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Lexington, KY, USA

Data Bulletin

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Direct Current and Photovoltaic Systems

Applying Heavy Duty Safety Switches (Fusible and Non-Fusible) on dc and Photovoltaic Systems

Retain for future use.

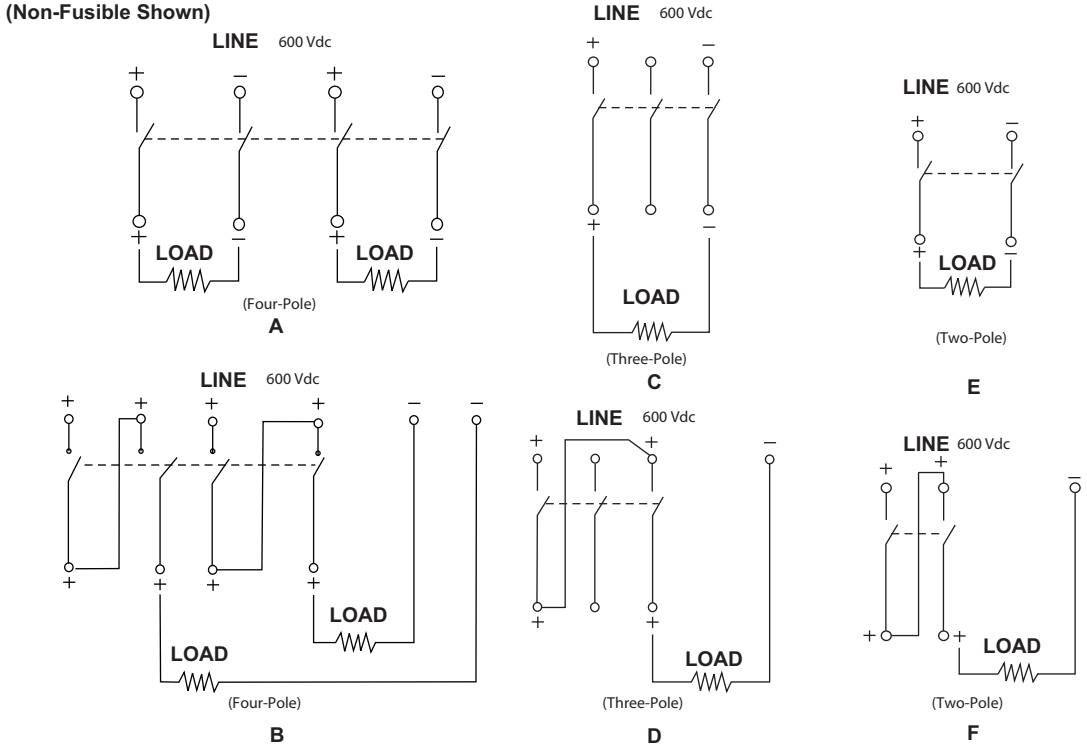
General dc and Photovoltaic Systems, UL® Listed, CSA® Certified (Files E2875 and E154282)

NOTE: Heavy duty safety switches may be used on photovoltaic systems with a grounded feed. Refer to Figures 1B, 1D, 1F and 2 (negative grounding shown; positive grounded systems are similarly allowed). For ungrounded systems, see National Electrical Code® (NEC®) 690.35 (NEC 2008, NFPA 70).

All heavy duty safety switches with dc ratings (2-, 3- and 4-pole fusible and non-fusible) are Underwriters Laboratories® (UL®) Listed and CSA® Certified for use on dc applications when wired as shown in Figure 1 (A, B, C, D, E, and F). 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 safety switches are dc horsepower rated as indicated on the safety switch wiring diagram.
- Heavy duty safety switches have a 10,000 ampere dc short-circuit rating at 600 Vdc unless otherwise stated on the switch wiring diagram. Consult factory for short circuit current ratings at 250 Vdc.
- Refer to current Square D® Digest for lug wire range of heavy duty safety switches.
- Photovoltaic systems using ungrounded arrays must use two poles of the disconnect as shown in Figure 1 (A, C, and E) where one pole is placed in each of the two ungrounded conductors.
- Applications 1A, 1C, and 1E (see Figure 1) are for ungrounded photovoltaic arrays only.

Figure 1: General dc and Photovoltaic Systems, Fusible and Non-Fusible Wiring Diagram

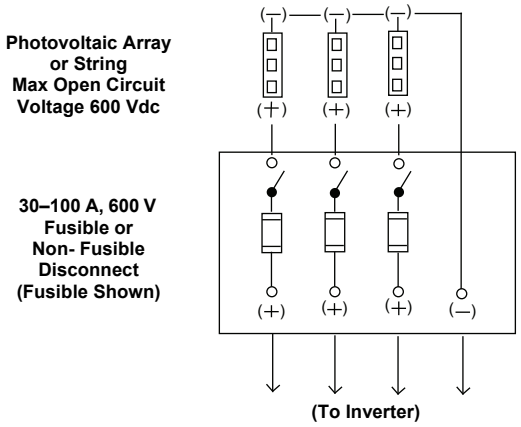


SQUARE D
by Schneider Electric

Alternate Photovoltaic System Wiring, Evaluated and Self-Certified by Schneider Electric

Not UL Listed

Figure 2: Grounded Feed per NEC® Article 690



- These photovoltaic connections are to be used only with grounded photovoltaic systems where the grounded conductor-to-ground bond is made inside the inverter by the dc ground-fault protection system. Do not duplicate this existing bond in the field.
- Positive grounded systems are similarly allowed.
- For ungrounded systems, see NEC 690.35 (NEC2008, NFPA70).

Current Ratings

Non-Fusible

Catalog Number	Switch Nameplate 600 V	Switch dc Rating per Pole [1]	Photovoltaic Short-Circuit Current (I_{sc})
NOTE: The non-fusible disconnect is rated for carrying 100% of the test current, which makes the rated current 1.25 x I_{sc}			
HU361	30 A	20 A	16 A (20/1.25)
HU362	60 A	60 A	48 A (60/1.25)
HU363	100 A	100 A	80 A (100/1.25)

Fusible

Catalog Number	Switch Nameplate 600 V	Switch dc Rating per Pole [2]	Photovoltaic Maximum Circuit Current [3]	Photovoltaic Short-Circuit Current (I_{sc})
NOTE: For fusible disconnects where the fuse must be rated: 1.25 x 1.25 x I_{sc} = 1.56 x I_{sc}.				
H361	30 A	20 A	16 A dc per pole	12.8 A (20/1.56)
H362	60 A	60 A	48 A dc per pole	38 A (60/1.56)
H363	100 A	100 A	80 A dc per pole	64 A (100/1.56)

1 The switch per pole rating is I_{sc} multiplied by 125%.

2 The switch per pole rating must be at least the photovoltaic maximum circuit current multiplied by 125%.

3 From NEC 2008 and NFPA 70, Article 690.8: the photovoltaic maximum circuit current is I_{sc} multiplied by 125%.

- 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.
- If a fusible disconnect is used, 600 Vdc rated fuses may be required.
- One inverter may be connected to each pole of the switch.
- Refer to the current Square D Digest for lug wire range of heavy duty safety switches.

Schneider Electric USA, Inc.
1601 Mercer Road
Lexington, KY 40511 USA
1-888-SquareD (1-888-778-2733)
www.schneider-electric.us