

# Data Bulletin

## Direct Current and Photovoltaic Systems Applying Heavy Duty Safety Switches (Fused and Not Fused) on DC and Photovoltaic Systems Class Number 3110

Retain for future use.

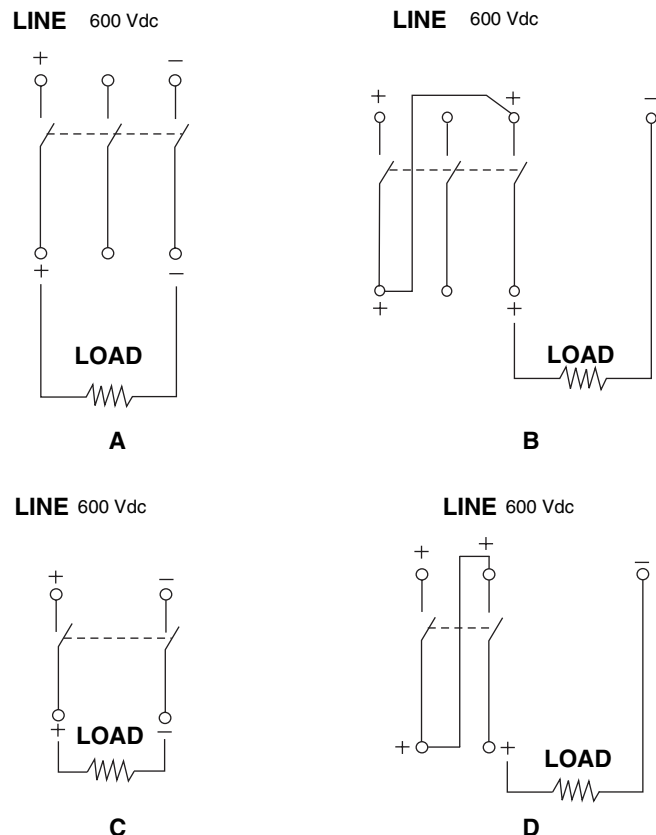
### GENERAL DC SYSTEMS (for Photovoltaic, see next page)

All heavy duty safety switches with DC ratings (2- and 3-pole fusible and non-fusible) are Underwriters Laboratories® (UL®) Listed for use on DC applications when wired as shown in Figure 1 (A, B, C and D). Additionally:

- Heavy duty safety switches are rated for 600 Vdc maximum open circuit voltage.
- Non-fusible safety switches may carry 100 percent of the nameplate current rating.
- Fusible safety switches may carry 80 percent of nameplate current rating (continuous use).
- Heavy duty switches are dc horsepower rated as indicated on the safety switch wiring diagram.
- Heavy duty switches have a 10,000 amperage dc short-circuit rating unless otherwise stated on the switch wiring diagram.

**Figure 1: General DC Systems  
Fused and Non-Fusible Wiring Diagram  
(for Photovoltaic, see next page)**

(Not Fused Shown)

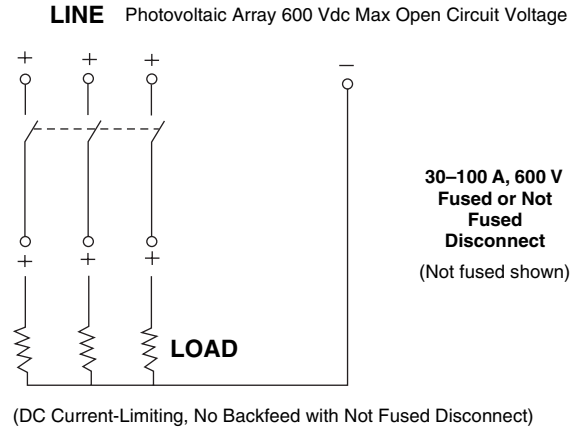


## PHOTOVOLTAIC SYSTEMS

Schneider Electric has obtained a limited UL® Listing (File E2875, Vol. 1) for 30–100 A heavy duty safety switches (3-pole fusible and non-fusible) when used on photovoltaic systems (see tables below for limitations and ratings) and wired as shown in Figure 2. The National Electrical Code® (NEC®) does not allow the negative conductor to be switched when disconnecting photovoltaic systems (NEC Article 690).

*NOTE: Heavy duty safety switches may be used on photovoltaic systems with a grounded negative feed. Refer to Figures 1B, 1D and 2.*

**Figure 2: Negative Grounded Feed per NEC Article 690**



**Table 1: Limitations**

| Switch Nameplate Amperage<br>600 V | Maximum Current for the PV Array or<br>Photovoltaic String | Rated Short-Circuit Current per Pole<br>for the PV Array |
|------------------------------------|--|--|
| 30 A                               | 18 A DC per pole   | 11.5 A (18/1.56)   |
| 60 A                               | 60 A DC per pole   | 38 A (60/1.56)   |
| 100 A                              | 100 A DC per pole  | 64 A (100/1.56)  |

- If a non-fusible disconnect is used, the inverter must not be capable of backfeeding currents into a short circuit or fault in the photovoltaic array or string.
- One inverter may be connected to each pole of the switch.
- Refer to Table 2 (below) for the lug wire range of heavy duty switches.

**Table 2: Heavy Duty Safety Switch Wire Range**

| Ampere Rating | Conductors per Phase and<br>Neutral | Wire Range of Safety Switch per Phase and<br>Neutral AWG/kcmil * | Wire Range of Lug AWG/kcmil * |
|---------------|-------------------------------------|--|-------------------------------|
| 30 A          | 1                                   | #12–6 (Al) or #14–6 (Cu)   | #12–2 (Al) or #14–2 (Cu)      |
|               | 2                                   | #14–10 Cu solid or stranded                                      | #14–10 Cu solid or stranded   |
| 60 A          | 1                                   | #12–3 (Al) or #14–3 (Cu)   | #12–2 (Al) or #14–2 (Cu)      |
| 100 A         | 1                                   | #12–1/0 (Al) or #14–1/0 (Cu)                                     | #12–1/0 (Al) or #14–1/0 (Cu)  |

\* 30–100 Amp switches suitable for 60°C or 75°C conductors.

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