

USER MANUAL

Please read this manual carefully before installing and using the modules. It is the great honor to provide you with our PV modules. In order to enable the PV module to be installed correctly and to generate electric power properly, please read the following operation instruction carefully.

1. Warning:

1. Artificially concentrated sunlight shall not be directed on the module or panel.
2. Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the value of I_{sc} and V_{oc} marked on this module should be multiplied by of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.
3. Do not touch live terminals with bare hands. Use insulated tools for electrical connections.
4. To reduce the risk of electrical shock or burns, modules may be covered with an opaque material during installation to avoid shocks or burns.
5. The installation work of the PV array can only be done under the protection of sun-sheltering covers or sunshades and only qualified person can install or perform maintenance work on this module.
6. Follow the battery manufacture's recommendations if batteries are used with modules.
7. All instructions should be read and understood before attempting to install, wire, operate and maintain the module.

2. Unpacking

After the PV module has been shipped to the installation site all of the parts should be unpacked properly with care.

Caution: The condign environment for unpacking the modules and all other apparatus should be proofed against dampness and rainfall.

3. Preparation before Installation:

1. Optical check before installation, to make sure there is no bug in the packing and junction box as well as the surface of module.
2. Check the series number.
3. Check the solar cell modules with irradiance of more than $600W/m^2$ and get the voltage. In case the voltage is ZERO, it should NOT be

installed and please contact the supplier.

4. Tools & Material for Installation

(1) Screwdriver

(2) Clamp

(3) For each installation hole, there should be a screw (M8*25), gasket and screw cap, all made of stainless iron.

(4) The users should design and build metallic bracket for installing and bearing the weight of the PV modules. The brackets are specially designed for users' installation places such as the open land or on the roof of houses.

Caution: To avoid damage from flooding and other unpredictable events, and avoid heavy impact. To design a gradient angle facing the sun radiation direction in order to insure the full sunshine receives as much as possible.

4. INSTALLATION AND OPERATION

- **Systems should be installed by qualified personnel only and at least two persons. The system involves electricity, and can be dangerous if the personnel are not familiar with the appropriate safety procedures.**
- **Do not step on the module.**
- **Although modules are quite rugged, the glass can be broken (and the module will no longer work properly) if it is dropped or hit by tools or other objects.**
- **Put the solar cell modules on the frame and put on the screws and then combine them firmly after put on all the gaskets. All the screw caps should be finished on the frame together firmly. 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 solar module frame and support structure to prevent this corrosion.**
- **The solar module frame must be attached to a support structure using 1/4" or M6 stainless steel hardware in a minimum of four (4) places symmetrical on the solar module .The stainless steel hardware used for securing the module frame should secure with an applied torque of 6 foot-pounds(8Newton-meters).**
- **Module support structures that are to be used to support modules should be wind rated and approved for use by the appropriate local and civil codes prior to installation.**
- **When solar modules are used to charge batteries, the battery must be installed in a manner, which will protect the performance of the system and the safety of its users. Follow the battery manufacturer's, guidelines concerning installation, operation and maintenance**

recommendations. In general, the battery (or battery bank) should be away from the main flow of people and animal traffic. Select a battery site that is protected from sunlight, rain, snow, debris, and is well ventilated. Most batteries generate hydrogen gas when charging, which can be explosive. Do not light matches or create sparks near the battery bank. When a battery is installed outdoors, it should be placed in an insulated and ventilated battery case specifically designed for the purpose.

- In most applications, PV modules should be installed in a location where they will receive maximum sunlight throughout the year. In the Northern Hemisphere, the modules should typically face south, and in the Southern Hemisphere, the modules should typically face north. Modules facing 30 degrees away from true South (or north) will lose approximately 10 to 15 percent of their power output. If the module faces 60 degrees away from true South (or North), the power loss will be 20 to 30 percent. When choosing a site, avoid trees, buildings or obstructions, which could cast shadows on the solar.

5. Wiring and Connection:

1. Before this procedure, please read the operation instructions of the PV control system carefully.
2. Make wiring by Multi-connecting cables between the PV modules in series or parallel connection, which is determined by user's configuration requirement for system power, current and voltage.
3. Open the connection box of the control system and connect the cabled from the PV arrays to the connection box in accordance with the installation indication of the PV control systems.
4. All module frames and mounting racks must be properly grounded in accordance with local and national electrical codes.
5. Follow the requirements of applicable local and national electrical codes.

6. Maintenance and Care:

1. A built up of dust or dirt on the module(s) front face will result in a decreased energy output. Clean the panel(s) preferably once per annum if possible (dependant on site conditions) using a soft cloth dry or damp, as necessary.
2. Never use abrasive material under any circumstances.
3. Examine the PV module(s) for signs of deterioration. Check all wiring for possible rodent damage, weathering and that all connections are tight and corrosion free. Check electrical leakage to ground.
4. Check fixing screws and mounting brackets and tight, adjust and tighten as necessary.