Product Selection

D85 Series—Alternating Relays [1]

Output Contacts	Control Voltage	Socket	Catalog Number
SPDT	12 Vac	8-pin	**D851NR**
SPDT	24 Vac	8-pin	**D851NT**
SPDT	120 Vac	8-pin	**D851NA**
SPDT	240 Vac	8-pin	**D851NB**
SPDT w/selector switch	12 Vac	8-pin	**D851LR**
SPDT w/selector switch	24 Vac	8-pin	**D851LT**
SPDT w/selector switch	120 Vac	8-pin	**D851LA**
SPDT w/selector switch	240 Vac	8-pin	**D851LB**
DPDT	12 Vac	11-pin	**D852NR**
DPDT	24 Vac	11-pin	**D852NT**
DPDT	120 Vac	11-pin	**D852NA**
DPDT	240 Vac	11-pin	**D852NB**
DPDT w/selector switch	12 Vac	11-pin	**D852LR**
DPDT w/selector switch	24 Vac	11-pin	**D852LT**
DPDT w/selector switch	120 Vac	11-pin	**D852LA**
DPDT w/selector switch	240 Vac	11-pin	**D852LB**
DPDT cross-wired	12 Vac	8-pin	**D852XNR**
DPDT cross-wired	24 Vac	8-pin	**D852XNT**
DPDT cross-wired	120 Vac	8-pin	**D852XNA**
DPDT cross-wired	240 Vac	8-pin	**D852XNB**
DPDT cross-wired w/selector switch	12 Vac	8-pin	**D852XLR**
DPDT cross-wired w/selector switch	24 Vac	8-pin	**D852XLT**
DPDT cross-wired w/selector switch	120 Vac	8-pin	**D852XLA**
DPDT cross-wired w/selector switch	240 Vac	8-pin	**D852XLB**

Accessories

D85 Series—Alternating Relays

Description	Standard Pack	Catalog Number
8-pin socket	10	**D3PA2**
11-pin socket	10	**D3PA3-A2**
Hold-down spring	10	**D65CHDS**

Note

[1] Contact Eaton for relays for 3-switch applications (Lead-Lag-Stop).

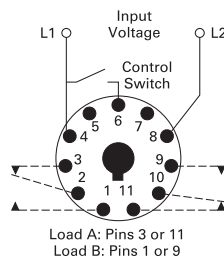## Technical Data and Specifications

D85 Series—Alternating Relays

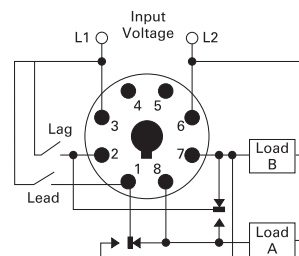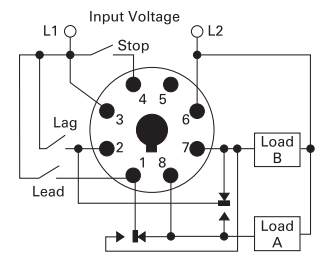| Description	Specification
Voltage tolerance	+10%/-15% of control voltage at 50/60 Hz
Load (burden)	Less than 3 VA
Output contacts	10 A resistive at 240 Vac / 30 Vdc, 1/2 hp at 120/240 Vac (NO), 1/3 hp at 120/240 Vac (NC)
Mechanical life	10,000,000 operations
Electrical life	100,000 operations
Temperature	−20 °F to +150 °F (−28 ° to 65 °C)
Transient protection	10,000 volts for 20 microseconds
Indicator LEDs	2 LEDs marked LOAD A and LOAD B
Optional selector switch settings	ALTERNATE, LOCK LOAD A, LOCK LOAD B

Wiring Diagrams

D851 Series Relays, SPDT

Load A: Pin 2
Load B: Pin 8

D852 Series Relays, DPDT

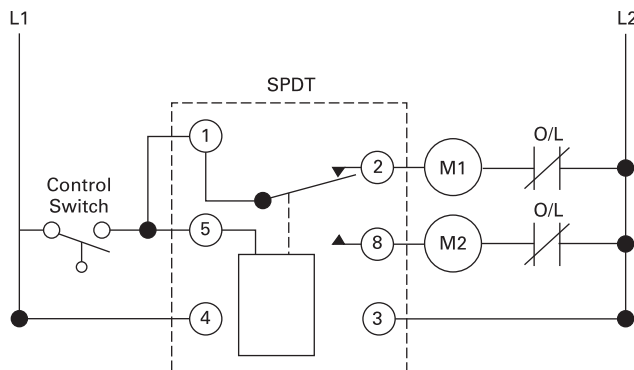Load A: Pins 3 or 11
Load B: Pins 1 or 9

D852X Series Relays, DPDT Cross-Wired

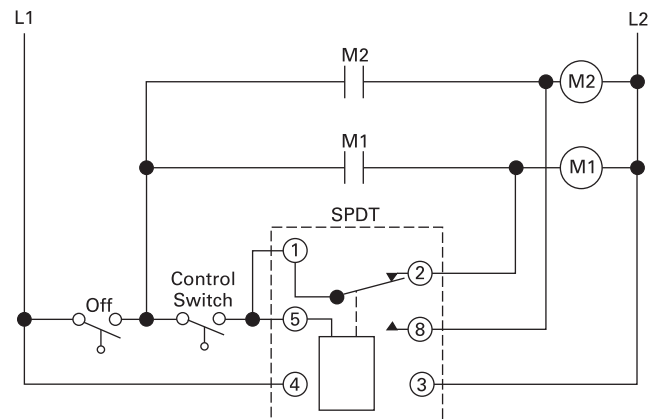### D853 Series Relays, Three-Switch Applications

Typical Installations for SPDT and DPDT Alternating Relays, Standard Installation

In the OFF state (standard installation), the control switch is open, the alternating relay is in the LOAD A position, and both loads (M1 and M2) are off. When the control switch closes, it energizes the first load (M1). The red LED marked "LOAD A" glows. As long as the control switch remains closed, M1 remains energized.

When the control switch opens, the first load (M1) is turned off and the alternating relay toggles to the LOAD B position. When the control switch closes again, it energizes the second load (M2). The red LED marked "LOAD B" glows.
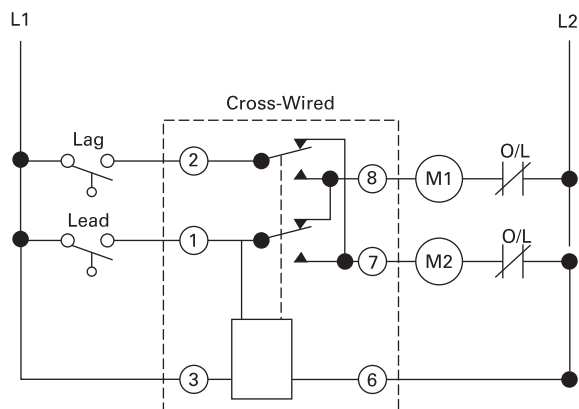
Typical Installations for SPDT and DPDT Alternating Relays, Anti-Bounce Installation

When the control switch opens, the second load (M2) is turned off, the alternating relay toggles back to the LOAD A position, and the process can be repeated again. On relays with DPDT contacts, two pilot lights can be used for remote indication of LOAD A or LOAD B status.

To eliminate any bounce condition of the control switch, the addition of a second switch (OFF) along with two auxiliary contacts is recommended as shown in the Anti-Bounce Installation.
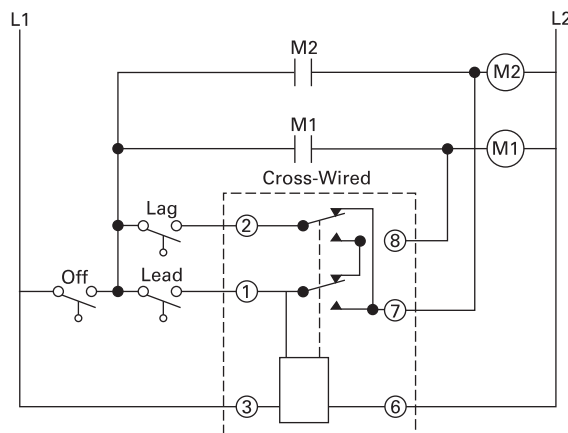
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Typical Installations for DPDT Cross-Wired Alternating Relays, Standard Installation

Typical Installations for DPDT Cross-Wired Alternating Relays, Anti-Bounce Installation

In the OFF state, both the LEAD control switch and the LAG control switch are open, the alternating relay is in the LOAD A position, and both loads are off. When the LEAD control switch closes, it energizes the first load (M1). The red LED marked "LOAD A" glows. As long as the LEAD control switch remains closed, M1 remains energized. If the LAG control switch closes, it energizes the second load (M2).

When the LAG control switch opens, the second load (M2) is turned off. When the LEAD control switch opens, the first load (M1) is turned off and the alternating relay toggles to the LOAD B position.
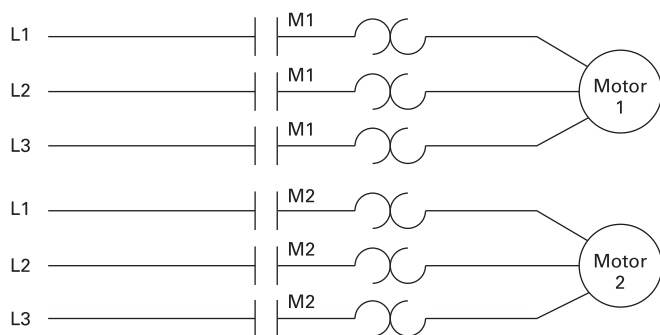
When the LEAD control switch closes, it turns on the second load (M2). The red LED marked "LOAD B" glows. If the LAG control switch closes, it will energize the first load (M1). When the LAG control switch opens, the first load (M1) is turned off. When the LEAD control switch opens, the second load (M2) is turned off, the alternating relay toggles back to the LOAD A position, and the process can be repeated again.
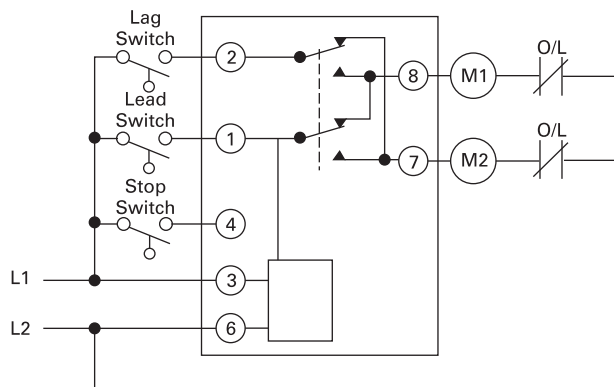
To eliminate any bounce condition of the control switch, the addition of a second switch (OFF) along with two auxiliary contacts is recommended as shown in the Anti-Bounce Installation.

Typical Installations for DPDT Cross-Wired Relays for Three-Switch Applications

In the OFF state, all three switches are open, the alternating relay is in the LOAD A position, and both loads are off. No action happens with the alternating relay or either load when the STOP switch closes. When the LEAD switch closes, Load #1 (M1) turns on. When the LAG switch closes, Load #2 (M2) turns on. Both loads remain on as long as all three switches are closed.

When the LAG switch opens, Load #2 (M2) remains on because the STOP switch is still closed. When the LEAD switch opens, Load #1 (M1) remains on because the STOP switch is still closed. When the STOP switch opens, both Load #1 (M1) and Load #2 (M2) are turned off simultaneously.

The alternating relay toggles to the LOAD B position. The entire cycle is then repeated, but with Load #2 (M2) energized first followed by Load #1 (M1). This type of operation is known as "Sequence On–Simultaneously Off (S.O.S.O.)"—the two loads are energized sequentially, but remain on together until the STOP switch is opened.

If both the STOP switch and LEAD switch fail to close and turn on the first load, both loads will be turned on simultaneously when the LAG switch is closed.

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Dimensions

Approximate Dimensions in Inches (mm)

D85 Series—Alternating Relays