

Double Power Cylinder

Series MGZR

(without non-rotation mechanism)

∅20, ∅25, ∅32, ∅40, ∅50, ∅63, ∅80

How to Order

Standard MGZ R 40 Z 100 Z73

Without non-rotation mechanism •

Mounting types •

Nil	Basic type
L	Transaxial foot type
F	Front flange type
G	Rear flange type
D	Double clevis type

Bore size •

20	20mm	50	50mm
25	25mm	63	63mm
32	32mm	80	80mm
40	40mm		

Port thread type •

Nil	M5 × 0.8	∅20
	Rc	∅25
TN	NPT	∅32
		∅40
		∅50
TF	G	∅63
		∅63
		∅80

Number of auto switches

Nil	2 pcs.
S	1 pc.

Auto switch type

Nil	Without auto switch (cylinder with built-in magnet)
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* Select applicable auto switch models from the table below.
* Auto switches are packed together when shipped (unassembled).

Stroke (mm)
Refer to the standard stroke table on page 18.

Coil scraper

Nil	Without coil scraper
Z	With coil scraper

Applicable auto switches: ∅20, ∅25, ∅32

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
							Perpendicular	In-line						
Reed switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	A90V	A90	●	●	○	IC circuit	Relay PLC
						12V	100V	A93V	A93	●	●	○	—	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	F9NV	F9N	●	●	—	IC circuit	Relay PLC
				3-wire (PNP)				F9PV	F9P	●	●	○	—	
Solid state switch	Diagnostic indication (2-color display)	Grommet	Yes	2-wire	24V	5V, 12V	—	F9BV	F9B	●	●	○	—	Relay PLC
				3-wire (NPN)				F9NWV	F9NW	●	●	○	IC circuit	
				3-wire (PNP)				F9PWV	F9PW	●	●	○	—	
				2-wire				F9BWV	F9BW	●	●	○	—	
Solid state switch	Improved water resistance (2-color display)	Grommet	Yes	2-wire	24V	12V	—	—	F9BA	—	●	○	—	—

Applicable auto switches: ∅40, ∅50, ∅63, ∅80

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load		
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)				
							Perpendicular	In-line							
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	24V	5V	—	—	Z76	●	●	—	IC circuit	—	
				2-wire		12V	100V	—	Z73	●	●	●	—	Relay PLC	
Solid state switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	—	Z80	●	●	—	IC circuit	—	
						3-wire (NPN)	Y69A	Y59A	●	●	○	IC circuit			
Solid state switch	Diagnostic indication (2-color display)	Grommet	Yes	3-wire (PNP)	24V	5V, 12V	—	Y7PV	Y7P	●	●	○	—	Relay PLC	
				2-wire				Y69B	Y59B	●	●	○	—		
				3-wire (NPN)				Y7NWV	Y7NW	●	●	○	IC circuit		
				3-wire (PNP)				Y7PWV	Y7PW	●	●	○	—		
Solid state switch	Improved water resistance (2-color display)	Grommet	Yes	2-wire	24V	12V	—	—	Y7BWV	Y7BW	●	●	○	—	—
Solid state switch	Improved water resistance (2-color display)	Grommet	Yes	2-wire	24V	12V	—	—	Y7BA	—	●	○	—	—	

*Lead wire length symbols: 0.5m..... Nil (Example) Y69B
3m..... L (Example) Y69BL
5m..... Z (Example) Y69BZ

Notes) • Solid state switches marked "○" are produced upon receipt of order.
• Retrofitting of an auto switch on a cylinder that is originally ordered without one requires a switch spacer per the next page.

Double Power Cylinder (without non-rotation mechanism) *Series MGZR*



Specifications

Bore size (mm)		20	25	32	40	50	63	80
Action		Double acting/Single rod						
Fluid		Air						
Proof pressure		1.5MPa						
Max. operating pressure		1.0MPa						
Min. operating pressure		Standard stroke: 0.08MPa						
		Long stroke: 0.12MPa						
Ambient and fluid temperature		Without auto switch: -10° to 70°C (with no freezing)						
		With auto switch: -10° to 60°C (with no freezing)						
Lubrication		Non-lube						
Piston speed	OUT	50 to 700mm/s						
	IN	50 to 350mm/s	50 to 450mm/s					
Stroke length tolerance		Up to 250 ^{+1.0} ₀ , 251 to 1000 ^{+1.4} ₀						
Cushion		Rubber bumper						
Screw tolerance		JIS class 2						
Mounting		Basic type, Transaxial foot type, Front flange type Rear flange type, Double clevis type						

Switch Spacer Model

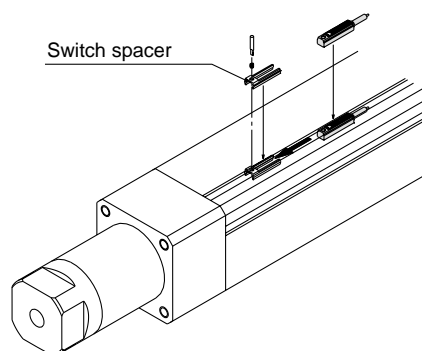
Applicable bore size (mm)	20, 25, 32	40, 50, 63, 80
Switch spacer model	BM Y3-016	BMP1-032

Mounting Bracket Part Nos.

Bore size (mm)	20	25	32	40
Foot	MGZ-L02	MGZ-L25	MGZ-L03	MGZ-L04
Flange	MGZ-F02	MGZ-F25	MGZ-F03	MGZ-F04
Double clevis ^{Note)}	MGZ-D02	MGZ-D25	MGZ-D03	MGZ-D04

Bore size (mm)	50	63	80
Foot	MGZ-L05	MGZ-L06	MGZ-L08
Flange	MGZ-F05	MGZ-F06	MGZ-F08
Double clevis ^{Note)}	MGZ-D05	MGZ-D06	MGZ-D08

Note) Double clevis bracket is provided with clevis pins and cotter pins.



Standard Strokes

Bore sizes (mm)	Standard strokes (mm)	Long strokes (mm)
20, 25	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500 600, 700, 800
32, 40, 50 63, 80	75, 100, 125, 150, 175 200, 250, 300	350, 400, 450, 500, 600 700, 800, 900, 1000

Intermediate strokes and strokes shorter than 75mm are also available.

Weights

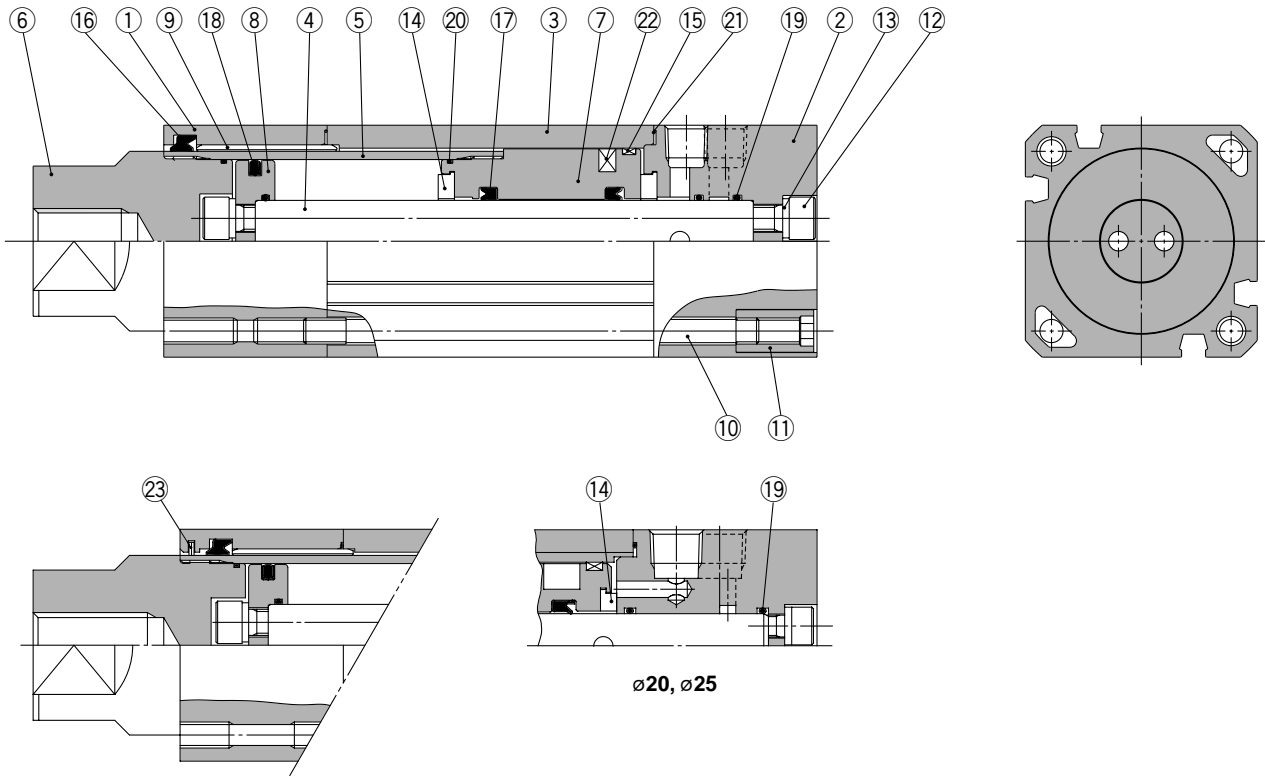
Bore size (mm)		20	25	32	40	50	63	80
Standard weight	Basic type	0.48	0.70	1.09	1.91	3.03	4.83	8.85
	Foot type	0.63	0.86	1.34	2.39	3.92	6.08	10.61
	Flange type	0.59	0.83	1.32	2.34	3.79	5.83	9.92
	Double clevis type	0.58	0.83	1.32	2.19	3.47	5.62	10.66
Weight per each 50mm of stroke	All mounting brackets	0.19	0.22	0.29	0.39	0.59	0.78	1.21

Theoretical Output

Model	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
MGZ20	20 × 25	10	OUT	726	145	218	290	363	436	508	581	653	726
			IN	236	47	71	94	118	141	165	189	212	236
MGZ25	25 × 30	12	OUT	1085	217	326	434	543	651	760	868	977	1085
			IN	378	76	113	151	189	227	265	302	340	378
MGZ32	36 × 32	16	OUT	1621	324	486	648	811	973	1135	1297	1459	1621
			IN	603	121	181	241	302	362	422	482	543	603
MGZ40	45 × 40	20	OUT	2533	507	760	1013	1267	1520	1773	2026	2280	2533
			IN	942	188	283	377	471	565	659	754	848	942
MGZ50	55 × 50	25	OUT	3848	770	1154	1539	1924	2309	2694	3078	3463	3848
			IN	1473	295	442	589	737	884	1031	1178	1326	1473
MGZ63	68 × 63	32	OUT	5945	1189	1784	2378	2973	3567	4162	4756	5351	5945
			IN	2313	463	694	925	1157	1388	1619	1850	2082	2313
MGZ80	87 × 80	40	OUT	9715	1943	2915	3886	4858	5829	6801	7772	8744	9715
			IN	3770	754	1131	1508	1885	2262	2639	3016	3393	3770

Series MGZ

Construction



Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Clear anodized
2	Head cover	Aluminum alloy	Clear anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Aluminum alloy	Hard anodized
5	Tube rod	Carbon steel	Hard chromium electroplated
6	Tube rod cover	Carbon steel	Electroless nickel plated
7	Piston	Aluminum alloy	Chromated
8	Stationary piston	Aluminum alloy	Chromated
9	Bushing	Lead bronze casting	
10	Tie rod	Carbon steel	Corrosion resistant chromated
11	Tie rod nut	Carbon steel	Nickel plated
12	Hexagon socket head screw	Chrome molybdenum steel	Nickel plated

No.	Description	Material	Note
13	Spring washer	Steel wire	Nickel plated
14	Bumper	Urethane rubber	
15	Wear ring	Resin	
16	Rod seal A	NBR	
17*	Rod seal B	NBR	
18	Piston seal	NBR	
19	Piston gasket	NBR	
20	Tube rod gasket	NBR	
21	Cylinder tube gasket	NBR	
22*	Magnet	Magnet	
23	Coil scraper	Metal	

Replacement parts: Seal kits

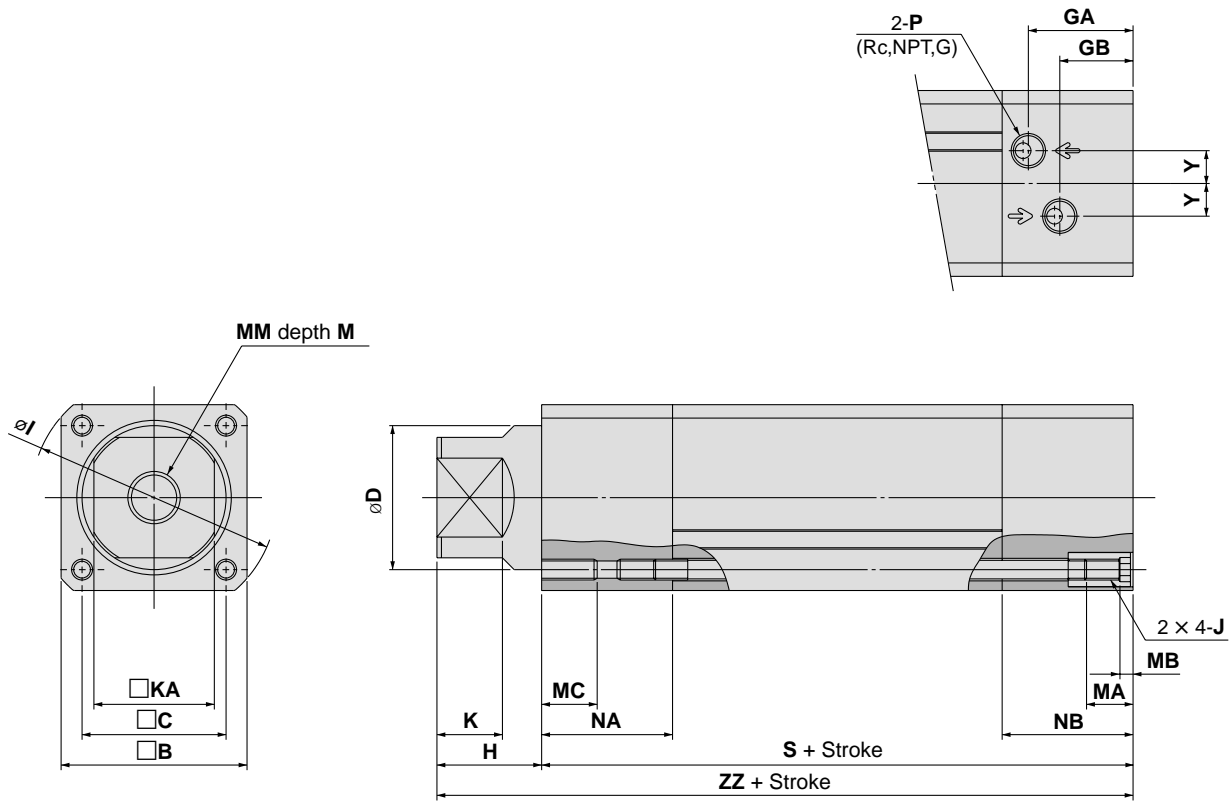
Bore size (mm)	Seal kit no.	Kit components
20	MGZ20-PS	Items 16 and 21 from the above chart
25	MGZ25-PS	
32	MGZ32-PS	
40	MGZ40-PS	
50	MGZ50-PS	
63	MGZ63-PS	
80	MGZ80-PS	

* Seal kits consist of items 16 and 21, and can be ordered by using the seal kit number corresponding to each bore size.

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Dimensions

Basic type



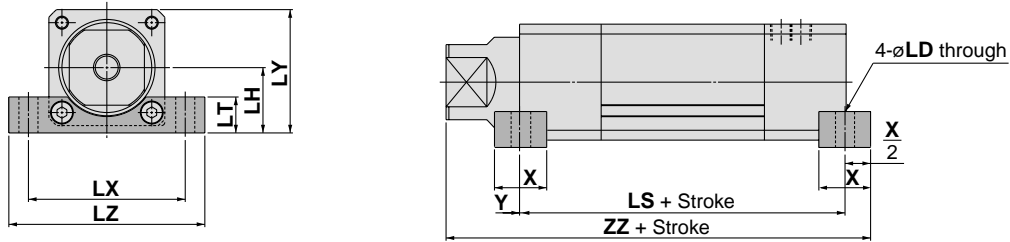
(mm)

Bore size (mm)	Stroke range	B	C	D	KA	GA	GB	H	I	J	K	M	MA	MB	MC	MM	NA	NB	P	S	Y	ZZ
20	to 800	39	29	25	21	16	12.5	20	51	M5 × 0.8	11	17	11	4	10	M8 × 1.25	19	21	M5 × 0.8	86	5	106
25	to 800	43	33	30	24	26	18	21	57	M5 × 0.8	12	17	11	4	10	M8 × 1.25	26	34	1/8	107	6.5	128
32	to 1000	49	38	36	30	28.5	19.5	35	66	M6 × 1	22	22	16	4	12	M10 × 1.5	37	1/8	120	8.5	155	
40	to 1000	59	46	45	36	34.5	23.5	40	78	M6 × 1	25	30	16	4	12	M16 × 2	44	1/4	138	9.5	178	
50	to 1000	71	55	55	46	40	28	45	92	M8 × 1.25	25	35	16	5	15	M20 × 2.5	50	1/4	150	12.5	195	
63	to 1000	82	66	68	53	46.5	34.5	50	110	M8 × 1.25	25	35	16	5	15	M20 × 2.5	56	1/4	171	15	221	
80	to 1000	106	86	87	65	54	36	50	144	M12 × 1.75	25	38	20	6	23	M22 × 2.5	66	3/8	198	20	248	

Series MGZ

Dimensions: With Mounting Bracket

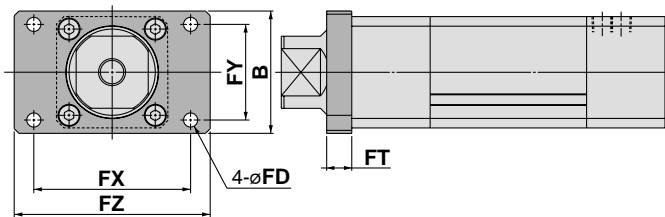
Transaxial foot: (L) type



(mm)

Bore size (mm)	Stroke range	X	Y	LD	LH	LT	LX	LY	LZ	LS	ZZ
20	to 800	16	0	6.6	22	13	58	41.5	72	86	114
25	to 800	16	0	6.6	24	14	62	45.5	75	107	136
32	to 1000	22	0	9	27.5	16	96	52	88	120	166
40	to 1000	24	0	9	34	19	110	63.5	100	138	190
50	to 1000	32	1	11	40	22	146	75.5	120	148	210
63	to 1000	36	3	13	47	24	110	88	140	165	236
80	to 1000	40	3	17	59	30	146	112	180	192	265

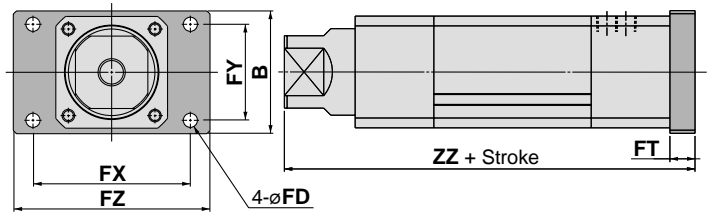
Front flange: (F) type



(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ
20	to 800	44	5.5	8	50	34	60
25	to 800	48	6.6	8	57	36	70
32	to 1000	60	9	12	64	46	78
40	to 1000	74	9	12	80	58	100
50	to 1000	78	9	16	100	61	125
63	to 1000	100	12	16	112	75	138
80	to 1000	120	14	16	132	95	155

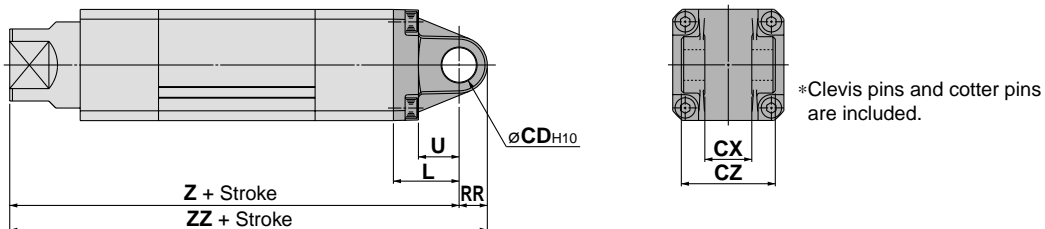
Rear flange: (G) type



(mm)

Bore size (mm)	Stroke range	B	FD	FT	FX	FY	FZ	ZZ
20	to 800	44	5.5	8	50	34	60	114
25	to 800	48	6.6	8	57	36	70	136
32	to 1000	60	9	12	64	46	78	167
40	to 1000	74	9	12	80	58	100	190
50	to 1000	78	9	16	100	61	125	211
63	to 1000	100	12	16	112	75	138	237
80	to 1000	120	14	16	132	95	155	264

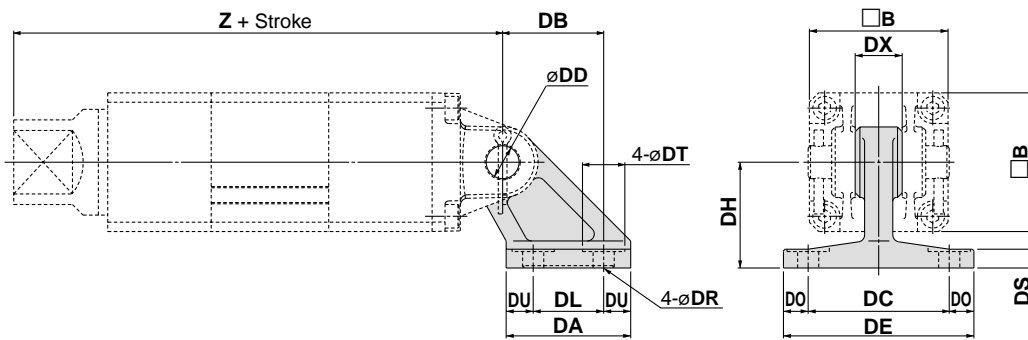
Double clevis: (D) type



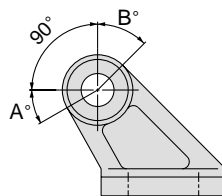
(mm)

Bore size (mm)	Stroke range	L	RR	U	CDH10	CX ^{+0.3} / _{+0.1}	CZ	Z	ZZ
20	to 250	23	8.5	14	10	14	28	129	137.5
25	to 350	23	11	14	10	14	28	151	162
32	to 600	30	12	17	14	20	40	185	197
40	to 600	30	15	17	14	20	40	208	223
50	to 700	42	18	26	22	30	60	237	255
63	to 900	42	23	26	22	30	60	263	286
80	to 900	50	28	30	25	32	64	298	326

Double Clevis Bracket



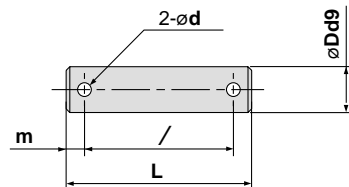
Model	Bore size (mm)	B	DA	DB	DC	DD _{H10}	DE	DH	DL	DO	DR	DS	DT	DU	DX	Z
MB-B03	20	39	42	32	44	10 ^{+0.058/0}	62	33	22	9	6.6	7	15	10	14	129
	25	43	42	32	44	10 ^{+0.058/0}	62	33	22	9	6.6	7	15	10	14	151
MB-B05	32	49	53	43	60	14 ^{+0.070/0}	81	45	30	10.5	9	8	18	11.5	20	185
	40	59	53	43	60	14 ^{+0.070/0}	81	45	30	10.5	9	8	18	11.5	20	208
MB-B08	50	71	73	64	86	22 ^{+0.084/0}	111	65	45	12.5	11	10	22	14	30	237
	63	82	73	64	86	22 ^{+0.084/0}	111	65	45	12.5	11	10	22	14	30	263
MB-B12	80	106	90	78	110	25 ^{+0.084/0}	136	75	60	13	13.5	14	24	15	32	298



Rotation

Bore size (mm)	A°	B°	A°+B°+90°
20	35	50	175
25	30	50	170
32, 40	30	50	170
50, 63	35	50	175

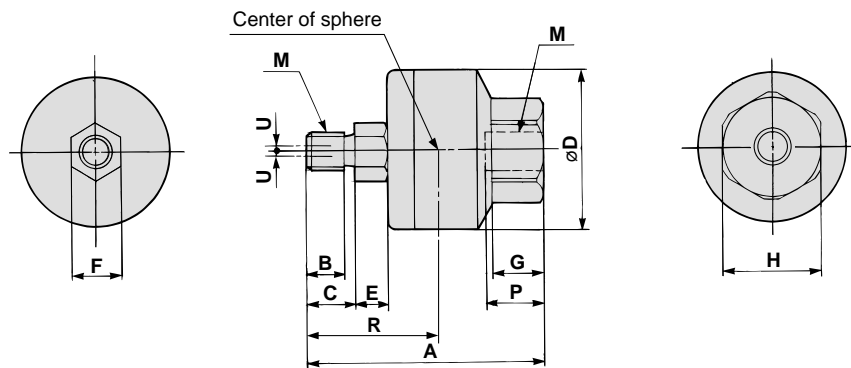
Clevis Pin



Model	Bore size (mm)	Dd9	L	l	m	d (drill through)	Cotter pin ^{Note)}
CD-M03	20, 25	10 ^{-0.040/-0.078}	44	36	4	3	ø3 × 18 /
CD-M05	32, 40	14 ^{-0.050/-0.093}	60	51	4.5	4	ø4 × 25 /
CD-M08	50, 63	22 ^{-0.065/-0.117}	82	72	5	4	ø4 × 35 /
CDP-7A	80	25 ^{-0.065/-0.117}	88	78	5	4	ø4 × 36 /

Note) When using cotter pins, flat washers are used together.

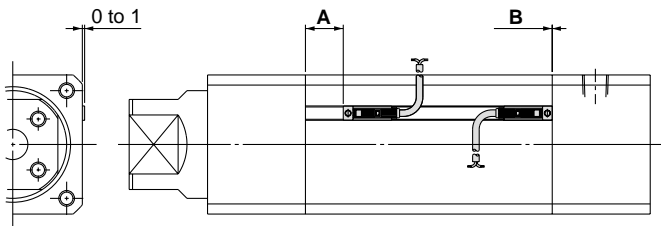
Floating Joint



Applicable bore size	Model	M		A	B	C	D	E	F	G	H	Center of sphere R	Max. screw-in depth P	Allowable eccentricity U	Max. operating tension and compression N		Weight (kg)
		Nominal size	Pitch												Compression	Tension	
20, 25	JB40-8-125	8	1.25	51	8.5	11	31	6	11	11	22	29	13	0.75	6000	1300	0.15
32	JB63-10-150	10	1.5	62.5	10	13	41	7.5	14	13.5	27	35.5	15	1	11000	3100	0.29
40	JB80-16-200	16	2	80.5	16	20	50	9.5	19	16	32	47.5	18	1.25	18000	5000	0.56
50, 63	JB100-20-250	20	2.5	101	21	26	59.5	11.5	24	20	41	59	24	2	28000	7900	1.04
80	JB140-22-250	22	2.5	129	18	22	79	14	30	22	46	71.5	38	2.5	54000	15300	2.6

Series MGZ/MGZR

Proper Mounting Position for Stroke End Detection



Bore size (mm)	D-A9□, A9□V		D-F9N□, F9P□, F9B□ D-F9NW□, F9PW□, F9BW□		D-F9BAL	
	A	B	A	B	A	B
20	24	3	28	7	27	6
25	24	3	28	7	27	6
32	22	4	26	8	25	7

Bore size (mm)	D-Z7□, Z80 D-Y59□, Y69□, Y7P, Y7PV D-Y7□W, Y7□WV D-Y7BAL	
	A	B
40	23	0
50	23	0
63	32	0
80	37	4

Operating range

Auto switch model	Bore size (mm)		
	20	25	32
D-A9□, A9□V	8	9.5	8
D-F9N□, F9P□, F9B□ D-F9NW□, F9PW□, F9BW□	5	5	4.5
D-F9BAL	5	6	5

Auto switch model	Bore size (mm)			
	40	50	63	80
D-Z7□, Z80	10	10	11	13
D-Y59□, Y69□, Y7P, Y7PV D-Y7□W, Y7□WV	6	5	6	8
D-Y7BAL	5.5	5.5	6	7

*Hysteresis specifications are given as a guide, it is not a guaranteed range. (Tolerance $\pm 30\%$)
Hysteresis may fluctuate due to the operating environment.

Minimum Strokes for Mounting

Auto switch type	Model	No. of auto switches	Bore size (mm)	
			20, 25, 32	
Reed switch	D-A9□, A9□V	2 pcs. (same side)	50	
		1 or 2 pcs. (different sides)	15	
Solid state switch	D-F9N□, F9P□, F9B□	2 pcs. (same side)	55	
		1 or 2 pcs. (different sides)	15	
	D-F9NW□, F9PW□, F9BW□	2 pcs. (same side)	55	
		1 or 2 pcs. (different sides)	15	
	D-F9BAL	2 pcs. (same side)	70	
		1 or 2 pcs. (different sides)	25	

Auto switch type	Model	No. of auto switches	Bore size (mm)				
			32	40	50	63	80
Reed switch	D-Z7□, Z80	2 pcs. (same side)	60				
		1 or 2 pcs. (different sides)	20				
Solid state switch	D-Y59□, Y69□, Y7P, Y7PV	2 pcs. (same side)	60				
		1 or 2 pcs. (different sides)	20				
	D-Y7□W, Y7□WV	2 pcs. (same side)	70				
		1 or 2 pcs. (different sides)	25				
	D-Y7BAL	2 pcs. (same side)	70				
		1 or 2 pcs. (different sides)	25				

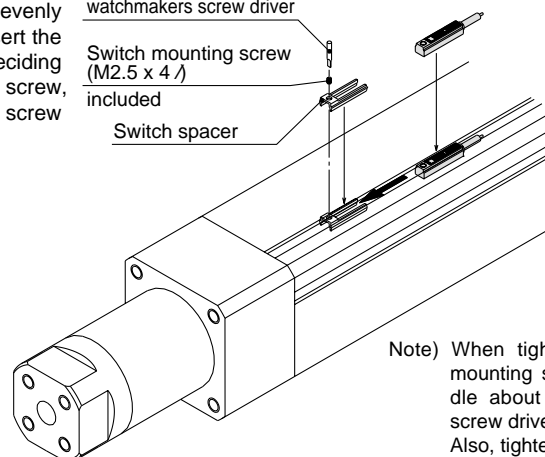
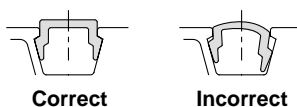
Mounting

When mounting an auto switch, first hold the switch spacer with your fingers and push it into the groove. Confirm that it is aligned evenly within the groove and adjust the position if necessary. Then, insert the auto switch into the groove and slide it into the spacer. After deciding on the mounting position within the groove, slip in the mounting screw, which is included, and tighten it, using a flathead watchmakers screw driver.

Flat head watchmakers screw driver

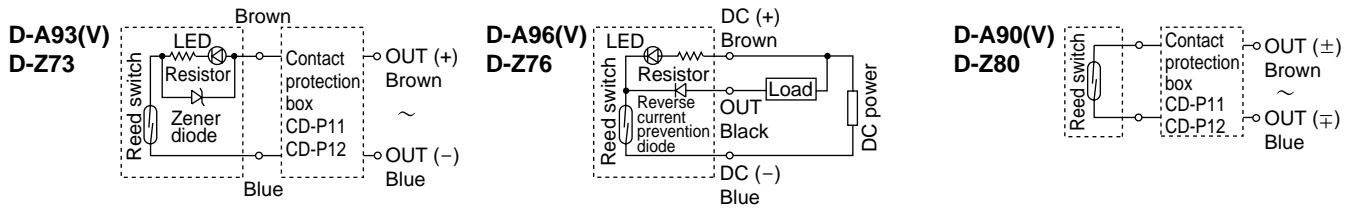
Switch mounting screw (M2.5 x 4) included

Switch spacer

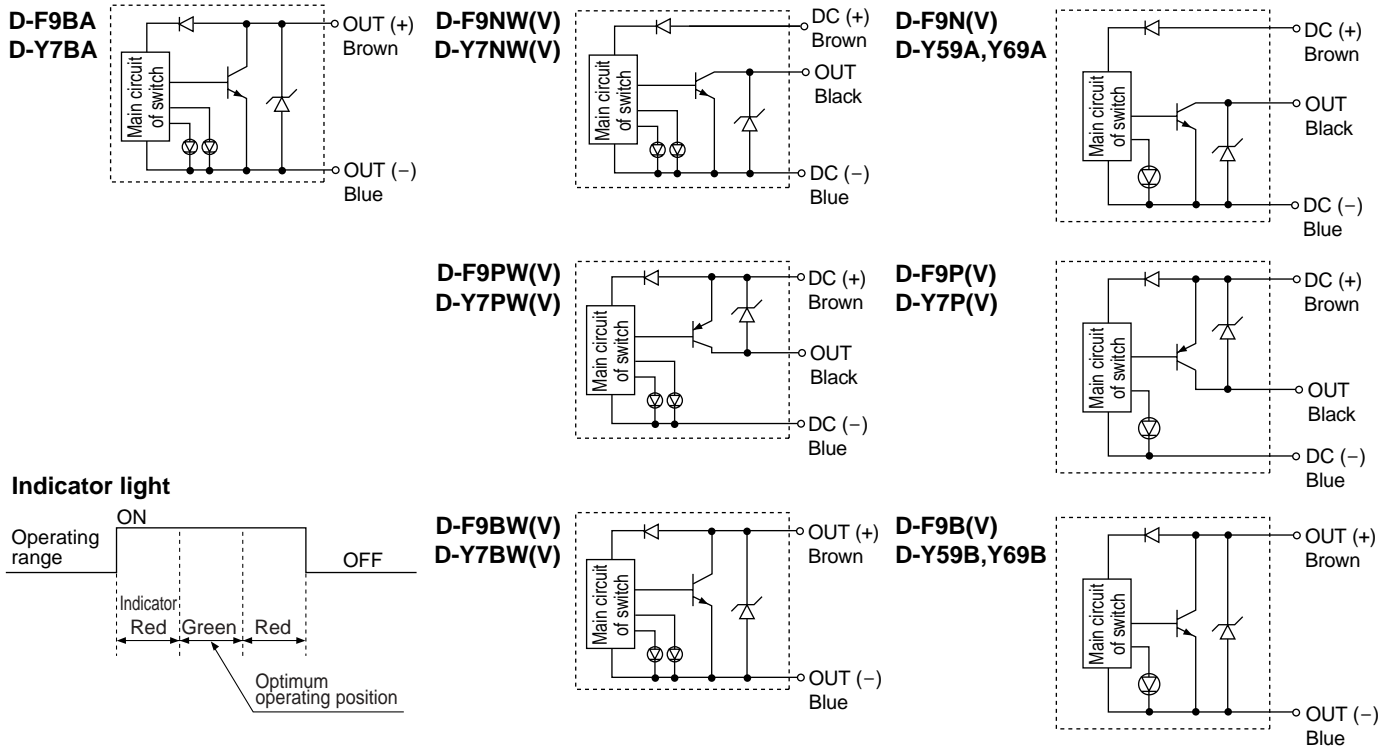


Note) When tightening the auto switch mounting screw, use a with a handle about 5 to 6mm in diameter screw driver watchmakers. Also, tighten with a torque of 0.05 to 0.1N·m. As a guide, turn about 90° past the point at which tightening can be felt.

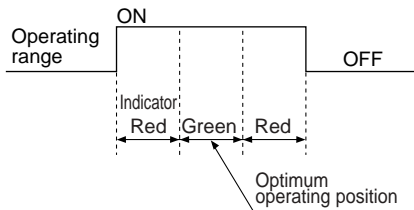
Reed Switch Internal Circuit



Solid State Switch Internal Circuit



Indicator light



Contact Protection Boxes: CD-P11, CD-P12

<Applicable auto switches>

D-Z7, Z8

The above auto switches do not have internal contact protection circuits.

1. The operating load is an induction load.
2. The length of wiring to the load is 5m or more.
3. The load voltage is 100.

Use a contact protection box in any of the above situations.

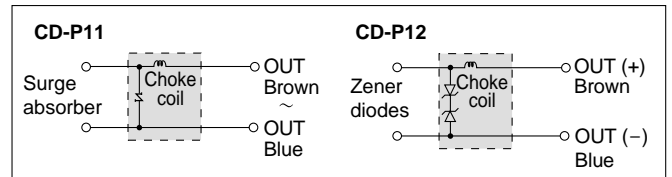
Specifications

Part no.	CD-P11		CD-P12
Load voltage	100V AC or less	200V AC	24V DC
Max. load current	25mA	12.5mA	50mA

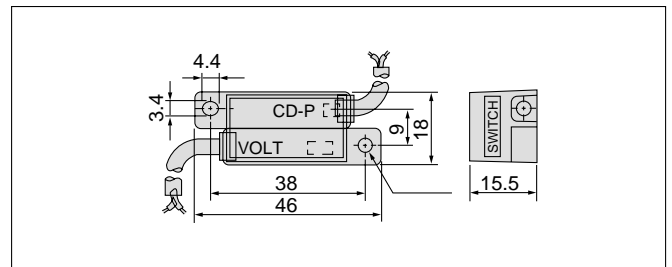
*Lead wire length — Switch contacts side 0.5m
Load connection side 0.5m



Internal circuit



Dimensions



Connection

To connect a switch 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. Furthermore, the switch unit should be kept as close as possible to the contact protection box, with a lead wire length of no more than 1 meter between them.

Solid-state Auto Switches for Direct Mounting Series D-M9N(V)/D-M9P(V)/D-M9B(V)



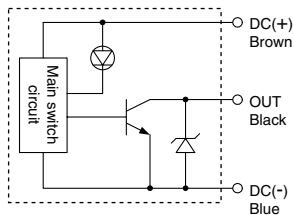
Grommet

- Reduced load currents for two-wire model (2.5 to 40 mA)
- Compliance with lead-free requirements
- Use of UL-approved lead wires (style 2844)

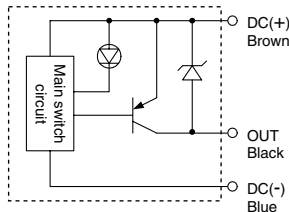


Internal circuits

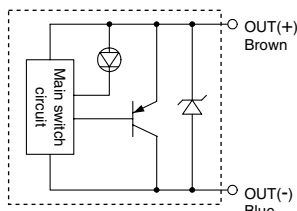
D-M9N/M9NV



D-M9P/M9PV



D-M9B/M9BV



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□/D-M9□V (with Indicator light)						
Model number	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	Three-wire			Two-wire		
Output	NPN		PNP		—	
Applicable load	Integrated circuit, relay and PLC				24 V DC relay and PLC	
Power voltage	5, 12, or 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
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 μA max. at 24 V DC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wire: oil-proof heavy-duty vinyl cable
2.7 x 3.2 with elliptic cross-section, 0.15 mm², two cores (D-M9B),
or three cores (D-M9N and D-M9P)

Solid state switch specifications

Leakage current	3-wire: 100 μA or less; 2-wire: 0.8 mA max.
Operating time	1 ms or less
Impact resistance	1000 m/s ²
Insulation resistance	50 MΩ or more at 500 V DC (between lead wire and case)
Withstand voltage	1000 V AC for 1 min. (between lead wire and case)
Ambient temperature	-10°C to 60°C
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction

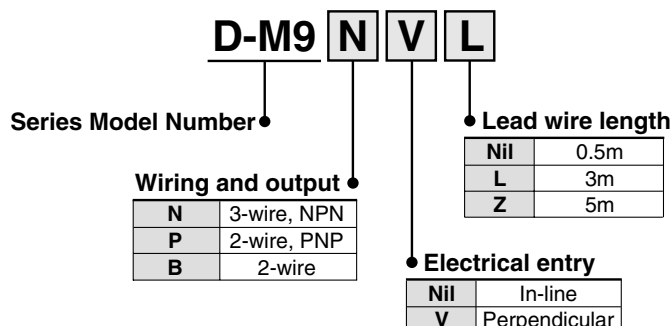
Weight

Unit: g

Model	D-M9N(V)	D-M9P(V)	D-M9B(V)	
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

How to Order

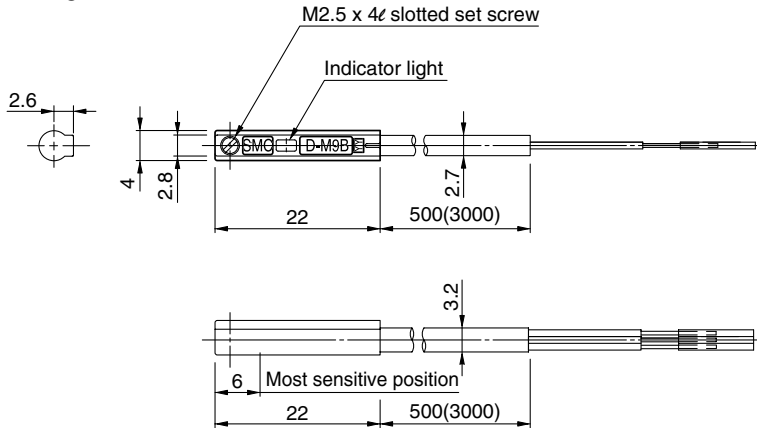
Standard Model Number



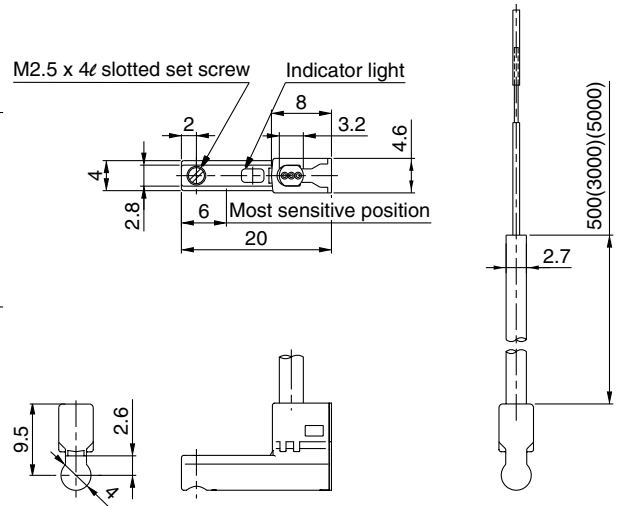
Series D-M9

Auto Switch Dimensions

D-M9□



D-M9□V



⚠ Specific Product Precautions

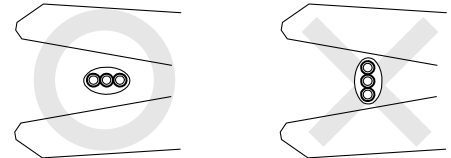
Be sure to read before handling. Contact SMC when the required specification is out of range.

Handling

⚠ Caution

Observe the following precautions when handling the product.

- The D-M9 series of auto switches is not overcurrent-protected. Faulty wiring or short circuit may result in breakage or burning-out of the switch.
- When stripping the cable clad, be careful about the orientation of the cable being stripped. The insulator may be accidentally torn or damaged depending on the orientation, as shown on the right.



- We recommend the following tools

Manufacturer	Product name	Product number
VESSEL	Wire stripper	No 3000G
Tokyo Ideal	Strip master	45-089

* The stripper for the round shape cords (ø2.0) is for a 2-wire style.

- Please do not attach the switch with any other screws than those already attached to the auto switch body.

The operation range is shorter than that of the conventional models.

If the auto switch replaces the conventional model, it may not function depending on its application because the operation range is shorter. Refer to the examples below.

- In an application where at the end, the stopping position shifting range is larger than the operation range. For example, pushing a work against something, or pressing a work into a hole, or clamping a work.
- In an application where the auto switch is used to detect an intermediate stopping position. (Detecting time is shortened.)

Note) Please contact SMC for the operation range details for each actuator.

The switch is damaged instantly when a load is shortened since short circuit protection is not built-in. Pay special attention to avoid reversing the connection of the brown lead of the power supply line and the black output line connection.