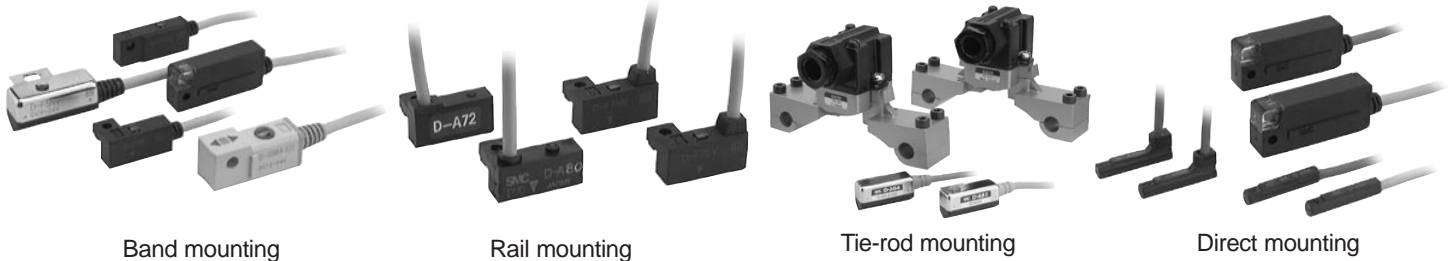


SMC Auto Switch Variations

Function	Style	Mounting method	Electrical entry	Auto switch model No.	Page
General purpose auto switch	Reed switch	Band	Grommet	D-C73/C76/C80	5.3-9
			Grommet	D-B53/B54/B64	5.3-10
			Connector	D-C73C/C80C	5.3-11
			Terminal conduit	D-A33/A34	5.3-12
			Terminal conduit	D-A33A/A34A	5.3-13
			DIN terminal	D-A44	5.3-12
			DIN terminal	D-A44A	5.3-13
			DIN terminal	D-A44C	5.3-13
		Rail	Grommet	D-A72/A73/A80	5.3-14
			Grommet	D-A72H/A73H/A76H/A80H	5.3-15
			Connector	D-A73C/A80C	5.3-16
			Connector	D-A73C/A80C	5.3-16
		Tie-rod	Grommet	D-A53/A54/A56/A64/A67	5.3-17
			Terminal conduit	D-A33C/A34C	5.3-18
			DIN terminal	D-A44C	
		Direct	Grommet	D-A90/A93/A96	5.3-19
				D-A90V/A93V/A96V	5.3-20
				D-90/97	5.3-21
				D-90A/93A	5.3-22
				D-Z73/Z76/Z80	5.3-23
	D-E73A/E76A/E80A			5.3-24	
	D-E73A/E76A/E80A			5.3-24	
	D-E73A/E76A/E80A			5.3-24	
	Solid state switch	Band	Grommet	D-H7A1/H7A2/H7B	5.3-29
			Grommet	D-G59/G5P/K59	5.3-30
			Connector	D-H7C	5.3-31
			Terminal conduit	D-G39/K39	5.3-32
			Terminal conduit	D-G39A/K39A	5.3-33
			Terminal conduit	D-G39C/K39C	5.3-38
		Rail	Grommet	D-F79/F7P/J79	5.3-34
			Grommet	D-F79V/F7PV/F7BV	5.3-35
			Connector	D-J79C	5.3-36
			Connector	D-J79C	5.3-36
		Tie-rod	Grommet	D-F59/F5P/J59/J51	5.3-37
			Terminal conduit	D-G39C/K39C	5.3-38
		Direct	Grommet	D-F9N/F9P/F9B	5.3-39
				D-F9NV/F9PV/F9BV	
				D-Y59A/Y7P/Y59B	5.3-40
				D-Y69A/Y7PV/Y69B	
				D-M5N/M5P/M5B	5.3-41

General purpose auto switch



SMC Auto Switch Variations

Function	Style	Mounting method	Electrical entry	Auto switch model No.	Page
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The suitable operating point can be indicated with green light. (Red→Green←Red)

2 color indication style	Reed switch	Band	Grommet	D-B59W	5.3-25
		Rail	Grommet	D-A79W	5.3-26
		Tie-rod	Grommet	D-A59W	5.3-27
	Solid state switch	Band	Grommet	D-H7NW/H7PW/H7BW	5.3-42
				D-G59W/G5PW/K59W	5.3-43
				D-F79W/F7PW/J79W	5.3-44
		Rail	Grommet	D-F7NWW/F7BWW	5.3-45
				D-F59W/F5PW/J59W	5.3-46
				D-M5NW/M5PW/M5BW	5.3-47
		Tie-rod	Grommet	D-Y7NW/Y7PW/Y7BW	5.3-48
				D-Y7NWW/Y7PWW/Y7BWW	5.3-48
		Direct	Grommet	D-F9NW/F9PW/F9BW	5.3-66
				D-F9NWW/F9PWW/F9BWW	5.3-66

The output signal can be detected in an unsteady detecting area.

2 color indication style with diagnostic output	Solid state switch	Band	Grommet	D-H7LF (Latching style)	5.3-49
				D-H7NF	5.3-50
				D-G59F	5.3-51
		Rail	Grommet	D-F7LF (Latching style)	5.3-52
				D-F79F	5.3-53
				D-F5LF (Latching style)	5.3-65
		Tie-rod	Grommet	D-F59F	5.3-54

Water (coolant) resistant performance

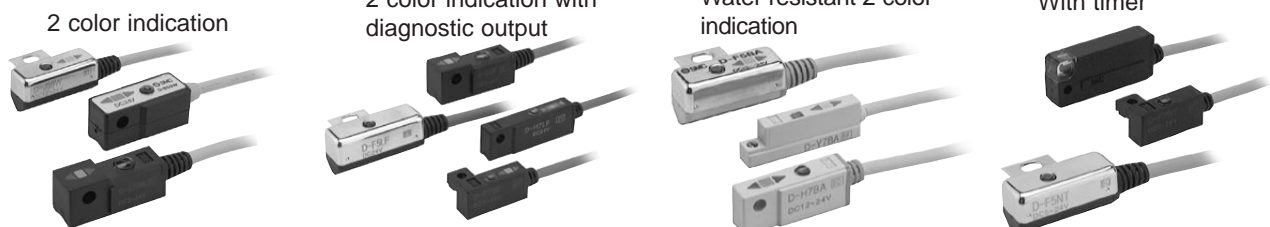
Water resistant 2 color indication	Solid state switch	Band	Grommet	D-H7BAL	5.3-55
				D-G5BAL	5.3-56
		Rail	Grommet	D-F7BAL	5.3-57
				D-F5BAL	5.3-58
		Tie-rod	Grommet	D-Y7BAL	5.3-63
				D-F9BAL	5.3-67
Direct	Grommet				

With built-in OFF-delay timer (200ms)

With timer	Solid state switch	Band	Grommet	D-G5NNTL	5.3-59
		Rail	Grommet	D-F7NNTL	5.3-60
		Tie-rod	Grommet	D-F5NNTL	5.3-61
		Direct	Grommet	D-M5NNTL/M5PTL	5.3-62

Possible to use in an environment where disturbance magnetic fields are generated.

Strong magnetic field resistant	Solid state switch	Rail	Grommet	D-P5DWL	5.3-64
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Technical Data

Prior to Use Auto Switch Specifications

⚠ Precautions

Refer to "Auto Switch Precautions" in p.0-44 to 0-46 before handling.

Auto Switch Common Specifications

Auto switch style	Reed switch	Solid state switch
Current leakage	None	3 wire: 100 μ A or less, 2 wire: 1mA or less
Operating time	1.2ms	1ms or less ⁽³⁾
Shock resistance	300m/s ²	1000m/s ²
Insulation resistance	50 M Ω or more at 500MV DC (between lead wire and the case)	
Withstand voltage	1500V AC/min. (between lead wire and the case) ⁽¹⁾	1000V AC/min. (between lead wire and the case)
Ambient temperature	-10 to 60°C	
Protective construction	IEC529 Standard IP67, Waterproof construction (JISC0920) ⁽²⁾	

Note 1) Connector style (D-A73C/A80C/C73C/C80C) and D-9/9□A/A9/A9□V style: 1000V AC/min. (between lead wire and the case)

Note 2) IEC529 Standard IP63, Rainproof construction (JISC0920) for Terminal conduit style (D-A3/A3□A/A3□C/G39/G39A/G39C/K39/K39A/K39C) and DIN terminal style (D-A44/A44A/A44C).

Note 3) Except solid state switch with timer (D-M5□TL, G5NTL, F7NTL, F5NTL) and **Auto switch for strong magnetic field resistance (D-P5DWL)**.
D-J51: 5ms or less

Lead Wire Length

How to Order Ex.)

D-A73 **L**

•Lead wire length

—	0.5m
L	3m
Z	5m
N*	None

* Applicable for the connector style (D- ** C) only

Note 1) Applicable auto switch with 5 meter 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
(Except D-F9/F9□V)

Note 2) The standard lead wire length of solid state switch with timer or with water resistant 2 color indication is 3 meters. (Not available 0.5m)

Note 3) The standard lead wire length of strong magnetic field resistant solid state switch is 3 or 5 meters. (Not available 0.5m.)

Part No. of lead wire with connector

(Available for connector style only.)

Part No.	Lead wire length
D-LC05	0.5m
D-LC30	3m
D-LC50	5m

Change of Lead Wire Color

Lead wire colors of SMC auto switches have been changed in order to meet Nippon Electric Control Equipment Industries Association Standard No. 402.

2 wire auto switch

	Old	New
Output (+)	Red	Brown
Output (-)	Black	Blue

Solid state auto switch with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

3 wire auto switch

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

Solid state auto switch with latching style diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latching style diagnostic output	Yellow	Orange

Prior to Use

Auto Switch Hysteresis/Contact Protection Box

Contact Protection Box/CD-P11, CD-P12

①

The following auto switches are not incorporated with the contact protection box.

D-A7/A8, D-A7□H/A80H, D-A73C, A80C, D-C7/C8, D-C73C/C80C, D-E7□A, E80A, D-Z7/Z8, D-9/9□A, D-A9/A9□V, and D-A79W type

Use an auto switch with a contact protection box in any case listed below. 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.

- ① Operating load is an inductive load.
- ② The wiring length to load is more than 5m.
- ③ The load voltage is 100 or 200 V AC.

②

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 30m.
- ② When using PLC with large flow current

Contact Protection Box/Specifications

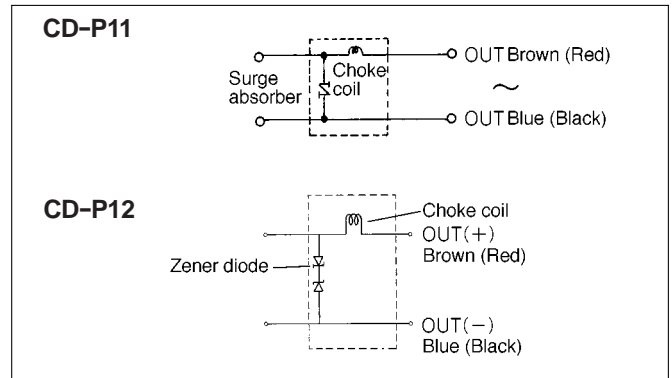
Part No.	CD-P11		CD-P12
Load voltage	100V AC max.	200V AC	24V DC
Max. load current	25mA	12.5mA	50mA

Lead wire length - Switch connecting side 0.5m
Load connecting side 0.5m

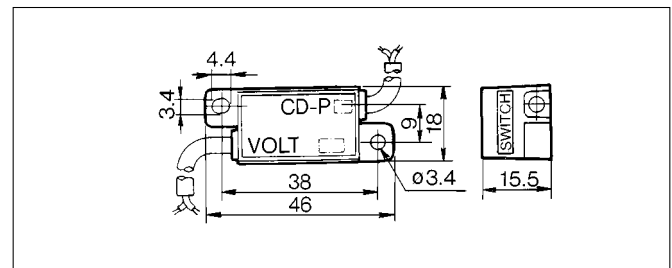


Contact Protection Box/Internal Circuit

(): If applicable for IEC Standard

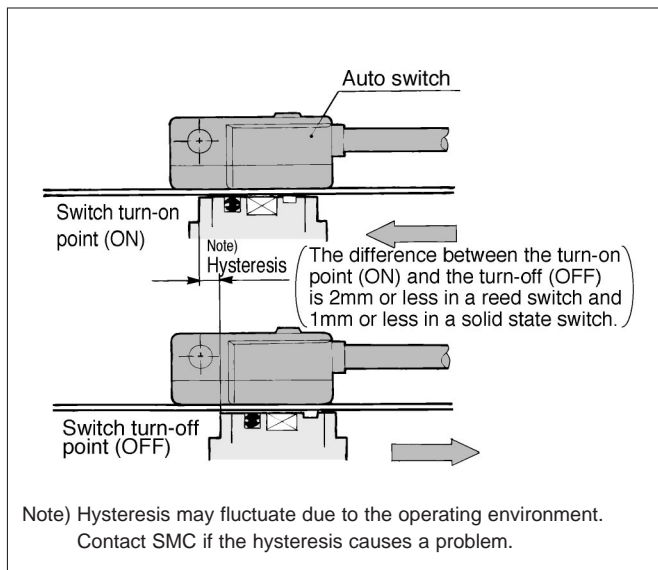


Contact Protection Box/Dimensions



Auto Switch Hysteresis

The distance between the turn-on point (ON) of the switch by moving the piston to the turn-off point (OFF) is called "Hysteresis". This hysteresis is included as part of the operating range (one side).



Contact Protection Box/Connection Method

For connection of the switch body and the contact protection box, connect the lead wire in the side indicated as "SWITCH" on the contact protection box to the lead wire from the switch body. The length of lead wire between the switch body and the contact protection box should be within 1m and they should be set as close together as possible.

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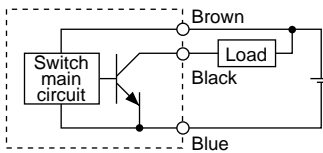
Technical Data

Prior to Use

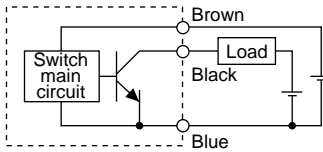
Auto Switch Connection Method/Connection Example

Basic Wiring

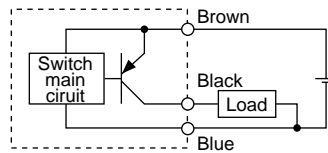
• Solid state switch 3 wire NPN



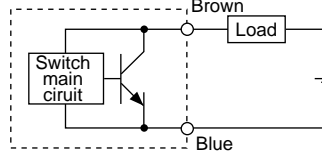
(When power source for switch and load is not common.)



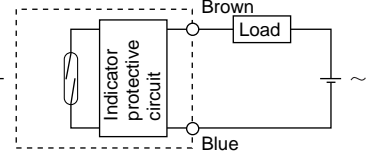
3 wire PNP



2 wire

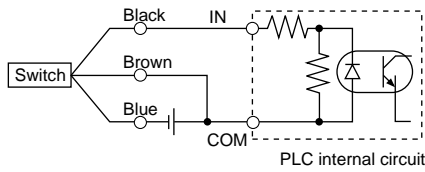


• Reed switch 2 wire

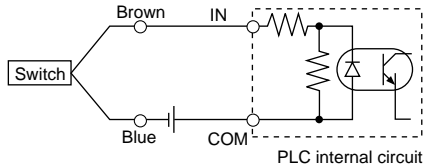


Typical PLC (Programmable Logic Controller) Connection Circuits

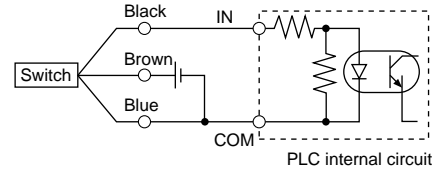
• Sink input 3 wire NPN



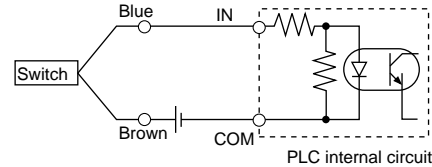
2 wire



• Source input 3 wire PNP



2 wire

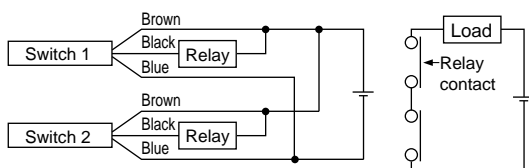


Connect according to the input specification of PLC because the connection method varies with the input specification of PLC.

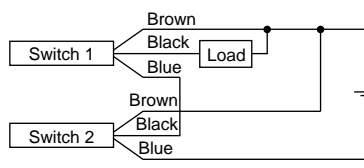
AND (Serial), OR (Parallel) Connection Examples

• 3 wire

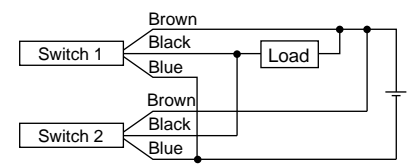
NPN/AND connection (with relay)



NPN/AND connection (with switch)



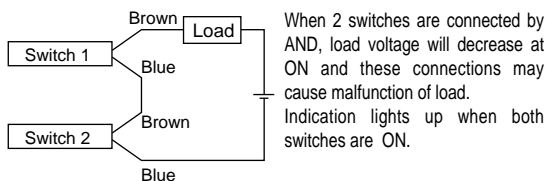
NPN/OR connection



Indication lights up when both switches are ON.

• 2 wire (2 pcs.)

AND connection

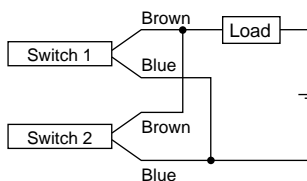


When 2 switches are connected by AND, load voltage will decrease at ON and these connections may cause malfunction of load. Indication lights up when both switches are ON.

Load voltage at ON=Supply voltage-Internal drop voltage X 2 pcs.
=24V-4V X 2 pcs.
=16V

Example) Supply voltage 24V DC, switch internal drop voltage 4V

OR connection



[Solid state switch]

When 2 switches are connected by OR, load voltage will increase at OFF and these connections may cause malfunction.

[Reed switch]

There is no current leakage so that load voltage does not increase at OFF. The flowing current is broken up into the ON-state switches, so indicator light becomes dark or may not turn ON due to the lack of the current.

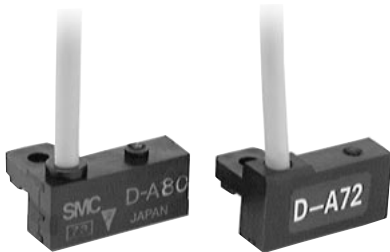
Load voltage at OFF=Leakage current X 2 pcs. X Load impedance
=1mA X 2 pcs. X 3kΩ
=6V

Example) Load impedance 3kΩ, switch leakage current 1mA

Reed Switch/Rail Mounting

D-A72/D-A73/D-A80

Grommet
Electrical entry : Perpendicular



Applicable Actuator Series

Series	Bore size (mm)
CDJ2, CDVJ	ø10, ø16
CDQ2	ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø140, ø160
CDXW	Plate mounted ø10, ø16, ø20, ø25, ø32, Housing mounted ø16, ø20, ø25, ø32
CDY1S, CY1L	ø6, ø10, ø15, ø20, ø25, ø32, ø40
RSDQ	ø16, ø20, ø32, ø40, ø50
MDU	ø25, ø32, ø40, ø50, ø63
CE1	ø12, ø20, ø32, ø40, ø50, ø63
MK, MK2	ø20, ø25, ø32, ø40, ø50, ø63
CXT	ø32, ø40

Specifications

PLC: Programmable Logic Controller

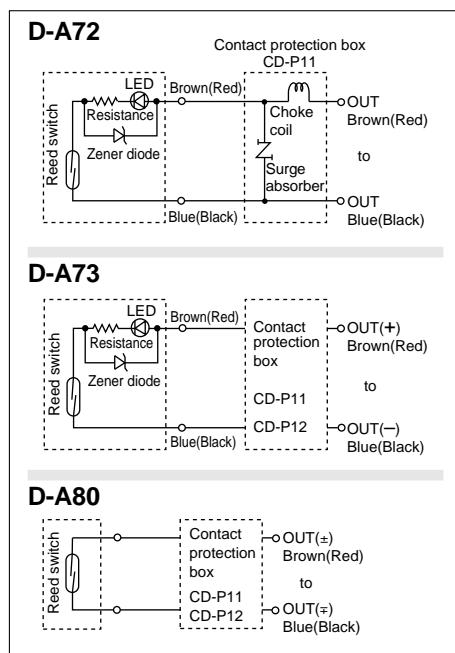
D-A7 (With indicator light)			
Auto switch model number	D-A72	D-A73	
Application	Relay/PLC	Relay/PLC	
Load voltage	200V AC	24V DC	100V AC
Load current range	5 to 10mA	5 to 40mA	5 to 20mA
Contact protection circuit	None		
Internal voltage drop	≤ 2.4V		
Indicator light	ON: When red light emitting diode		

D-A8 (Without indicator light)			
Auto switch model number	D-A80		
Application	Relay/IC circuit/PLC		
Load voltage	24V ^{AC} / _{DC} or less	48V ^{AC} / _{DC}	100V ^{AC} / _{DC}
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

• Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
 Note 1) Refer to common specifications on the p.5.3-5.
 Note 2) Refer to the p.5.3-5 for lead wire length.

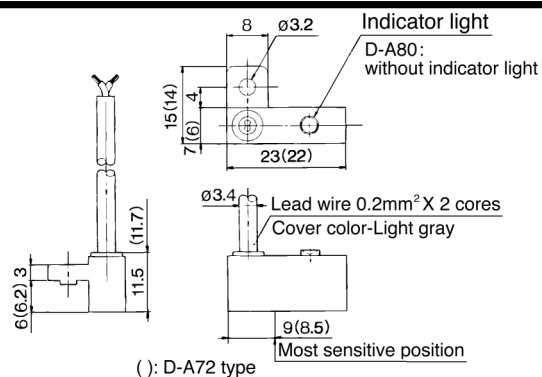
Internal Circuit

(): If not applicable for IEC Standard



Note) ① In the case operation load is an inductive load.
 ② In the case the wiring length to load is ">" 5m.
 ③ In the case the load voltage is 100 or 200V AC.
 Be sure to use the auto switch with the contact protection box in any case mentioned above.
 D-A72 must be used with contact protection box.
 Refer to p.5.3-6 for the details of contact protection box.

Dimensions



Operation Range (ℓ Dimension)

Actuator series	Bore size (mm)															
	6	10	12	15	16	20	25	32	40	50	63	80	100	125	140	160
CDJ2, CDVJ	—	8	—	—	9	—	—	—	—	—	—	—	—	—	—	—
CDQ2	—	—	10	—	12	12	12	12	11	10	12	12	13	13	13	13
CDXW	B	—	—	—	6	6	6	6	—	—	—	—	—	—	—	—
	P	—	6	—	—	6	6	6	—	—	—	—	—	—	—	—
CDY1S	6	6	—	6	—	6	6	6	6	—	—	—	—	—	—	—
CY1L	6	6	—	6	—	6	6	6	6	—	—	—	—	—	—	—
RSDQ	—	—	—	—	—	12	12	12	11	10	—	—	—	—	—	—
MDU	—	—	—	—	—	—	13	13	13	13	13	—	—	—	—	—
CE1	—	—	10	—	—	12	—	12	11	10	12	—	—	—	—	—
MK, MK2	—	—	—	—	—	12	12	12	11	10	12	—	—	—	—	—
CXT	—	—	—	—	—	—	—	12	11	—	—	—	—	—	—	—

Note) Average value at normal temperature including hysteresis. (Tolerance ± 30%)

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Technical Data

Solid State Switch/Rail Mounting

D-F79/D-F7P/D-J79

Grommet



Applicable Actuator Series

Series	Bore size (mm)
CDJ2, CDVJ3, CDVJ5	ø10, ø16
CDQ2	ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø140, ø160
CD□XW	Plate mounted(P), ø10, ø16, ø20, ø25, ø32, Housing mounted(B), ø16, ø20, ø25, ø32
CDY1S, CY1L	ø6, ø10, ø15, ø20, ø25, ø32, ø40
RSDQ	ø20, ø25, ø32, ø40, ø50
MDU	ø25, ø32, ø40, ø50, ø63
CE1	ø12, ø20, ø32, ø40, ø50, ø63
MK, MK2	ø20, ø25, ø32, ø40, ø50, ø63
CXT	ø32, ø40

Specifications

PLC: Programmable Logic Controller

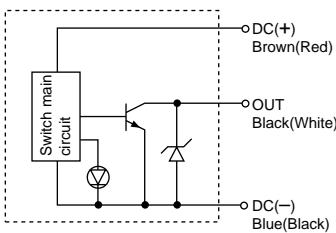
D-F7□/ D-J79 (With indicator light)			
Auto switch model number	D-F79	D-F7P	D-J79
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	≤ 10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	80mA or less	5 to 40mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA) of load current	0.8V or less	4V or less
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode		

• Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5mm
 Note 1) Refer to common specifications on p.5.3-5.
 Note 2) Refer to p.5.3-5 for lead wire length.

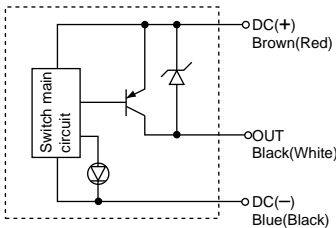
Internal Circuit

(): If not applicable for IEC Standard

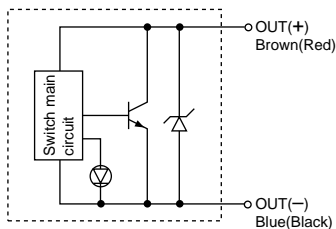
D-F79



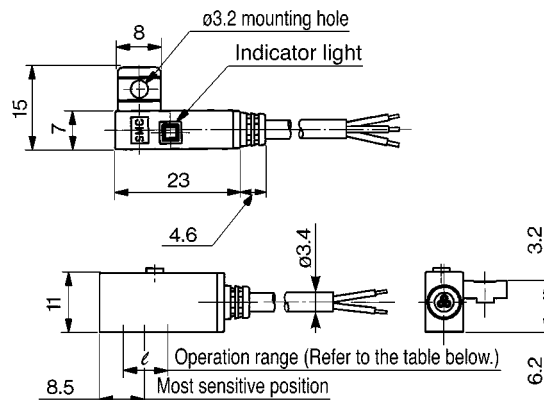
D-F7P



D-J79



Dimensions



Operation Range (ℓ Dimension)

Actuator series	Bore size															
	6	10	12	15	16	20	25	32	40	50	63	80	100	125	140	160
CDJ2, CDVJ3, CDVJ5	—	5	—	—	5	—	—	—	—	—	—	—	—	—	—	—
CDQ2	—	—	5.5	—	6	5.5	5	6	6	6	6.5	6.5	7	9	9	8.5
CD□XW	B	—	—	—	4	3.5	3.5	4	—	—	—	—	—	—	—	—
		P	—	—	—	2.5	3.5	2.5	—	—	—	—	—	—	—	—
CDY1S, CY1L	3	3	—	4	—	3	3	3	3.5	—	—	—	—	—	—	—
RSDQ	—	—	—	—	—	5.5	—	6	6	6	—	—	—	—	—	—
MDU	—	—	—	—	—	—	6.5	7	6.5	6.5	6.5	—	—	—	—	—
CE1	—	—	5.5	—	—	5.5	—	6	6	6	6.5	—	—	—	—	—
MK, MK2	—	—	—	—	—	5.5	5	6	6	6	6.5	—	—	—	—	—
CXT	—	—	—	—	—	—	—	6	6	—	—	—	—	—	—	—

Note) Average value at normal temperature including hysteresis. (Tolerance ±30%)

RB

J

D

-X

20-

Technical Data

Information ②

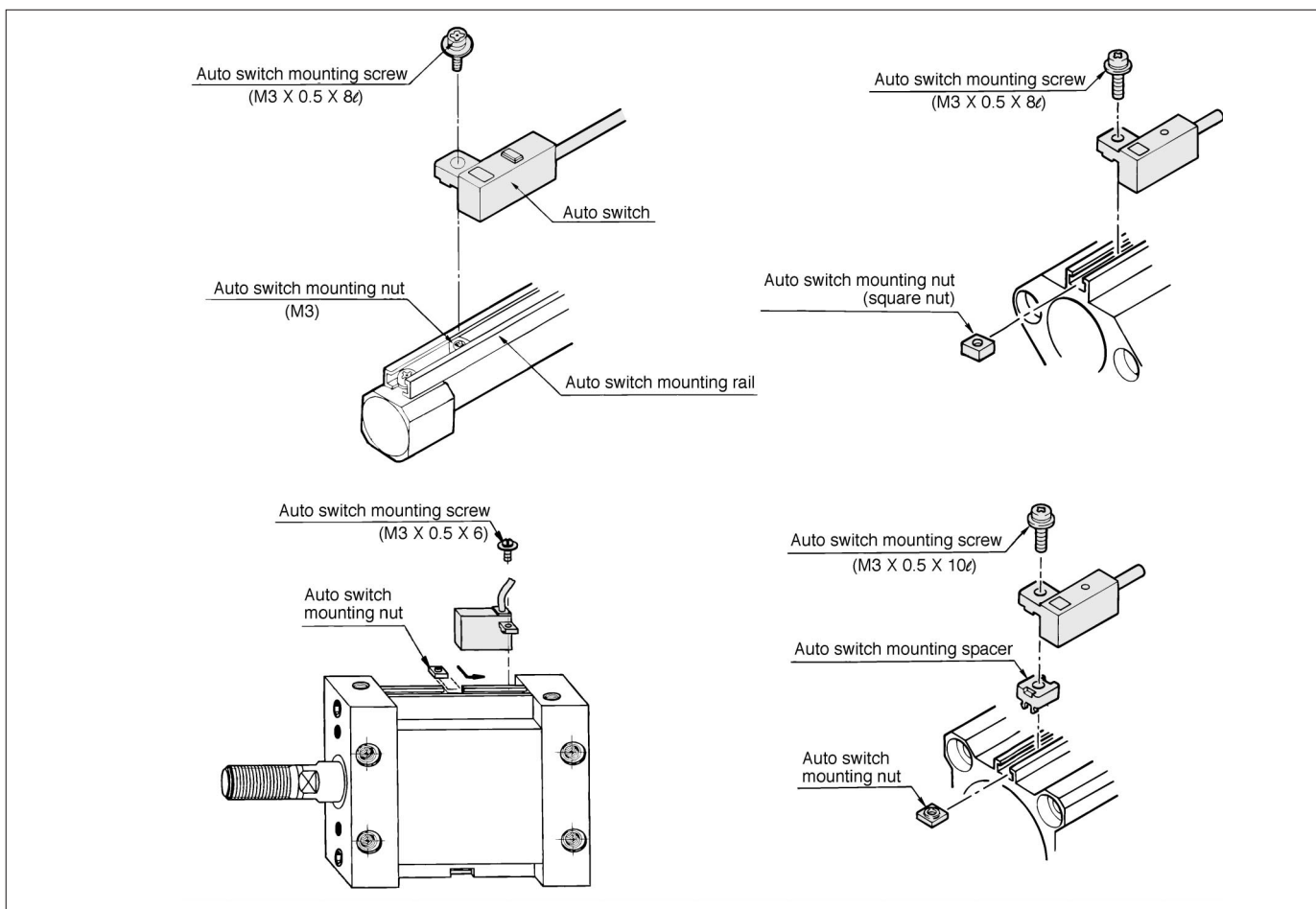
How to Mount and Move the Auto Switch

Mounting Bracket Rail mounting

<Applicable auto switch>

Reed switch D-A72, D-A73, D-A80, D-A72H, D-A73H, D-A76H, D-A80H
 D-A73C, D-A80C, D-A79W
 Solid state switch D-F79, D-F7P, D-J79, D-F7NV, D-F7PV, D-F7BV, D-J79C
 D-F79W, D-F7PW, D-J79W, D-F7NWV, D-F7BWV
 D-F79F, D-F7LF, D-F7BAL, D-F7NTL

How to mount and move the auto switch



- ① Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.
- ② Fit the convex part of auto switch mounting arm into the concave part of auto switch mounting rail. Then slide the switch over the nut.
 (CDQ2 series: Fit the convex part of auto switch mounting arm through the auto switch spacer into the concave part of auto switch mounting rail.)

- ③ Push the auto switch mounting screw lightly into the mounting nut through the hole of auto switch mounting arm.
- ④ After reconfirming detection position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7Nm.)
- ⑤ Modification of the detecting position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including nut, screw and spacer)

Cylinder series	Bore size (mm)												
	12	16	20	25	32	40	50	63	80	100	125	140	160
CDQ2	BQ-1	BQ-1	BQ-1	BQ-1	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2
MDU	-	-	-	BMU1-025	BMU1-025	BMU1-025	BMU1-025	BMU1-025	-	-	-	-	-
RSDQ	-	-	-	BQ-1	-	-	-	-	-	-	-	-	-
MK, MK2	-	-	BQ-1	BQ-1	BQ-2	BQ-2	BQ-2	-	-	-	-	-	-
CE1	BQ-1	-	-	-	-	-	-	BQ-2	-	-	-	-	-
CXT	-	-	-	-	-	-	-	-	-	-	-	-	-

Mounting screw set (Stainless steel specification)

Use the following mounting screw set (Nut included.) according to the required operating conditions. (Auto switch spacer is not included.)

BBA2: For D-A7/A8/F7/J7

D-F7BAL is mounted on the cylinder with the above stainless steel screw BBA2 before shipment of BBA2 is enclosed with D-F7BAL when shipped without cylinder.