Installation Manual

1. OVERVIEW

This installation manual contains information regarding the installation and safe handling of Wuxi Saijing Solar Co., LTD photovoltaic module (hereafter referred to as “module”). Wuxi Saijing Solar Co., LTD referred to as “ECSOLAR”.

Installer must read and understand the instructions before installation. If there are any questions, please contact ECSOLAR after sales department for further information.

Installer should conform to all safety precautions in the guide and local codes when installing solar modules. In addition, before installing the system, contact local authorities to determine the necessary permitting, installation and inspection requirements. Keep this manual in a safe place for further reference (care and maintenance) and in case of sale or disposal of the modules.

2. SOLAR MODULE

Photovoltaic solar modules convert light energy to direct current electrical energy. They are designed for outdoor use. ECSOLAR Modules are ideal to power remote homes, recreational vehicles, water pumps, telecommunication systems and many other applications either with or without the use of storage batteries.

3. PRECAUTIONS

- All PV modules should be installed according to all local and national applicable standards, codes and regulations.
- Installing solar photovoltaic systems requires specialized skills and knowledge. Installation should be performed only by qualified persons.
- Installers should assume the risk of all injury that might occur during installation, operation and maintenance of the modules.
- Rooftop installations should be placed over fire resistant roofs only.
- Do not use mirrors or other magnifiers to artificially concentrate sunlight on the modules. Do not expose back sheet foils directly to sunlight.
- Do not stand or step on the module. To avoid glass breakage, do not place any heavy objects on the module.
- Do not drop the module or allow objects to fall on the module.
- Do not attempt to disassemble the modules, and do not remove any attached nameplates or components from the modules.
- To avoid damage to the backsheet, do not scratch or hit the backsheet.
- Do not drill holes in the frame. This may compromise the frame strength and cause corrosion of the frame.
- A panel with broken glass or torn backsheet cannot be repaired and must not be used since contact with any panel surface or the frame can cause an electric shock.
- Work only under dry conditions, and use only dry tools. Do not handle panels when they are wet unless wearing appropriate protective equipment.

- Use only insulated tools that are approved for working on electrical installations.
- Use only equipment, connectors, wiring and support frames suitable for a solar electric system. Always use the same type of module within a particular photovoltaic system.
- Do not touch the PV module unnecessarily during installation. The glass surface and the frame may be hot; there is a risk of burns and electric shock.
- Avoid exposing cables to direct sunlight in order to prevent their degradation.
- Under normal outdoor conditions the current and voltage generated by the system will differ from those listed on the datasheet. Datasheet values are the values measured under standard test conditions.
- Only use connectors to connect modules to form a string, or connect to another device. Removing the connectors will make the warranty void.

4. INSTALLATION

Site selection

PV modules should be mounted in a location where they will receive maximum sunlight throughout the year. Specifically, in the Northern Hemisphere, the modules should face South. In the Southern Hemisphere, the modules should face North.

- In order to achieve maximum annual yield, optimum orientation and tilt of PV modules is necessary. Sunlight shining vertically and completely onto the PV module is the best condition to generate maximum power. Artificially concentrated sunlight should not be directed on the module.
- Very hot module(s) can reduce power output performance. Ensure the module has good ventilation conditions to prevent overheating.
- Site-specific environment loads, such as wind and snow, should be taken into account to avoid exceeding the maximum load.
- The module must not be installed close to fire or flammable materials.

Module tilt angle

Modules connected in series should be installed at same orientation and angle. Different orientation or angle may cause loss of output power due to difference of amount of sunlight exposed to the module. The specific angle depends on the sunlight condition, local climate and the actual application requirement. The optimal tilting of module is almost the same as the latitude of installation location.

General installation

- The module mounting structure must be made of durable, corrosion-resistant and UV-resistant material.
- It is not allowed to dismount, drill or modify the frame or any other part of the PV module. This may void warranty.
- Use only insulated tools that are approved for working on electrical installations. Abide with the safety regulations for all other components used in the system, including wiring and cables, connectors, charging regulators, inverters, storage batteries and rechargeable batteries, etc.
- When the modules connect in series, the voltage of the string cannot exceed the max system

voltage, as reference the maximum number of modules (N) can be easily calculated by dividing the Maximum System Voltage of the modules by the respective Voc value of the module. When designing the SPV system, please always take into consideration the variation of the voltage under different temperatures.

- The module frame is made of anodized aluminum, and therefore corrosion can occur if the module is subject to a salt water environment with contact to a rack of another type of metal (Electrolysis Corrosion). If required, PVC or stainless steel washers can be placed between the module frame and support structure to prevent this type of corrosion. Module support structures that are to be used to support modules at correct tilt angles should be rated for wind and snow loads and comply with local and civil codes prior to installation.
- The DC electrical energy generated by photovoltaic systems may also be converted to AC and connected to a utility grid system. As local utilities' policies on connecting renewable energy systems to their grids vary from region to region, consult a qualified system designer or integrator to design such a system. Permits are normally required for installing such a system and the utility must formally approve and inspect such a system before it can be accepted.

Installation methods

- Modules can be installed on the frame using mounting holes or clamps. Modules must be installed according to the following instructions. Not mounting according to these instructions may avoid the warranty.

Frame Holes Mounting

- There are 8 or more mounting holes on the reverse side of aluminum alloy frame. Modules must be securely attached to the mounting structure using 4 mounting holes. Metric M6×1 zinc-plate screws or stainless steel screws and flat washer are designed to use.
- The modules are designed to resist a wind load of 2400 Pa and a snow load of 5400 Pa. If additional wind or snow loads are anticipated for the installation, additional mounting holes should be used.

Clamp mounting

- The PV modules are suitable for mechanical mounting both in portrait and landscape orientation.
- The module clamps must not come into contact with the front glass or deform the frame in any way. Avoid shading effects from the module clamps and insertion systems.

Grounding

- For grounding and bonding requirements, please refer to regional and national safety and electricity standards. If grounding is required, use a recommended connector type, or an equivalent, for the grounding wire.
- If grounding is required, the grounding wire must be properly fastened to the module frame to assure adequate electrical connection.
- When use copper wire grounding, the end that linked to the grounding nut of the frame should be plated tin, or a transitional washer should be used to prevent electrochemistry corrosion.

5. MAINTENANCE

To ensure optimum module performance, ECSOLAR recommends the following maintenance measures:

- Clean the glass surface of the module when required. Always use clean water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent may be used to remove stubborn dirt.
- Check the electrical, grounding and mechanical connections every six months to verify that they are clean, secure, undamaged and free of corrosion.
- If any problem arises, consult a professional for suggestions.
- Caution: Observe the maintenance instructions for all components used in the system, such as support frames, charging regulators, inverters, batteries etc.

6. DISCLAIMER OF LIABILITY

The installation, handling and use of ECSOLAR modules are beyond company control. Accordingly, ECSOLAR does not assume responsibility for loss, damage, injury or expense resulting from improper installation, handling, use or maintenance.

ECSOLAR assumes no responsibility for any infringement of patents or other rights of third parties that may result from use of the module. No license is granted by implication or under any patent or patent rights.

ECSOLAR reserves the right to update the product, specifications or this installation manual without prior notice.

7. CONTACT

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