

## **Installation 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:**

- 1.1 Artificially concentrated sunlight shall not be directed on the module or panel.
- 1.2 Application class is class A.
- 1.3 Fire resistant roof covering is Class C. The mounting design may have an impact on the fire resistance
- 1.4 Modules rated for use in this application class may be used in systems operating at greater than 50V DC or 240W, where general contact access is anticipated. Modules qualified for safety through this part of IEC61730 and IEC61730-2 and within this application class are considered to meet the requirements for safety class II .
- 1.5 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.
- 1.6 Do not touch live terminals with bare hands. Use insulated tools for electrical connections.
- 1.7 To reduce the risk of electrical shock or burns, modules may be covered with an opaque material during installation to avoid shocks or burns.
- 1.8 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.

- 1.9 Follow the battery manufacture's recommendations if batteries are used with modules.
- 1.10 All instructions should be read and understood before attempting to install, wire, operate and maintain the module.
- 1.11 If instructions are provided allowing modules to be installed in parallel electrically, the installation instructions shall specify that each module (or series string of modules so connected) shall be provided with the maximum series fuse.

## **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:**

- 3.1 Optical check before installation, to make sure there is no bug in the packing and junction box as well as the surface of module.
- 3.2 Check the series number
- 3.3 Check the solar cell modules with irradiance of more than  $600\text{W}/\text{m}^2$  and get the voltage. In case the voltage is ZERO, it should NOT be installed and please contact the supplier.
- 3.4 Tools & Material for Installation
  - ① Screwdriver
  - ② Clamp
  - ③ Each mounting hole matches with a set of a screw, a nut and two washer, 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.

RECOMMENDED TILT ANGLES FOR A FIXED SYSTEM	
SITE LATITUDE IN DEGREES	FIXED TILT ANGLE
0° TO 15°	15°
15° TO 25°	SAME AS LATITUDE
25° TO 30°	LATITUDE+5°
30° TO 35°	LATITUDE+10°
35° TO 40°	LATITUDE+15°
40° +	LATITUDE+20°

#### 4. ELECTRICAL CHARACTERISTICS FOR ALL MODULES

CEC6-60-XXXP

电气参数 (标准测试条件) Electrical Characteristics	CEC6-60-260P	CEC6-60-265P	CEC6-60-270P	CEC6-60-275P	CEC6-60-280P
最大功率-Pmax (Wp) Max Power (Wp)	260	265	270	275	280
最大工作电压-Vmp (V) Max-Power Voltage Vmp (V)	30.62	30.78	31.03	31.29	31.46
最大工作电流-Imp (A) Max-Power Current Imp (A)	8.49	8.61	8.70	8.79	8.90
开路电压-Voc (V) Open-Circuit Voltage Voc (V)	37.15	37.41	37.66	37.91	38.16
短路电流-Isc (A) Short-Circuit Current Isc (A)	9.09	9.20	9.31	9.42	9.53
最大系统电压-Vdc (V) Max-system Voltage (Vdc)	1000	1000	1000	1000	1000
功率公差 (%) Power Tolerance (%)	± 3%	± 3%	± 3%	± 3%	± 3%

CEC6-72-XXXP

# CECEP Solar Energy Technology(Zhenjiang) Co., Ltd.

电气参数 (标准测试条件) Electrical Characteristics	CEC6-72-325P	CEC6-72-330P	CEC6-72-335P	CEC6-72-340P	CEC6-72-345P
最大功率-Pmax (Wp) Max Power (Wp)	325	330	335	340	345
最大工作电压-Vmp (V) Max-Power Voltage Vmp (V)	37.25	37.45	37.62	37.82	38.10
最大工作电流-Imp (A) Max-Power Current Imp (A)	8.72	8.81	8.90	8.99	9.06
开路电压-Voc (V) Open-Circuit Voltage Voc (V)	45.7	45.9	46.2	46.4	46.60
短路电流-Isc (A) Short-Circuit Current Isc (A)	9.18	9.27	9.32	9.39	9.47
最大系统电压-Vdc (V) Max-system Voltage (Vdc)	1000	1000	1000	1000	1000
功率公差 (%) Power Tolerance (%)	± 3%	± 3%	± 3%	± 3%	± 3%

## CEC6-60-XXXM

电气参数 (标准测试条件) Electrical Characteristics	CEC6-60-275M	CEC6-60-280M	CEC6-60-285M	CEC6-60-290M	CEC6-60-295M
最大功率-Pmax (Wp) Max Power (Wp)	275	280	285	290	295
最大工作电压-Vmp (V) Max-Power Voltage Vmp (V)	31.44	31.57	31.77	31.99	32.21
最大工作电流-Imp (A) Max-Power Current Imp (A)	8.75	8.87	8.97	9.07	9.16
开路电压-Voc (V) Open-Circuit Voltage Voc (V)	38.16	38.32	38.56	38.83	39.09
短路电流-Isc (A) Short-Circuit Current Isc (A)	9.36	9.49	9.60	9.70	9.80
最大系统电压-Vdc (V) Max-system Voltage (Vdc)	1000	1000	1000	1000	1000
功率公差 (%) Power Tolerance (%)	± 3%	± 3%	± 3%	± 3%	± 3%

## CEC6-72-XXXM

电气参数 (标准测试条件) Electrical Characteristics	CEC6-72-335M	CEC6-72-340M	CEC6-72-345M	CEC6-72-350M	CEC6-72-355M
最大功率-Pmax (Wp) Max Power (Wp)	335	340	345	350	355
最大工作电压-Vmp (V) Max-Power Voltage Vmp (V)	37.65	38.26	38.55	38.90	38.95
最大工作电流-Imp (A) Max-Power Current Imp (A)	8.90	8.89	8.95	9.02	9.12
开路电压-Voc (V) Open-Circuit Voltage Voc (V)	46.13	46.21	46.65	47.10	47.50
短路电流-Isc (A) Short-Circuit Current Isc (A)	9.48	9.49	9.53	9.58	9.65
最大系统电压-Vdc (V) Max-system Voltage (Vdc)	1000	1000	1000	1000	1000
功率公差 (%) Power Tolerance (%)	± 3%	± 3%	± 3%	± 3%	± 3%

STANDARD TEST CONDITIONS: 25°C, AM1.5, 1000W/m<sup>2</sup>.

## 5. Installation and operation

5.1 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.

5.2 Do not step on the module.

5.3 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.

5.4 Put the solar cell modules on the frame and put on the screws and then combine them firmly after put on all the washers. 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.

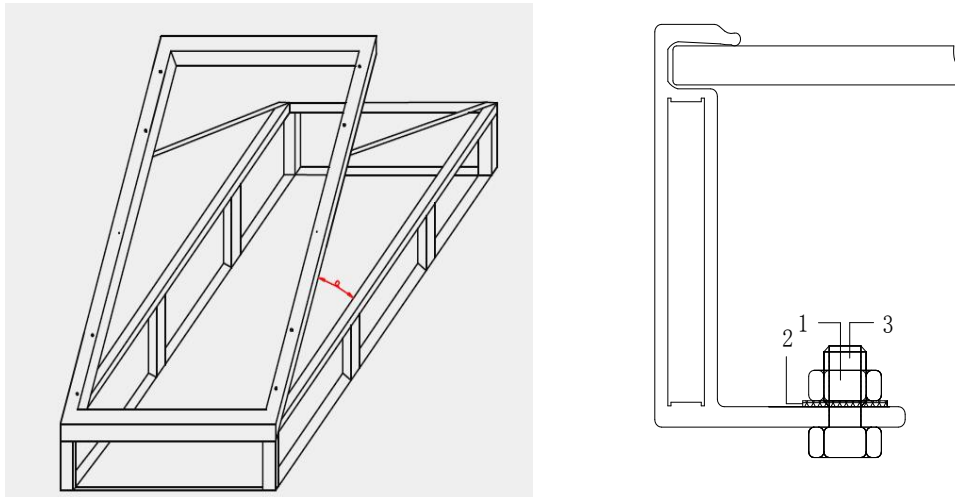
5.5 The solar module frame must be attached to a support structure using M8(60pcs use M6) stainless steel hardware of eight (8/6) places symmetrical on the other solar module. The stainless steel hardware used for securing the module frame should secure with an applied torque of 6 foot-pounds (8 Newton-meters). show in figure 1.

Another mounting method clamping system: choose the right fixture to fix the module on the support frame, show in figure 2. Use 2 mid-clamp clamp on one side of the module, and another 2 edge-clamp, to connect with another module. The dimension of the clamp for 60P Module is 40mm\*35mm or 35mm\*35mm according to the dimension of the module, with a distance of 40cm to the top and bottom. The dimension of the clamp for 72P Module is 50mm\*35mm or 40mm\*35mm according to the dimension of the module, with a distance of 50cm from the top and bottom.

The recommended standoff height is 20 cm. If other mounting means are employed this may affect the TUV Listing or the fire class ratings, the incline angle  $\alpha$  to be adjusted according to local condition. Use

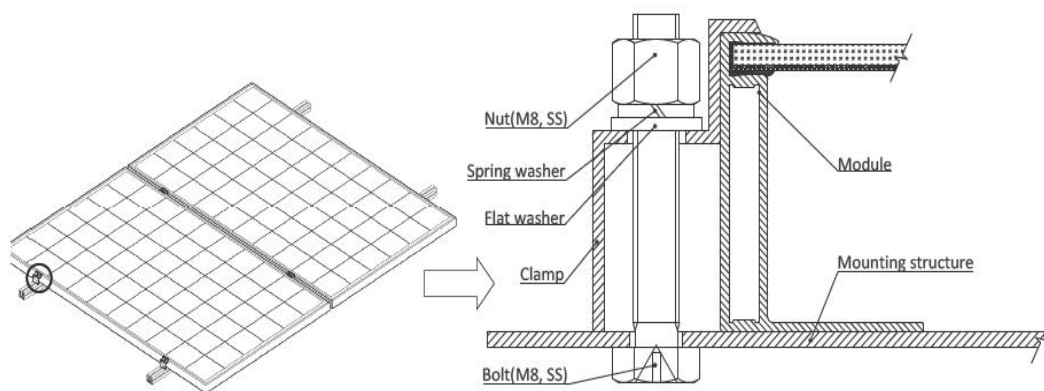
insulation materials to isolate different metal like stainless steel, aluminum. This would prevent corrosion.

Figure 1



- 1、 Stainless steel M8 nut
- 2、 Stainless steel washer
- 3、 Stainless steel M8 t-head bolt

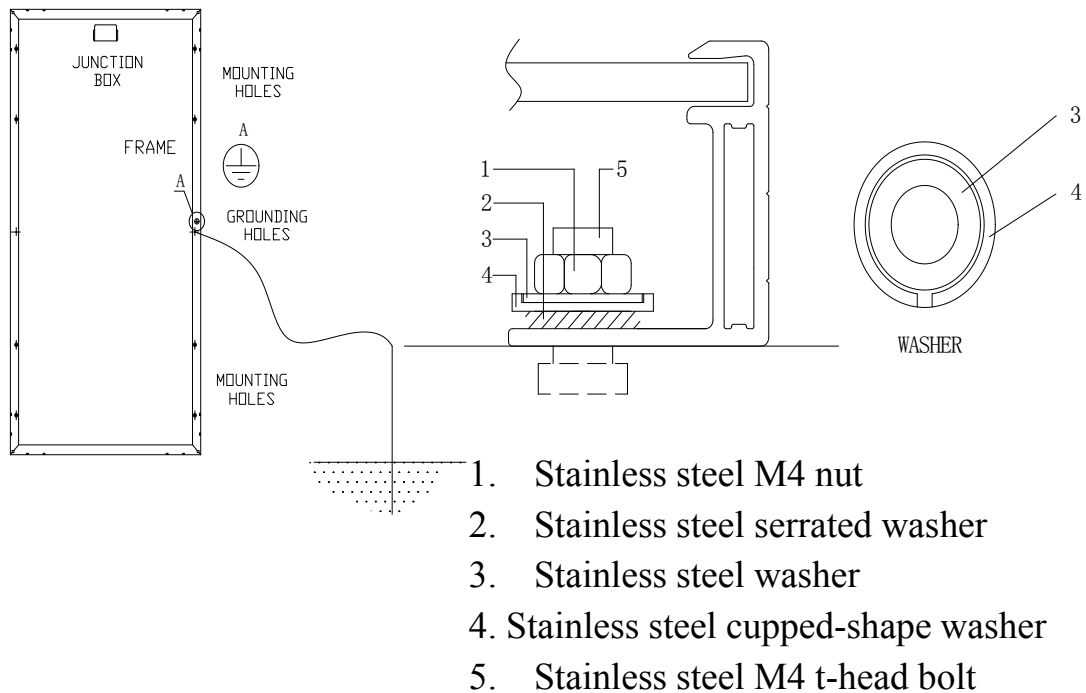
Figure 2



The module has been evaluated by TUV for mounting using the 8 provided mounting holes in the frame.

### 5.6 Way of grounding:

All module frames should be grounded for safety. The grounding connections between modules must be approved by a qualified electrician, the grounding itself must be made by a qualified electrician. The ground wire should be at least the same size as the electrical conductors, ground wires no less than 4mm<sup>2</sup> are recommended.



5.7 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.

5.8 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.

5.9 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.

5.10 The modules installed under the following conditions: wind pressure  $\leq 2400\text{Pa}$ , Snow pressure  $\leq 5400\text{Pa}$ . In regions with heavy snowfall in winter, select the height of the mounting system so that the lowest edge of the module is not covered by snow for any length of time. In addition, ensure that the lowest portion of the module is placed high enough so that it is not shaded by plants, trees or damaged by flying sand.

## 6. **Wiring and Connection:**

6.1 Before this procedure, please read the operation instructions of the PV control system carefully.

6.2 Partial shading of an individual module can cause a reverse voltage across the shaded module. Current is then forced through the shaded area by the other modules.



When a bypass diode is wired in parallel with the series string, the forced current will flow through the diode and bypass the shaded module, thereby minimize module heating and array current losses. Diodes are used as bypass diodes.

Have a Rated Average Forward Current 10A .Above maximum system current at highest module operating temperature.

Have a Rated Repetitive Peak Reverse Voltage 50V. Above maximum system voltage at lowest module operating temperature.

### 6.3

CEC6-60-250M Series: The number of series connection is 21; The number of parallel connection is 3; Max. fusing current is 15A.

CEC6-72-300M Series: The number of series connection is 17; The number of parallel connection is 3; Max. fusing current is 15A.

CEC6-72-300P Series: The number of series connection is 17; The number of parallel connection is 3; Max. fusing current is 15A.

CEC6-60-250P Series: The number of series connection is 18; The number of parallel connection is 3; Max. fusing current is 15A.

Do not disconnect under load

6.4 When designing the system, we recommend that the maximum number of modules in parallel should be no more than four while the maximum number of modules in series no more than eight.

6.5 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.

6.6 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.

6.7 All module frames and mounting racks must be properly grounded in accordance with local and national electrical codes.

6.8 Follow the requirements of applicable local and national electrical codes.

6.9 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. When the modules are connected in series , each module's connector should be "+、-"linked. When the modules are assembled in parallel connection, each module's connector should be "+、+"linked together and "-、-"together linking.

(1) serial -connection of modules

series wiring



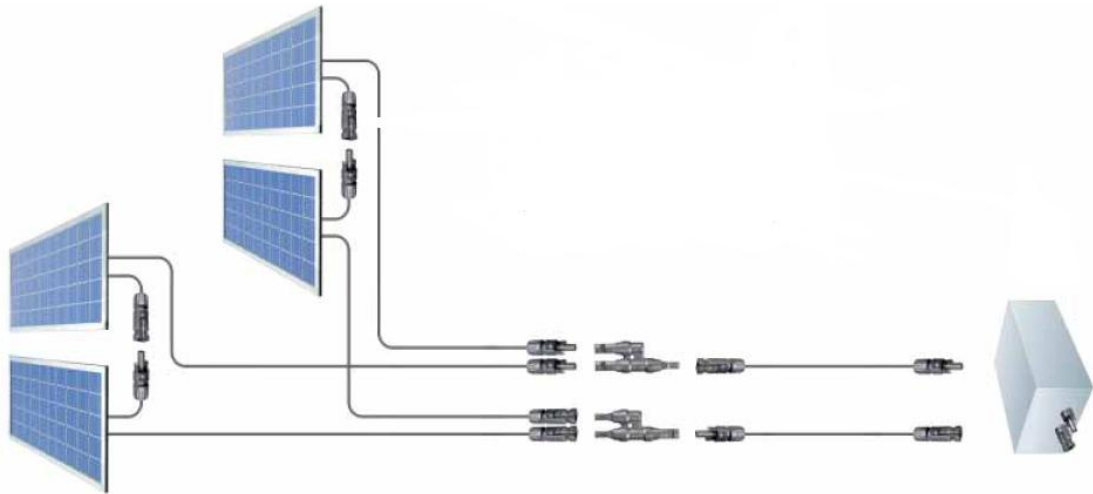
(2) parallel- connection of modules

parallel wiring



6.10 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.

Connect the system of modules to the connection box:



7.1A 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.

7.2 Never use abrasive material under any circumstances.

7.3 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.

7.4 Check fixing screws and mounting brackets are tight, adjust and tighten as necessary.

## 8. Importer

E Best international trading Pty Ltd

Add: Lot 17. 21-35, Ricketts Rd Mount Waverly 3149

Contact person: Lei Wong

Email: [sales@ebestsolarware](mailto:sales@ebestsolarware)

Tel: (03) 9545 6858

Fax: (03) 9545 6868

ABN: 71606409009

Web: [www.ebestsolarwarehouse.com.au](http://www.ebestsolarwarehouse.com.au)

CECEP Solar Energy Technology (Zhenjiang) Co., Ltd.

Add: No.9, Beishan Road, New Area, Zhenjiang, Jiangsu, China.

Tel: +86 511 85597723

Email: [sales@cecsec.cn](mailto:sales@cecsec.cn)

Web: [www.cecepsolar.com](http://www.cecepsolar.com)