



Installation | Safety instructions | Maintenance

Photovoltaic Modules User Manual

Please carefully read the following installation and safety instructions. Non-compliance with these instructions may void the module warranty.

Purpose of This Guide

This guide contains information regarding the installation and safe handling of SHINETIME SOLAR photovoltaic modules (hereafter referred to as "modules"). All instructions should be read and understood before attempting installation. If there are any questions, please contact your dealer or SHINETIME SOLAR for further information.

The installer should conform to all safety precautions in the guide when installing modules. Before installing a solar photovoltaic system, the installer should become familiar with the mechanical and electrical requirements for photovoltaic systems. Keep this guide in a safe place for future reference.

General

- | The modules have been evaluated by UL for a maximum positive or negative design loading of 30 lbs/ft².
- | Installing solar photovoltaic systems requires specialized skills and knowledge. The installer assumes all risk of injury, including risk of electric shock. Module installation should be performed only by qualified persons.
- | All modules come with a permanently attached junction box and #12 AWG (4 mm²) wire terminated in PV connectors. Your dealer can provide additional extension cables to simplify module wiring.
- | Exercise caution when wiring or handling modules exposed to sunlight.
- | When disconnecting wires connected to a photovoltaic module that is exposed to sunlight, an electric arc may occur. Arcs can cause burns, start fires or otherwise create safety problems. Exercise caution when disconnecting wiring on modules exposed to sunlight.
- | Photovoltaic solar modules convert light energy to direct-current electrical energy, and are designed for outdoor use. Proper design of support structures is the responsibility of the system designer and installer.
- | Modules may be ground mounted, pole mounted, or mounted on rooftops.



Do not attempt to disassemble the module, and do not remove any attached nameplates or components. Doing so will void the warranty.

- | Do not apply paint or adhesive to the module.



Do not use mirrors or other hardware to artificially concentrate sunlight on the module.

- | When installing modules, observe all applicable local, regional and national codes and regulations. Obtain a building and/or electrical permit where required.



Safety precautions for installing a solar photovoltaic system

- | Solar modules produce electrical energy when exposed to sunlight.
- | Only connect modules with the same rated output current in series. If modules are connected in series, the total voltage is equal to the sum of the individual module voltages.
- | Only connect modules or series combinations of modules with the same voltage in parallel. If modules are connected in parallel, the total current is equal to the sum of individual module or series combination currents.
- | Keep children well away from the system while transporting and installing mechanical and electrical components.
- | Completely cover all modules with an opaque material during installation to prevent electricity from being generated.



Do not wear metallic rings, watchbands, ear, nose, or lip rings or other metallic devices while installing or troubleshooting photovoltaic systems.



Use appropriate safety equipment (insulated tools, insulating gloves, etc) approved for use on electrical installations.

- | Observe the instructions and safety precautions for all other components used in the system, including wiring and cables, connectors, DC-breakers, mounting hardware, inverters, etc.
- | Use only equipment, connectors, wiring and mounting hardware suitable for use in a photovoltaic system.
- | Always use the same type of module within a particular photovoltaic system.
- | Under normal operating conditions, PV modules will produce currents and voltages that are different than those listed in the data sheet. Data sheet values are applicable at standard test data.
- | Short-circuit current and open-circuit voltages should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacity, fuse sizes and size of controls connected to the module or system output. Refer to Section 690-8 of the National Electrical Code (NEC) for an additional multiplying factor of 125 percent (80 percent de-rating) which may be applicable.

General Installation Notes

- | Drainage holes must not be covered with parts of the mounting system. The junction box has a breather port which must be mounted facing downward and cannot be exposed to the rain. The junction box should be on the higher side of the module when it is mounted in order to orient the breather port correctly.
- | Do not lift the module by grasping the module's junction box or electrical leads.
- | Do not stand or step on module.
- | Do not drop the module or allow objects to fall on the module.
- | Do not place any heavy objects on the module.
- | Inappropriate transport and installation may damage the module glass or frame.

Mechanical Installation

Selecting the location

- | Select a suitable location for installation of the module.
- | For optimum performance, the module must be facing true south in northern latitudes and true north in



southern latitudes.

- | For detailed information on optimal module orientation, refer to standard solar photovoltaic installation guides or a reputable solar installer or systems integrator.
- | The module should not be shaded at any time of the day.
- | Do not install the module near equipment or in locations where flammable gases can be generated or collected.

Selecting the proper mounting structure and hardware

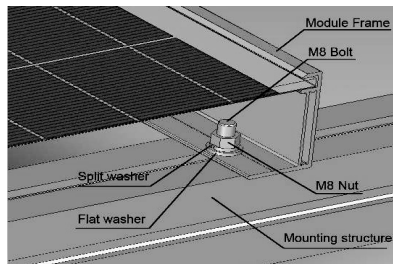
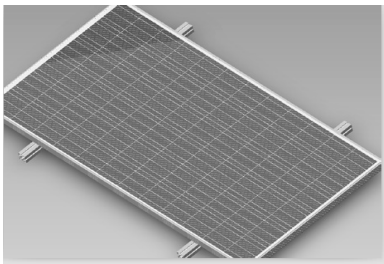
- | The module mounting structure must be made of durable, corrosion-resistant and UV-resistant material.
- | In regions with heavy snowfall in winter, select the height of the mounting system so that the lowest edge of the module is not covered by snow for any length of time. In addition, ensure that the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by flying sand.
- | Modules must be securely attached to the mounting structure.
- | Provide adequate ventilation under the modules in conformity to your local regulations. A minimum distance of 10 cm between the roof plane and the frame of the module is generally recommended.
- | Always observe the instructions and safety precautions included with the module support frames.
- | Do not attempt to drill holes in the glass surface of the modules as this will void the warranty.
- | Do not drill additional mounting holes in the module frames of the modules as this will void the warranty.
- | Before installing modules on a roof, ensure that the roof construction is suitable. In addition, any roof penetration required to mount the module must be properly sealed to prevent leaks.
- | When installing a module on a pole, choose a pole and module mounting structure that will withstand the anticipated winds for the area.
- | Dust building up on the surface of the module can impair with their module performance. SHINETIME SOLAR recommends installing the modules with a tilt angle of at least 10 degrees, making it easier for dust to be washed off by rain.
- | Observe the linear thermal expansion of the module frames (the recommended minimum distance between two modules is 1 cm).
- | Always keep the backsheet of the panel free from foreign objects or structural elements, which could come into contact with the panel, especially when the panel is under mechanical load.
- | Ensure panels are not subjected to wind or snow loads exceeding the maximum permissible loads, and are not subject to excessive forces due to the thermal expansion of the support structures: See the following paragraph for more detailed information.

Mounting Methods

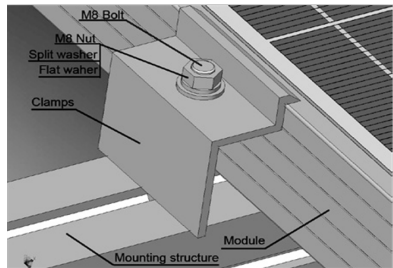
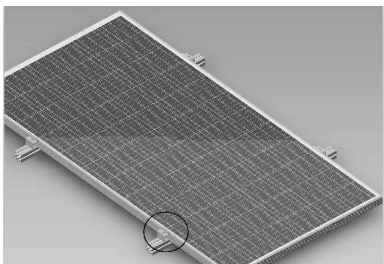
1. Install solar modules with mounting wholes or claps



Modules can be installed on the frame using mounting holes, clamps or an insertion system. Modules must be installed according to the following examples. Not mounting the modules according to these instructions may void the warranty.



Module installed with mounting holes



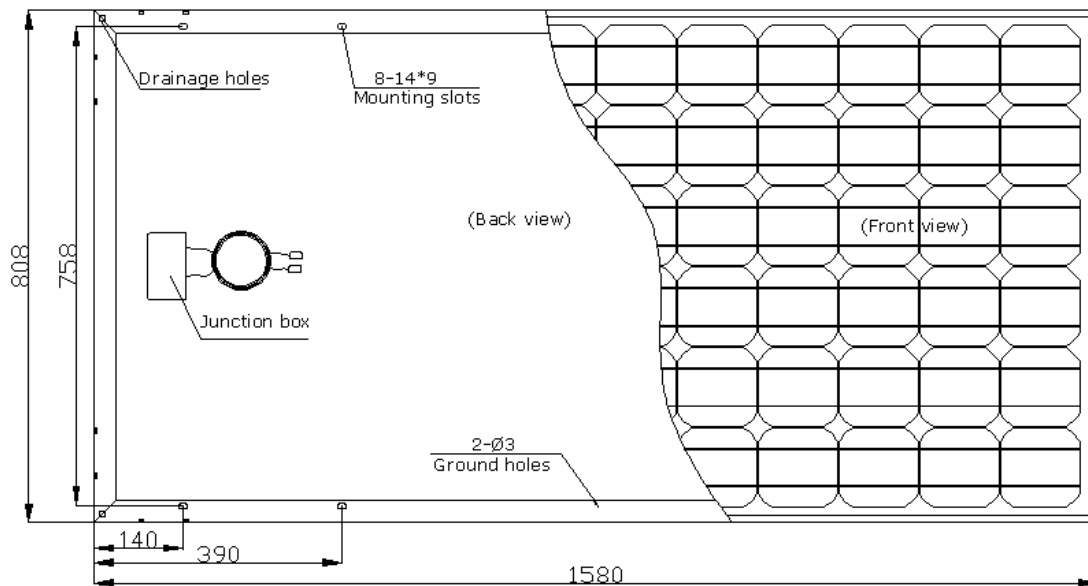
Module installed with clamps

Module can be installed in both landscape and portrait modes.

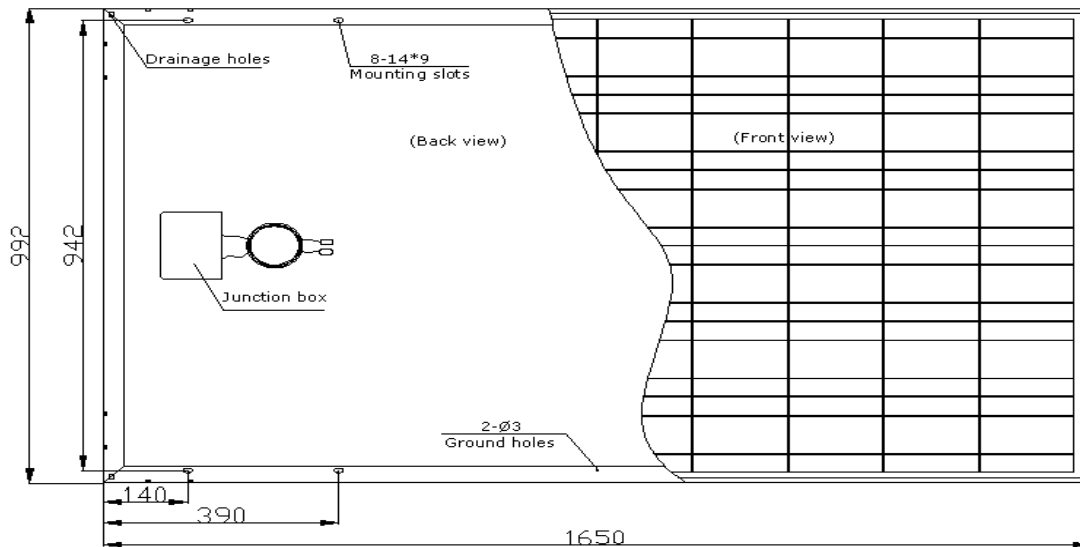
The modules must be properly secured to their support so that they can withstand live load conditions, including wind uplift, to the pressure they have been certified for. It is the installer's responsibility to insure that the clamps used to secure the modules are strong enough.

Depending on the local wind and snow loads, additional mounting points may be required.

Mono-crystalline Cell Module

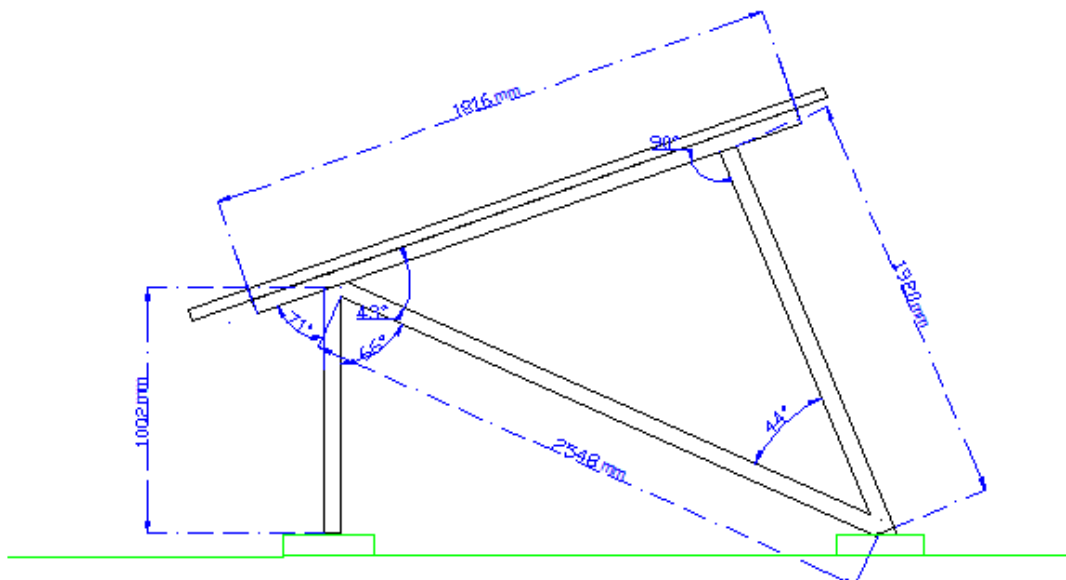


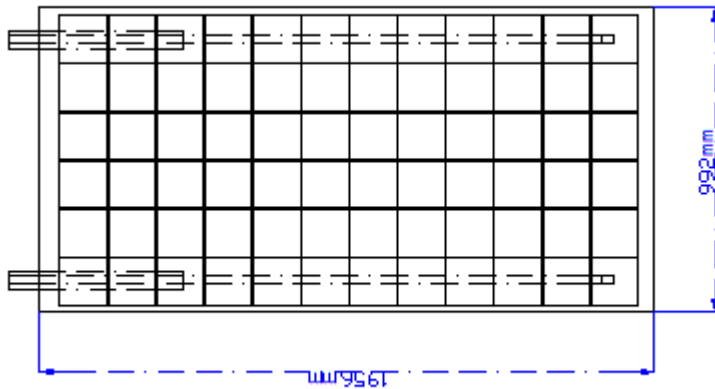
Poly-crystalline Cell Module



2. Mounting solar modules with bracket on flat roof and ground

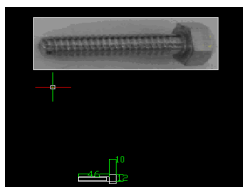
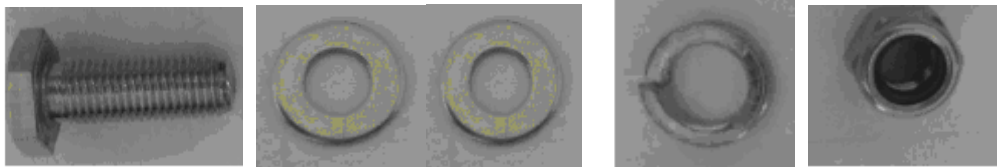
- | Fasten bracket on flat roof or ground first, fasten solar modules on bracket, use nuts to fasten bracket.
- | The bracket would endure 20 years, and is made of anticorrosive material. Temperature zinc steels and Stainless steel is recommended.
- | The bracket should be solid enough to resist continuous load, pressure from wind, snow, earthquake and other outside force.
- | Use insulation materials to isolate different metal like stainless steel, aluminum. This would prevent corrosion.



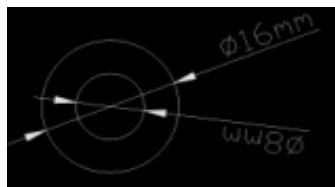


| insert screw into flat gasket, insert screw into installation hole both on the modules and supporting frame.

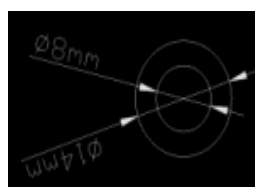
| insert screw into flat gasket and spring gasket, then apply nut on the screw fasten it.



A2-70, M8SCREW



FLAT GASKET SPRING



GASKET



M8 NUT





| Please refer to the following form for supporting bracket's slope angle

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°

3. Others

| The recommended standoff height is 5 cm. If other mounting means are employed this may affect the UL Listing.

| Direction of module installation: PV module are rectangle shaped; PV module array longitudinal installation (the way that installs the module by long side longitudinal) is mostly used because the transverse installation (the way that installs the module by long side transversely) has less rain cleaning ability.

| For distance between the modules, longitudinal distance (along the roof gradient) should be enough for installation and disassembly; transverse distance should be 3-10cm.

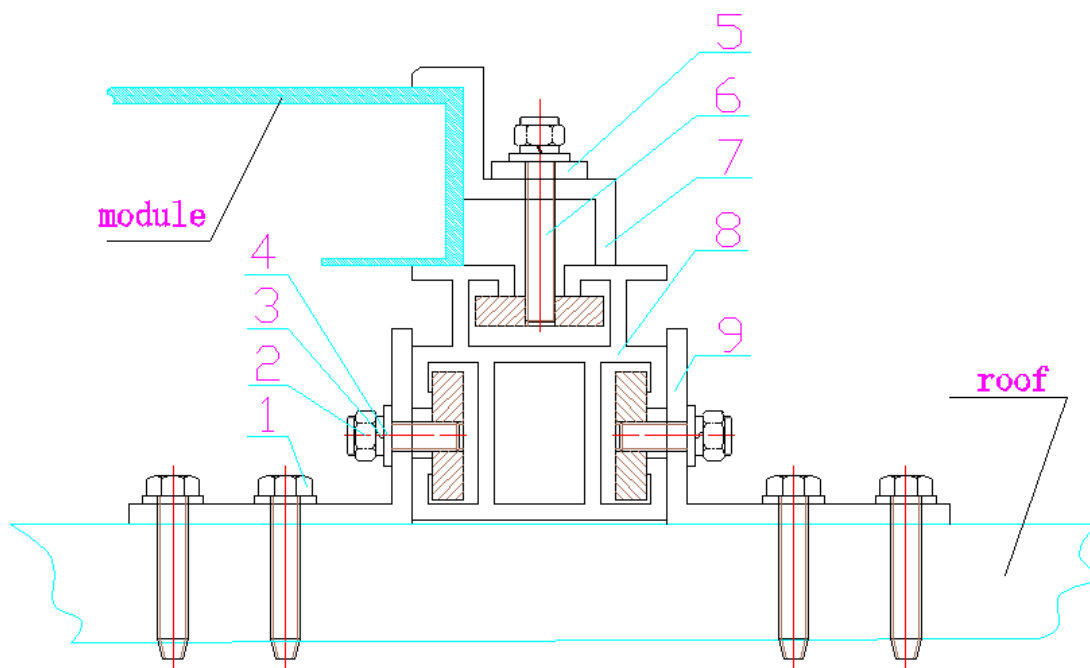
| Other mounting methods are acceptable as long as the minimum requirements as described above.

Above requirements are only basic instructions.

For example, on slant roof

Mono-crystalline Cell Module

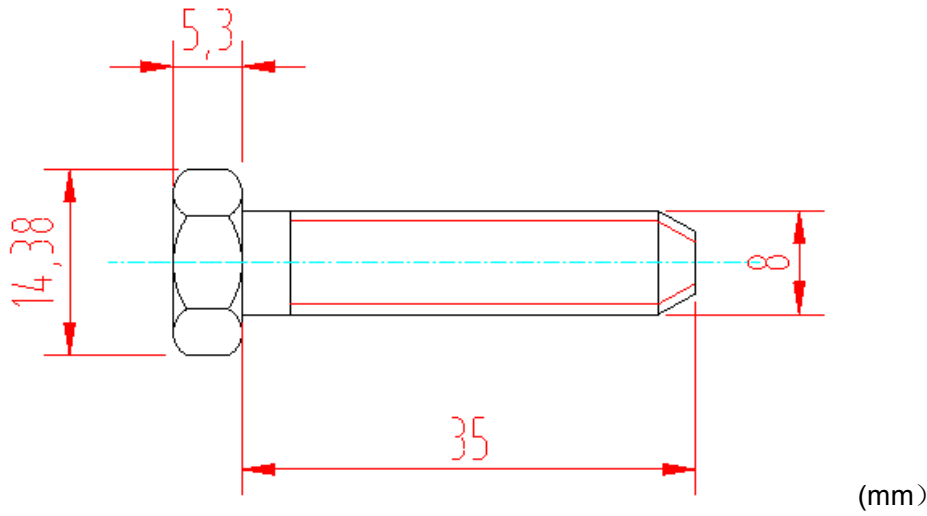
Poly- crystalline Cell Module



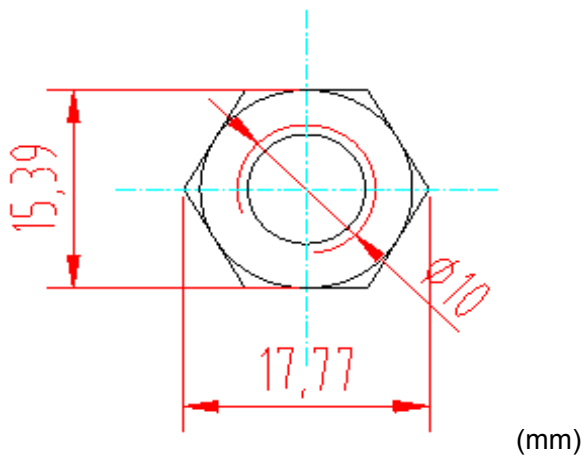


4. Accessory:

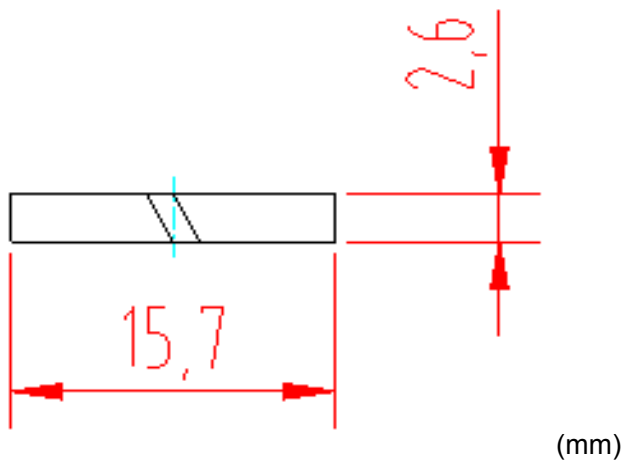
4.1 Hexagon Self-locking Bolt M8*35



4.2 Hexagon Nut M10

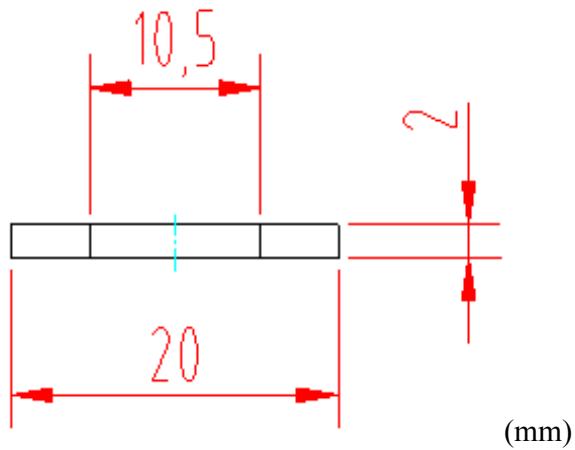


4.3 Spring Washer M10

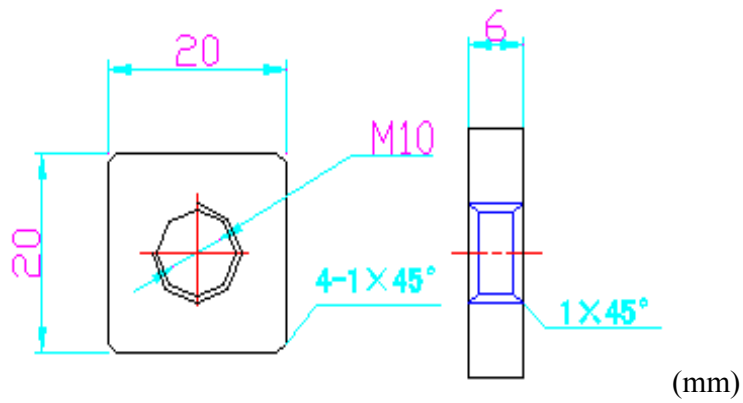




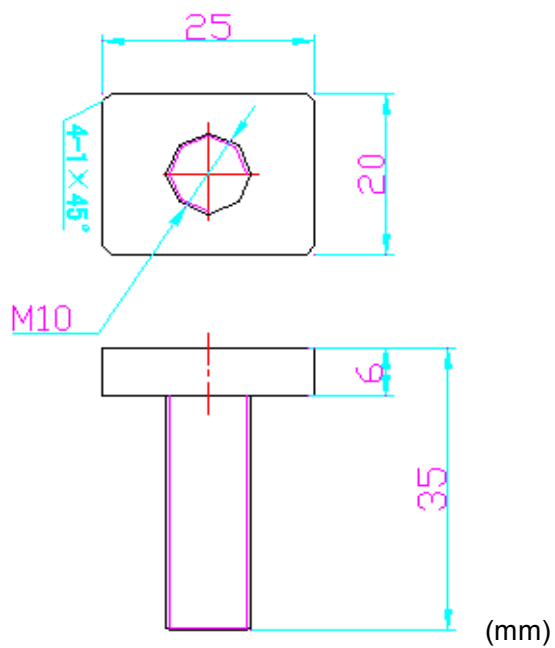
4.4 Flat Washers M10



4.5 Nonstandard Nut M10

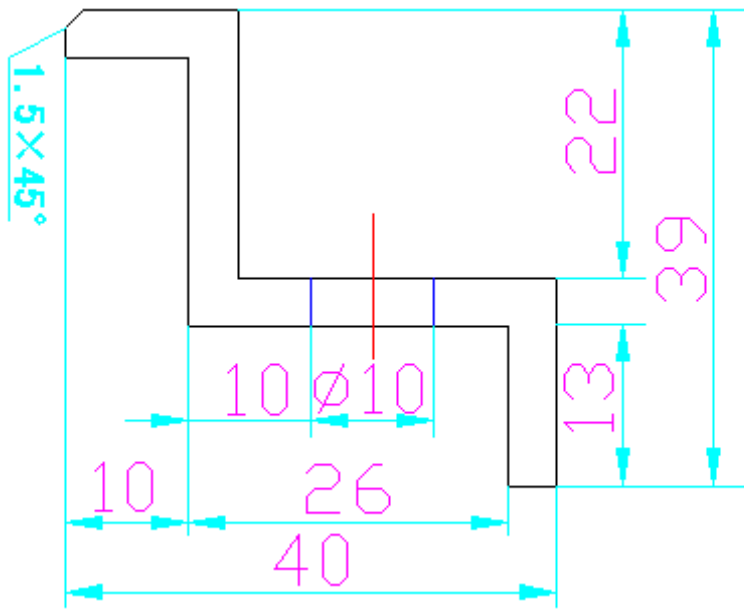


4.6 Nonstandard Bolt M10



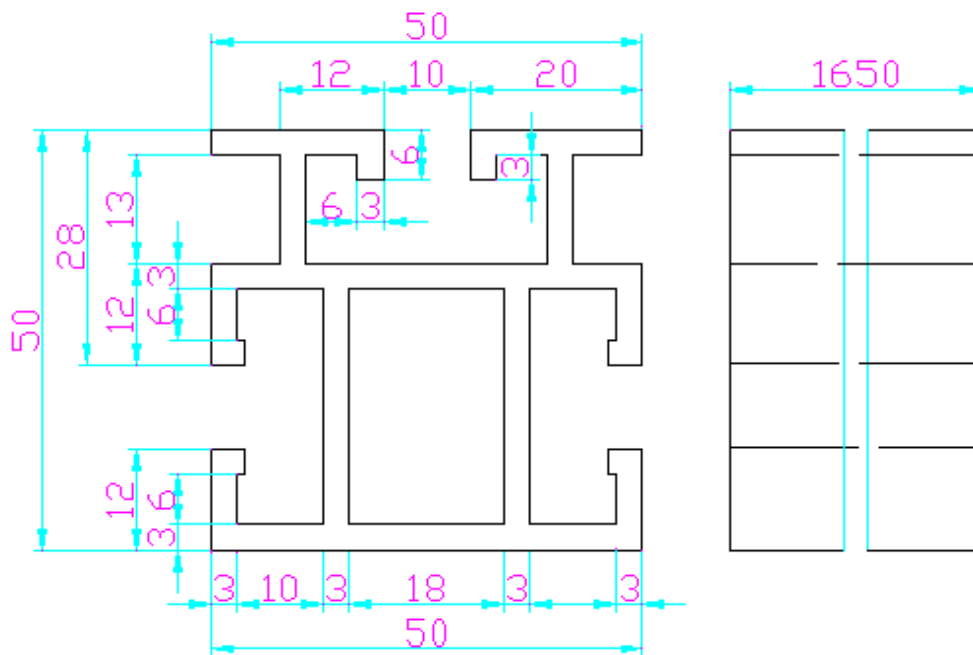


4.7 Pressure Plate



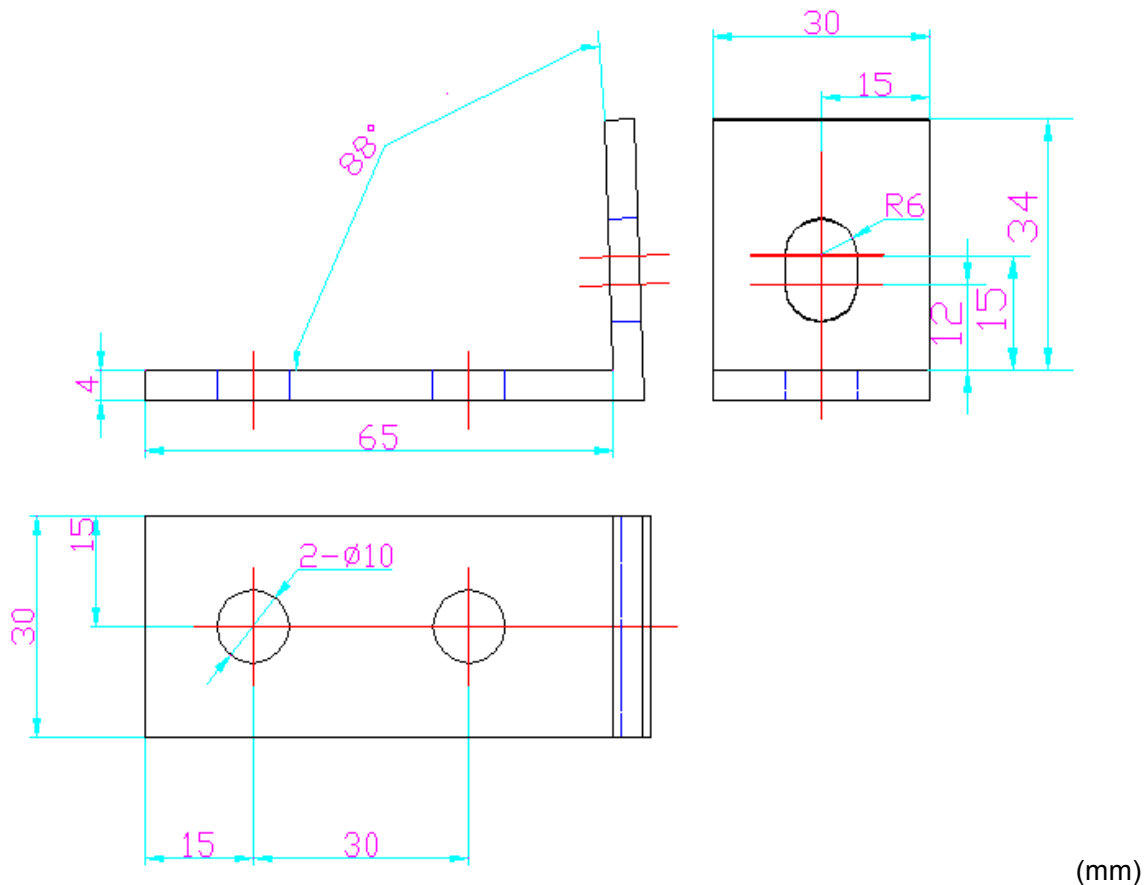
(mm)

4.8 Crossbeam



(mm)

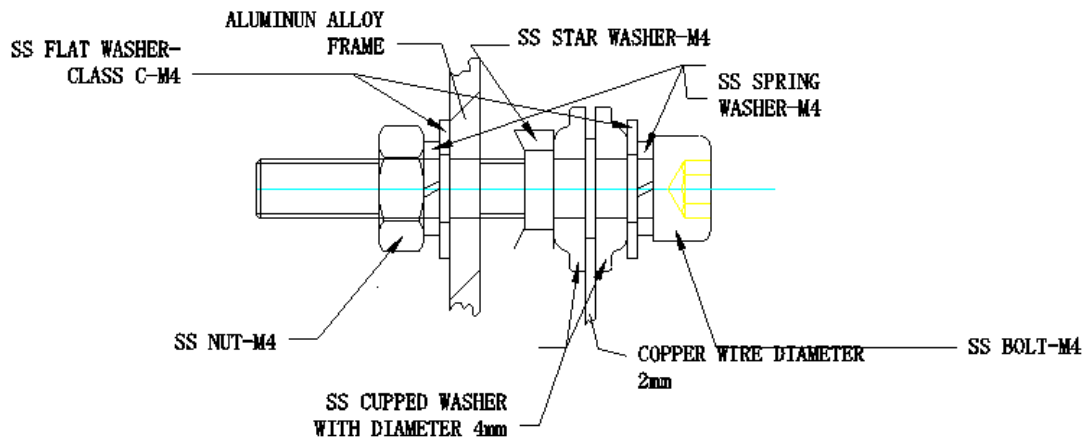
4.9 Crossbeam Foundation



Electrical Installation

Grounding

| There is the grounding hole and grounding marking along either edge of the frame indicating a ground bonding location. All module frames must be properly grounded. All bolts, nuts, washers are stainless-steel. Observe all local electric codes and regulations. Use solid uninsulated copper wire sizes 10 or 12 AWG. The wire must have no nick. Make the grounding wire connect to the bolt and tighten it. Put M4 stainless steel bolt across M4 stainless steel spring washer, M4 stainless steel flat washer, 2 pc of stainless steel cupped washer with a diameter of 4 (Copper wire is wound on the bolt between two cupped washers.) and M4 stainless steel star washer, and then through the grounding hole on the aluminum frame components, M4 stainless steel flat washer And spring washer, at last tighten them with the stainless steel M4 nut. (TORQUE: 4N.M)



| Details for wiring in accordance with the NEC, and that the grounding method of the frame of arrays shall comply with the NEC, article 250.

General Electrical Installation

- | Do not use modules of different configurations in the same system.
- | This module is supplied with Multi Contact connectors for electrical connections.
- | Refer to Section 690.31 of the NEC to determine appropriate types and temperature ratings of conductors. Wiring should be #12 AWG, 4 mm² (minimum) and must be temperature rated at 90 °C (minimum).
- | Completely cover system modules with an opaque material to prevent electricity from being generated while disconnecting conductors.
- | Refer to Sections 690.8 and 310 of the NEC to determine over current, conductor ampacity and size requirements.
- | In Canada, installation shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.
- | For best performance, ensure that positive and negative DC wires run closely together avoiding loops.

WARNING!

Electrical shock hazard! Do not touch bare conductors or other potentially energized parts.

Maintenance

SHINETIME SOLAR recommends the following maintenance items to ensure optimum performance of the module:

- | Clean the glass surface of the module as necessary. Use water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent can be used if necessary. Do not use dishwasher detergent.
- | Electrical and mechanical connections should be checked periodically by qualified personnel to verify that they are clean, secure and undamaged.
- | Check the electrical and mechanical connections periodically to verify that they are clean, secure and undamaged.



- | Problems should only be investigated by qualified personnel.
- | Observe the maintenance instructions for all other components used in the system.
- | Artificially concentrated sunlight shall not be directed on the module.

Shutting down the system

- | Completely cover system modules with an opaque material to prevent electricity from being generated while disconnecting conductors.
- | Disconnect system from all power sources in accordance with instructions for all other components used in the system.
- | The system should now be out of operation and can be dismantled. In doing so, observe the all safety instructions as applicable to installation.

Electrical ratings of the concerned modules:

The electrical characteristics are within $\pm 3\%$ of the indicated values of ISC, VOC, and Pmax under Standard Test Conditions (irradiance of 1000 W/m², AM 1.5 spectrum, and a cell temperature of 25°C/77°F).

Disclaimer of Liability

Because the use of this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic products are beyond SHINETIME SOLAR's control, SHINETIME SOLAR does not accept responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance. No responsibility is assumed by SHINETIME SOLAR for any infringement of patents or other rights of third parties, which may result from use of the PV product. No license is granted by implication or otherwise under any patent or patent rights. The information in this manual is based on SHINETIME SOLAR's knowledge and experience and is believed to be reliable, but such information including product specification (without limitations) and suggestions does not constitute a warranty, expressed or implied. SHINETIME SOLAR reserves the right to change the manual, the product, the specifications, or product information sheets without prior notice.

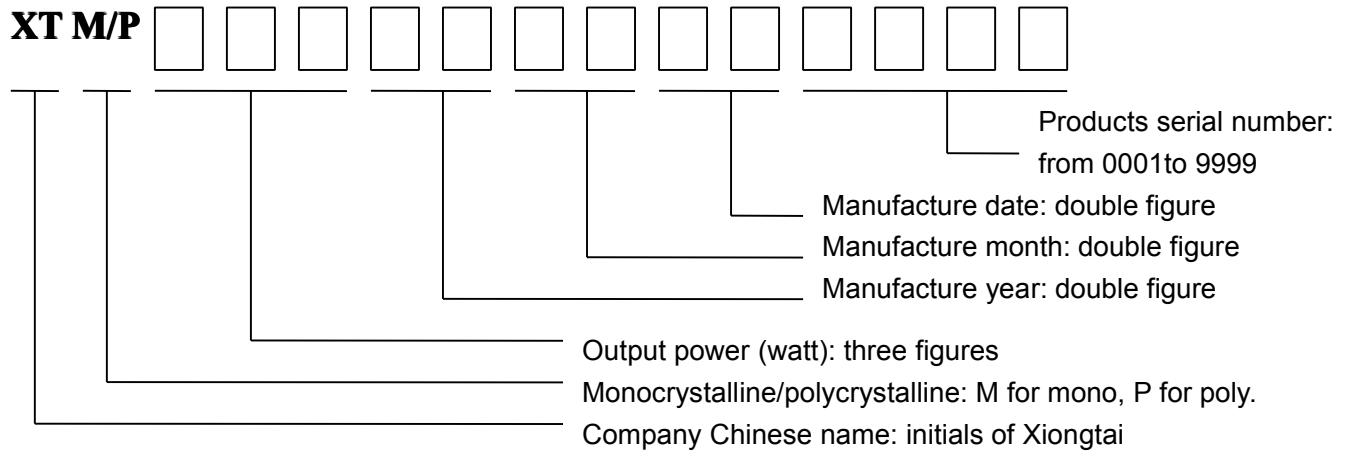
Please consult your dealer or the manufacturer concerning the warranty of your modules. If you have any further questions, your dealer will gladly assist you. The Installation Manual is subject to technical modifications without notice.

Appendix 1

SHINETIME SOLAR bar code compilation rules:



The bar code compilation is according to company name, solar cell material, output power, manufacture year, month and date, and products serial number respectively.





Appendix 2

Mono XTC M5 125*125 72pcs Series:

Model	Maximum System Voltage (V dc)	Open Circuit Voltage at STC (V dc)	Rated Voltage at STC (V dc)	Rated Current at STC(A dc)	Short Circuit Current at STC (A dc)	Rated Maximum Power at STC (Watts)	Maximum Series Fuse (A)
XTM5-72-140	600	42.3	35.2	3.98	4.38	140	15
XTM5-72-145	600	42.4	35.3	4.11	4.51	145	15
XTM5-72-150	600	42.5	35.4	4.24	4.64	150	15
XTM5-72-155	600	42.6	35.5	4.37	4.81	155	15
XTM5-72-160	600	42.8	35.6	4.50	4.93	160	15
XTM5-72-165	600	42.8	35.7	4.63	5.07	165	15
XTM5-72-170	600	42.9	35.8	4.75	5.2	170	15
XTM5-72-175	600	43.1	35.9	4.88	5.3	175	15
XTM5-72-180	600	43.2	36.0	5	5.4	180	15
XTM5-72-185	600	43.2	36.1	5.13	5.56	185	15
XTM5-72-190	600	43.3	36.2	5.25	5.67	190	15
XTM5-72-195	600	43.6	36.3	5.38	5.76	195	15
XTM5-72-200	600	43.7	36.4	5.50	5.88	200	15
XTM5-72-205	600	43.8	36.5	5.62	5.97	205	15

Mono XTC M5 125*125 96pcs Series:



Model	Maximum System Voltage (V dc)	Open Circuit Voltage at STC (V dc)	Rated Voltage at STC (V dc)	Rated Current at STC (A dc)	Short Circuit Current at STC (A dc)	Rated Maximum Power at STC (Watts)	Maximum Series Fuse (A)
XTM5-96-235	600	57.6	48.0	4.9	5.39	235	15
XTM5-96-240	600	57.8	48.1	4.99	5.45	240	15
XTM5-96-245	600	57.9	48.2	5.09	5.53	245	15
XTM5-96-250	600	57.9	48.2	5.19	5.61	250	15
XTM5-96-255	600	58.1	48.3	5.28	5.67	255	15
XTM5-96-260	600	58.2	48.4	5.38	5.75	260	15
XTM5-96-265	600	58.3	48.4	5.48	5.82	265	15

Mono XTC M6 156*156 72pcs Series:

Model	Maximum System Voltage (V dc)	Open Circuit Voltage at STC (V dc)	Rated Voltage at STC (V dc)	Rated Current at STC (A dc)	Short Circuit Current at STC (A dc)	Rated Maximum Power at STC (Watts)	Maximum Series Fuse (A)
XTM6-72-280	600	43.4	35.9	7.81	8.57	280	15
XTM6-72-285	600	43.5	36.0	7.92	8.66	285	15
XTM6-72-290	600	43.6	36.1	8.03	8.75	290	15
XTM6-72-295	600	43.7	36.2	8.15	8.82	295	15
XTM6-72-300	600	43.8	36.3	8.26	8.89	300	15
XTM6-72-305	600	43.9	36.4	8.38	8.93	305	15
XTM6-72-310	600	44	36.5	8.49	9.02	310	15

Poly XTC P6 156*156 60pcs Series:



Model	Maximum System Voltage (V dc)	Open Circuit Voltage at STC (V dc)	Rated Voltage at STC (V dc)	Rated Current at STC (A dc)	Short Circuit Current at STC (A dc)	Rated Maximum Power at STC (Watts)	Maximum Series Fuse (A)
XTP6-60-200	600	35.6	29.4	6.80	7.60	200	15
XTP6-60-205	600	35.7	29.5	6.95	7.71	205	15
XTP6-60-210	600	35.8	29.6	7.09	7.86	210	15
XTP6-60-215	600	35.9	29.7	7.24	7.98	215	15
XTP6-60-220	600	36	29.8	7.38	8.11	220	15
XTP6-60-225	600	36.1	29.9	7.53	8.22	225	15
XTP6-60-230	600	36.2	30	7.67	8.34	230	15
XTP6-60-235	600	36.3	30.1	7.81	8.46	235	15
XTP6-60-240	600	36.4	30.2	7.95	8.55	240	15
XTP6-60-245	600	36.5	30.3	8.09	8.52	245	15

Poly XTC P6 156*156 72pcs Series:



Model	Maximum System Voltage (V dc)	Open Circuit Voltage at STC (V dc)	Rated Voltage at STC (V dc)	Rated Current at STC (A dc)	Short Circuit Current at STC (A dc)	Rated Maximum Power at STC (Watts)	Maximum Series Fuse (A)
XTP6-72-240	600	42.6	35.5	6.76	7.61	240	15
XTP6-72-245	600	42.7	35.6	6.88	7.71	245	15
XTP6-72-250	600	42.8	35.7	7.00	7.80	250	15
XTP6-72-255	600	42.9	35.8	7.12	7.91	255	15
XTP6-72-260	600	43.0	35.9	7.24	8.00	260	15
XTP6-72-265	600	43.1	35.9	7.38	8.11	265	15
XTP6-72-270	600	43.2	36	7.50	8.21	270	15
XTP6-72-275	600	43.3	36.1	7.62	8.31	275	15
XTP6-72-280	600	43.4	36.2	7.73	8.41	280	15
XTP6-72-285	600	43.5	36.3	7.85	8.51	285	15
XTP6-72-290	600	43.6	36.4	7.97	8.61	290	15
XTP6-72-295	600	43.7	36.5	8.09	8.70	295	15
XTP6-72-300	600	43.8	36.6	8.21	8.82	300	15