

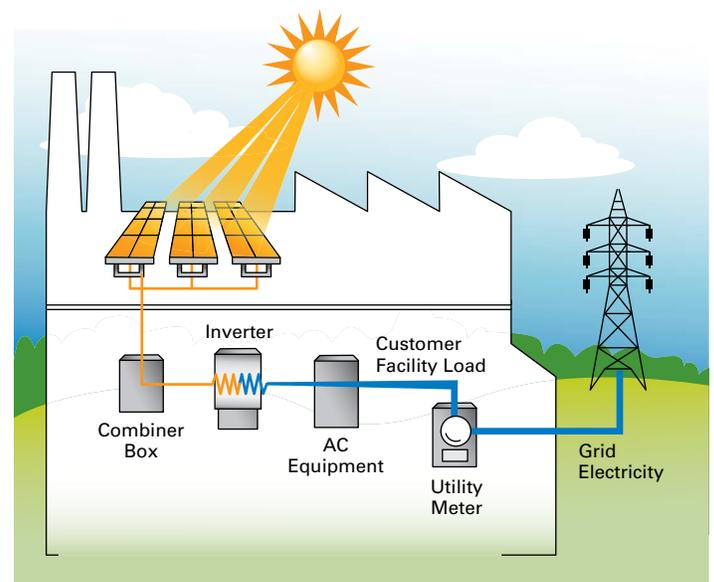
Convert the energy of the sun into electrical power



Photovoltaic (PV) systems convert the energy of the sun into electrical power that is fed directly into the electric grid. Within the balance of system (BOS), direct current (DC) circuit breakers protect the wiring connected from the PV modules to the combiner or the inverter, while also functioning as a disconnect.

Eaton is a global leader in circuit protection and brings this expertise to bear in the photovoltaic market. PVGard™ solar circuit breakers are part of a product family that combines a disconnect with overcurrent protection in one device to protect photovoltaic systems. PVGard breakers can replace fuses and disconnects in combiner box and inverter applications—saving space, streamlining purchasing and receiving, and reducing spare parts requirements.

There are two PVGard lineups to choose from—the industry-exclusive, 600 Vdc Per-Pole breakers and switches for residential and light commercial applications, and the 1000 Vdc Poles-in-Series breakers and switches for commercial and utility-scale solar systems.





PVGard 600 Vdc Per-Pole lineup

This breakthrough circuit breaker from Eaton will save significant space, time and cost. As a single circuit Per-Pole device, it allows space savings of up to 66% when compared to traditional poles-in-series disconnects, switches and breakers. In addition, it eliminates the need for jumpers for poles-in-series connection—saving on installation time and labor as well as inventory.

Features

- Meets and exceeds the standards of UL 489B for photovoltaic molded-case circuit breakers and molded-case switches
- Designed to meet higher voltage and lower fault current levels of solar systems
- 50 °C calibrated
- Tested to extreme ambient conditions from –40 to +90 °C
- Offers both 100% and 80% rated breakers
- Can handle bidirectional current flow
- Can be applied in grounded, ungrounded or bipolar systems
- Full complement of accessories for status, signaling, lockout/tagout and remote on/off operation
- Ability to open on signal from DC arc or ground fault detector
- Wide range of current ratings increases options for matching incoming strings
- Eliminates fuse stocking costs and matching issues

PVGard 1000 Vdc Poles-in-Series lineup

This 1000 Vdc Poles-in-Series lineup provides reliable and safe disconnect means and overcurrent protection in one combined solution for commercial and utility-scale PV systems. This solution does not require certain jumpers for poles in series connection to be a UL® 489B listed device, providing reliability and flexibility in design/installation. If needed, cost-effective, UL listed Eaton jumpers can be added separately.

Available accessories

- Auxiliary switch
- Shunt trip
- Electrical operator
- Alarm lockout
- Undervoltage release
- Terminals
- Lock-off devices
- End cap kits
- Rotary handle mechanisms
- Flexible shaft handle mechanisms

Optional modifications

- Freeze testing

Designed specifically for high- and low-temperature demands of PV installations, PVGard circuit breakers undergo extreme ambient cycling tests and carry a robust operating temperature range. Trip units calibrate at 50 °C ambient temperatures, ensuring continuous operation in higher temperature environments typical to solar.

Rigorous third-party testing includes limited and standard fault current tests, electrical and mechanical endurance, di-electric voltage withstand and temperature tests. Eaton's PVGard products are standalone devices that do not require jumpers to be UL 489B listed devices.

PVGard breakers are available with a full complement of accessories to provide string status, enable remote trip and on/off operation, and can be customized to site requirements. PVGard breakers conform to the UL 489B standard for photovoltaic molded-case circuit breakers and switches.

PVGard 600 Vdc photovoltaic circuit breakers

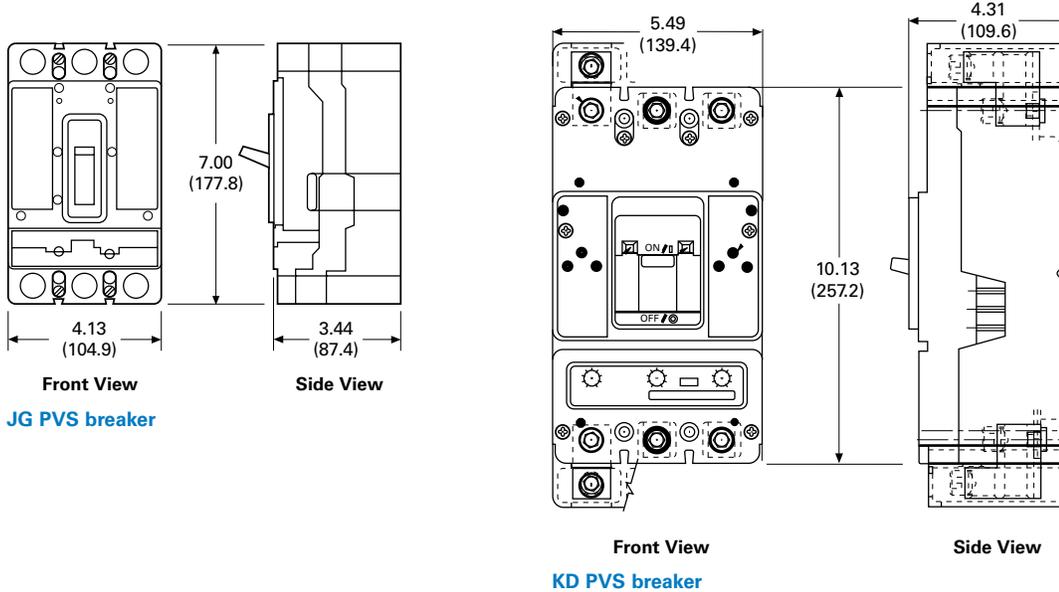
| Description | Frame | |
|--|-------------------------------|------------------------------|
| | JG PVS | KD PVS |
| Ratings | | |
| Number of poles | 3 | 3 |
| Ampere range | 90–250 A | 100–400 A |
| Maximum voltage rating | 600 Vdc | 600 Vdc |
| Interrupting capacity at 600 Vdc | 1.2 kA | 3 kA |
| Design ambient temperature | 50 °C | 50 °C |
| Third-party certification | UL 489B | UL 489B |
| Suitable for reverse-feed applications | Yes | Yes |
| Terminations | | |
| Al/Cu wire | TA250FJ: (1) #8–350 kcmil | TA300K: (1) #3–350 kcmil |
| | 3TA251FJK1: (2) 2/0–(2) 4/0 ❶ | TA350K: (1) 250–500 kcmil |
| | 3TA251FJK2: (2) 2/0–(2) 4/0 ❷ | TA403K: (2) 1/0–400 kcmil |
| Cu wire | T250FJ: (1) #4–350 kcmil | 3TA402K: (1) 500–750 kcmil ❸ |
| | | T300K: (1) #3–350 kcmil |

❶ Three terminals with terminal shield as a kit.

❷ Three terminals with two interphase barriers as a kit.

❸ Not UL 489B recognized size for maximum of 400 A breaker.

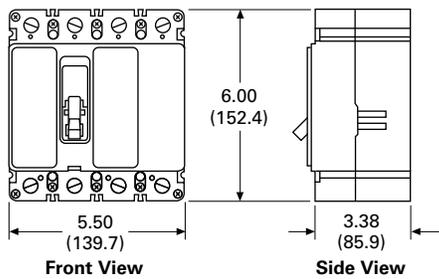
Dimensions in inches (mm)



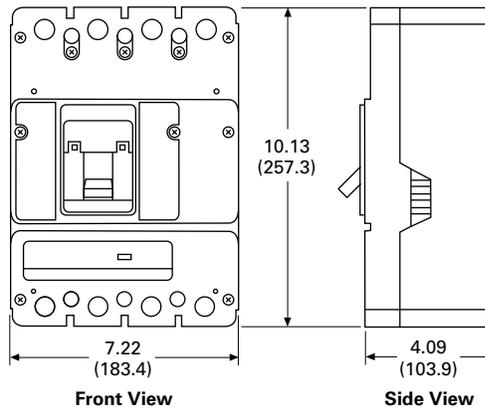
PVGard 1000 Vdc solar photovoltaic circuit breakers

| Description | Frame | | | |
|--|--------------|-------------------|------------------|-------------------|
| | FD PV | KD PV | LG PV | MDL PV |
| Ratings | | | | |
| Number of poles | 4 | 4 | 4 | 3 |
| Ampere range | 30–100 A | 125–350 A | 250–400 A | 300–600 A |
| Maximum voltage rating | 1000 Vdc | 1000 Vdc | 1000 Vdc | 1000 Vdc |
| Interrupting capacity at 1000 Vdc | 3 kA | 5 kA | 5 kA | 7.5 kA |
| Design ambient temperature | 50 °C | 50 °C | 50 °C | 50 °C |
| Third-party certification | UL 489B | UL 489B | UL 489B | UL 489B |
| Suitable for reverse-feed applications | Yes | Yes | Yes | Yes |
| Terminations | | | | |
| Al/Cu wire | #6–300 kcmil | (2) 3/0–250 kcmil | (2) #2–500 kcmil | (3) 3/0–400 kcmil |
| Cu wire | #4–4/0 kcmil | (2) 3/0–250 kcmil | (2) #2–500 kcmil | (3) 3/0–300 kcmil |

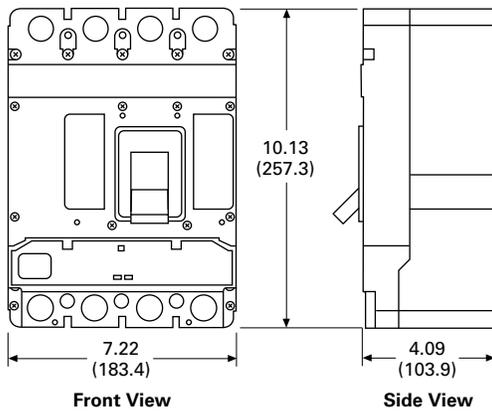
Dimensions in inches (mm)



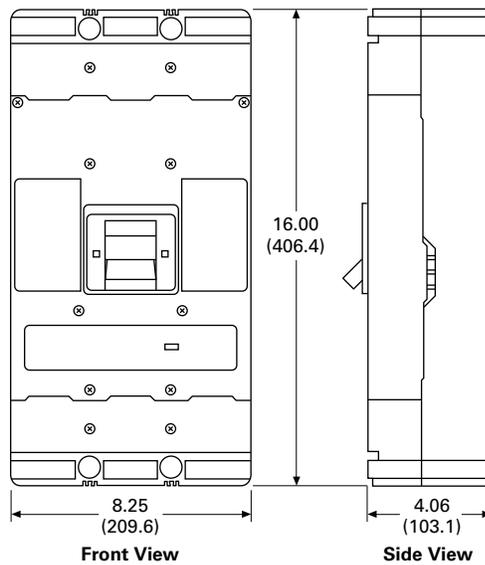
FD PV breaker



KD PV breaker



LG PV breaker



MDL PV breaker

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