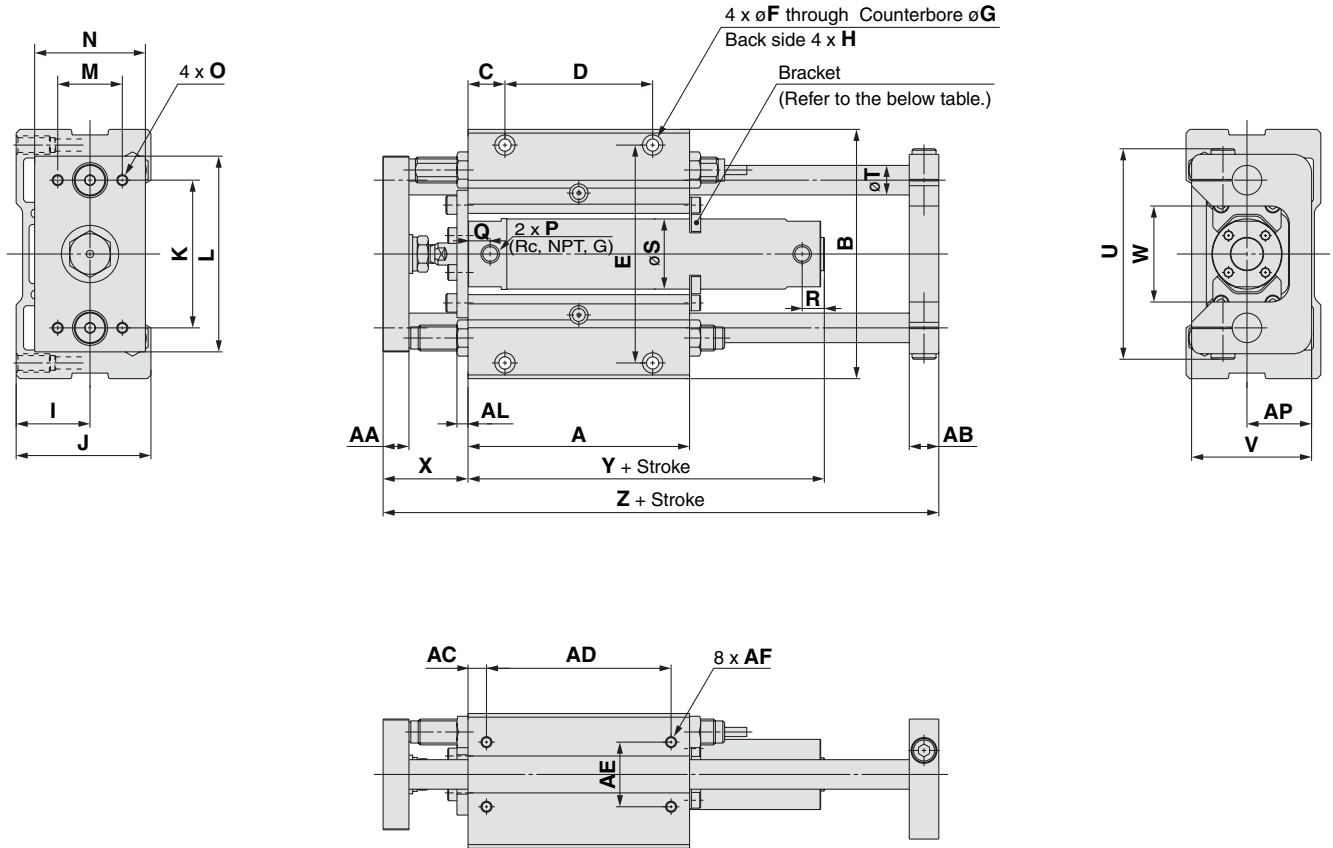
Basic cylinders with ø50 or larger bore sizes cannot be disassembled.

(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.)

Series MGG

Dimensions

Basic: MGG□B
 ø20 to ø50



Bore size (mm)	Stroke range (mm)	A	AA	AB	AC	AD	AE	AF	AL	AP	B	C	D	E	F	G	H	I	J	K	L	M	N
20	75, 100, 125, 150, 200	90	11	11	7.5	75	30	M5 x 0.8 depth 10	6	25	108	15	60	92	5.5	9.5 depth 6	M8 x 1.25 depth 14	30	55	60	80	25	45
25	75, 100, 125, 150	100	14	13	7.5	85	30	M6 x 1 depth 12	6	30	130	17.5	65	113	6.6	11 depth 8	M10 x 1.5 depth 18	35	65	70	100	35	54
32		120	14	16	10	100	35	M6 x 1 depth 12	6	35	135	20	80	118	6.6	11 depth 8	M10 x 1.5 depth 18	40	73	80	106	35	60
40	200, 250	140	17	19	10	120	40	M8 x 1.25 depth 16	9	45	170	20	100	150	9	14 depth 10	M12 x 1.75 depth 21	50	93	95	134	50	75
50	300	170	23	21	10	150	45	M10 x 1.5 depth 20	9	50	194	25	120	170	11	17 depth 12	M14 x 2 depth 25	55	103	115	152	56	90

Bore size (mm)	O	P ^{Note)}	Q	R	S	T	U	V	W	X	Y	Z
20	M6 x 1 depth 9	1/8	12	12	26	12	82	48	40	39	71	157
25	M6 x 1 depth 13	1/8	12	12	31	13	100	57	46	46	71	175
32	M6 x 1 depth 13	1/8	12	12	38	16	114	65	52	46	73	201
40	M8 x 1.25 depth 16	1/8	13	12	47	20	138	84	62	56	80	238
50	M10 x 1.5 depth 21	1/4	14	14	58	25	164	94	75	67	92	285

Note) Rc, NPT, G port are available.

Long Stroke

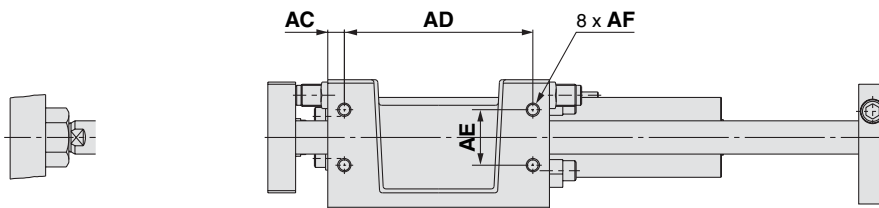
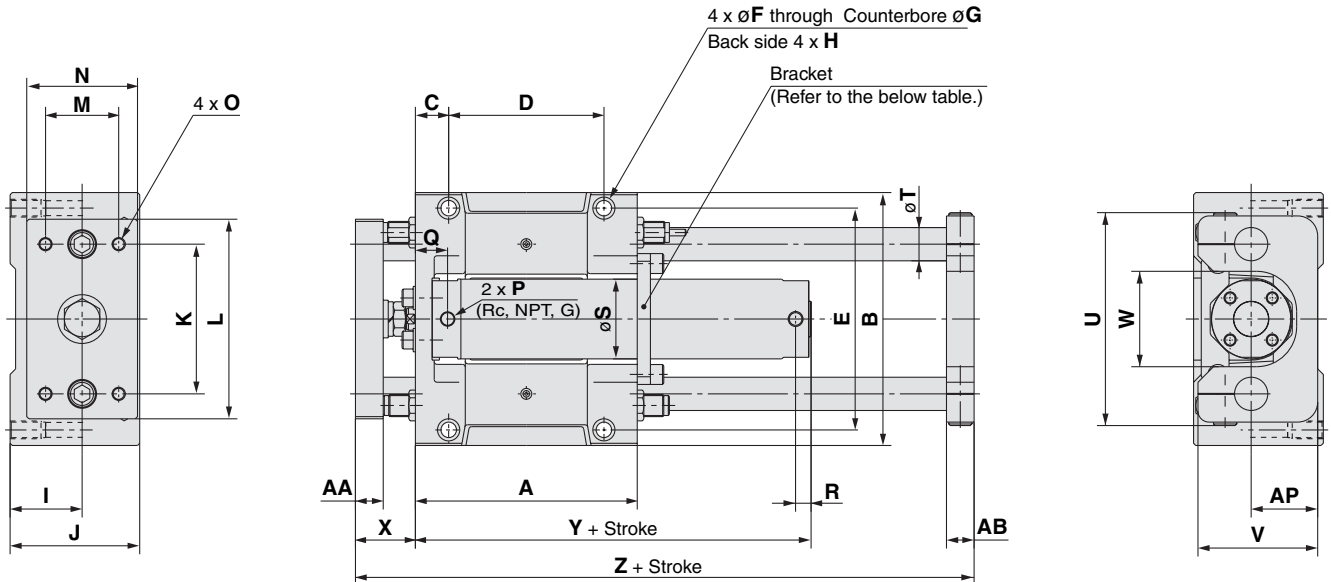
Bore size (mm)	Stroke range (mm)	R	Y
20	250 to 400	14	79
25	350 to 500	14	79
32	350 to 600	14	81
40	350 to 800	15	89
50	350 to 1000	16	104

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

Dimensions

Basic: MGG□B
 ø63 to ø100



ø100 piston rod end connection

Bore size (mm)	Stroke range (mm)	A	AA	AB	AC	AD	AE	AF	AP	B	C	D	E	F	G	H	I	J	K	L	M	N
63	75, 100	200	25	25	15	170	50	M12 x 1.75 depth 24	60	228	30	140	200	13.5	20 depth 14.5	M16 x 2 depth 28	65	117	135	180	66	100
80	125, 150 200, 250	230	30	27	15	200	55	M12 x 1.75 depth 24	70	262	30	170	234	13.5	20 depth 14.5	M16 x 2 depth 28	75	138	160	214	76	115
100	300	280	32	30	17.5	245	70	M14 x 2 depth 28	80	304	35	210	274	15	23 depth 17	M18 x 2.5 depth 32	85	153	190	245	80	125

Bore size (mm)	O	P ^{Note)}	Q	R	S	T	U	V	W	X	Y	Z
63	M12 x 1.75 depth 23	1/4	29	14	72	30	192	108	86	54	107	308
80	M12 x 1.75 depth 28	3/8	40	19	89	35	224	128	104	66	131	355
100	M14 x 2 depth 30	1/2	40	19	110	40	262	143	128	66	131	410

Note) Rc, NPT, G port are available.

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
63	350 to 1100	16	119
80	350 to 1200	23	145
100	350 to 1300	23	145

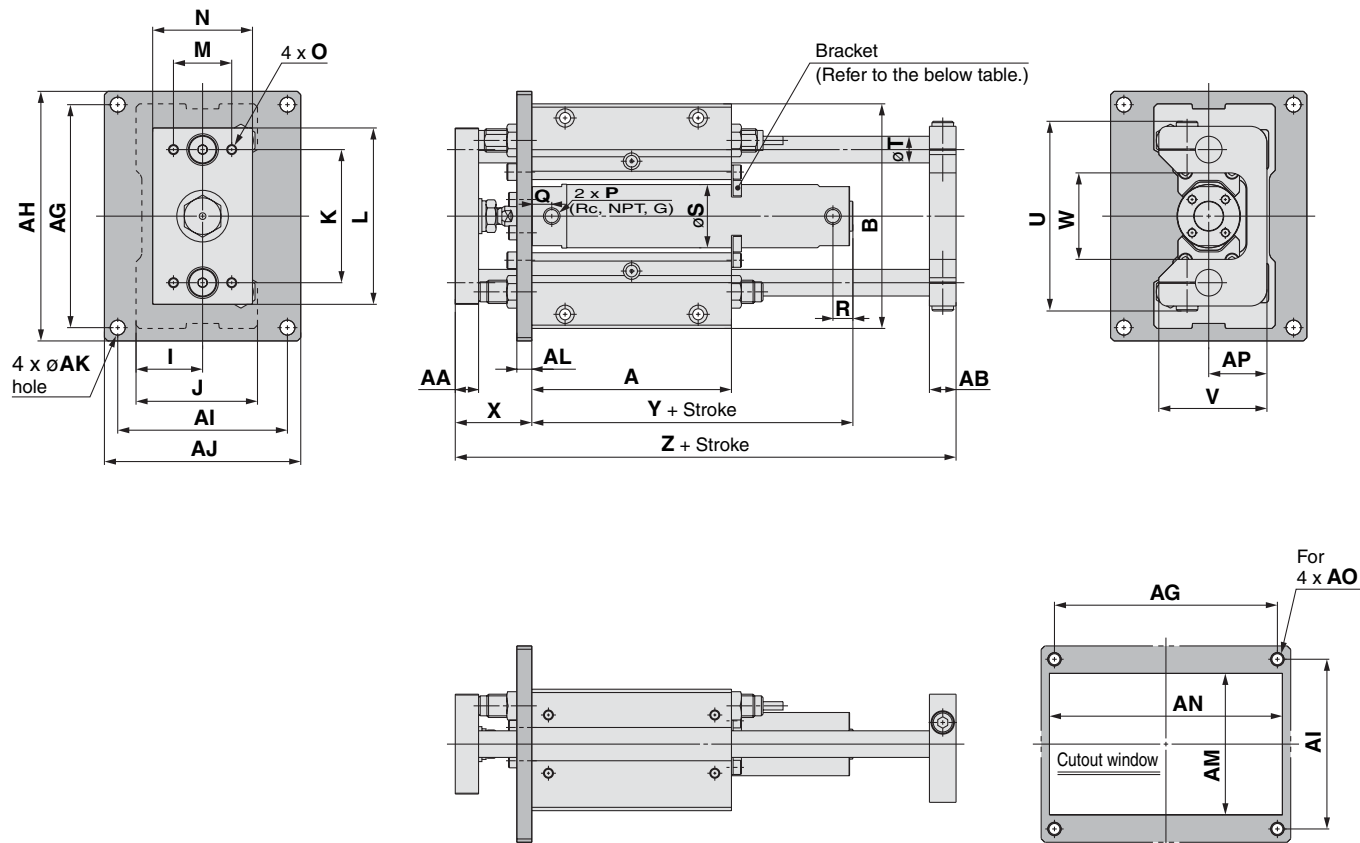
Bracket Mounting Stroke

Bore size (mm)	Bracket mounting stroke
63	300 st or more
80	400 st or more
100	500 st or more

Series MGG

Dimensions

Front mounting flange: MGG□F
 ø20 to ø50



Mounting dimensions

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	O
20	75, 100, 125, 150, 200	90	11	11	112	125	82	95	6.6	9	65	115	M6	25	108	30	55	60	80	25	45	M6 x 1 depth 9
25	75, 100, 125, 150	100	14	13	134	150	92	108	9	9	75	135	M8	30	130	35	65	70	100	35	54	M6 x 1 depth 13
32		120	14	16	134	150	102	118	9	9	85	140	M8	35	135	40	73	80	106	35	60	M6 x 1 depth 13
40	200, 250	140	17	19	170	186	134	150	9	12	105	175	M8	45	170	50	93	95	134	50	75	M8 x 1.25 depth 16
50	300	170	23	21	190	210	140	160	11	12	115	200	M10	50	194	55	103	115	152	56	90	M10 x 1.5 depth 21

Bore size (mm)	P ^{Note)}	Q	R	S	T	U	V	W	X	Y	Z
20	1/8	12	12	26	12	82	48	40	39	71	157
25	1/8	12	12	31	13	100	57	46	46	71	175
32	1/8	12	12	38	16	114	65	52	46	73	201
40	1/8	13	12	47	20	138	84	62	56	80	238
50	1/4	14	14	58	25	164	94	75	67	92	285

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

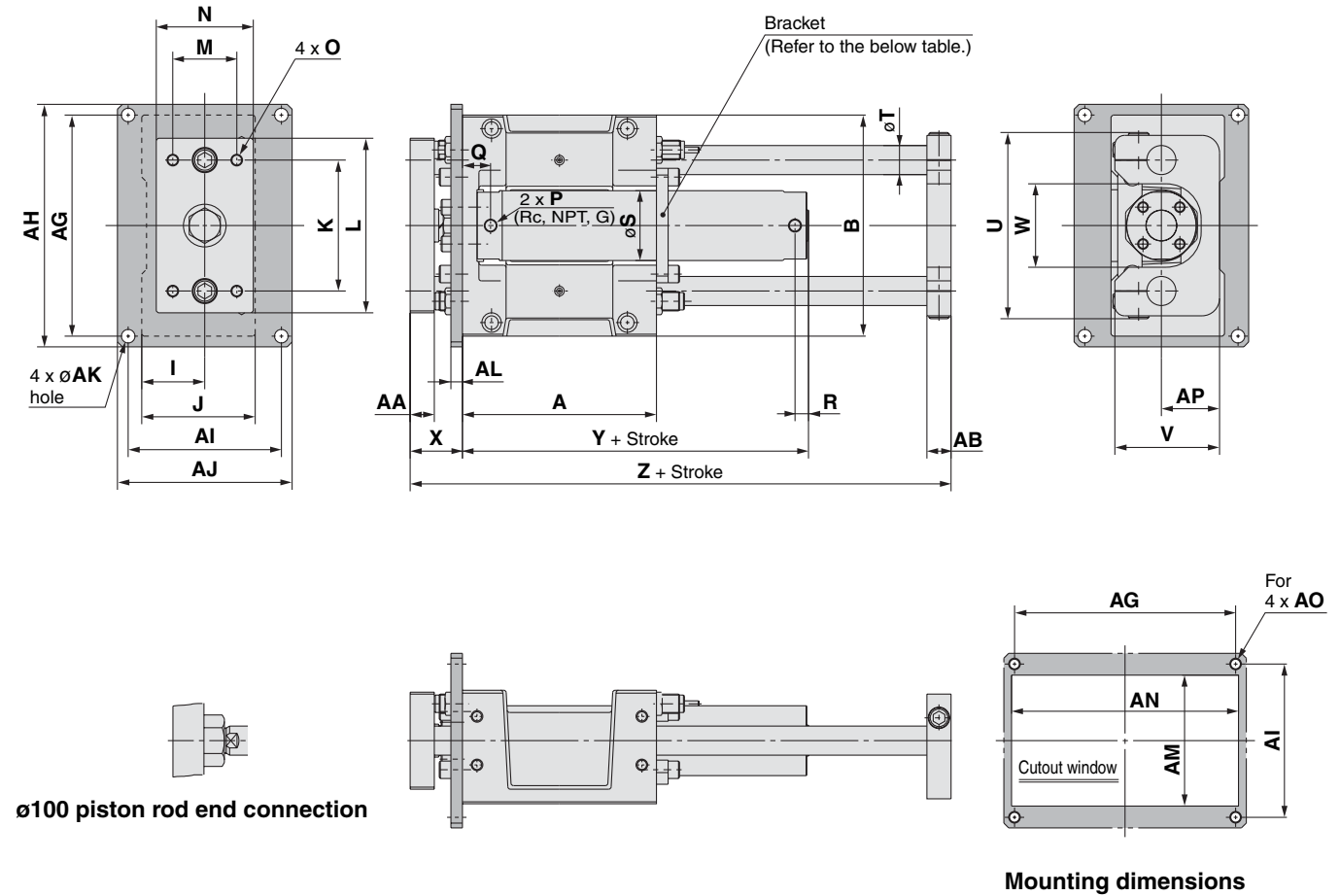
Bracket Mounting Stroke

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) Rc, NPT, G port are available.

Dimensions

Front mounting flange: MGG□F
ø63 to ø100



Mounting dimensions

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	O	P ^{Note)}
63	75, 100	200	25	25	228	250	158	180	14	12	135	234	M12	60	228	65	117	135	180	66	100	M12 x 1.75 depth 23	1/4
80	125, 150	230	30	27	262	284	178	200	14	16	155	268	M12	70	262	75	138	160	214	76	115	M12 x 1.75 depth 28	3/8
100	200, 250 300	280	32	30	300	326	200	226	16	16	175	310	M14	80	304	85	153	190	245	80	125	M14 x 2 depth 30	1/2

Bore size (mm)	Q	R	S	T	U	V	W	X	Y	Z
63	29	14	72	30	192	108	86	54	107	308
80	40	19	89	35	224	128	104	66	131	355
100	40	19	110	40	262	143	128	66	131	410

Long Stroke

Bore size (mm)	Stroke range (mm)	R	Y
63	350 to 1100	16	119
80	350 to 1200	23	145
100	350 to 1300	23	145

Bracket Mounting Stroke

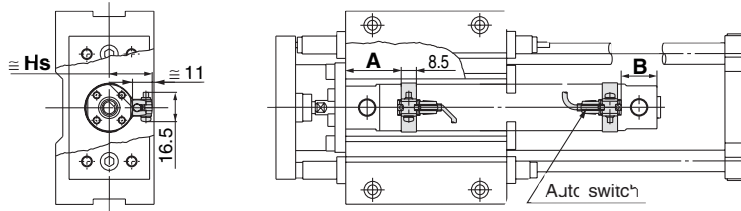
Bore size (mm)	Bracket mounting stroke
63	300 st or more
80	400 st or more
100	500 st or more

Note) Rc, NPT, G port are available.

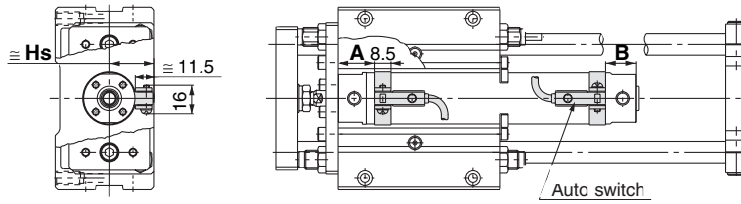
Series MGG

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

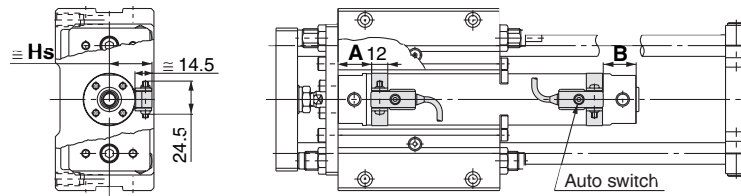
D-A9 type,
D-M9/M9□W type



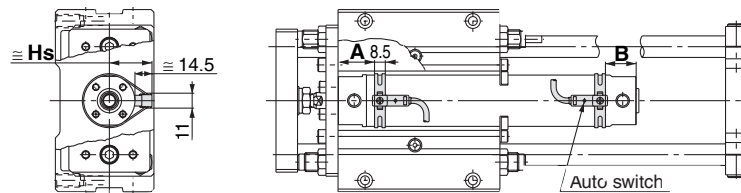
D-C7/C8 type,
D-H7 type



D-B5/B6 type,
D-G5/K5 type



D-B7/B8 type,
D-G7/K7 type



Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-A9□		D-M9□ D-M9□W		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 D-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	29	20 (28)	33	24 (32)	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	29	20 (28)	33	24 (32)	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	30	21 (29)	34	25 (33)	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	35	23 (32)	39	27 (36)	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	42	28 (40)	46	32 (36)	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)
63	42	28 (40)	46	32 (36)	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)
80	—	—	—	—	—	—	—	—	46.5	30.5 (44.5)	49.5	33.5 (47.5)	—	—	48	32 (46)
100	—	—	—	—	—	—	—	—	46.5	30.5 (44.5)	49.5	33.5 (47.5)	—	—	48	32 (46)

Auto Switch Mounting Height

(mm)

Auto switch model	D-A9□ D-M9□ D-M9□W		D-C7□ D-C80 D-H7□ D-H7NF D-H7BAL		D-C73C D-C80C		D-B7/B8 D-B73C D-B80C D-G7/K7 D-K79C D-H7C		D-G5/K5 D-G5□W D-K59W D-G5NTL D-B5/B6 D-B59W D-G5BAL D-G59F	
	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	
20	24	24.5	27	27.5	27.5	27.5	27.5	27.5	27.5	
25	26.5	27	29.5	30	30	30	30	30	30	
32	30	30.5	33	33.5	33.5	33.5	33.5	33.5	33.5	
40	34.5	35	37.5	38	38	38	38	38	38	
50	40	40.5	43	43.5	43.5	43.5	43.5	43.5	43.5	
63	47	47.5	50	50.5	50.5	50.5	50.5	50.5	50.5	
80	—	—	—	—	—	—	—	—	59	
100	—	—	—	—	—	—	—	—	69.5	

* (): Values for long strokes, double rods.

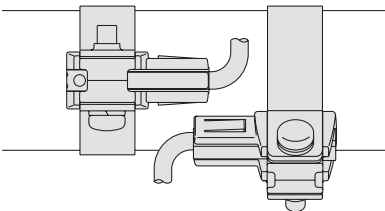
Note) When setting an auto switch, confirm the operation and adjust its mounting position.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted		
	With 1 pc.	With 2 pcs.	With n pcs.
		Same side	Same side
D-A9□ D-M9□ D-M9□W	10	45 (Note)	45 + 45 (n-2)
D-C7□ D-C80	10	50	50 + 45 (n-2)
D-H7□ D-H7□W D-H7BAL/H7NF	10	60	60 + 45 (n-2)
D-C73C D-C80C D-H7C	10	65	65 + 50 (n-2)
D-B5□/B64 D-G5□/K59□ D-B59W	10	75	75 + 55 (n-2)
D-B7□/B80 D-G79/K79	10	45	50 + 45 (n-2)

Note) Caution when two D-A93, M9□, M9□W auto switches are used.

Auto switch model	With two auto switches	
	Same side	
		
	The auto switches are offset (one auto switch is displaced more around the outside of the cylinder tube) so that the auto switches and lead wires do not interfere with each other.	
D-A93	Less than 50 stroke	
D-M9□ D-M9□W	Less than 55 stroke	

Operating Range

Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-A9□	7	6	8	8	8	9	—	—
D-M9□	3	3	4	3.5	4	4	—	—
D-M9□W	5	5.5	5	5.5	6.5	7	—	—
D-B7□/B80 D-B73C/B80C	8	10	9	10	10	11	—	—
D-C7□/C80 D-C73C/C80C	8	10	9	10	10	11	—	—
D-B5□/B64	8	10	9	10	10	11	11	11
D-B59W	13	13	14	14	14	17	16	18
D-G79/K79/K79C	8	10	9	10	10	11	—	—

Auto switch model	Bore size								
	20	25	32	40	50	63	80	100	
D-H7□/H7□W D-H7BAL/H7NF	4	4	4.5	5	6	6.5	—	—	
D-H7C	7	8.5	9	10	9.5	10.5	—	—	
D-G5□/K59 D-G5□W/K59W D-G5NTL/G5BAL	4	4	4.5	5	6	6.5	6.5	7	
D-G59F	5	5	5.5	6	7	7.5	7.5	8	
D-G5NBL	35	40	40	45	45	45	45	50	

* 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 an ambient environment.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)							
	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
D-A9□ D-M9□ D-M9□W	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	Note) ①BMA2-063 ②BJ3-1	—	—
D-C7□/C80 D-C73C D-C80C D-H7□/H7C D-H7□W D-H7BAL D-H7NF	BMA2-020	BMA2-025	BMA2-032	BMA2-040	BMA2-050	BMA2-063	—	—
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BAL/G59F D-G5NTL D-G5NBL	BA-01	BA-02	BA-32	BA-04	BA-05	BA-06	BA-08	BA-10
D-B7□/B80 D-B73C/B80C D-G79/K79 D-K79C	BM1-01	BM1-02	BM1-32	BM1-04	BM1-05	BM1-06	—	—

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

[Mounting screws set made of stainless steel]

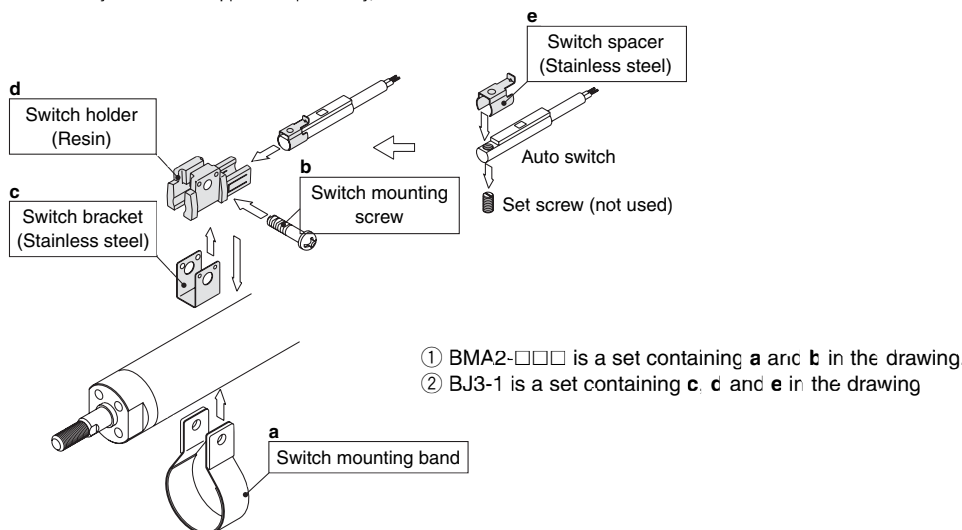
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the switch mounting bracket separately, since it is not included.)

BBA3: For D-B5, B6, G5, K5 type

BBA4: For D-C7, C8, H7 type

"D-H7BAL/G5BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA3" or "BBA4" screws are attached.



Other than the applicable auto switches listed in "How to Order" the following auto switches can be mounted. For detailed specifications, refer to "Best Pneumatics 2004" Vol. 8 catalog, etc.

Type	Model	Electrical entry (Direction)	Features	Applicable bore size
Reed switch	D-C73, C76, B73, B73C, B76	Grommet (in-line)	—	ø20 to ø63
	D-C80, B80C		Without indicator light	
	D-B53		—	ø20 to ø100
Solid state switch	D-H7A1, H7A2, H7B, G79, K79, K79C		—	ø20 to ø63
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)	
	D-G5NTL		With timer	ø20 to ø100

* With pre-wired connector is available for solid state auto switches. For details, refer to "Best Pneumatics 2004" Vol. 8 catalog

* Normally closed (NC = b contact), solid state switches (D-F9G, F9H type) are also available. For details, refer to "Best Pneumatics 2004" Vol. 8 catalog

* Wide range detection type, solid state auto switch (D-G5NBL type) is also available. For details, refer to "Best Pneumatics 2004" Vol. 8 catalog

Series MGG/MGC

Auto Switch Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 A or less 2-wire: 0.8 mA or less
Operating time	1.2 ms	1 ms or less
Impact resistance	300 m/s ²	1000 m/s ²
Insulation resistance	50 M or more at 500 VDC Mega (between lead wire and case)	
Withstand voltage	1500 VAC for 1 minute (between lead wire and case) ^{Note)}	1000 VAC for 1 minute (between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC529 standard IP67, JIS C 0920 waterproof construction	
Standard	Conforming to CE Standards	

Note) D-C73C/C80C type: 1000 VAC/min. (Between lead wire and case)

Lead Wire Length

Lead wire length indication

(Example) **D-M9BW** **L**

Lead wire length

Nil	0.5 m
M	1 m
L	3 m
Z	5 m

Note 1) Applicable auto switch with 5 m lead wire "Z"

Solid state switch Manufactured upon receipt of order as standard

Note 2) To designate solid state switches with flexible specifications, add "-61" after the lead wire length. Flexible cable is used for D M9□, D M9□W as standard. There is no need to place the suffix -61 at the end of part number.

(Example) **D-H7BAL-** **61**

Flexible specification

Note 3) m (M): D M9□W only.

Note 4) Lead wire tolerance

Lead wire length	Tolerance
0.5 m	±15 mm
1 m	±30 mm
3 m	±90 mm
5 m	±150 mm

Part No. of Lead Wires with Connectors (Applicable for Connector Type Only)

Model	Lead wire length
D-LC05	0.5 m
D-LC30	3 m
D-LC50	5 m

Contact Protection Boxes: CD-P11, CD-P12

<Applicable switch model>

D-A9/C73C/C80C/B7□/B8□ type

The auto switches below do not have a built-in contact protection circuit. Therefore, please use a contact protection box with the switch for any of the following cases:

- ① Where the operation load is an inductive load
- ② Where the wiring length to load is greater than 5 m.
- ③ Where the load voltage is 100 VAC

The contact life may be shortened (due to permanent energizing conditions)

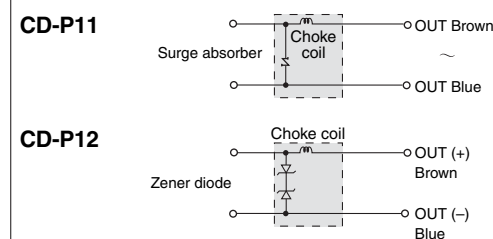
Specifications

Part no.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

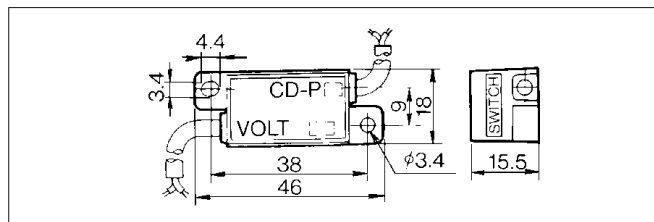
* Lead wire length: Switch connection side 0.5 m
Load connection side 0.5 m



Internal Circuit



Dimensions



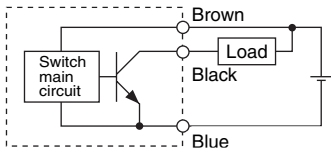
Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SW TC-1 to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box with a lead wire length of no more than 1 meter.

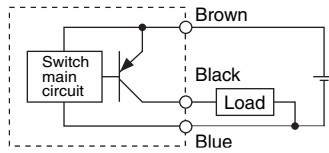
Auto Switch Connections and Examples

Basic Wiring

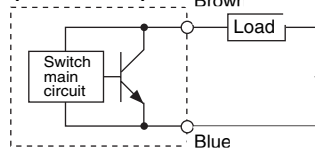
Solid state 3-wire, NPN



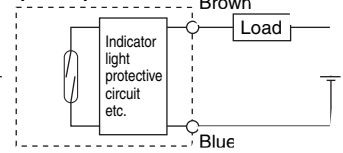
Solid state 3-wire, PNP



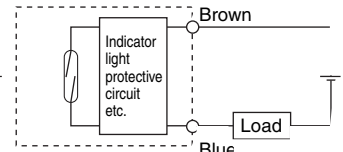
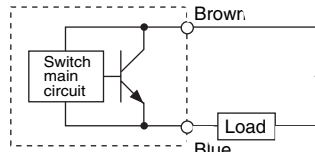
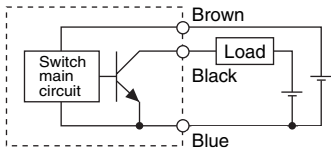
2-wire (Solid state)



2-wire (Reed)

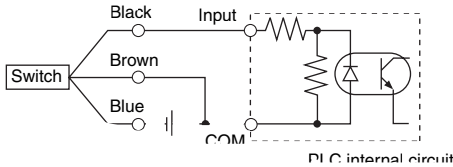


(Power supplies for switch and load are separate.)

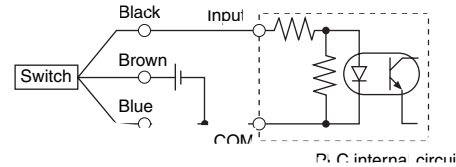


Example of Connection to PLC (Programmable Logic Controller)

• Sink input specification 3-wire, NPN

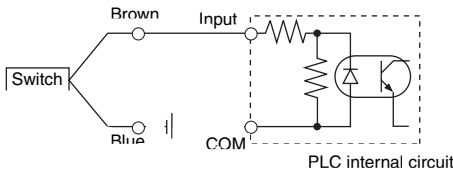


• Source input specification 3-wire, PNP

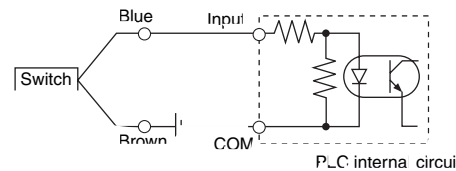


Connect according to the applicable PLC input specifications, since the connection method will vary depending on the PLC input specifications

2-wire



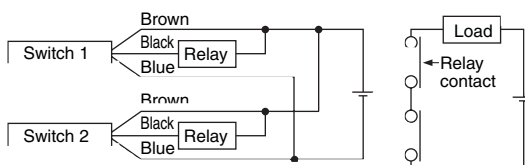
2-wire



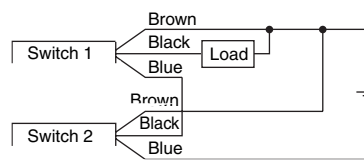
Example of AND (Serial) and OR (Parallel) Connection

• 3-wire

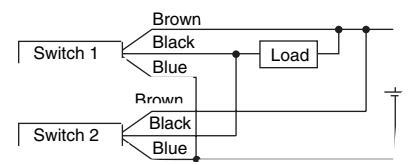
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

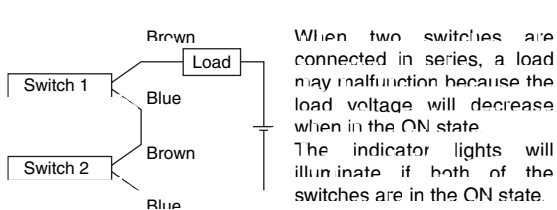


OR connection for NPN output



The indicator lights will illuminate when both switches are turned ON

2-wire with 2-switch AND connection

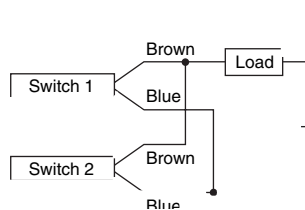


When two switches are connected in series, a load may malfunction because the load voltage will decrease when in the ON state. The indicator lights will illuminate if both of the switches are in the ON state.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

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

2-wire with 2-switch OR connection



(Solid state)

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

$$\begin{aligned} \text{Load voltage at OFF} &= \text{leakage current} \times 2 \text{ pcs.} \\ &\quad \times \text{load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k} \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 k
Leakage current from switch is 1 mA

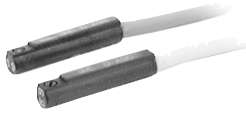
(Reed)

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

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



Grommet



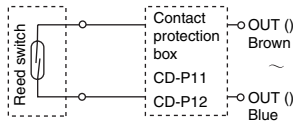
Caution

Operating Precautions

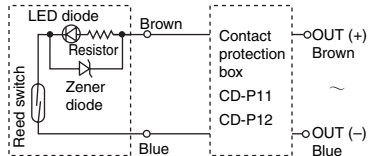
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

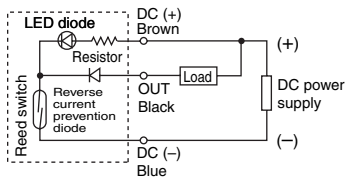
D-A90



D-A93



D-A96



- Note) ① In a case where the operation load is an inductive load
 ② In a case where the wiring load is greater than 5 m
 ③ In a case where the load voltage is 100 VAC

Use the auto switch with a contact protection box in any of the above mentioned cases. (For details about the contact protection box, refer to page 56.)

Auto Switch Specifications

PLC: Programmable Logic Controller

D-A90 (Without indicator light)			
Auto switch part no.	D-A90		
Electrical entry direction	In-line		
Applicable load	IC circuit Relay, PLC		
Load voltage	24 VAC/DC or less	48 VAC/DC or less	100 VAC/DC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 or less (including lead wire length of 3 m)		
D-A93/D-A96 (With indicator light)			
Auto switch part no.	D-A93	D-A96	
Electrical entry direction	In-line		
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
Load current range and max. load current	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93 — 2.4 V or less (to 20 mA)/ 3 V or less (to 40 mA)		0.8 V or less
Indicator light	Red LED illuminates when turned ON		
Standard	Conforming to CE Standards		

Lead wires

- D-A90/D-A93 Oilproof heavy-duty vinyl cable: $\phi 2.7$ 0.18 mm² x 2 cores (Brown, Blue) 0.5 m
 - D-A96 — Oilproof heavy-duty vinyl cable: $\phi 2.7$ 0.15 mm² x 3 cores (Brown, Black, Blue) 0.5 m
- Note 1) Refer to page 56 for reed switch common specifications.
 Note 2) Refer to page 56 for lead wire lengths.

Weight

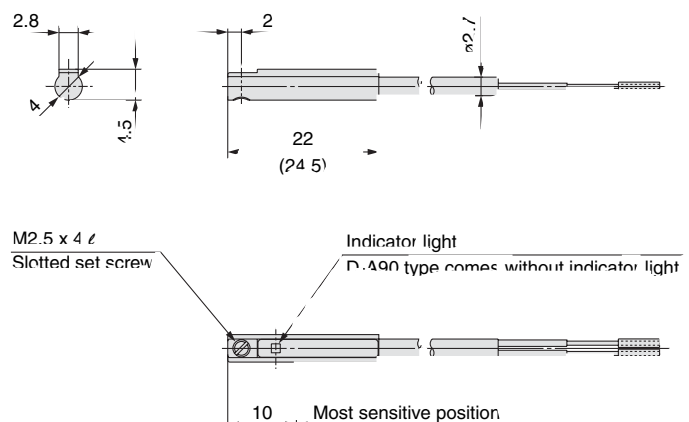
Unit: g

Auto switch part no.	D-A90	D-A93	D-A96
Lead wire length (m)	0.5	6	8
	3	30	41

Dimensions

Unit: mm

D-A90/D-A93/D-A96



() dimensions for D-A93.

Reed Switch: Band Mounting Style D-B54/D-B64



Grommet



Auto Switch Specifications

PLC: Programmable Logic Controller

D-B5 (With indicator light)			
Auto switch part no.	D-B54		
Applicable load	Relay, PLC		
Load voltage	24 VDC	100 VAC	200 VAC
Load current range ^{Note 3)}	5 to 50 mA	5 to 25 mA	5 to 12.5 mA
Contact protection circuit	Built-in		
Internal voltage drop	2.4 V or less (to 20 mA)/3.5 V or less (to 50 mA)		
Indicator light	Red LED illuminates when turned ON.		
D-B6 (Without indicator light)			
Auto switch part no.	D-B64		
Applicable load	Relay, PLC		
Load voltage	24 VAC/DC or less	100 VAC	200 VAC
Maximum load current	Max. 50 mA	Max. 25 mA	Max. 12.5 mA
Contact protection circuit	Built-in		
Internal resistance	25 or less		
Standard	Conforming to CE Standards		

● Lead wires — Oilproof heavy-duty vinyl cable: $\phi 4$ 0.3 mm² x 2 cores (Brown, Blue) 0.5 m

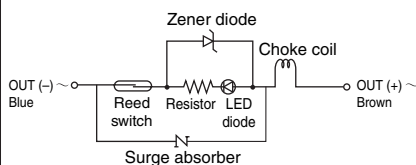
Note 1) Refer to page 56 for reed switch common specifications.

Note 2) Refer to page 56 for lead wire lengths.

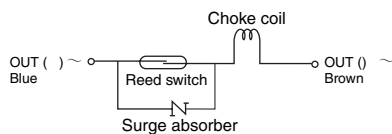
Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 2 mA or more.

Auto Switch Internal Circuit

D-B54



D-B64



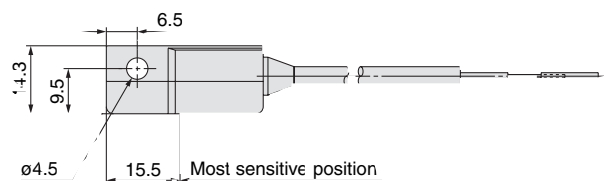
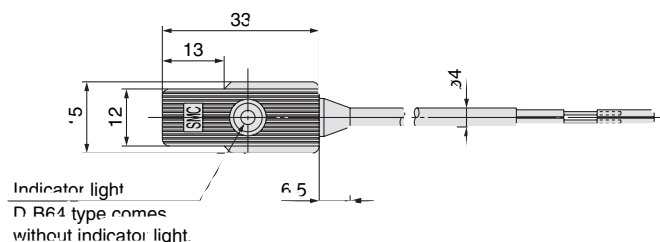
Weight

Unit: g

Auto switch part no.	D-B54	D-B64
Lead wire length (m)		
0.5	22	22
3	78	78
5	126	—

Dimensions

Unit: mm



Reed Switch: Band Mounting Style D-C73C/D-C80C



Connector



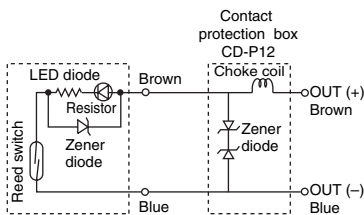
Caution

Operating Precautions

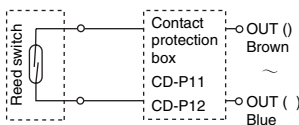
1. Confirm that the connector is appropriately tightened. If tightened insufficiently, the waterproof performance will deteriorate.
2. For how to handle a connector, refer to "Best Pneumatics 2004" Vol. 8 catalog.

Auto Switch Internal Circuit

D-C73C



D-C80C



- Note) ① In a case where the operation load is an inductive load
② In a case where the wiring load is greater than 5 m

Use the contact protection box in any of the above listed situations. The contact point life may decrease. (Refer to page 56 for contact protection box.)

Auto Switch Specifications

PLC: Programmable Logic Controller

D-C73C (With indicator light)	
Auto switch part no.	D-C73C
Applicable load	Relay, PLC
Load voltage	24 VDC
Load current range ^{Note 4)}	5 to 40 mA
Contact protection circuit	None
Internal voltage drop	2.4 V or less
Indicator light	Red LED illuminates when turned ON.
D-C80C (Without indicator light)	
Auto switch part no.	D-C80C
Applicable load	Relay, PLC
Load voltage	24 VAC/DC or less
Maximum load current	50 mA
Contact protection circuit	None
Internal resistance	1 Ω or less (including lead wire length of 3 m)
Standard	Conforming to CE Standards

● Lead wires — Oilproof heavy-duty vinyl cable: $\phi 3.4$, 0.2 mm² x 2 cores (Brown Blue), 0.5 m

Note 1) Refer to page 56 for reed switch common specifications.

Note 2) Refer to page 56 for lead wire lengths.

Note 3) Lead wire with connector may be snipped with switch.

Note 4) 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 4 mA or more.

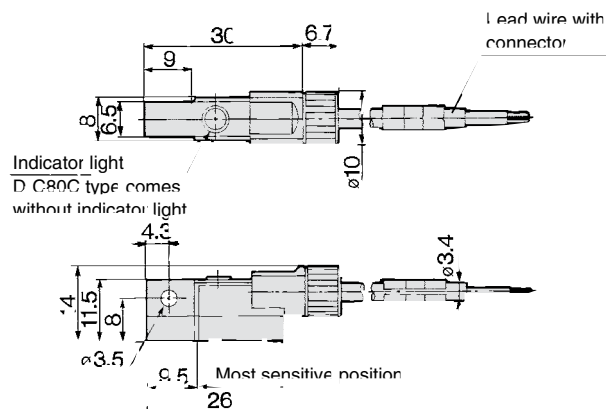
Weight

Unit: g

Auto switch part no.	D-C73C	D-C80C
Lead wire length (m)	0.5	14
	3	53
	5	83

Dimensions

Unit: mm

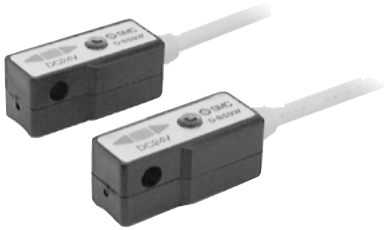


2-Color Indication Solid State Switch: Band Mounting Style D-B59W



Grommet

- The optimum operating position can be determined by the color of the light. (Red → Green ← Red)



Auto Switch Specifications

PLC: Programmable Logic Controller

D-B59W (With indicator light)	
Auto switch part no.	D-B59W
Applicable load	Relay, PLC
Load voltage	24 VDC
Load current range ^{Note 3)}	5 to 40 mA
Contact protection circuit	Built-in
Internal voltage drop	4 V or less
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.
Standard	Conforming to CE Standards

- Lead wires — Oilproof heavy-duty vinyl cable $\phi 4$, $0.3 \text{ mm}^2 \times 2$ cores (Brown, Blue), 0.5 m

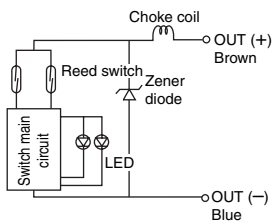
Note 1) Refer to page 56 for reed switch common specifications.

Note 2) Refer to page 56 for lead wire lengths

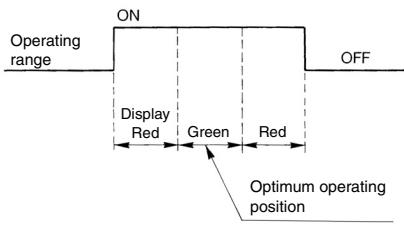
Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 5 mA or more.

Auto Switch Internal Circuit

D-B59W



Indicator light / Display method



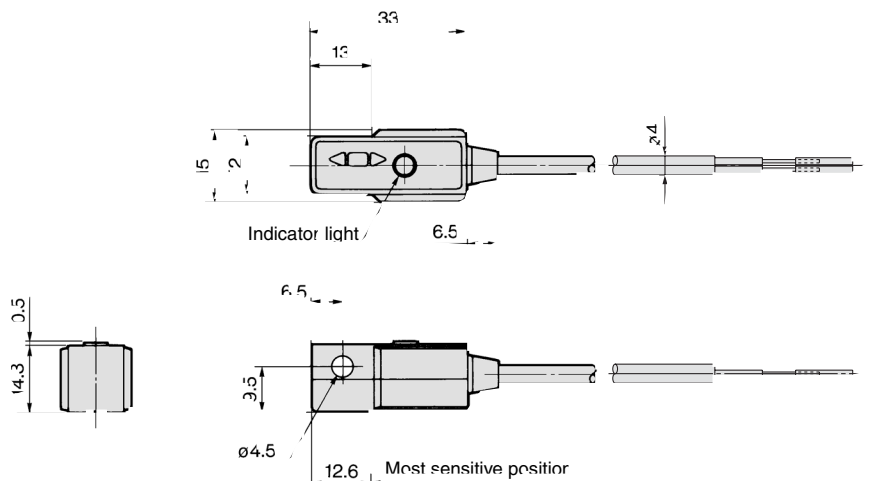
Weight

Unit: g

Auto switch part no.		D-B59W
Lead wire length (m)	0.5	20
	3	76
	5	—

Dimensions

Unit: mm



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



Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Lead free
- UL certified (style 2844) lead cable is used.
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.



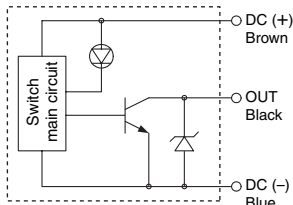
Caution

Operating Precautions

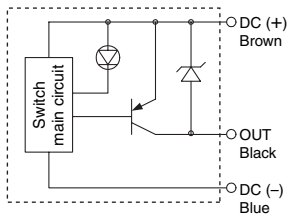
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

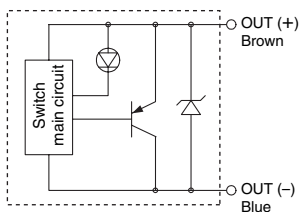
D-M9N



D-M9P



D-M9B



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□ (With indicator light)			
Auto switch part no.	D-M9N	D-M9P	D-M9B
Electrical entry direction	In-line		
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		4 V or less
Leakage current	100 A or less at 24 VDC		0.8 mA or less
Indicator light	Red LED illuminates when turned ON.		
Standard	Conforming to CE Standards		

Lead wires

Oilproof heavy-duty vinyl cable: $\phi 2.7 \times 3.2$ ellipse

D-M9B 0.15 mm² x 2 cores

D-M9N, D-M9P 0.15 mm² x 3 cores

Note 1) Refer to page 56 for solid state switch common specifications.

Note 2) Refer to page 56 for lead wire lengths.

Weight

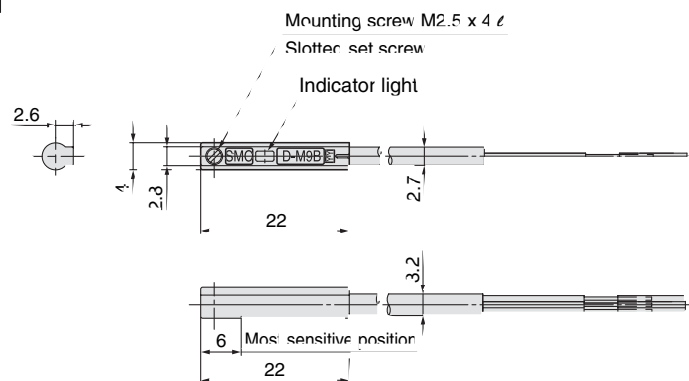
Unit: g

Auto switch part no.	D-M9N	D-M9P	D-M9B	
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

Dimensions

Unit: mm

D-M9□



Solid State Switch: Band Mounting Style D-G59/D-G5P/D-K59



Grommet



Auto Switch Specifications

PLC Programmable Logic Controller

D-G5□/ D-K59 (With indicator light)			
Auto switch part no.	D-G59	D-G5P	D-K59
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	80 mA or less	5 to 40 mA
Internal voltage drop	1.5 V or less (0.8 V or less at load current 10 mA)	0.8 V or less	4 V or less
Leakage current	100 A or less at 24 VDC		0.8 mA or less at 24 VDC
Indicator light	Red LED illuminates when turned ON.		
Standard	Conforming to CE Standards		

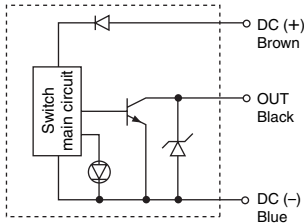
- Lead wires — Oilproof heavy-duty vinyl cable: $\phi 4$ 0.3 mm² x 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue) 0.5 m

Note 1) Refer to page 56 for solid state switch common specifications.

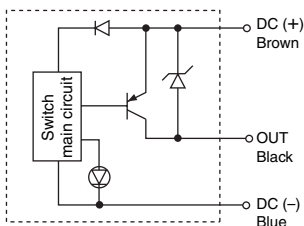
Note 2) Refer to page 56 for lead wire lengths.

Auto Switch Internal Circuit

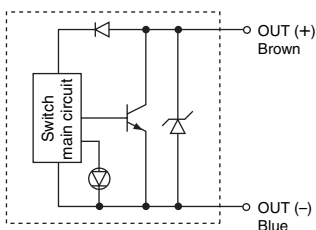
D-G59



D-G5P



D-K59



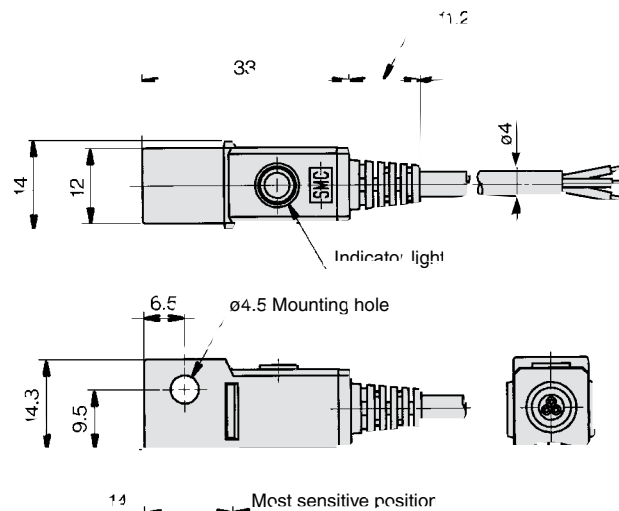
Weight

Unit: g

Auto switch part no.	D-G59	D-G5P	D-K59
Lead wire length (m)	0.5	20	18
	3	78	68
	5	124	108

Dimensions

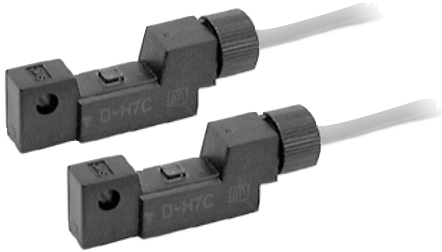
Unit: mm



Solid State Switch: Band Mounting Style D-H7C



Connector



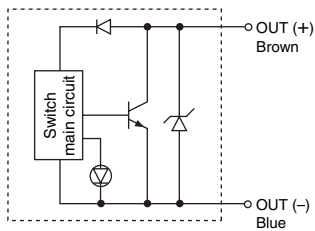
Caution

Operating Precautions

1. Confirm that the connector is appropriately tightened. If tightened insufficiently, the waterproof performance will deteriorate.
2. For how to handle a connector, refer to "Best Pneumatics 2004" Vol. 8 catalog.

Auto Switch Internal Circuit

D-G59



Auto Switch Specifications

PLC: Programmable Logic Controller

D-H7C (With indicator light)	
Auto switch part no.	D-H7C
Wiring type	2-wire
Output type	—
Applicable load	24 VDC Relay, PLC
Power supply voltage	—
Current consumption	—
Load voltage	24 VDC (10 to 28 VDC)
Load current	5 to 40 mA
Internal voltage drop	4 V or less
Leakage current	0.8 mA or less at 24 VDC
Indicator light	Red LED illuminates when turned ON.
Standard	Conforming to CE Standards

- Lead wires — Oilproof heavy-duty vinyl cable: $\phi 3.4$ 0.2 mm² x 2 cores (Brown, Blue), 0.5 m
- Note 1) Refer to page 56 for solid state switch common specifications.
- Note 2) Refer to page 56 for lead wire lengths and lead wire with connector.

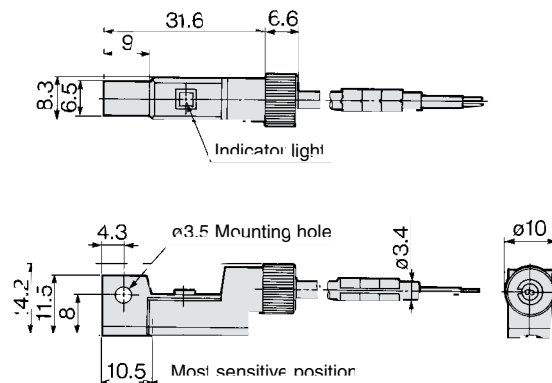
Weight

Unit: g

Auto switch part no.	D-H7C	
Lead wire length (m)	0.5	15
	3	54
	5	85

Dimensions

Unit: mm



2-Color Indication Solid State Switch: Direct Mounting Style

D-M9NW/D-M9PW/D-M9BW



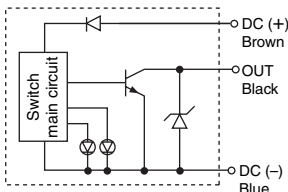
Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- UL certified (style 2844) lead cable is used.
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)

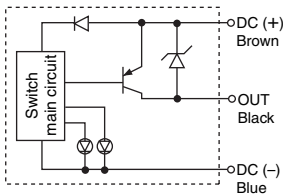


Auto Switch Internal Circuit

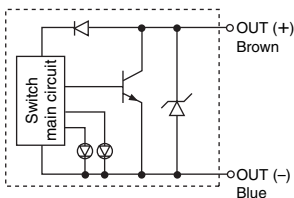
D-M9NW



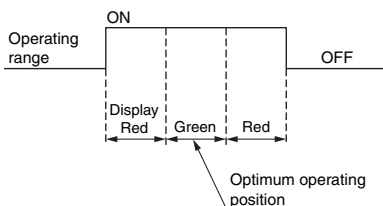
D-M9PW



D-M9BW



Indicator light / Display method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□W (With indicator light)			
Auto switch part no.	D-M9NW	D-M9PW	D-M9BW
Electrical entry direction	In-line		
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 A or less at 24 VDC		0.8 mA or less
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.		
Standard	Conforming to CE Standards		

● Lead wires

Oilproof heavy-duty vinyl cable: $\phi 2.7 \times 3.2$ ellipse

D-M9BW 0.15 mm² x 2 cores

D-M9NW, D-M9PW 0.15 mm² x 3 cores

Note 1) Refer to page 56 for solid state switch common specifications.

Note 2) Refer to page 56 for lead wire lengths.

Weight

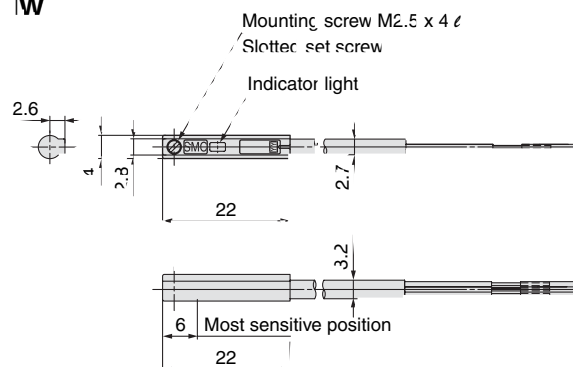
Unit: g

Auto switch part no.	D-M9NW	D-M9PW	D-M9BW
Lead wire length (m)	0.5	8	7
	1	14	13
	3	41	38
	5	68	63

Dimensions

Unit: mm

D-M9□W



2-Color Indication Solid State Switch: Band Mounting Style

D-G59W/D-G5PW/D-K59W



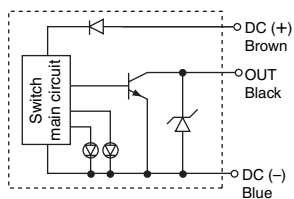
Grommet

- The optimum operating position can be determined by the color of the light. (Red → Green ← Red)

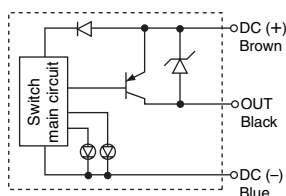


Auto Switch Internal Circuit

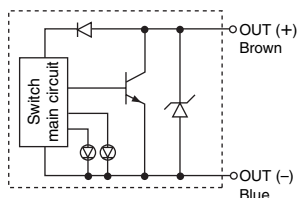
D-G59W



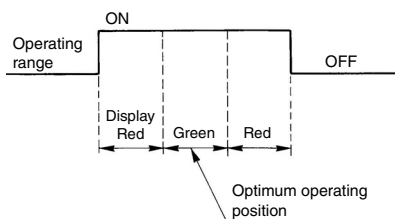
D-G5PW



D-K59W



Indicator light / Display method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-G5□W/D-K59W (With indicator light)			
Auto switch part no.	D-G59W	D-G5PW	D-K59W
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	80 mA or less	5 to 40 mA
Internal voltage drop	1.5 V or less (0.8 V or less at load current 10 mA)	0.8 V or less	4 V or less
Leakage current	100 A or less at 24 VDC		0.8 mA or less at 24 VDC
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.		
Standard	Conforming to CE Standards		

- Lead wires — Oilproof heavy-duty vinyl cable: $\phi 4$ 0.3 mm² x 3 core-s (Brown, Black, Blue), 2 core-s (Brown, Blue) 0.5 m

Note 1) Refer to page 56 for solid state switch common specifications.

Note 2) Refer to page 56 for lead wire lengths.

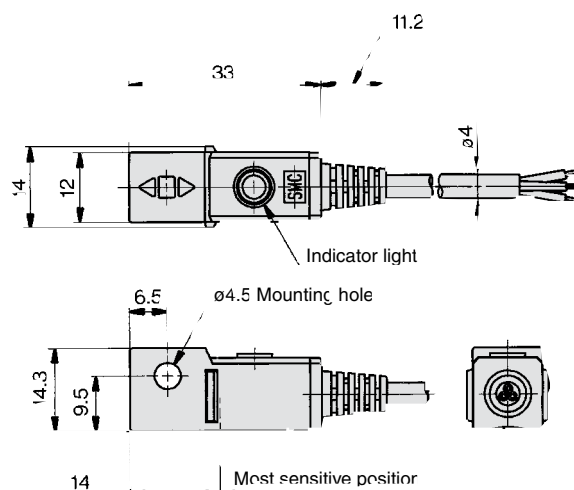
Weight

Unit: g

Auto switch part no.	D-G59W	D-G5PW	D-K59W
Lead wire length (m)	0.5	20	18
	3	78	68
	5	124	108

Dimensions

Unit: mm



Water Resistant 2-Color Indication Solid State Switch: Band Mounting Style D-H7BAL



Grommet

- Water (coolant) resistant type
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)



Caution

Operating Precautions

Please consult SMC if using coolant liquid other than water based solution.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-H7BAL (With indicator light)	
Auto switch part no.	D-H7BAL
Wiring type	2-wire
Output type	—
Applicable load	24 VDC Relay, PLC
Power supply voltage	—
Current consumption	—
Load voltage	24 VDC (10 to 28 VDC)
Load current	5 to 40 mA
Internal voltage drop	4 V or less
Leakage current	0.8 mA or less at 24 VDC
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.
Standard	Conforming to CE Standards

- Lead wires — Oilproof heavy-duty vinyl cable: $\phi 3, \phi 4, C.2 \text{ mm}^2 \times 2$ cores (Brown, Blue) 3 m (Standard)

Note 1) Refer to page 56 for solid state switch common specifications

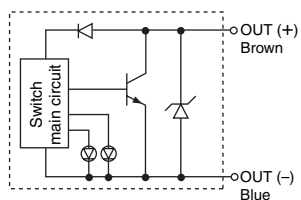
Note 2) Refer to page 56 for lead wire lengths

Weight

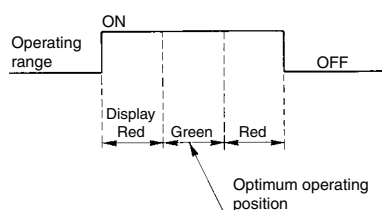
Unit: g

Auto switch part no.	D-H7BA	
Lead wire length (m)	0.5	—
	3	50
	5	81

Auto Switch Internal Circuit

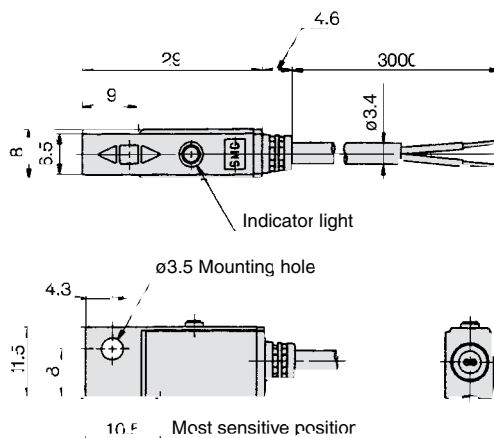


Indicator light / Display method



Dimensions

Unit: mm



Water Resistant 2-Color Indication Solid State Switch: Band Mounting Style D-G5BAL



Grommet

- Water (coolant) resistant type
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)



Caution

Operating Precautions

Please consult SMC if using coolant liquid other than water based solution.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-G5BAL (With indicator light)	
Auto switch part no.	D-G5BAL
Wiring type	2-wire
Output type	—
Applicable load	24 VDC Relay, PLC
Power supply voltage	—
Current consumption	—
Load voltage	24 VDC (10 to 28 VDC)
Load current	5 to 40 mA
Internal voltage drop	4 V or less
Leakage current	0.8 mA or less at 24 VDC
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.
Standard	Conforming to CE Standards

- Lead wires — Oilproof heavy-duty vinyl cable: $\phi 3, \phi 4, C.2 \text{ mm}^2 \times 2$ cores (Brown, Blue) 3 m (Standard)

Note 1) Refer to page 56 for solid state switch common specifications

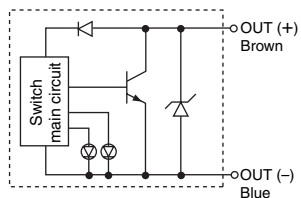
Note 2) Refer to page 56 for lead wire lengths

Weight

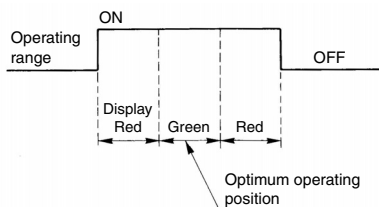
Unit: g

Auto switch part no.	D-G5BA	
Lead wire length (m)	0.5	—
	3	68
	5	108

Auto Switch Internal Circuit

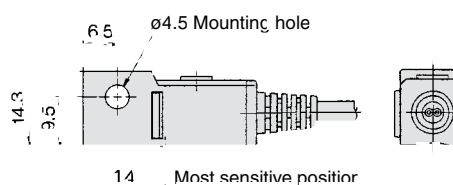
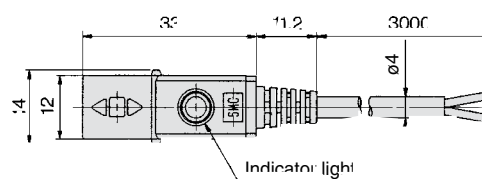


Indicator light / Display method



Dimensions

Unit: mm



2-Color Indication with Diagnostic Output Solid State Switch: Band Mounting Style D-H7NF

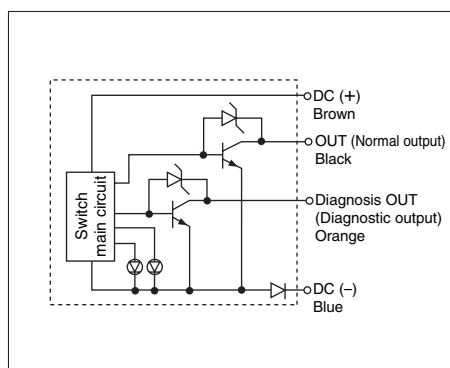


Grommet

- Since the output signal can be detected in an unsteady detecting area, the difference of detecting position can be confirmed by the side of PLC (Programmable Logic Controller).
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)



Auto Switch Internal Circuit



Auto Switch Specifications

PLC: Programmable Logic Controller

D-H7NF (With indicator light)	
Auto switch part no.	D-H7NF
Wiring type	4-wire
Output type	NPN
Diagnostic output type	Normal operation
Applicable load	IC circuit, Relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)
Current consumption	10 mA or less
Load voltage	28 VDC or less
Load current	50 mA or less at the total amount of normal output and diagnostic output
Internal voltage drop	1.5 V or less (0.8 V or less at 5 mA)
Leakage current	100 A or less at 24 VDC
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.
Standard	Conforming to CE Standards

- Lead wires Oilproof heavy-duty vinyl cable $\phi 3.4$ 0.2 mm² × 4 cores (Brown Black Orange Blue), 0.5 m
- Note 1) Refer to page 56 for solid state switch common specifications
- Note 2) Refer to page 56 for lead wire lengths

Weight

Unit: g

Auto switch part no.	D-H7NF	
Lead wire length (m)	0.5	13
	3	56
	5	90

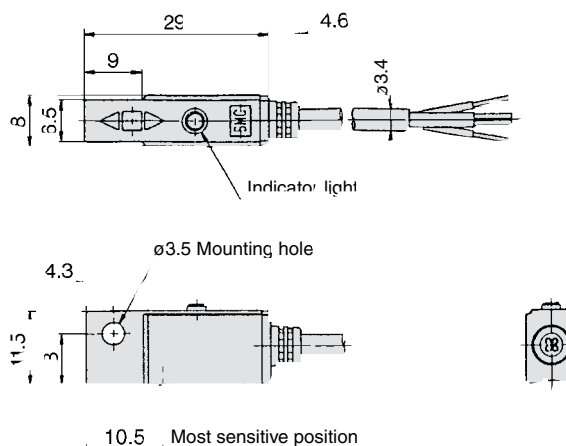
Diagnostic Output Operation

The diagnostic signal is output within unsteady detecting area (where indicator light is Red) and the diagnostic output becomes OFF when the detecting position remains within the optimum operating position (where indicator is Green). When the detecting position is not adjusted the diagnostic output becomes ON.

Indicator light	ON		OFF		Red
	Red	Green	Red	Green	
OUT (Normal output)	ON	ON	ON	OFF	ON
Diagnosis OUT (Diagnostic output)	ON	OFF	ON	OFF	ON

Dimensions

Unit: mm



2-Color Indication with Diagnostic Output Solid State Switch: Band Mounting Style D-G59F

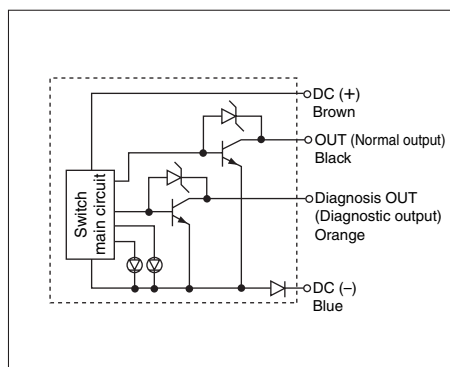


Grommet

- Since the output signal can be detected in an unsteady detecting area, the difference of detecting position can be confirmed by the side of PLC (Programmable Logic Controller).
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)



Auto Switch Internal Circuit



Auto Switch Specifications

PLC: Programmable Logic Controller

D-G59F (With indicator light)	
Auto switch part no.	D-G59F
Wiring type	4-wire
Output type	NPN
Diagnostic output type	Normal operation
Applicable load	IC circuit, Relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)
Current consumption	10 mA or less
Load voltage	28 VDC or less
Load current	50 mA or less at the total amount of normal output and diagnostic output
Internal voltage drop	1.5 V or less (0.8 V or less at 5 mA)
Leakage current	100 A or less at 24 VDC
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.
Standard	Conforming to CE Standards

- Lead wires — Oilproof heavy-duty vinyl cable $\phi 4$ 0.2 mm² x 4 cores (Brown, Black, Orange, Blue) 0.5 m
- Note 1) Refer to page 56 for solid state switch common specifications
- Note 2) Refer to page 56 for lead wire lengths

Weight

Unit: g

Auto switch part no.	D-G59F	
Lead wire length (m)	0.5	20
	3	74
	5	117

Diagnostic Output Operation

The diagnostic signal is output within unsteady detecting area (where indicator light is Red) and the diagnostic output becomes OFF when the detecting position remains within the optimum operating position (where indicator is Green). When the detecting position is not adjusted the diagnostic output becomes ON.

Indicator light	ON		Rec	OFF		Rec
	Rec	Green		Rec	OFF	
OUT (Normal output)	ON	ON	ON	OFF	ON	ON
Diagnosis OUT (Diagnostic output)	ON	OFF	ON	OFF	ON	ON

Dimensions

Unit: mm

