Guide Cylinder With End Lock

Series MGG

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

How to Order

MGG L B 32 □ – 100 – H N M9BW □ □

Guide cylinder

Bearing

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
63	63 mm
80	80 mm
100	100 mm

Port thread

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 25.

Lock position

H	Head end lock
R	Rod end lock

Manual release

N	Non-lock type
L	Lock type

Auto switch

Nil	Without auto switch (Built-in magnet)

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

Number of auto switches

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

Made to Order
Refer to page 26.

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

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

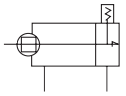
* Solid state switches marked with "○" are produced upon receipt of order.
* D-A9□V, M9□V, M9□WV, and D-F9BA cannot be mounted.

* 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.)

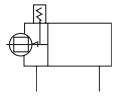
Caution
When using auto switches shown inside ( ), stroke end detection may not be possible depending on the one-touch fitting or speed controller model. Please contact SMC in this case.

Model / Specifications

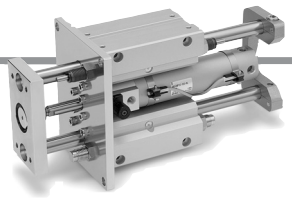
JIS Symbol

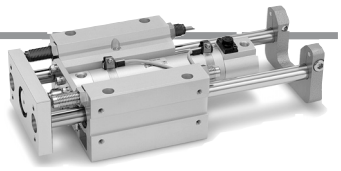


Head end lock



Rod end lock





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		CDBG1BN	Bore size	Port thread	Stroke	- Lock position	Manual release	- Auto switch	- XC70
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 1000mm/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 –10mm	0 to –15mm						
Base cylinder lubrication		Non-lube							
Thread tolerance		JIS Class 2							
Stroke length tolerance		$^{+1.9}_{+0.2}$ mm (1000 st or less), $^{+2.3}_{+0.2}$ mm (1001 st or more)							
Non-rotating accuracy*	**Slide bearing**	±0.07°	±0.06°	±0.06°	±0.05°	±0.04°	±0.04°	±0.04°	±0.03°
	Ball bushing bearing	±0.06°	±0.05°	±0.04°	±0.04°	±0.04°	±0.03°	±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.

Lock Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Holding force (Max.) (N)	215	330	550	860	1340	2140	3450	5390
Lock position	Head end, Rod end							
Backlash	2 mm or less							
Manual release	Non-lock type, Lock type							

∗ Adjust switch positions for operation at both the stroke end and backlash (2 mm) movement positions.

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 (mm^2)

Weight

(kg)

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
Additional weight of lock unit	Head end lock (H)	Non-lock type (N)	0.05	0.07	0.08	0.17	0.26	0.44	0.8	1.15
		Lock type (L)	0.07	0.08	0.1	0.21	0.3	0.48	0.88	1.23
	Rod end lock (R)	Non-lock type (N)	0.07	0.08	0.12	0.19	0.31	0.51	0.9	1.31
		Lock type (L)	0.09	0.1	0.14	0.23	0.34	0.54	0.97	1.39

Calculation: (Example) **MGGLB32-500-HN**
(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
- Additional weight of lock unit ····· 0.08 (Head end, Non-lock type)

3.84 + 0.25 x 500/50 + 0.02 + 0.019 + 0.08 = 6.459 kg

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

Symbol	Specifications
XC79	Machining tapped hole, drilled hole and pin hole additionally

Moving Parts Weight

(kg)

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

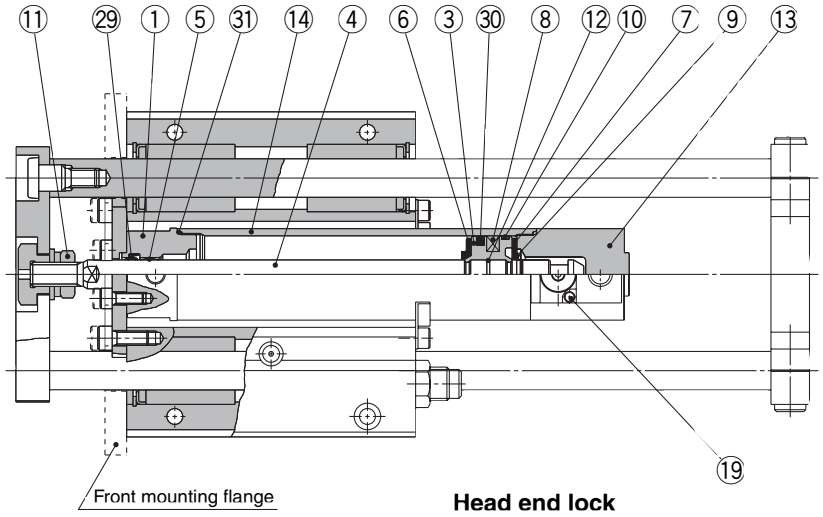
Calculating weight of moving parts (Example) **MGGLB32-500-HN**
- Moving parts basic weight ····· 1.61
- Additional stroke weight ····· 0.203/50 st
- Stroke ····· 500 st

1.61 + 0.203 x 500/50 = 3.64 kg

Refer to pages 8 to 16 for the allowable end load and deflection, as well as the allowable eccentric load.

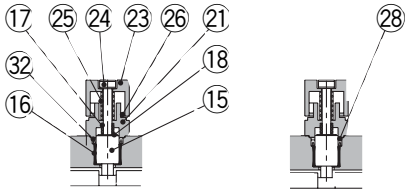
Construction

MGG□□
ø20 to ø100



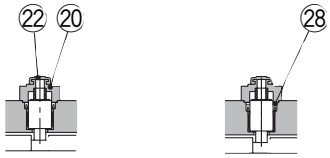
Head end lock

Manual release (Lock type)

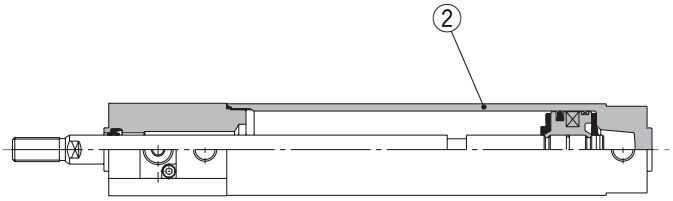


ø20 to ø63 **ø80, ø100**

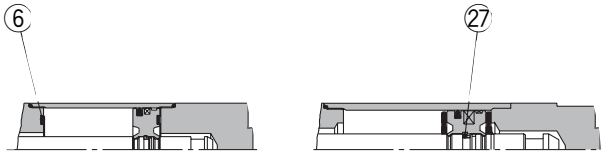
Manual release (Non-lock type)



ø20 to ø63 **ø80, ø100**



With rod end locking (Base cylinder only)



ø80, ø100 **ø40 to ø100**

* Since the guide unit figure is the same as the standard type, refer to page 17 through to 19.

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	Description is "Bumper" for ø63 and larger	
7	**Bumper B**	Urethane	ø40 and larger are the same as Bumper A	
8	**Magnet**	—		
9	**Snap ring**	Stainless steel	Not required for ø80, ø100	
10	**Wear ring**	Resin		
11	**Rod end nut**	Rolled steel	Nickel plated	ø100 is carbon steel
12	**Piston gasket**	NBR		
13	**Head cover**	Aluminum alloy	White hard anodized	For head side locking type and long stroke
14	**Cylinder tube**	Aluminum alloy	Hard anodized	
15	**Lock piston**	Carbon steel	Hard chrome plated, Heat treated	
16	**Lock bushing**	Bearing alloy		
17	**Lock spring**	Stainless steel		
18	**Bumper**	Urethane		
19	**Hexagon socket head cap screw**	Chromium molybdenum steel	Black zinc chromated	
20	**Cap A**	Aluminum die-casted	Black painted	For non-lock type
21	**Cap B**	Carbon steel	Oxide film treated	For lock type
22	**Rubber cap**	Synthetic rubber	For non-lock type	
23	**M/O knob**	Zinc die-casted	Black painted	For lock type
24	**M/O bolt**	Chromium molybdenum steel	Black zinc chromated, Red painted	For lock type
25	**M/O spring**	Steel wire	Zinc chromated	For lock type ø20, ø25, ø32 are stainless stee

Component Parts

No.	Description	Material	Note
26	**Stopper ring**	Carbon steel	Zinc chromated For lock type
27	**Piston holder**	Urethane	Used for ø40 and larger
28	**Seal retainer**	Rolled steel	Used for ø80 and ø100
29	**Rod seal**	NBR	
30	**Piston seal**	NBR	
31	**Tube gasket**	NBR	
32	**Lock piston seal**	NBR	

* Since the guide unit parts are the same as the standard type, refer to page 17 through to 19.

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
20	CBG1N20-PS	Set of nos. above ㉙, ㉚, ㉛, ㉜.
25	CBG1N25-PS	
32	CBG1N32-PS	
40	CBG1N40-PS	

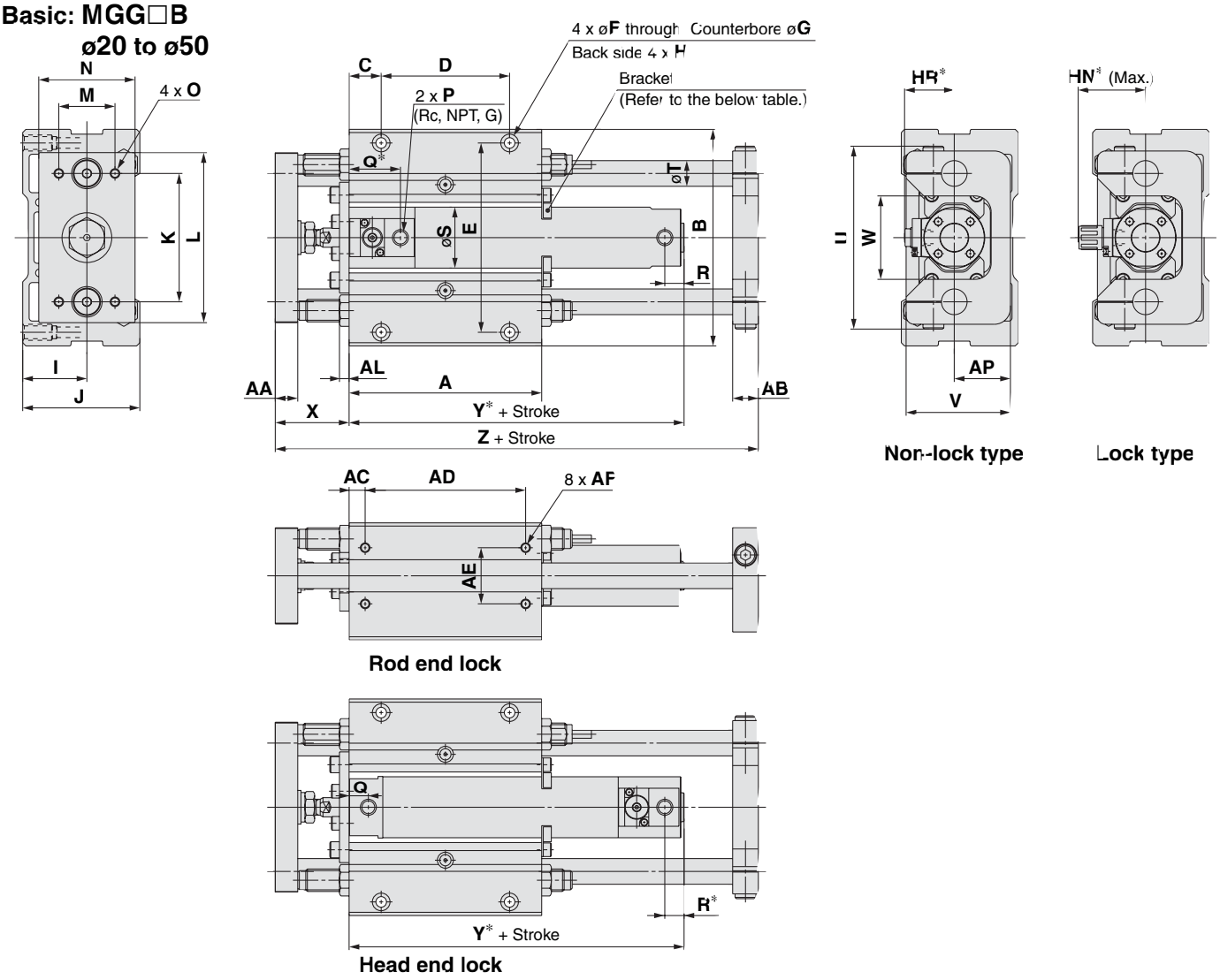
* Seal kit includes ㉙ to ㉜. Order the seal kit, based on each bore size.

⚠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.)

Dimensions

Basic: MGG□B
ø20 to ø50



Dimensions not marked with an "∗" are the same as standard type. (mm)

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, 200, 250, 300	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		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		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)	S	T	U	V	W	X	Z
20	M6 x 1 depth 9	1/8	26	12	82	48	40	39	157
25	M6 x 1 depth 13	1/8	31	13	100	57	46	46	175
32	M6 x 1 depth 13	1/8	38	16	114	65	52	46	201
40	M8 x 1.25 depth 16	1/8	47	20	138	84	62	56	238
50	M10 x 1.5 depth 21	1/4	58	25	164	94	75	67	285

Note) Rc, NPT, G port are available.

Bore size (mm)	For lock type	For non-lock type
	HN*	**HR***
20	37	25.3
25	40	28.3
32	43	31.3
40	52.5	38.3
50	58.5	44.5

Bore size (mm)	Rod end lock			Head end lock		
	Q*	**R**	**Y***	**Q**	**R***	**Y***
20	38.5	12 (14)	98 (106)	12	11	95
25	39	12 (14)	98 (106)	12	11	95
32	40	12 (14)	101 (109)	12	11	97
40	41	12 (15)	109 (118)	13	11	111
50	47	14 (16)	125 (137)	14	16	128

Note) ( ): Dimensions for long stroke.

Long Stroke

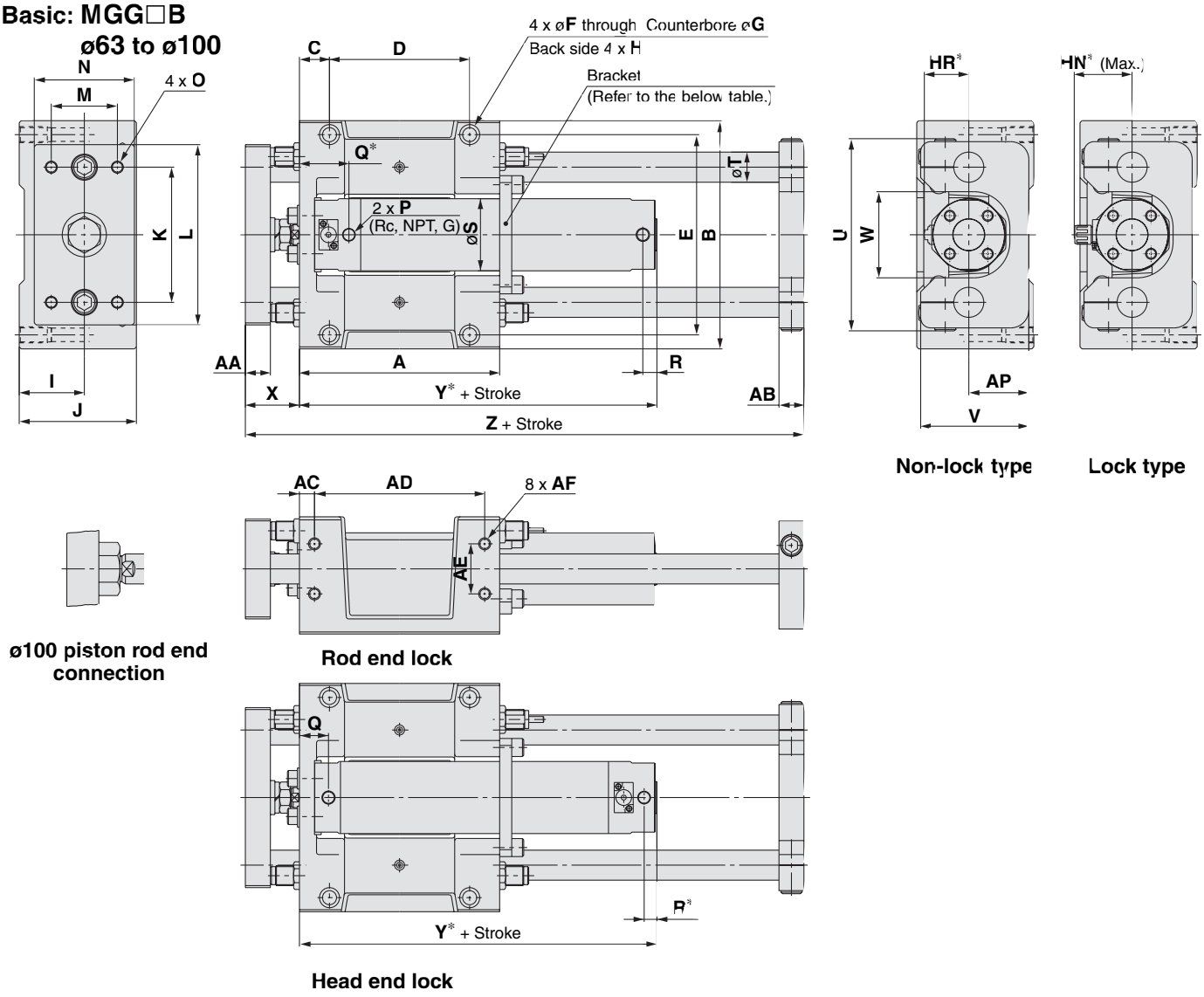
Bore size (mm)	Stroke range (mm)
20	250 to 400
25	350 to 500
32	350 to 600
40	350 to 800
50	350 to 1000

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



Dimensions not marked with an "∗" are the same as standard type.

(mm)

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, 125 150, 200 250, 300	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		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		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)	S	T	U	V	W	X	Z
63	M12 x 1.75 depth 23	1/4	72	30	192	108	86	54	308
80	M12 x 1.75 depth 28	3/8	89	35	224	128	104	66	355
100	M14 x 2 depth 30	1/2	110	40	262	143	128	66	410

Note) Rc, NPT, G port are available.

Bore size (mm)	For lock type	For non-lock type
	HN*	**HR***
63	59	45
80	68	53.5
100	79	64.5

Bore size (mm)	Rod end lock			Head end lock		
	Q*	**R**	**Y***	**Q**	**R***	**Y***
63	63	14 (16)	142 (154)	29	15	147
80	82	19 (23)	175 (189)	40	17	182
100	85	19 (23)	180 (194)	40	23	188

Note) ( ): Dimensions for long stroke.

Long Stroke

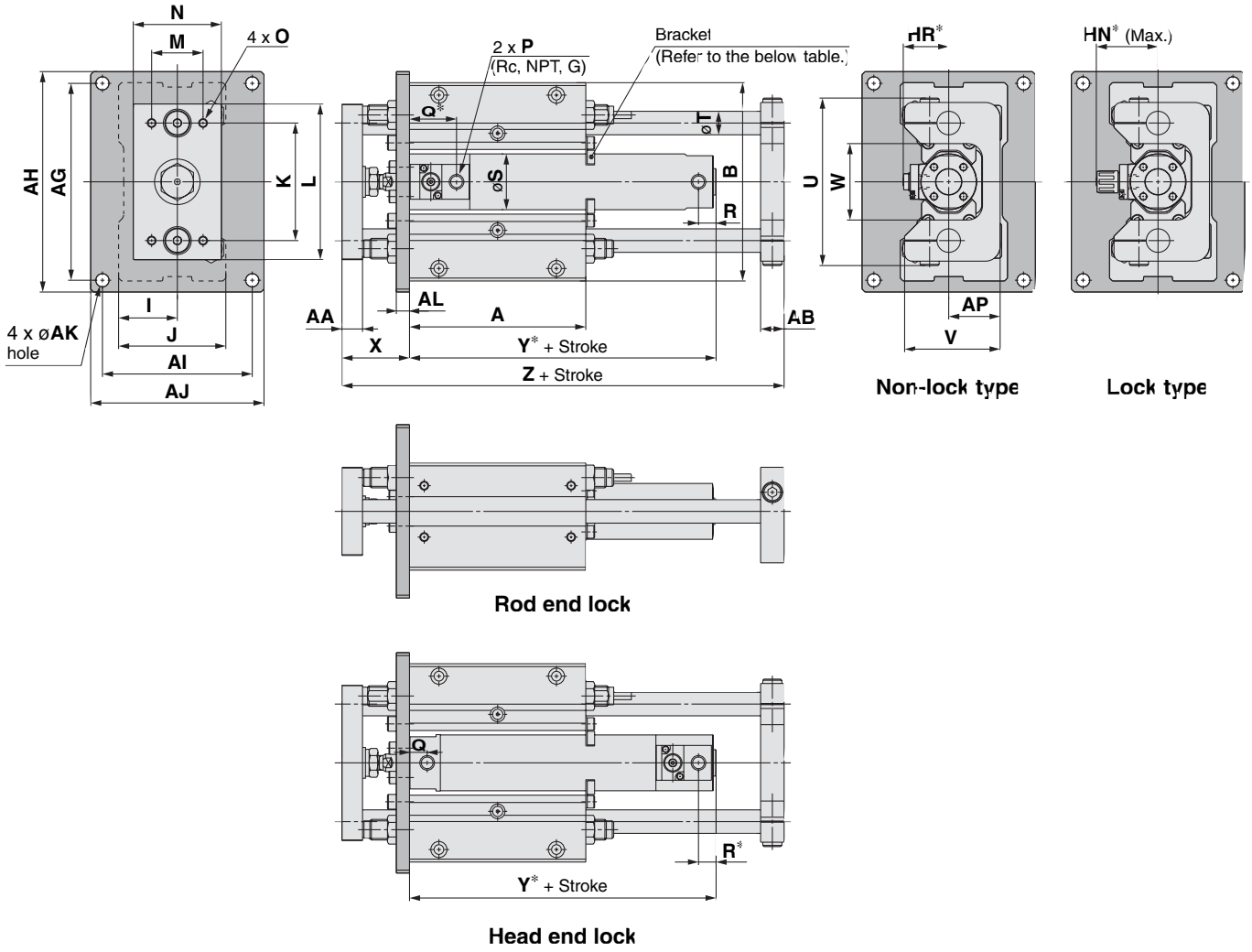
Bore size (mm)	Stroke range (mm)
63	350 to 100
80	350 to 1200
100	350 to 1300

Bracket Mounting Stroke

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

Dimensions

Front mounting flange: MGG□F
ø20 to ø50



Dimensions not marked with an "∗" are the same as standard type.

(mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB	AG	AH	AI	AJ	AK	AL	AP	B	I	J	K	L	M	N	O	P Note)	S	T	U	V
20	75, 100, 125, 150, 200	90	11	11	112	125	82	95	6.6	9	25	108	30	55	60	80	25	45	M6 x 1 depth 9	1/8	26	12	82	48
25	75, 100, 125, 150, 200, 250, 300	100	14	13	134	150	92	108	9	9	30	130	35	65	70	100	35	54	M6 x 1 depth 13	1/8	31	13	100	57
32		120	14	16	134	150	102	118	9	9	35	135	40	73	80	106	35	60	M6 x 1 depth 13	1/8	38	16	114	65
40		140	17	19	170	186	134	150	9	12	45	170	50	93	95	134	50	75	M8 x 1.25 depth 16	1/8	47	20	138	84
50		170	23	21	190	210	140	160	11	12	50	194	55	103	115	152	56	90	M10 x 1.5 depth 21	1/4	58	25	164	94

Bore size (mm)	W	X	Z
20	40	39	157
25	46	46	175
32	52	46	201
40	62	56	238
50	75	67	285

Bore size (mm)	For lock type	For non-lock type
	HN*	**HR***
20	37	25.3
25	40	28.3
32	43	31.3
40	52.5	38.3
50	58.5	44.5

Bore size (mm)	Rod end lock			Head end lock		
	Q*	**R**	**Y***	**Q**	**R***	**Y***
20	38.5	12 (14)	98 (106)	12	11	95
25	39	12 (14)	98 (106)	12	11	95
32	40	12 (14)	101 (109)	12	11	97
40	41	12 (15)	109 (118)	13	11	111
50	47	14 (16)	125 (137)	14	16	128

Note) ( ) Dimensions for long stroke.

Note) Rc, NPT, G port are available.

Long Stroke

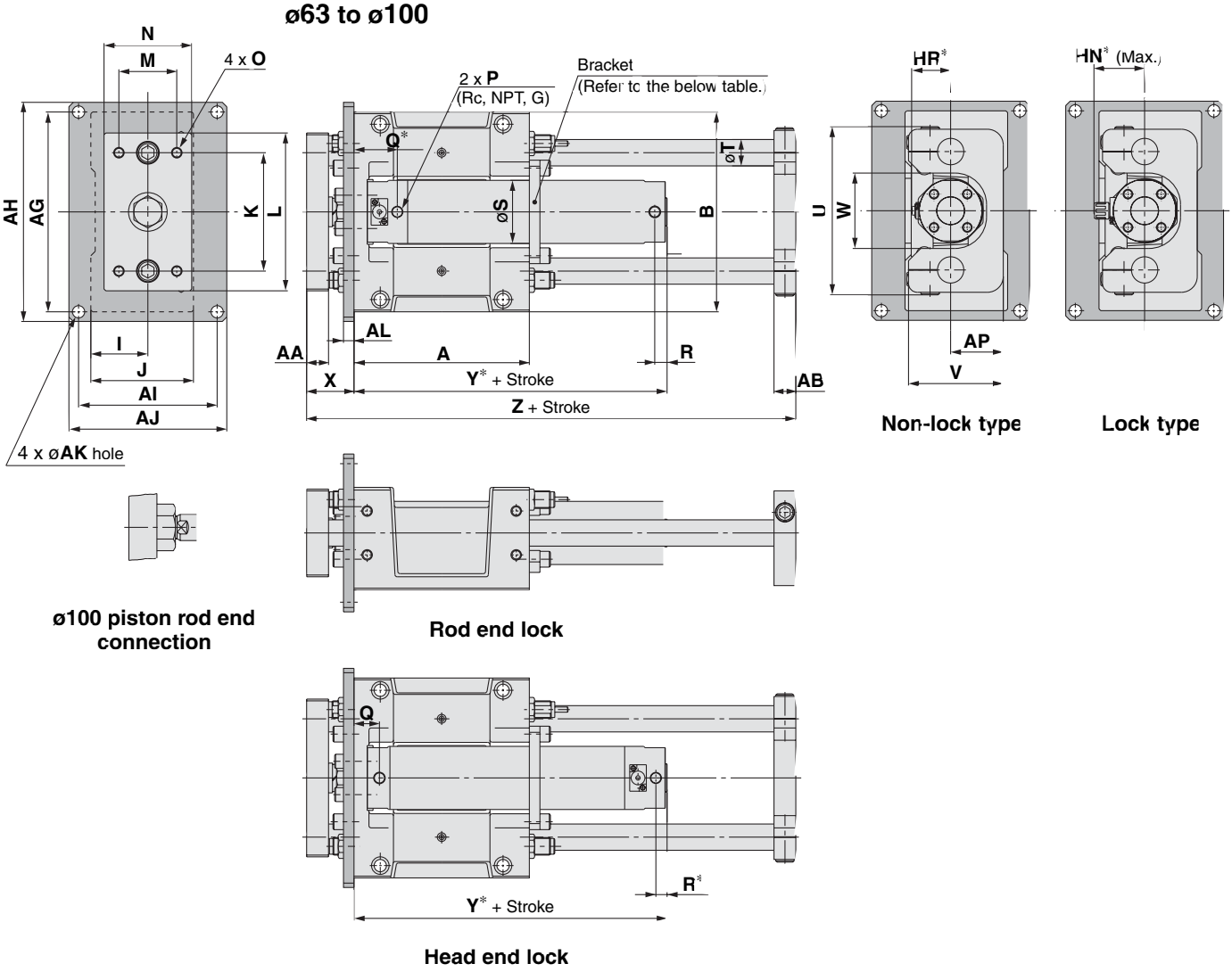
Bore size (mm)	Stroke range (mm)
20	250 to 400
25	350 to 500
32	350 to 600
40	350 to 800
50	350 to 1000

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

Front mounting flange: MGG□F
ø63 to ø100



Dimensions not marked with an "∗" are the same as standard type. (mm)

Bore size (mm)	Stroke range (mm)	A	AA	AB	AG	AH	AI	AJ	AK	AL	AP	B	I	J	K	L	M	N	O	P Note)	S	T	U	V
63	75, 100, 125 150, 200 250, 300	200	25	25	228	250	158	180	14	12	60	228	65	117	135	180	66	100	M12 x 1.75 depth 23	1/4	72	30	192	108
80		230	30	27	262	284	178	200	14	16	70	262	75	138	160	214	76	115	M12 x 1.75 depth 28	3/8	89	35	224	128
100		280	32	30	300	326	200	226	16	16	80	304	85	153	190	245	80	125	M14 x 2 depth 30	1/2	110	40	262	143

Note) Rc, NPT, G port are available.

Bore size (mm)	W	X	Z
63	86	54	308
80	104	66	355
100	128	66	410

Bore size (mm)	For lock type	For non-lock type
	HN*	**HR***
63	59	45
80	68	53.5
100	79	64.5

Bore size (mm)	Rod end lock			Head end lock		
	Q*	**R**	**Y***	**Q**	**R***	**Y***
63	63	14 (16)	142 (154)	29	15	147
80	82	19 (23)	175 (189)	40	17	182
100	85	19 (23)	180 (194)	40	23	188

Note) ( ): Dimensions for long stroke.

Long Stroke

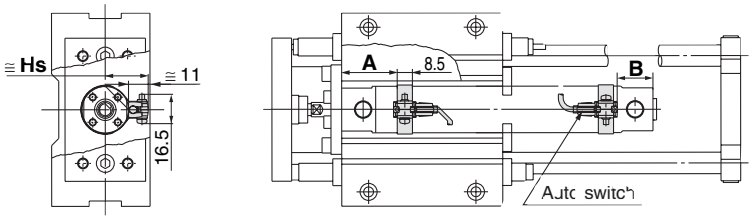
Bore size (mm)	Stroke range (mm)
63	350 to 1100
80	350 to 1200
100	350 to 1300

Long Stroke

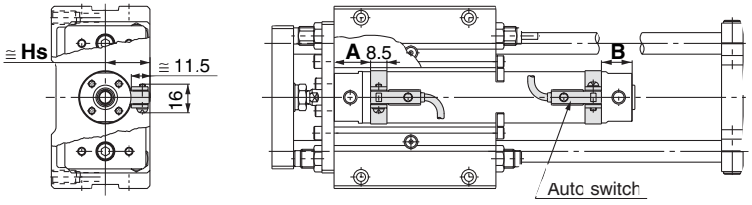
Bore size (mm)	Bracket mounting stroke
63	300 st or more
80	400 st or more
100	500 st or more

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

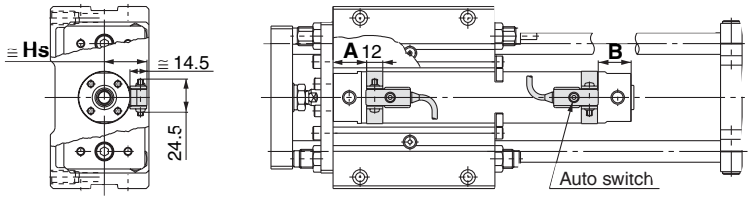
D-A9 type,
D-M9/M9□W type



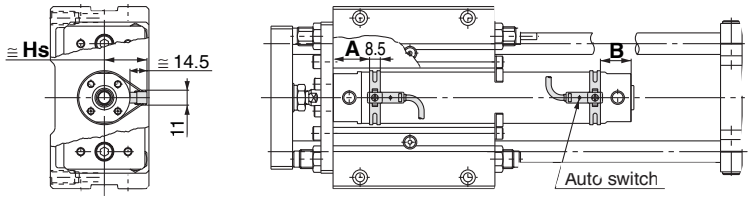
D-C7/C8 type,
D-H7 type



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 / Bore size	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

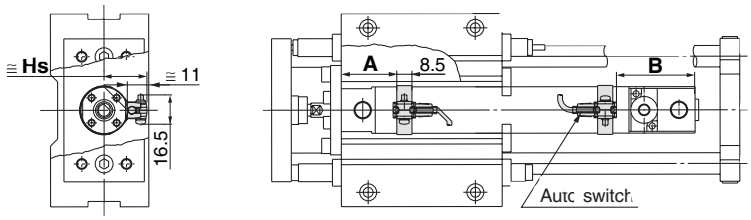
(mm)

Auto switch model / Bore size	D-A9□ D-M9□ D-M9□W	D-C7□ D-C80 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/K5 D-G5□W D-K59W D-G5NTL D-B5/B6 D-B59W D-G5BAL D-G59F
	Hs	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5	27.5
25	26.5	27	29.5	30	30
32	30	30.5	33	33.5	33.5
40	34.5	35	37.5	38	38
50	40	40.5	43	43.5	43.5
63	47	47.5	50	50.5	50.5
80	—	—	—	—	59
100	—	—	—	—	69.5

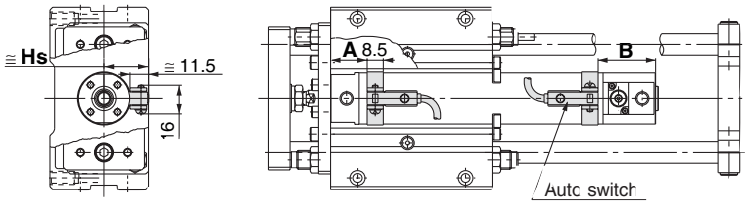
∗ ( ): Values for long strokes, double rods.
Note) When setting an auto switch, confirm the operation and adjust its mounting position.

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height / End Lock Type With Head End Lock

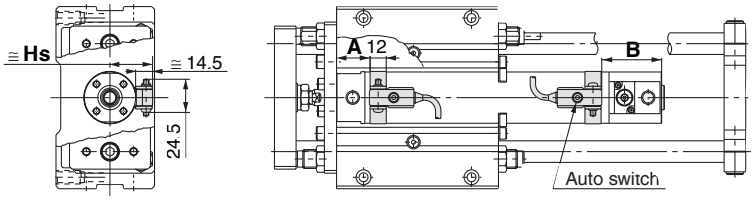
D-A9 type,
D-M9/M9□W type



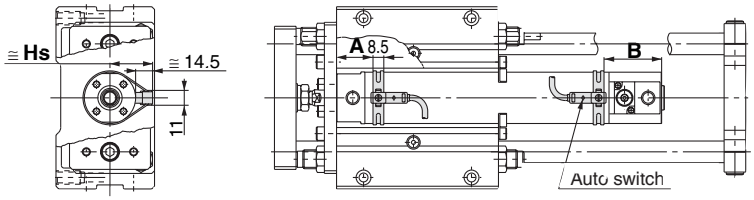
D-C7/C8 type,
D-H7 type



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 / Bore size	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	44	33	48	30.5	45.5	29.5	44.5	23.5	38.5	26.5	41.5	28.5	43.5	25	40
25	29	44	33	48	30.5	45.5	29.5	44.5	23.5	38.5	26.5	41.5	28.5	43.5	25	40
32	30	45	34	49	31.5	46.5	30.5	45.5	24.5	39.5	27.5	42.5	29.5	44.5	26	41
40	35	54	39	58	36.5	55.5	35.5	54.5	29.5	48.5	32	51.5	34.5	53.5	31	50
50	42	64	46	68	43.5	65.5	42.5	64.5	36.5	58.5	39.5	61.5	41.5	63.5	38	60
63	42	68	46	72	43.5	69.5	42.5	68.5	36.5	62.5	39.5	65.5	41.5	67.5	38	64
80	—	—	—	—	—	—	—	—	46.5	81.5	49.5	84.5	—	—	48	83
100	—	—	—	—	—	—	—	—	46.5	87.5	49.5	90.5	—	—	48	89

Auto Switch Mounting Height

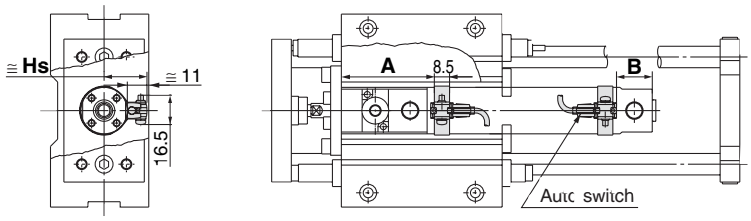
(mm)

Auto switch model / Bore size	D-A9□ D-M9□ D-M9□W	D-C7□ D-C80 D-H7□ D-H7□W D-H7HF 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
20	24	24.5	27	27.5	27.5
25	26.5	27	29.5	30	30
32	30	30.5	33	33.5	33.5
40	34.5	35	37.5	38	38
50	40	40.5	43	43.5	43.5
63	47	47.5	50	50.5	50.5
80	—	—	—	—	59
100	—	—	—	—	69.5

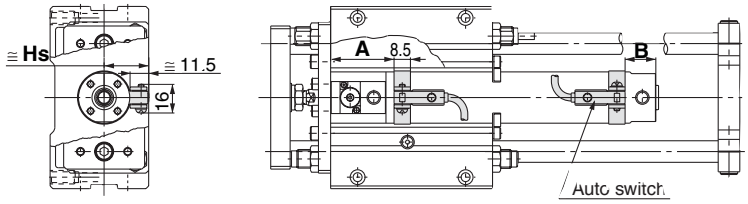
Note) When setting an auto switch, confirm the operation and adjust its mounting position.

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height / End Lock Type With Rod End Lock

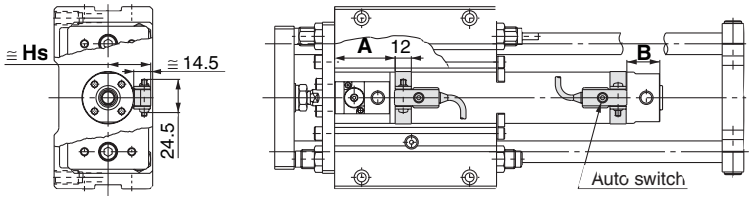
D-A9 type,
D-M9/M9□W type



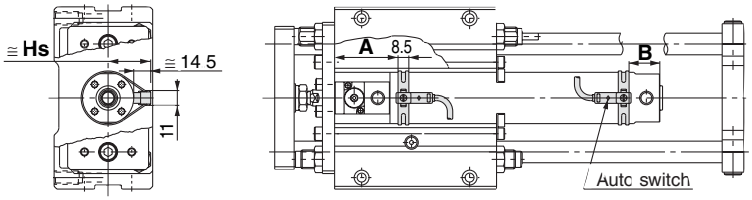
D-C7/C8 type,
D-H7 type



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 / Bore size	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	56	20 (28)	60	24 (32)	57.5	21.5 (29.5)	56.5	20.5 (28.5)	50.5	14.5 (22.5)	53.5	17.5 (25.5)	55.5	19.5 (27.5)	52	16 (24)
25	56	20 (28)	60	24 (32)	57.5	21.5 (29.5)	56.5	20.5 (28.5)	50.5	14.5 (22.5)	53.5	17.5 (25.5)	55.5	19.5 (27.5)	52	16 (24)
32	58	21 (29)	62	25 (33)	59.5	22.5 (30.5)	58.5	21.5 (29.5)	52.5	15.5 (23.5)	55.5	18.5 (26.5)	57.5	20.5 (28.5)	54	17 (25)
40	64	23 (32)	68	27 (36)	65.5	24.5 (33.5)	64.5	23.5 (32.5)	58.5	17.5 (26.5)	61	20.5 (29.5)	63.5	22.5 (31.5)	60	19 (28)
50	75	28 (40)	79	32 (36)	76.5	29.5 (41.5)	75.5	28.5 (40.5)	69.5	22.5 (34.5)	72.5	25.5 (37.5)	74.5	27.5 (39.5)	71	24 (36)
63	77	28 (40)	81	32 (36)	78.5	29.5 (41.5)	77.5	28.5 (40.5)	71.5	22.5 (34.5)	74.5	25.5 (37.5)	76.5	27.5 (39.5)	73	24 (36)
80	—	—	—	—	—	—	—	—	90.5	30.5 (44.5)	93.5	33.5 (47.5)	—	—	92	32 (46)
100	—	—	—	—	—	—	—	—	95.5	30.5 (44.5)	98.5	33.5 (47.5)	—	—	97	32 (46)

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-A9□ D-M9□ D-M9□W	D-C7□ D-C80 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/K5 D-G5□W D-K59W D-G5NTL D-B5/B6 D-B59W D-G5BAL D-G59F
	Hs	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5	27.5
25	26.5	27	29.5	30	30
32	30	30.5	33	33.5	33.5
40	34.5	35	37.5	38	38
50	40	40.5	43	43.5	43.5
63	47	47.5	50	50.5	50.5
80	—	—	—	—	59
100	—	—	—	—	69.5

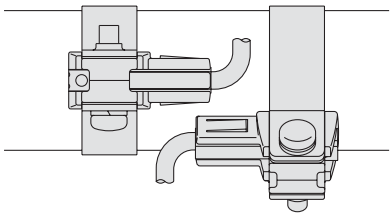
∗ ( ): Values for long strokes.
Note) When setting an auto switch, confirm the operation and adjust its mounting position.

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	—	—

(mm)

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]

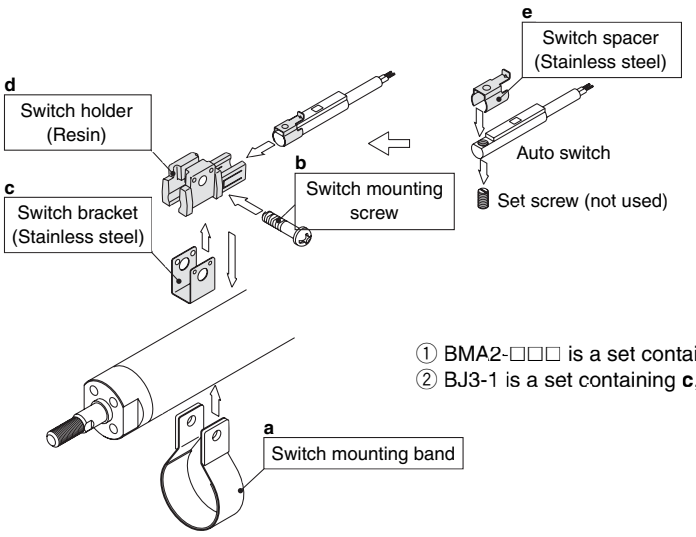
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the switch mounting bracket separately, since it is not included.)

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.



① BMA2-□□□ is a set containing **a** and **b** in the drawing.

② BJ3-1 is a set containing **c**, **d** and **e** in the drawing.

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**

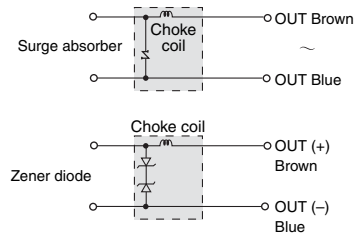
The contact life may be shortened (due to permanent energizing conditions)

Specifications

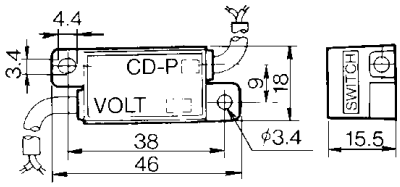
Part no.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

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

Internal Circuit



Dimensions



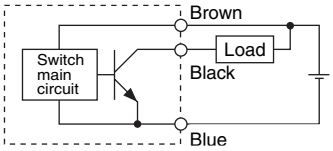
Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH 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.

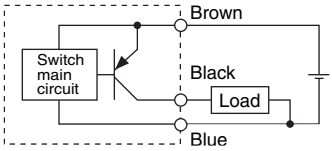
Auto Switch Connections and Examples

Basic Wiring

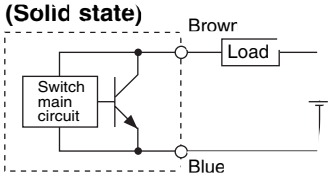
Solid state 3-wire, NPN



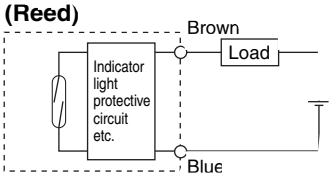
Solid state 3-wire, PNP



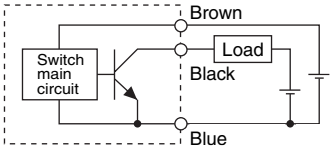
2-wire (Solid state)

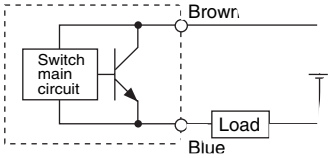


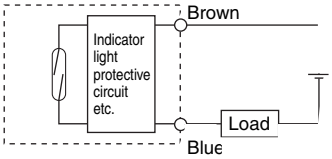
2-wire (Reed)



(Power supplies for switch and load are separate.)

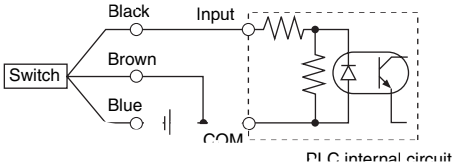




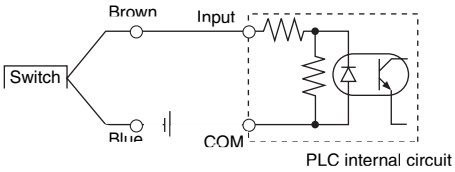


Example of Connection to PLC (Programmable Logic Controller)

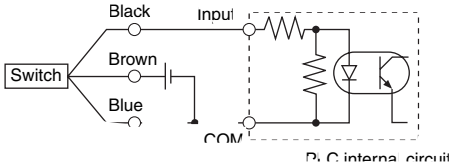
• Sink input specification
3-wire, NPN



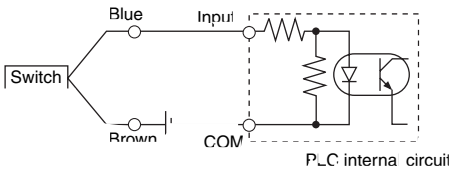
2-wire



• Source input specification
3-wire, PNP



2-wire

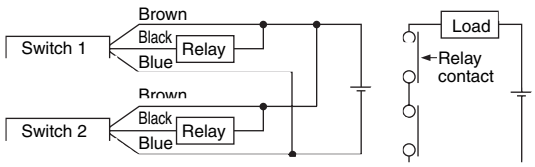


Connect according to the applicable PLC input specifications, since the connection method will vary depending on the PLC input specifications.

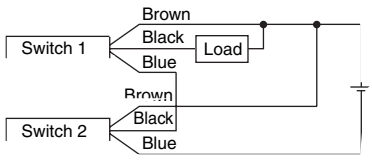
Example of AND (Serial) and OR (Parallel) Connection

• 3-wire

AND connection for NPN output (using relays)

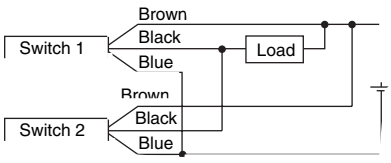


AND connection for NPN output (performed with switches only)

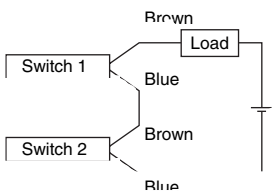


The indicator lights will illuminate when both switches are turned ON.

OR connection for NPN output



2-wire with 2-switch AND connection

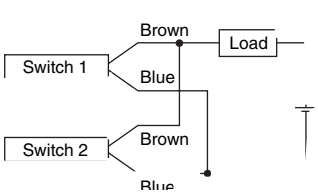


When two switches are connected in series, a load may malfunction because the load voltage will decrease when in the ON state.
The indicator lights will illuminate if both of the switches are in the ON state.

Load voltage at ON = Power supply voltage − Residual voltage × 2 pcs.
= 24 V − 4 V × 2 pcs.
= 16 V

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.

Load voltage at OFF = Leakage current × 2 pcs. × Load impedance
= mA × 2 pcs. × 3 k
= 6 V

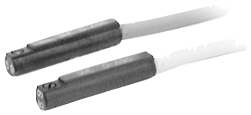
Example: Load impedance is 3 k
Leakage current from switch is 1 mA

(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

CE

Grommet



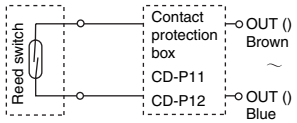
⚠Caution

Operating Precautions

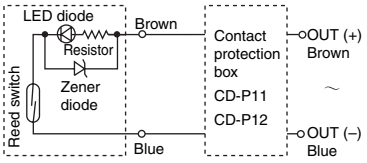
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

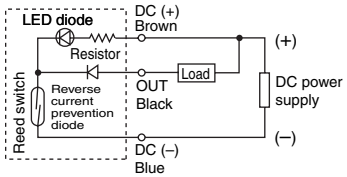
D-A90



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 Ω 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: ø2.7, 0.18 mm² x 2 cores (Brown, Blue), 0.5 m
D-A96 — Oilproof heavy-duty vinyl cable: ø2.7, 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

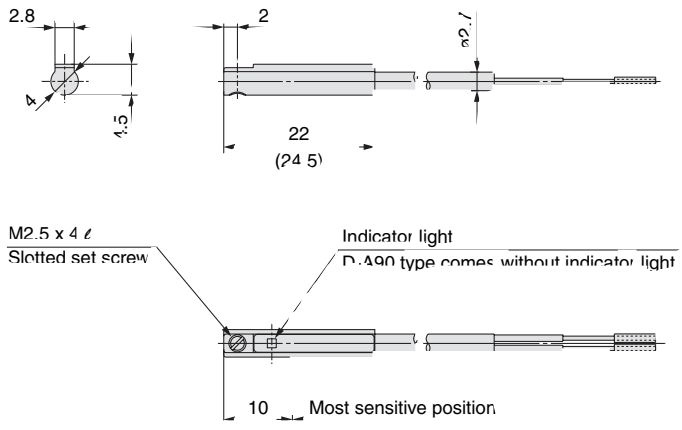
Unit: g

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

Dimensions

Unit: mm

D-A90/D-A93/D-A96



( ) dimensions for D-A93.

SMC

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

CE

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: ø4, 0.3 mm² x 2 cores (Brown, Blue), 0.5 m

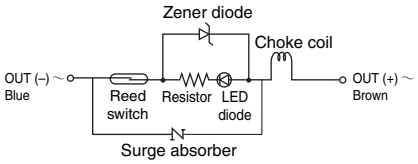
Note 1) Refer to page 56 for reed switch common specifications.

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

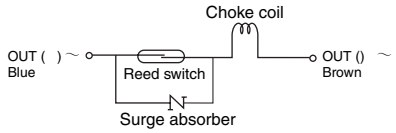
Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 1 mA or more.

Auto Switch Internal Circuit

D-B54



D-B64



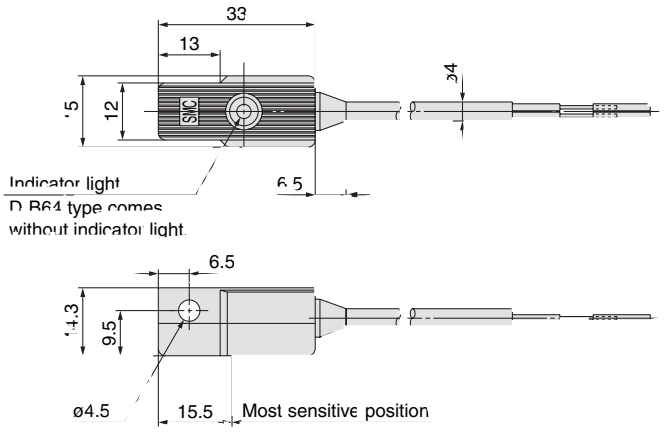
Weight

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

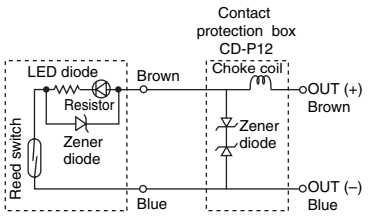
⚠Caution

Operating Precautions

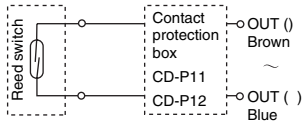
1. Confirm that the connector is appropriately tightened. If tightened insufficiently, the waterproof performance will deteriorate.
2. For how to handle a connector, refer to "Best Pneumatics 2004" Vol. 8 catalog.

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: ø3.4, 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 shipped 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 1 mA or more.

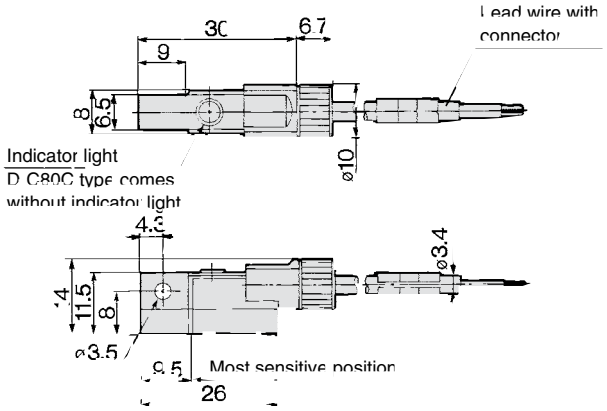
Weight

Unit: g

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

Dimensions

Unit: mm



SMC

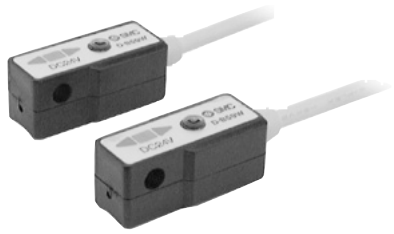
2-Color Indication Solid State Switch: Band Mounting Style
D-B59W

CE

Grommet

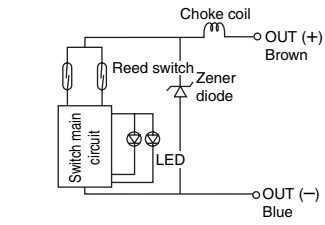
- **The optimum operating position can be determined by the color of the light.**

(Red → Green ← Red)

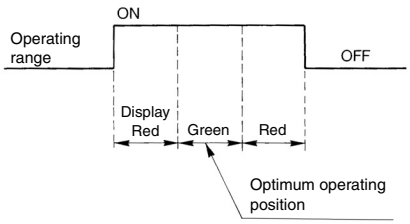


Auto Switch Internal Circuit

D-B59W



Indicator light / Display method



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 ø4, 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 mA or more.

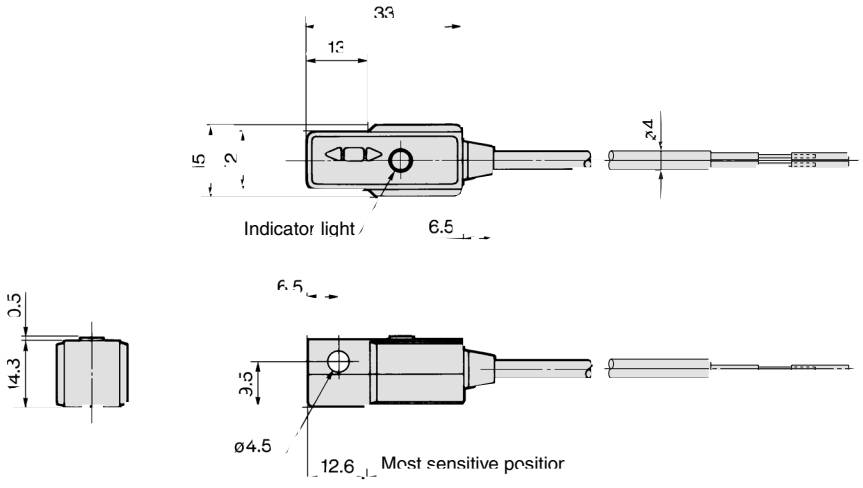
Weight

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.

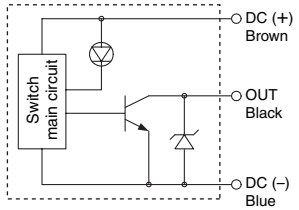
⚠Caution

Operating Precautions

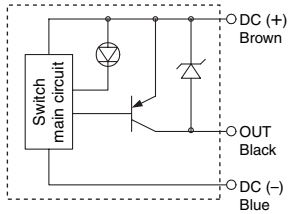
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

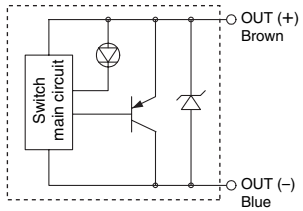
D-M9N



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: ø2.7 x 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

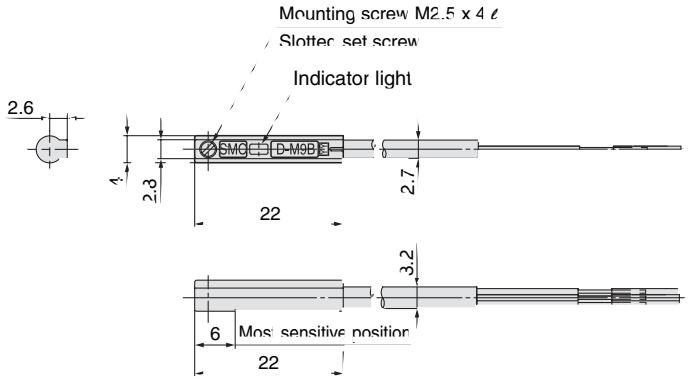
Unit: g

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		

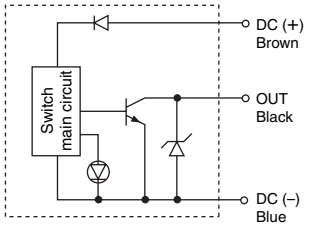
● Lead wires — Oilproof heavy-duty vinyl cable: ø4, 0.3 mm² x 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5 m

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

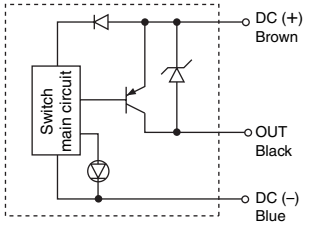
Note 2) Refer to page 56 for lead wire lengths.

Auto Switch Internal Circuit

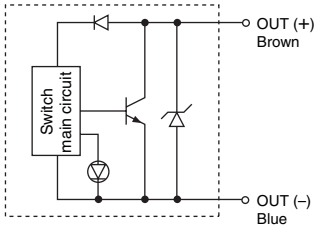
D-G59



D-G5P



D-K59



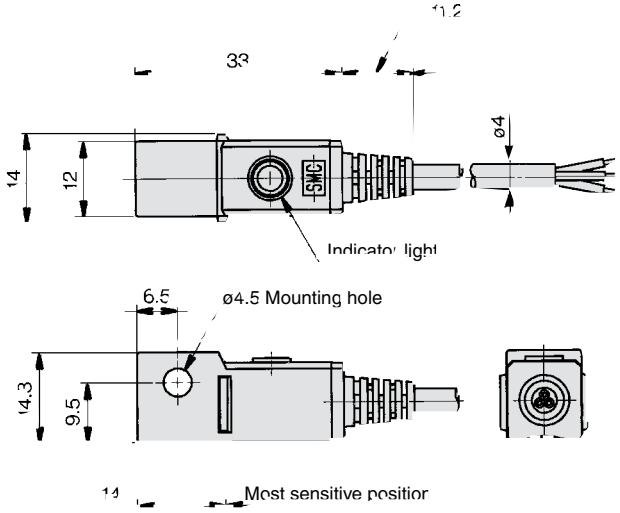
Weight

Unit: g

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

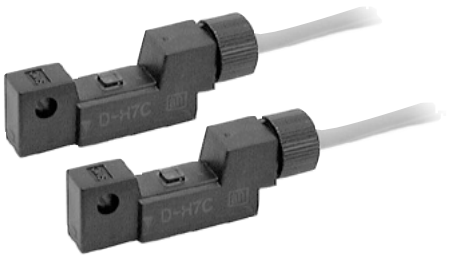
Dimensions

Unit: mm



Solid State Switch: Band Mounting Style
D-H7C

Connector



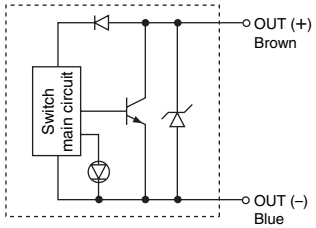
⚠Caution

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: ø3.4, 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.

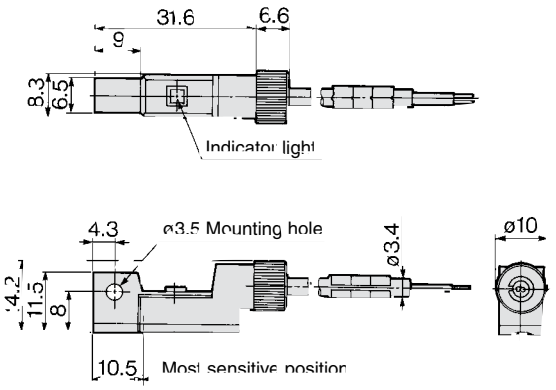
Weight

Unit: g

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

Dimensions

Unit: mm



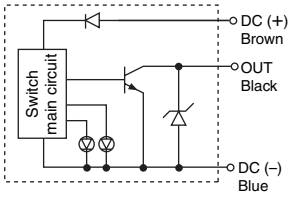
2-Color Indication Solid State Switch: Direct Mounting Style
D-M9NW/D-M9PW/D-M9BW

Grommet

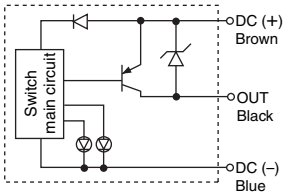
- 2-wire load current is reduced (2.5 to 40 mA).
- UL certified (style 2844) lead cable is used.
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)

Auto Switch Internal Circuit

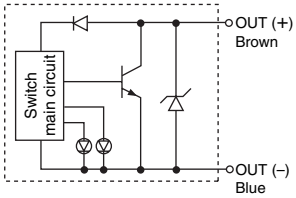
D-M9NW



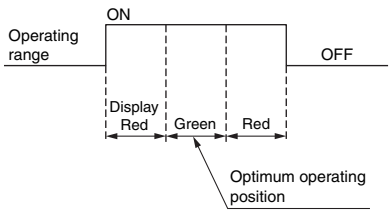
D-M9PW



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: ø2.7 x 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

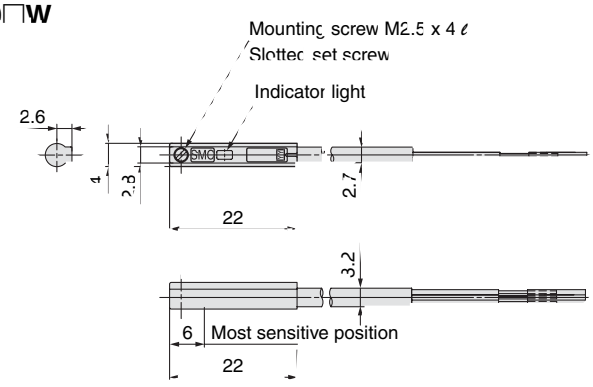
Unit: g

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

Dimensions

Unit: mm

D-M9□W



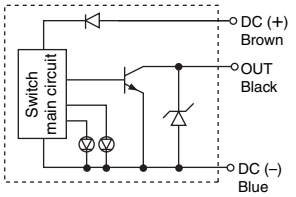
2-Color Indication Solid State Switch: Band Mounting Style
D-G59W/D-G5PW/D-K59W

Grommet

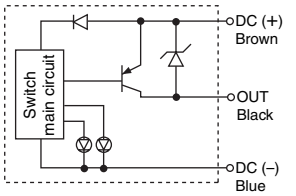
● **The optimum operating position can be determined by the color of the light. (Red → Green ← Red)**

Auto Switch Internal Circuit

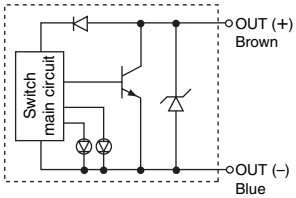
D-G59W



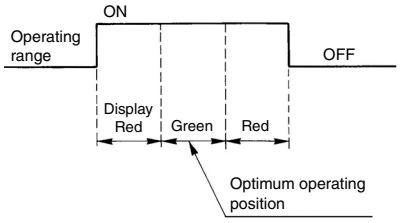
D-G5PW



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: ø4, 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.

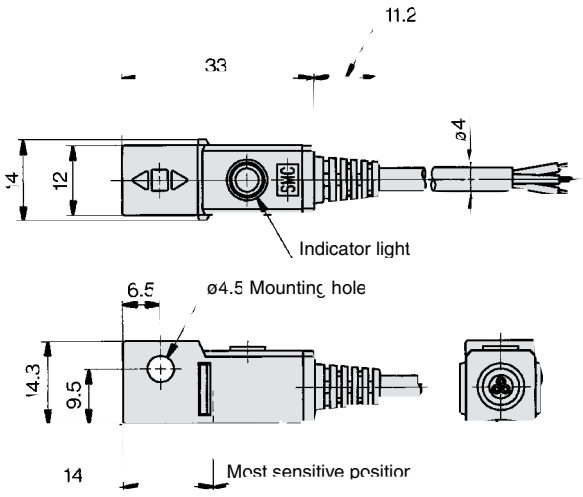
Weight

Unit: g

Auto switch part no.		D-G59W	D-G5PW	D-K59W
Lead wire length (m)	0.5	20	20	18
	3	78	78	68
	5	124	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: ø3, ø4, 0.2 mm² x 2 cores (Brown, Blue) 3 m (Standard)

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

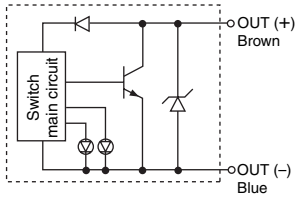
Note 2) Refer to page 56 for lead wire lengths.

Weight

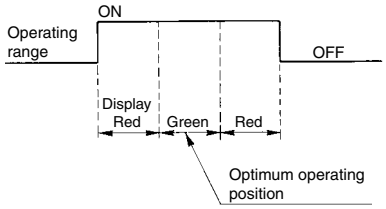
Unit: g

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

Auto Switch Internal Circuit

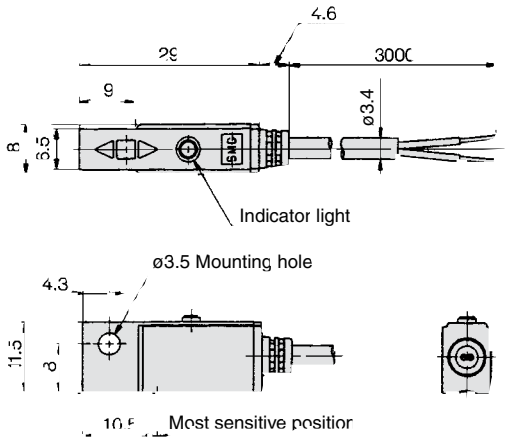


Indicator light / Display method



Dimensions

Unit: mm



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

D-G5BAL

CE

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: ø3, ø4, 0.2 mm² x 2 cores (Brown, Blue) 3 m (Standard)

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

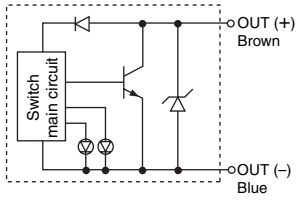
Note 2) Refer to page 56 for lead wire lengths.

Weight

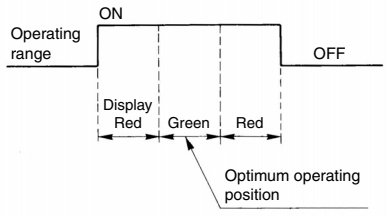
Unit: g

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

Auto Switch Internal Circuit

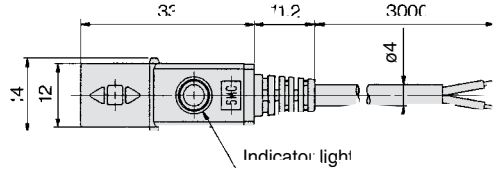


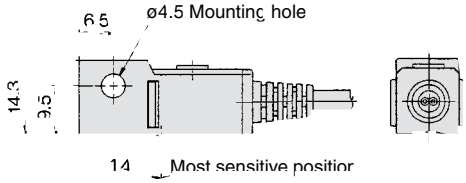
Indicator light / Display method



Dimensions

Unit: mm





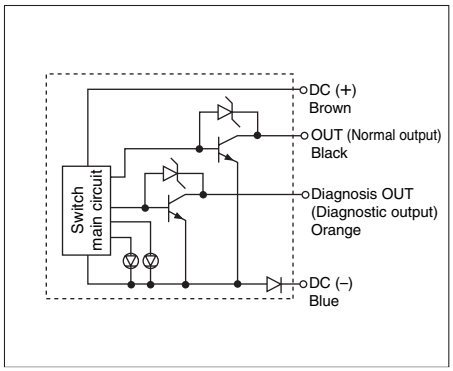
2-Color Indication with Diagnostic Output Solid State Switch: Band Mounting Style
D-H7NF

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 ø3.4, 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.

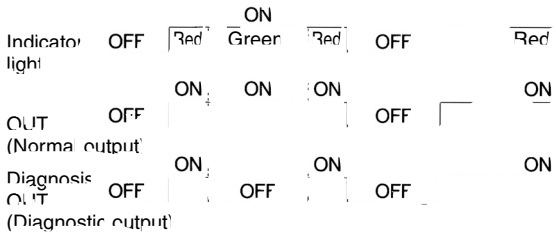
Weight

Unit: g

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

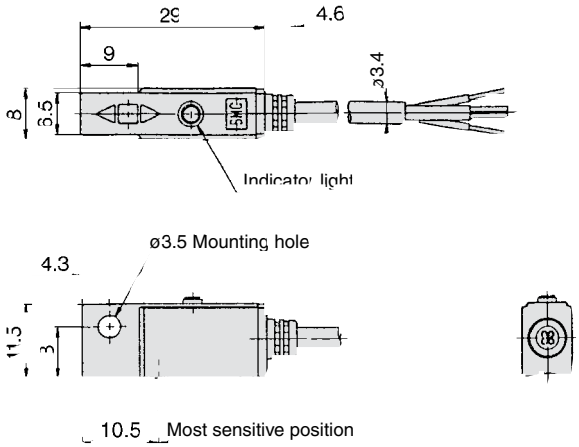
Diagnostic Output Operation

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.



Dimensions

Unit: mm

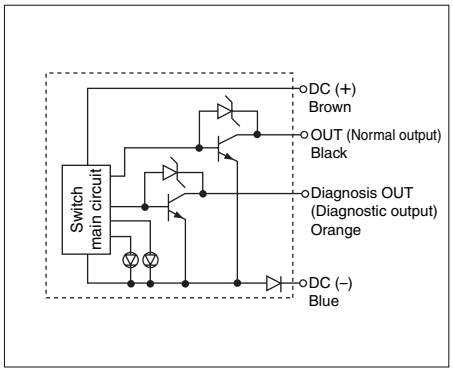


2-Color Indication with Diagnostic Output Solid State Switch: Band Mounting Style
D-G59F

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 ø4 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.

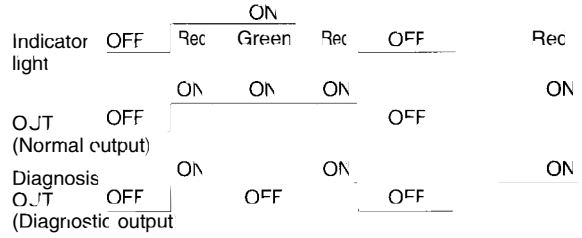
Weight

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.



Dimensions

Unit: mm