
From:
Sent: Wednesday, January 28, 2009 7:40 AM
To:
Cc:
Subject: Square D Solar application and UL response

Yesterday, we received our response from UL on obtaining the same 600VDC limited listing that Square D has for their HD switch. **According to UL, there is no listing of the Square D safety switch device for Photovoltaic applications. The single-pole 600VDC rating is not recognized nor listed with UL.** UL was unable to give us the testing requirements for the single-pole solar application that Square D met because they do not exist.

Upon review of the Tech Document we have from Square D, there are two versions available to the public. The 2005 version includes a statement stating the limited UL listing to the file and the 2007 version does not. **This has been an effective marketing tool and has placed Square D in a position that is not legally recognized by UL.**

What this means is that when a Square D switch is applied in a 600VDC application where each pole is required to break 600VDC, its UL listing is no longer valid due to misapplication of the product and it has never been UL witnessed tested to meet breaking requirements. The 2007 Tech Document has been changed enough to suggest it is UL listed for this, but does not specifically state it is not listed. I believe the market has been very effectively fooled by this misleading information due to an extreme need in the market.

Attached are the two documents, the key changed phrase is on the top of page 2.

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.

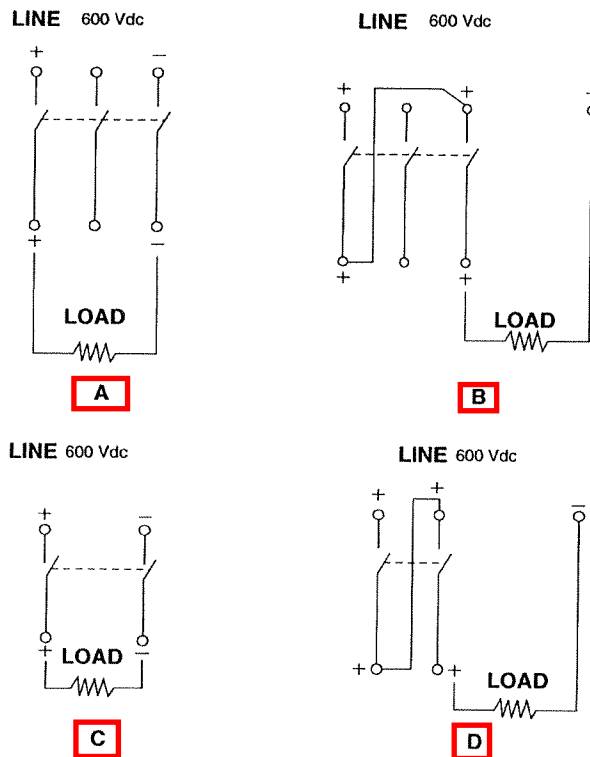
GENERAL DC SYSTEMS (for Photovoltaic, see next page)

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)



Does NOT Exist

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

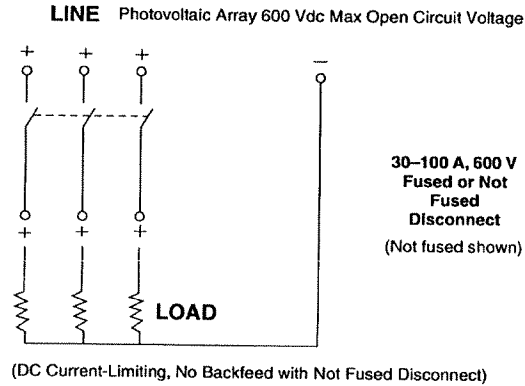


Table 1: Limitations

Switch Nameplate Amperage 600 V	Maximum Current for the PV Array or Photovoltaic String	Rated Short-Circuit Current per Pole 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.

UL Listing Does NOT Exist for this type of application of the product

Table 2: Heavy Duty Safety Switch Wire Range

Ampere Rating	Conductors per Phase and Neutral	Wire Range of Safety Switch per Phase and 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)
	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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GENERAL DC SYSTEMS

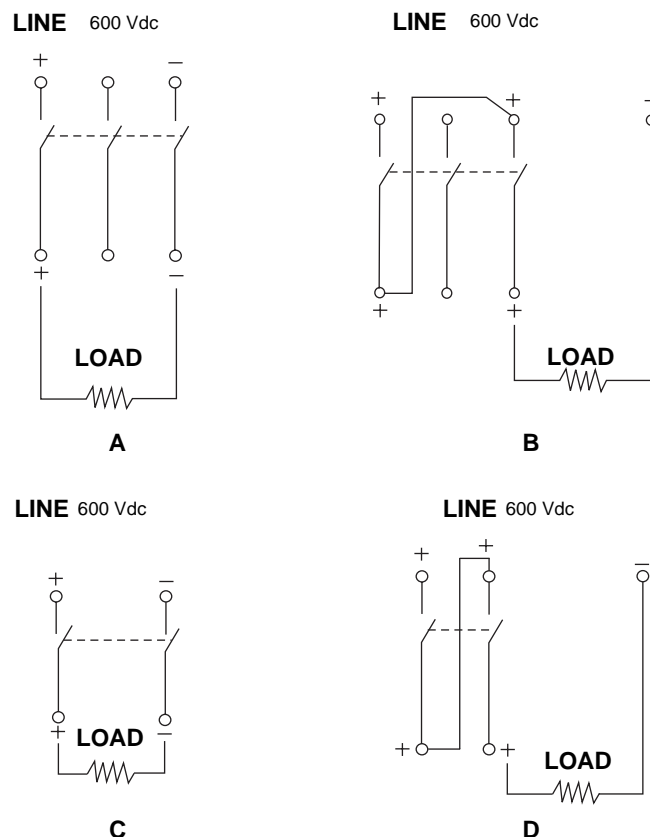
(for Photovoltaic, see next page)

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

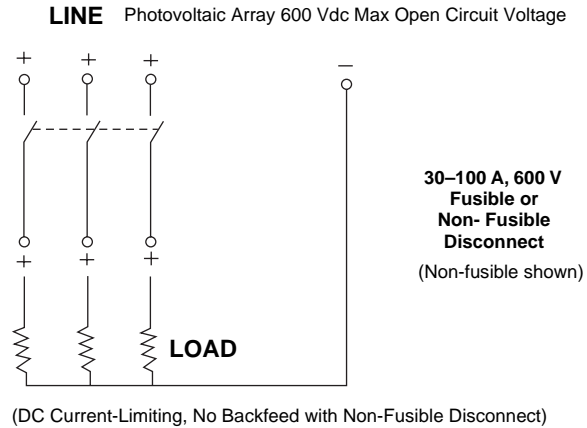
(Non-Fusible Shown)



PHOTOVOLTAIC SYSTEMS

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

Figure 2: Grounded Feed per NEC Article 690



NOTE: Negative grounding shown in Figure above; positive grounded systems are similarly allowed.

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