

Before Operation

Auto Switches Common Specifications

⚠ Precautions

Refer to "Auto Switches Precautions" on pages 6-16-4 to 6-16-6 before handling.

Auto Switches Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 μ A or less, 2-wire: 0.8 mA or less ⁽⁴⁾
Operating time	1.2 ms	1 ms or less ⁽³⁾
Impact resistance	300 m/s ²	1000 m/s ²
Insulation resistance	50 M Ω or more at 500 M VDC (Between lead wire and case)	
Withstand voltage	1500 VAC for 1 minute ⁽¹⁾ (Between lead wire and case)	1000 VAC for 1 minute (Between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC529 Standard IP67, Immersible construction (JIS C 0920) ⁽²⁾	

Note 1) Electrical entry: Connector type (A73C/A80C/C73C/C80C) and D-9/9□A/A9/A9□V type: 1000 VAC/min. (Between lead wire and the case)

Note 2) The following switches, Terminal conduit type (D-A3/A3□A/A3□C/G39/G39A/G39C/K39/K39A/K39C), DIN terminal type (D-A44/A44A/A44C) and Heat resistant auto switch (D-F7NJL) meet the IEC529 standard.

Note 3) IP63, JIS C 0920 Rainproof construction
Except solid state switch with timer (D-M5□TL, G5NTL/F7NTL/F5NTL) and magnetic resistant 2-color indication type solid state switch (D-P5DWL). D-J51: 5 ms or less

Note 4) Except D-J51 (1 mA or less at 100 VAC, 1.5 mA or less at 200 VAC), D-M5NW/M5PW/M5BW, D-F9BAL, D-P5DWL (1 mA or less at 24 VDC).

Lead Wire Length

Lead wire length indication

(Example) **D-A73 L**

Lead wire length

Nil	0.5 m	Z	5 m
L	3 m	N*	None

* Applicable for the connector type (D-□□C) only.

(Example) **D-F8PL-61**

Flexible lead wire specifications

(D-Y59, D-Y69, D-Y7 and D-M9□/M9□V series use flexible lead wire as standard.)

Part No. of Lead Wires with Connectors

(Applicable only for connector type)

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

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

Reed switch: D-B53/B54, D-C73(C)/C80C, D-A73(C)(H)/A80C, D-A53/A54, D-Z73, D-90/97/90A/93A

Solid state switch: Manufactured upon receipt of order as standard.

Note 2) The standard lead wire length of solid state switches with timer, water resistant 2-color indication type or heat resistant 2-color indication type is 3 meters in length. (0.5 m is not available.)

Note 3) Lead wire lengths of 3 m and 5 m are standard for magnetic field resistant 2-color indicator type solid state switches. (0.5 m is not available.)

Note 4) Add "-61" at th end of the part number for the flexible lead wire except D-Y59, D-Y69, D-Y7 and D-M9□/M9□V type auto switches.

Contact Protection Box: CD-P11, CD-P12

1

<Applicable switch types>

D-A7/A8, D-A7□H/A80H, D-A73C/A80C, D-C7/C8, D-C73C/C080C, D-E7□A/E80A, D-Z7/Z8, D-9/9□A, D-A9/A9□V, and D-A79W type

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

1. Operating load is an inductive load.
2. The length of wiring to the load is 5 m or more.
3. The load voltage is 100 or 200 VAC.

A contact protection box should be used in any of the above conditions. Unless using a contact protection box, the contact life may be shortened. (Due to permanent energizing conditions.)

D-A72(H) must be used with the contact protection box regardless of load styles and lead wire length.

2

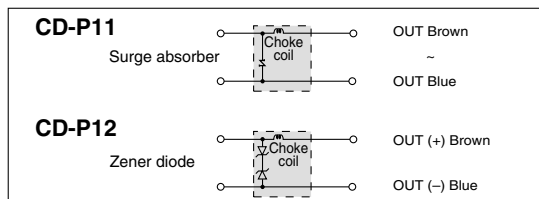
Please contact SMC when using built-in contact protection circuit style (D-A34[A][C], D-A44[A][C], D-A54/A64, D-B54/B64, D-A59W, D-B59W) in the following conditions: 1. The wiring length to load is more than 30 m; 2. When using PLC with large flow current.

Contact Protection Box Specifications

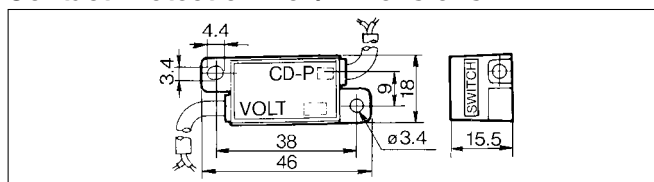
Part no.	CD-P11		CD-P12
Load voltage	100 VAC or less	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

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

Contact Protection Box Internal Circuit



Contact Protection Box/Dimensions

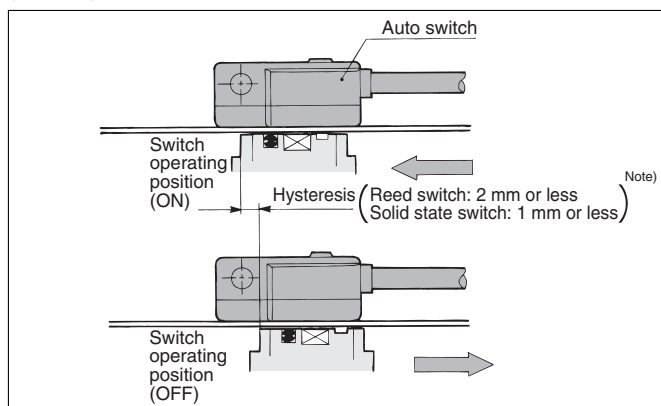


Contact Protection Box Connection

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 Hysteresis

Hysteresis is the distance between the position at which piston movement operates an auto switch to the position at which reverse movement turns the switch off. This hysteresis is included in part of the operating range (one side).



Note) Hysteresis may fluctuate due to the operating environment. Please contact SMC if hysteresis causes an operational problem.

Solid State Switch Direct Mounting Style D-M9N(V)/D-M9P(V)/D-M9B(V)

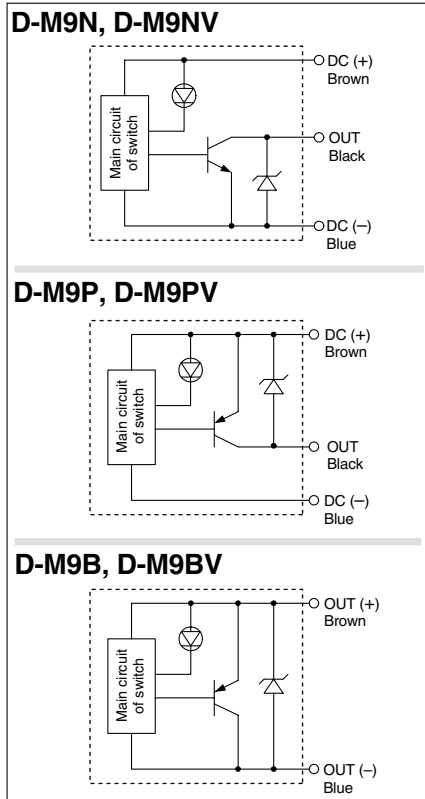
CE For details about certified products conforming to international standards, visit us at www.smcworld.com.

Grommet

- Lower load current
- Lead free solder
- Using UL certified (style 2844) lead wire



Auto Switch Internal Circuit



Operating range shortened, compared to conventional types.

When replacing conventional types, dependant upon application, the shortened operating range may cause auto switch imperceptible.

- When the range of stroke is wider than the operating range. Example) Stamping, press-fitting, clamping, etc.
- When used to detect intermediate position. (Detection output time is shortened.)

Note) Please consult with SMC regarding details of operation range by each actuator.

Since short circuit protection circuit is not built-in, the auto switch will be immediately damaged when the load is short-circuited. Be careful not to exchange the power cable (brown) with the output cable (black).

Auto Switch Specifications

PLC: Abbreviation of Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)						
Auto switch model	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
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 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wire — Oil resistant vinyl heavy-duty cord, $\phi 2.7 \times 3.2$ ellipse 0.15 mm², 2 cores (D-M9B), 3 cores (D-M9N, D-M9P)

Note 1) Regarding the common specifications of the solid state switches, refer to page 8-30-7.

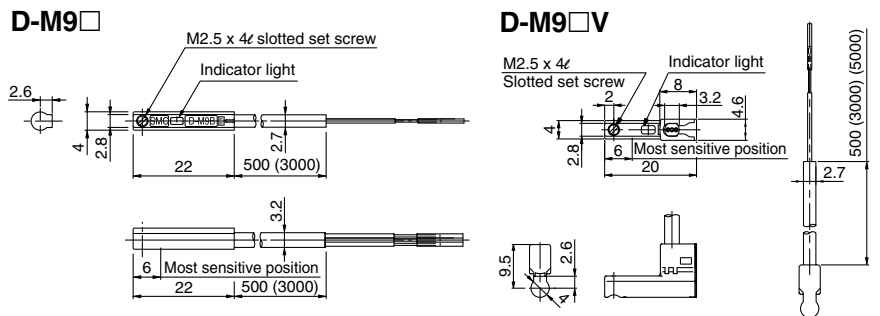
Note 2) Regarding the lead wire length, refer to page 8-30-7.

Weight

(g)

Auto switch model	D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8
	3	41	41
	5	68	68

Dimensions



⚠ Precautions

Be sure to read before handling. Please contact SMC when using beyond specifications.

Caution on Handling

⚠ Caution

- Over-current protection is not equipped with this product series. When it is wired incorrectly or a load is short-circuited, a switch may be damaged or burned.
- In the event of stripping cable sheath, use caution for the stripping direction. Its insulation may be torn or damaged, depending on the direction.
- Below is given as the recommended tool.

Maker	Product's name	Part no.
VESSEL Co., Inc.	Wirestripper	No 3000G
Tokyo Ideal Co., Ltd.	Stripmaster	45-089

* As for 2-wire, a stripper for round shape cord ($\phi 2.0$) is usable.

- Fix the switch with appropriate screw installed on the switch body. If using other screws, switch may be damaged.



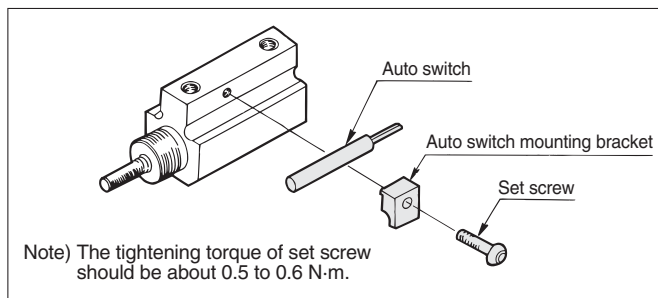
Technical Data 2: How to Mount and Move the Auto Switch

Mounting Bracket Tie-rod Mounting Style

<Applicable auto switch>

Reed switch.....D-90/97, D-90A/93A

How to Mount and Move the Auto Switch



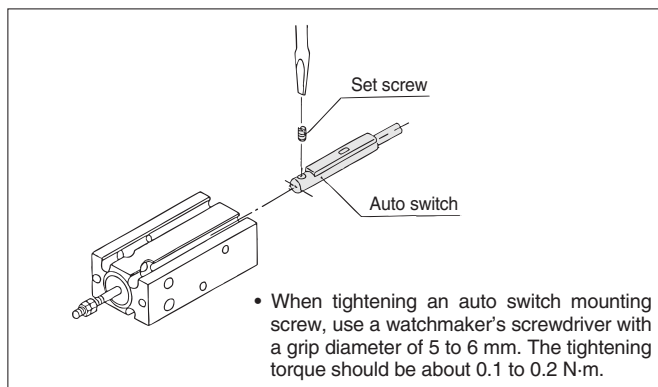
Auto Switch Mounting Bracket Part No. (Including bracket, screw)

Cylinder series	Applicable bore size (mm)		
	6	10	15
CDJP-□D	BP-1	BP-1	BP-1

<Applicable auto switch>

Reed switch.....D-A90(V)/A93(V)/A96(V)
Solid state switch.....D-M9N(V)/M9P(V)/M9B(V)
F9NW(V)/F59W/F9BW(V)
F9BAL

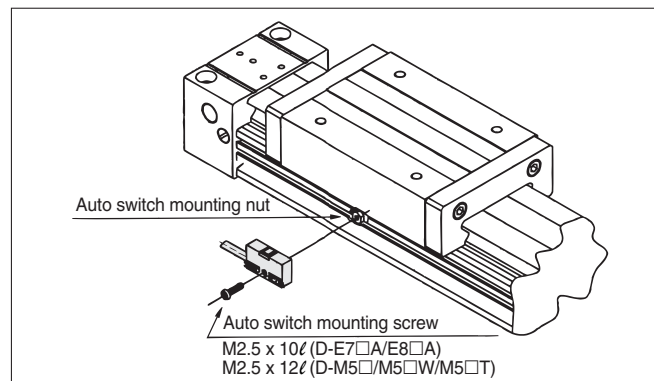
How to Mount and Move the Auto Switch



<Applicable auto switch>

Reed switch.....D-E73A/E76A/E80A
Solid state switch.....D-M5N/M5P/M5B
D-M5NW/M5PW/M5BW
D-M5NTL/M5PTL

How to Mount and Move the Auto Switch



1. Insert the auto switch mounting nut into the auto switch mounting groove and then set the switch at the mounting position by sliding.
2. Put the convex part of auto switch into the mounting groove and slide it over the nut.
3. Push the auto switch mounting screw lightly into the mounting nut through the mounting hole.
4. After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M2.5 screw should be 0.1 to 0.2 N·m.)

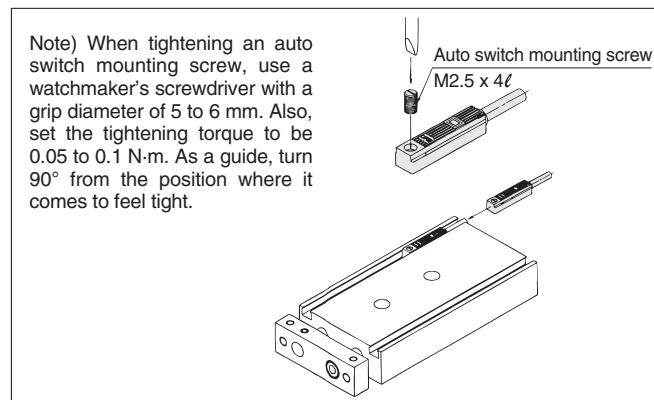
Auto Switch Mounting Bracket Part No. (Including nut, screw)

Cylinder series	Applicable bore size (mm)			
		25	32	40
ML1	M2.5 x 12ℓ	BM2-025	BM2-025	BM2-025
	M2.5 x 10ℓ	BM1-025	BM1-025	BM1-025

<Applicable auto switch>

Reed switch.....D-Z73/Z76/Z80
Solid state switch.....D-Y59^A/_B/Y69^A/_B, D-Y7P(V)
D-Y7NW(V)/Y7PW(V)/Y7BW(V)
D-Y7BAL

How to Mount and Move the Auto Switch



1. Insert the auto switch into the mounting groove and set it at the auto switch mounting position.
2. After reconfirming the detecting position, tighten the mounting screw to secure the auto switch.
3. Modification of the detecting position should be made in the condition of 1.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data