

### Safety and Installation Instructions

#### 1.0 Introduction

This manual provides safety and installation instructions for Sunny Inspire photovoltaic (PV) panels made with high efficiency back contact cells (Model number SA-HXX or SA-HXXX which XX or XXX defines product power output variants).

**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 Sunny Inspire Limited Warranty.

#### 1.1 Disclaimer of Liability

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

#### 1.2 Limited Warranty

Panel limited warranties are described in the Sunny Inspire warranty certificates obtainable at [www.sunnyinspire.com](http://www.sunnyinspire.com).

Warranties do not apply to any of the following;

PV panels which in Sunny Inspire absolute judgment have been subjected to: misuse, abuse, neglect or accident; alteration, improper installation, application or removal (including but not limited to installation, application or removal by any party other than a qualified personnel; non-observance of Sunny Inspire installation, users and/or maintenance instructions; repair or modifications by someone other than an approved service technician; power failure surges, lightning, flood, fire, accidental breakage or other events outside Sunny Inspire control.

#### 2.0 Safety Precautions

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

***Danger!*** Panel interconnects pass direct current (DC) and are sources of voltage when the panel 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 panel components that are damaged.*** Do not connect or disconnect panels when current from the panels or an external source is present.

- Cover all panels in the PV array with an opaque cloth or material before making or breaking electrical connections.
- It is imperative to use the supplied locking connectors and safety clips in order to defend against untrained personnel disconnecting the panels once they have been installed.
- All installations must be performed in compliance with all applicable regional and local codes.
- There are no user serviceable parts within the panel. Do not attempt to repair any part of the panel.
- Installation should be performed only by qualified 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 panels.
- Damaged panels (broken glass, torn back sheet, broken j-boxes, broken connectors, etc) can be electrical hazards as well as laceration hazards. Contact with damaged panel surfaces or panel frame can cause electric shock. The dealer or installers should remove the panel from array and contact the supplier for disposal instructions.

- Do not install or handle the panels when they are wet or during periods of high wind.
- Contact your panel supplier if maintenance is necessary.
- Save these instructions!

### 3.0 Electrical Characteristics

The panel electrical ratings are measured under Standard Test Conditions (STC) of 1 kW/m<sup>2</sup> irradiance with AM 1.5 spectrum and a cell temperature of 25° C. Sunny Inspire panels have specific electrical characteristics as shown on the datasheets.

A photovoltaic panel 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 panel 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 certain codes for sizing fuses and conductors.

Sunny Inspire recommends the use of open-circuit voltage temperature coefficients listed on the datasheets when determining Maximum System Voltage.

### 4.0 Electrical Connections

Panels 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 panels in a combined source circuit.

Sunny Inspire recommends that all wiring be double insulated with a minimum rating of 85° C (185° F). All wiring should use flexible copper (Cu) conductors. The minimum size should be determined by the applicable codes. We recommend a size not less than 4mm<sup>2</sup>. The insulation type should be appropriate for the type of installation method used and must meet SCII (Safety Class II) and IEC 61730 requirements.

#### 4.1 System Grounding

Please refer to the applicable regional and local codes on grounding PV arrays and mounting frames for specific requirements (e.g. lightning protection).

#### 4.2 Series Connection

The panels may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage.

#### 4.3 Parallel Connection

The panels may be combined in parallel to produce the desired current output. Series string must be fused prior to combining with other strings if the resulting maximum reverse current exceeds the fuse rating as shown in the datasheets. Bypass diodes are factory installed in the panels. Please refer to the applicable regional and local codes for additional fusing requirements and limitations on the maximum number of panels in parallel.

### 5.0 Panel Mounting

The Sunny Inspire Limited Warranty for PV Panels is contingent upon panels being mounted in accordance with the requirements described in this section.

#### 5.1 Site Considerations

Sunny Inspire panels should be mounted in locations that meet the following requirements:

**Operating Temperature:** All Sunny Inspire panels must be mounted in environments that ensure Sunny Inspire panels will operate within the following maximum and minimum operating temperatures:

Maximum Temperature	Operating	+85°Celsius, +185° Fahrenheit
Minimum Temperature	Operating	-40°Celsius, -40° Fahrenheit

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

No Sunny Inspire panel should be mounted at a site where it may be subject to direct contact with salt water.

### 5.2 Mounting Configurations

Panels may be mounted at any angle from horizontal to vertical. Select the appropriate orientation to maximize sunlight exposure.

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

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

When installed on a roof, the panel shall be mounted over a fire-resistant roof covering rated for the application.

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

Panels may be mounted using the following methods only:

- 1) **Frame Holes:** Secure the panel to the structure using the factory mounting holes. Stainless steel bolts, with nuts, washers, and lock washers are recommended per panel.
- 2) **Pressure Clamps or Clips:** Mount the panel with the clips on the side frame of the panel. The side frames are attached to the longer sides of the panel. Installers should ensure the clamps are of sufficient

strength to allow for the maximum design pressure of the panel. Clips and clamps are not provided by Sunny Inspire.

- 3) **End Mount:** End mounting is the capture mounting of the length of the panel's end frame to a supporting rail. The end frames are on the shorter sides of the panel. The end-mounting rail and clips or clamps must be of sufficient strength to allow for maximum design pressure of the panel. Verify this capacity with the mounting system vendor before installation.

### 6.0 Maintenance

Inspect all panels annually for safe electrical connections, sound mechanical connection and freedom from corrosion. Periodically clean the panel 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 panel. Use of such materials will invalidate the product warranty.