Series CE
Auto Switch Common Specifications

⚠ Specific Product Precautions

Be sure to read before handling.
Refer to pages 39 through 41 for auto switch precautions.

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3 wire: 10μA or less 2 wire: 1mA or less
Operating time	1.2ms	1ms or less Note 3)
Impact resistance	300m/s² {30.6G}	1000m/s² {102G}
Insulation resistance	50MΩ or more with a 500VDC megohmmeter (between lead wire & case)	
Withstand voltage	1500VAC for 1 min. Note 1) (between lead wire & case)	1000VAC for 1 min. (between lead wire & case)
Ambient temperature	–10 to 60°C	
Enclosure	IEC529 standard IP67, JISC0920 watertight construction Note 2)	

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

Note 2) Terminal conduit type (D-A3, A3□A, A3□C, G39, G39A, G39C, K39A, K39C) and DIN terminal type (D-A44, A44A, A44C) are IEC529 standard IP63, JISC0920 raintight construction.

Note 3) Excluding solid state switches with timer (D-M5□TL, G5NTL, F7NTL, F5NTL) and ferromagnetic resistant 2 color indicator type solid state switch (D-P5DWL). D-J51 is 5ms or less.

Lead Wire Length

Lead wire length designation (example)

D-A73L

Lead wire length

Nil	0.5m
L	3m
Z	5m
NNote)	None

Note) Applies only to D– □□ C type connector switches.

Note 1) Lead wire length Z: Auto switches applicable for 5m
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: All models are produced upon receipt of order (standard procedure). However, this does not include D-F9, F9□V and F7□WV.

Note 2) A lead wire length of 3m is standard for solid state switches with timer and water resistant 2 color indicator type solid state switches. (0.5m is not available.)

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

Part Nos. of lead wires with connectors
(applicable only for connector type)

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

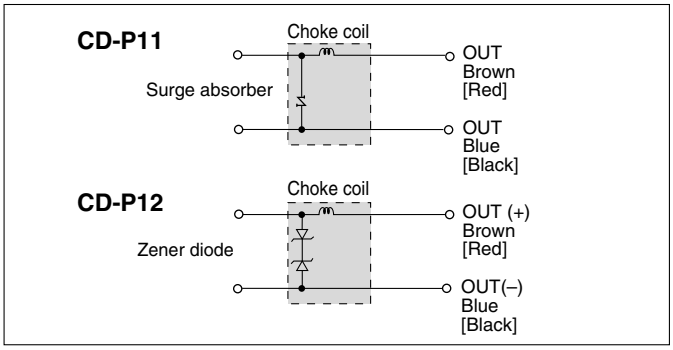
Contact Protection Box

D-A7 and D-A8 type switches do not have built-in contact protection circuits. A contact protection box should be used in cases such as when there is an induction load, when lead wires are 5m or longer, and with 100V or 200VAC.

Part No.	Operating voltage	Lead wire length
CD-P11	100V, 200VAC	Switch connection side: 0.5m Load connection side: 0.5m
CD-P12	24VDC	

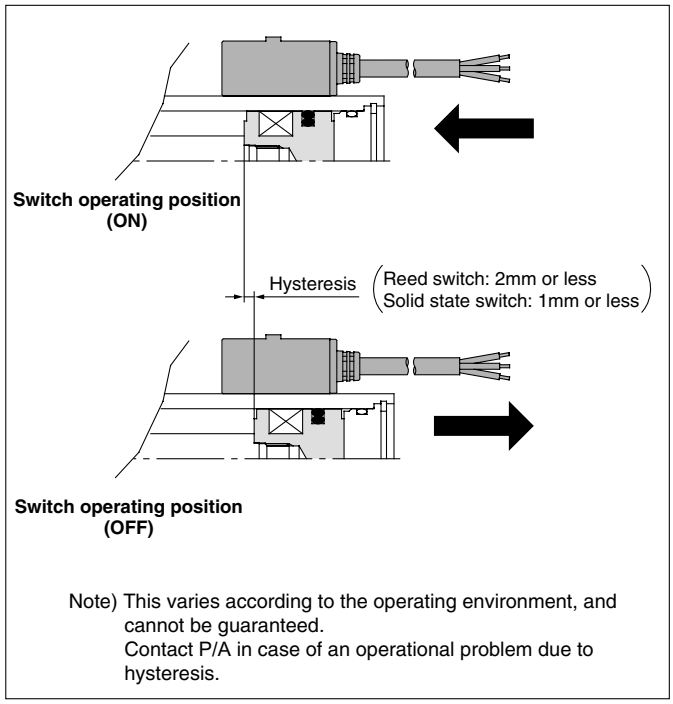
∗ Since D-A8 switches have no particular voltage designation below 100VAC, type selection should be based upon the operating voltage.

Contact protection box internal circuits



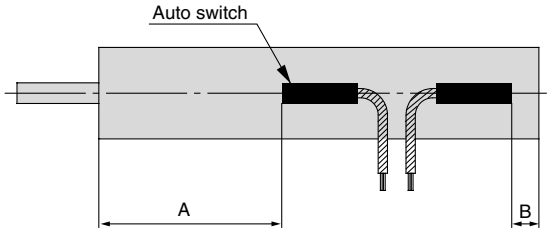
Lead wire colors inside [ ] are those prior to conformity with IEC standards.

Switch Hysteresis



Note) This varies according to the operating environment, and cannot be guaranteed.
Contact P/A in case of an operational problem due to hysteresis.

Proper Auto Switch Mounting Positions (Stroke End)



Proper auto switch mounting positions (Series CE1)

(mm)

Auto switch model	Symbol	Bore size (mm)					
		12	**20**	**32**	**40**	**50**	**63**
D-A7, A8	**A**	40.5	47	55	79	82	85.5
	B	4	13	17	39	44	41.5
D-A7□H, A80H, A73C, A80C, D-F7□, J79, F7□V, J79C	**A**	41	47.5	55.5	79.5	82.5	86
	B	4.5	13.5	17.5	39.5	44.5	42
D-A79W	**A**	38	44.5	52.5	76.5	79.5	83
	B	2	10.5	14.5	36.5	41.5	39
D-F7BA, F7□W, F7□F, J79W	**A**	45	51.5	59.5	83.5	86.5	90
	B	8.5	17.5	21.5	43.5	48.5	46
D-F7□WV	**A**	41.5	48	56	80	83	86.5
	B	5	14	18	40	45	42.5
D-A9□□	**A**	39.5	46	54	78	81	40.5
	B	3	12	16	38	43	81.5
D-F7NT	**A**	46	52.5	60.5	84.5	87.5	91
	B	9.5	18.5	22.5	44.5	49.5	47
D-F9□□	**A**	43.5	50	58	82	85	88.5
	B	7	16	20	42	47	44.5
D-F9□W□	**A**	42.5	49	57	81	84	87.5
	B	6	15	19	41	46	43.5

Proper auto switch mounting positions (Series CEP1)

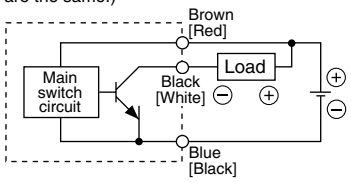
(mm)

Auto switch model	Symbol	Bore size (mm)	
		12	**20**
D-A90, A93, A96	**A**	75.2	82
	B	7.9	12
D-A90V, A93V, A96V	**A**	75.2	82
	B	7.9	12
D-F9N, F9P, F9B	**A**	79.2	86
	B	11.9	16
D-F9NV, F9PV, F9BV	**A**	78.2	85
	B	10.9	15
D-F9NW, F9PW, F9BW	**A**	79.2	86
	B	11.9	16
D-F9NWV, F9PWV, F9BWV	**A**	78.2	85
	B	10.9	15
D-F9BA□	**A**	79.2	86
	B	11.9	16

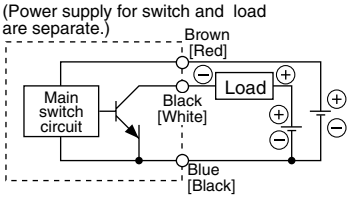
Series CE
Auto Switch
Connections and Examples

Basic Wiring

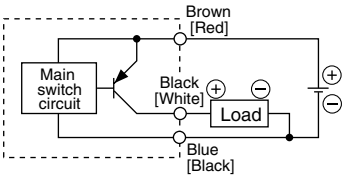
Solid state 3 wire, NPN
(Power supply for switch and load are the same.)



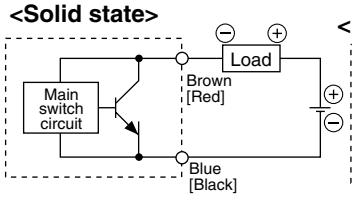
(Power supply for switch and load are separate.)

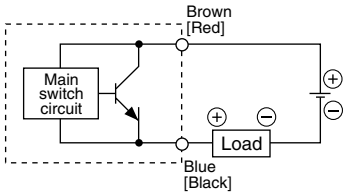


Solid state 3 wire, PNP

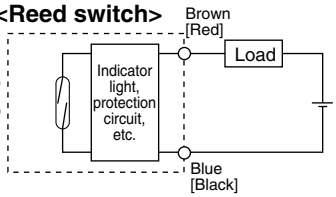


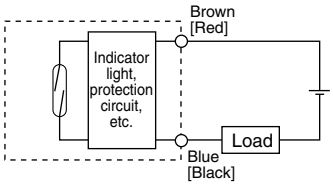
2 wire
<Solid state>





2 wire
<Reed switch>

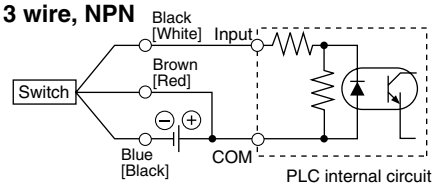




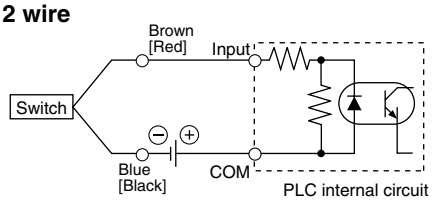
Examples of Connection to PLC (Sequence Controller)

Specification for sink input

3 wire, NPN

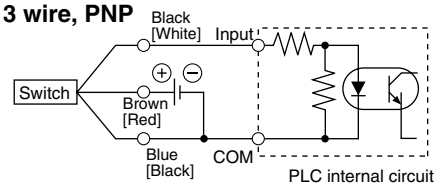


2 wire

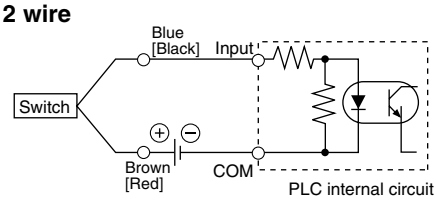


Specification for source input

3 wire, PNP



2 wire

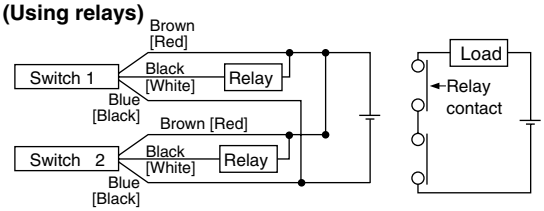


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

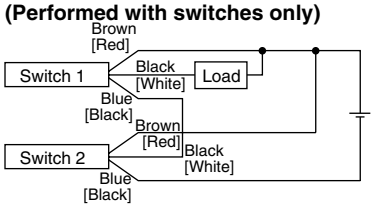
Connection Examples for AND (Series) and OR (Parallel)

3 wire

AND connection for NPN output (Using relays)

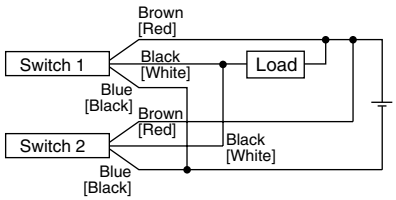


AND connection for NPN output (Performed with switches only)

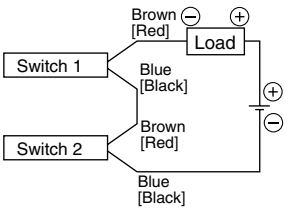


The indicator lights will light up when both switches are turned ON.

OR connection for NPN output



2 wire with 2 switch AND connection



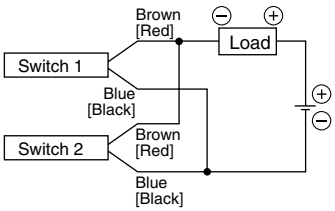
When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up if both of the switches are in the ON state.

Load voltage at ON = $\frac{\text{Power supply voltage}}{} - \frac{\text{Residual voltage}}{}$ x 2 pcs.

= 24V - 4V x 2 pcs.
= 16V

Example: Power supply is 24VDC
Voltage decline in switch is 4V

2 wire with 2 switch OR connection



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

Load voltage at OFF = $\frac{\text{leakage current}}{}$ x 2 pcs. x $\frac{\text{load impedance}}{}$

= 1mA x 2 pcs. x 3kΩ
= 6V

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

<Reed switch>
Because there is no current leakage, the load voltage will not increase when turned OFF, but due to the number of switches in the ON state, the indicator lights will sometimes get dark or not light up, because of dispersion and reduction of the current flowing to the switches.