

Direct Current and Photovoltaic Systems

Applying Heavy Duty Safety Switches (Fused and Not Fused) on DC and Photovoltaic Systems

Class 3130

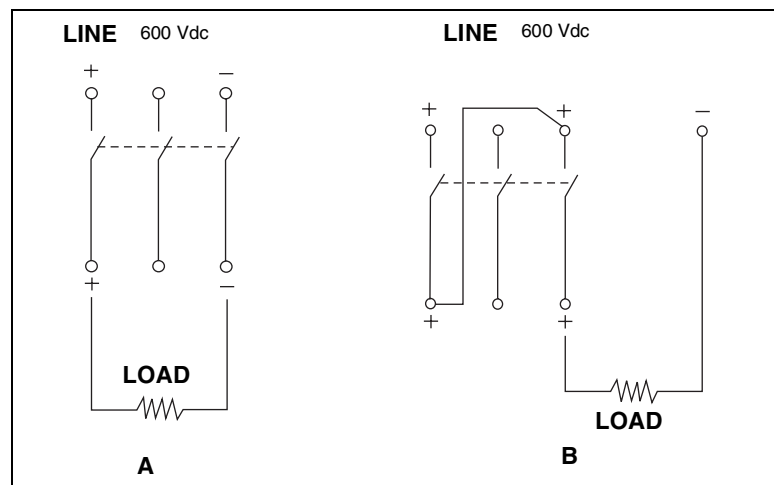
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DC SYSTEMS

All heavy duty safety switches with DC ratings (3-pole fusible and not fusible) are Underwriters Laboratories® (UL®) Listed for use on DC applications when wired as shown in Figure 1 (A and B). Additionally:

- Heavy duty safety switches are rated for 250 Vdc or 600 Vdc maximum open circuit voltage.
- Not 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.

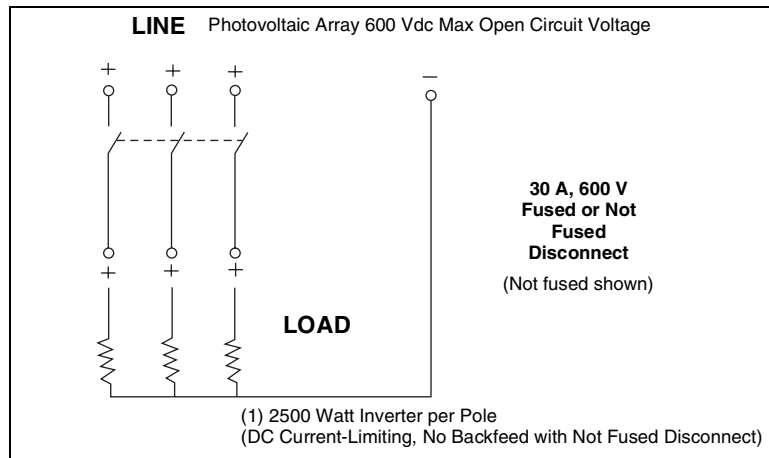
Figure 1: Fused and Not Fusible Wiring Diagram (Not Fused Shown)



PHOTOVOLTAIC SYSTEMS

Square D has obtained a limited UL Listing (File E2875, Vol. 1) for 30 A, 600 V, heavy duty safety switches when used on photovoltaic systems 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).

Figure 2: Negative Grounded Feed per NEC Article 690



Limitations

Heavy duty safety switches 30 A, 600 V (fusible or not fusible) may be used on photovoltaic systems with a grounded negative feed. Refer to Figure 1 B and Figure 2. The following limitations apply when wired as shown in Figure 2:

- The maximum current from the photovoltaic array or photovoltaic string shall not exceed 18 amperes direct current (dc) per pole. The rated (at Standard Test Conditions) short-circuit current per pole for the photovoltaic array or string shall not exceed 11.5 amperes (18 A/1.56).
- The maximum dc operating current drawn by the inverter shall not exceed 14 amperes per pole. One inverter may be connected to each pole of the switch.
- **If a not 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.

Refer to Table 1 below for the 30 A heavy duty safety switch wire range.

Table 1: Safety Switch Wire Range

Ampere Rating	Wire Range of Safety Switch per Phase and Neutral AWG/kcmil ¹	Wire Range of Lug AWG/kcmil
30 A	(1) #12-6 (Al)	(1) #12-2 (Al)
	(1) #14-6 (Cu)	(1) #14-2 (Cu)
	(2) #14-10 (Cu) solid	(2) #14-10 (Cu) solid
	(2) #14-10 (Cu) stranded	(2) #14-10 (Cu) stranded

¹ Based on NEC Table 312.6(B)

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