



Safety and Installation Instructions

for United States and Canada

This document applies to the following SunPower Modules:

72 Cell Models:

SPR-220-WHT-U, SPR-210-WHT-U, SPR-200-WHT-U,
SPR-215-BLK-U, SPR-205-BLK-U

SunPower Corporation
www.sunpowercorp.com

Safety and Installation Instructions (United States and Canada)

1.0 Introduction

This manual provides safety and installation instructions for UL-listed SunPower photovoltaic (PV) modules carrying the UL logo on the product label (Figure 1).



Figure 1

Important! Read this instruction sheet in its entirety before installing, wiring, or using this product in any way. Failure to comply with these instructions will invalidate the SunPower Limited Warranty for PV Module.

1.1 Disclaimer of Liability

The installation techniques, handling and use of this product are beyond company control. Therefore, SunPower does not assume responsibility for loss, damage or expense resulting from improper installation, handling or use.

1.2 Underwriters Laboratories (UL) Listing Information

This product meets or exceeds the requirements set forth by UL1703 for PV Modules. This UL Standard covers flat-plate PV modules and panels intended for installation on buildings or those intended to be freestanding. To satisfy the listing for this product the modules must be mounted with a rack or standoff structure. The UL listing does not include integration into a building surface because additional requirements may apply. This product is not intended for use where artificially concentrated sunlight is applied to the module.

1.3 Limited Warranty

Module limited warranties are described in the SunPower warranty certificates obtainable at www.sunpowercorp.com.

2.0 Safety Precautions

Before installing this device, read all safety instructions in this document.

Danger! Module interconnects pass direct current (DC) and are sources of voltage when the module is under load and when it is exposed to light. **Direct current can arc across gaps and may cause injury or death if improper connection or disconnection is made, or if contact is made with module leads that are frayed or torn.** Do not connect or disconnect modules when current from the modules or an external source is present.

- Cover all modules in the PV array with an opaque cloth or material before making or breaking electrical connections.
- All installations must be performed in compliance with the National Electrical Code (NEC) and any applicable local codes.
- There are no user serviceable parts within the module. Do not attempt to repair any part of the module.
- Installation should be performed only by authorized personnel.
- Remove all metallic jewelry prior to installing this product to reduce the chance of accidental exposure to live circuits.
- Use insulated tools to reduce your risk of electric shock.
- Do not stand on, drop, scratch, or allow objects to fall on modules.
- If the front glass is broken, or the back sheet is torn, contact with any module surface or module frame can cause electric shock.
- Do not install or handle the modules when they are wet or during periods of high wind.
- Contact your module supplier if maintenance is necessary.
- Save these instructions!

3.0 Electrical Characteristics

The module electrical ratings are measured under Standard Test Conditions (STC) of 1 kW/m² irradiance with AM 1.5G spectrum and a cell temperature of 25° C. SunPower modules deliver specific electrical characteristics (Figure 2).

Electrical Characteristics at STC

Module	Rated Power (W)	Power Tol (%)	Voltage at Rated Power (V)	Curr at Rated Power (A)	Open Circuit Voltage (V)	Short Circuit Current (A)	Max Series Fuse (A)	Max Sys Voltage (V)	Current Temp Coeff (mA/°C)	Voltage Temp Coeff (mV/°C)	Power Temp Coeff (%/°C)
SPR-220-WHT	220	+/- 8	39.8	5.53	48.3	5.95	15	600	3.5	-136.8	-0.38
SPR-215-BLK	215	+/- 8	39.8	5.40	48.3	5.80	15	600	3.5	-136.8	-0.38
SPR-210-WHT	210	+/- 5	40.0	5.25	47.7	5.75	15	600	3.5	-136.8	-0.38
SPR-205-BLK	205	+/- 5	40.0	5.13	47.8	5.53	15	600	3.5	-136.8	-0.38
SPR-200-WHT	200	+/- 5	40.0	5.0	47.8	5.4	15	600	3.5	-136.8	-0.38

Figure 2

A photovoltaic module may produce more current and/or voltage than reported at STC. Sunny, cool weather and reflection from snow or water can increase current and power output. Therefore, the values of I_{sc} and V_{oc} marked on the module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacities, fuse sizes, and size of controls connected to PV output. An additional 1.25 multiplier may be required by the NEC for sizing fuses and conductors as described in the NEC Section 690-8.

3.1 Fire Rating

The module is Class C fire rated.

4.0 Electrical Connections

Modules may be connected in series and/or parallel to achieve the desired electrical output as long as certain conditions are met. Please use only the same type of modules in a combined source circuit.

4.1 Equipment Grounding

To avoid electrical shock, ground the frame of the module or array before wiring the circuit using a grounding method that meets NEC requirements for grounding solar electrical systems. SunPower recommends the following two methods of grounding the module frame.

1) Attach an equipment ground conductor with stainless steel hardware at one of the four designated 0.17" grounding holes on the module frame. If an equipment ground conductor larger in diameter than #10 AWG is necessary, a grounding lay-in lug is required. A thread-forming 10-32 stainless steel screw is required when using a self-drilling type screw to make the frame ground connection. Please refer to NEC Article 690 on grounding PV arrays for specific requirements.

2) SunPower modules can be grounded using third-party grounding washer or clip systems provided they have been tested and certified to meet UL 467 requirements for bonding/grounding systems and are installed according to the manufacturer's specified instructions.

4.2 System Grounding

Important! For optimal performance, SunPower PV modules must only be used in configurations where the positive polarity of the PV array is connected to ground. **Failure to comply with this requirement will reduce the performance of the system and invalidate SunPower's Limited Power Warranty for PV Modules.**

For more information on grounding the system correctly, visit our website at www.sunpowercorp.com/inverters or contact SunPower technical support at 1-877-SUN-0123.

4.3 Series Connection

The modules may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage indicated in Figure 2.

4.4 Parallel Connection

The modules may be combined in parallel to produce the desired current output. Each series string or module may be required to be fused prior to combining with other strings. Figure 2 describes the maximum fuse size allowed. Please refer to the NEC Article 690 for additional fusing requirements.

5.0 Module Mounting

The SunPower Limited Warranty for PV Modules is contingent upon modules being mounted in accordance with the requirements described in this section.

5.1 Site Considerations

SunPower modules should be mounted in locations that meet the following requirements:

Operating Temperature: All SunPower modules must be mounted in environments that ensure SunPower modules will operate within the following maximum and minimum operating temperatures:

Maximum Operating Temperature	+90 ° Celsius, +194 ° Fahrenheit
Minimum Operating Temperature	-40 ° Celsius, -40 ° Fahrenheit

Care should be taken to provide adequate ventilation behind the modules, especially in hot environments.

Design Strength: SunPower modules are designed to meet a maximum positive (or upward, e.g. wind) and negative (or downward, e.g. static load) design pressure of 50 lb/ft² when mounted in one of the mounting configurations specified in Section 5.2. A design strength of 50 lb/ft² corresponds approximately to a wind speed of 125 mph.

When mounting modules in snow-prone or high-wind environments, special care should be taken to mount the modules in a manner that provides sufficient design strength while meeting local code requirements.

Excluded Operating Environments: Certain operating environments are not recommended for SunPower modules and are excluded from the SunPower Limited Warranty for these modules.

No SunPower module should be mounted at a site where it may be subject to direct contact with salt water.

5.2 Mounting Configurations

Modules may be mounted at any angle, from horizontal to vertical. Select the appropriate orientation to maximize sunlight exposure. Specific information on module dimensions and the location of mounting and grounding holes is provided below (Figures 3 and 4).

In order to prevent water from entering the junction box, which could present a safety hazard, modules should not be mounted such that the front/top glass faces downward (e.g., on a tracking structure that positions the modules with the junction box facing skyward during sleep mode).

Clearance between the module frames and structure or ground is required to prevent wiring damage and allows air to circulate behind the module.

The module is only UL Listed for use when its factory frame is fully intact. Do not remove or alter the module frame. Creating additional mounting holes may damage the module and reduce the strength of the frame.

Modules may be mounted using the following methods only:

- 1) Frame Holes:** Secure the module to the structure using the factory mounting holes. Four 1/4" stainless steel bolts, with nuts, washers, and lock washers are recommended per module. Refer to Figure 3 for the module dimensions and hole locations. This method has been certified by a third-party organization according to UL 1703.
- 2) Pressure Clamps or Clips:** Mount the module with the clips on the side frame of the module. The side frames are attached to the longer sides of the module. The centerline of the clips should be 6"-15" from the end of the side frame. Installers should ensure the clamps are of sufficient strength to allow for the maximum design pressure of the module. Clips and clamps are not provided by SunPower.
- 3) End Mount:** End mounting is the capture mounting of the length of the module's end frame to a supporting rail. The end frames are on the shorter dimensions of the module. The end-mounting rail and clips or clamps must be of sufficient strength to allow for the maximum design pressure of the module. Verify this capacity with the mounting system vendor before installation.

6.0 Maintenance

Inspect all modules annually for safe electrical connections, sound mechanical connection, and freedom from corrosion. Periodically clean the module surface with water and a soft cloth or sponge. Fingerprints may be removed with standard glass cleaner. Do not use harsh cleaning materials such as scouring powder, steel wool, scrapers, blades, or other sharp instruments to clean the glass surface of the module. Use of such materials will invalidate the product warranty.

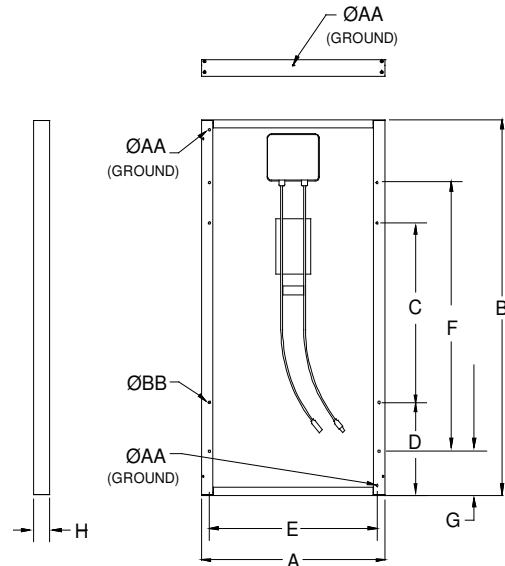


Figure 3

DIMENSION	MODEL FORMAT
	72-Cell Models (mm, in)
A	798 (31.42)
B	1559 (61.39)
C	915 (36.02)
D	332 (12.69)
E	754 (29.69)
F	1200 (47.24)
G	180 (7.04)
H	46 (1.81)
ØAA (Ground)	4X 4.2 (0.17)
ØBB	4X 6.6 (0.26)

Figure 4