

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 Hareon 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 Hareon 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

- | 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

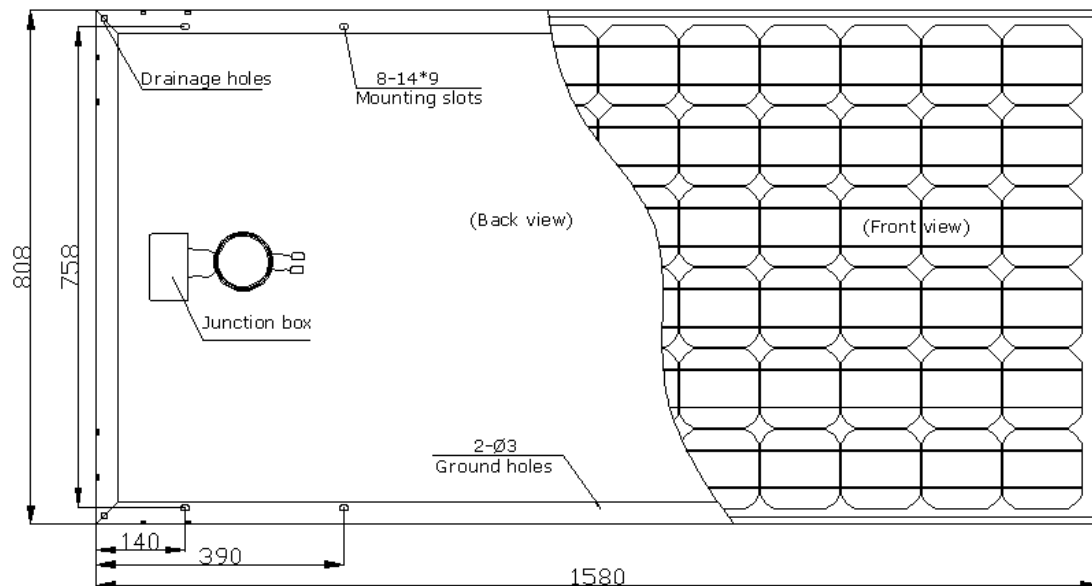
- | Observe all instructions and safety precautions included with the mounting system to be used with the module.
- | Do not drill holes in the glass surface of the module. Doing so will void the warranty.
- | Do not drill additional mounting holes in the module frame. Doing so will void the warranty.
- | Modules must be securely attached to the mounting structure using four mounting points for normal installation. If heavy wind or snow loads are anticipated, additional mounting points should also be used.
- | Load calculations are the responsibility of the system designer or installer.
- | The mounting structure and hardware must be made of durable, corrosion- and UV-resistant material.
- | The modules have been evaluated by UL for mounting using the 8 provided mounting holes in the frame.
- | Each module (or series string of modules so connected) shall be provided with the maximum series fuse as specified.

Mounting methods

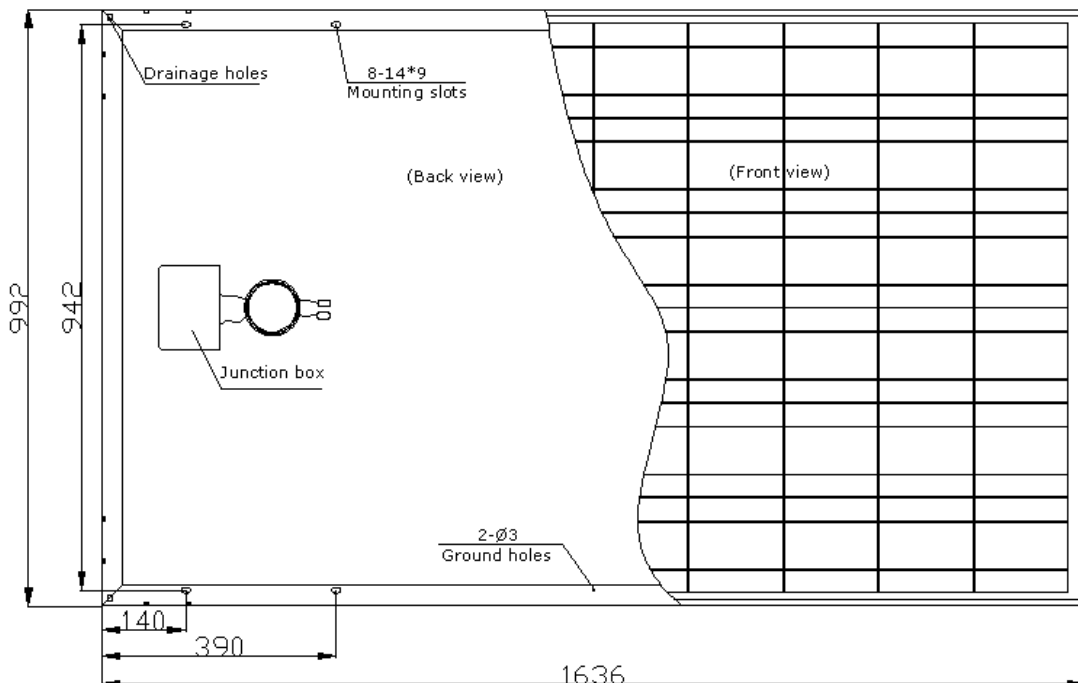
1. Mounting with Bolts

- | The module must be attached and supported by at least four bolts through the indicated mounting holes.
- | Depending on the local wind and snow loads, additional mounting points may be required.
- | The modules have been evaluated by UL for a maximum positive or negative design loading of 30 lbs/ft².

Mono-crystalline Cell Module



Poly-crystalline Cell Module



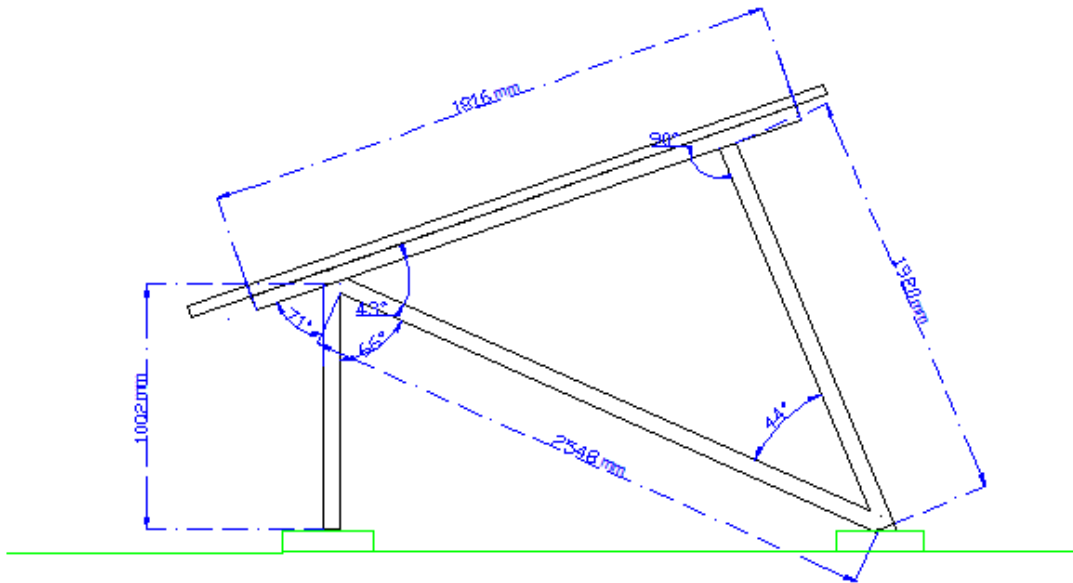
2. Mounting solar modules with bracket on flat roof and ground

| 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.

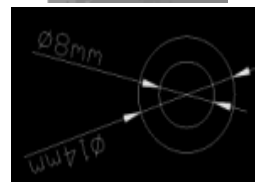
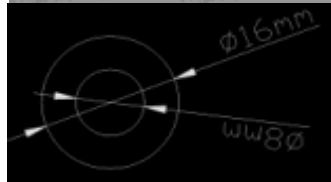
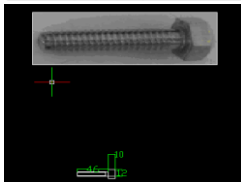
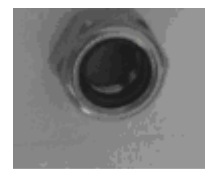
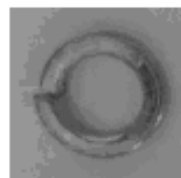
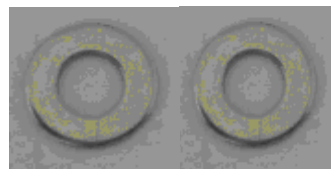
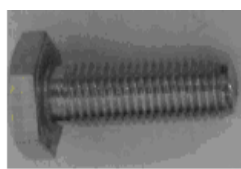
| The bracket should be solid enough to resist continuous load, pressure from wind, snow, earthquake and other outside force.

| 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



| 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 ⁰ TO 15 ⁰	15 ⁰
15 ⁰ TO 25 ⁰	SAME AS LATITUDE
25 ⁰ TO 30 ⁰	LATITUDE+5 ⁰
30 ⁰ TO 35 ⁰	LATITUDE+10 ⁰
35 ⁰ TO 40 ⁰	LATITUDE+15 ⁰
40 ⁰ +	LATITUDE+20 ⁰

3. Other

| 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.

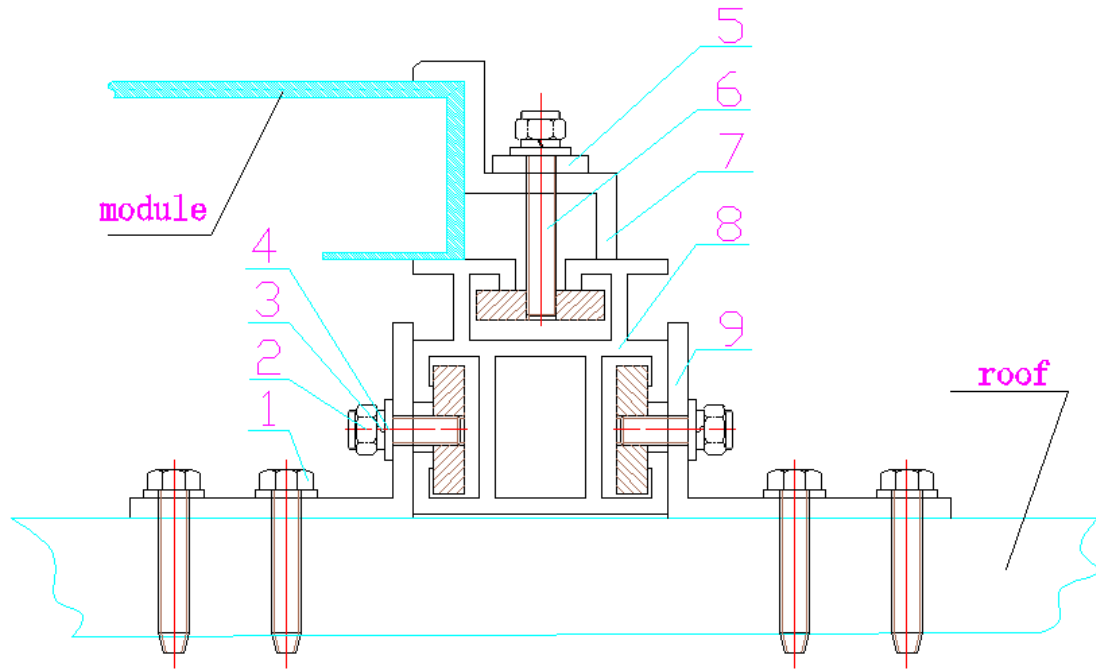
| For distance between the modules, longitudinal distance (along the roof gradient) should be enough for installation and disassembly; transverse distance should be 3-10cm.

| 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

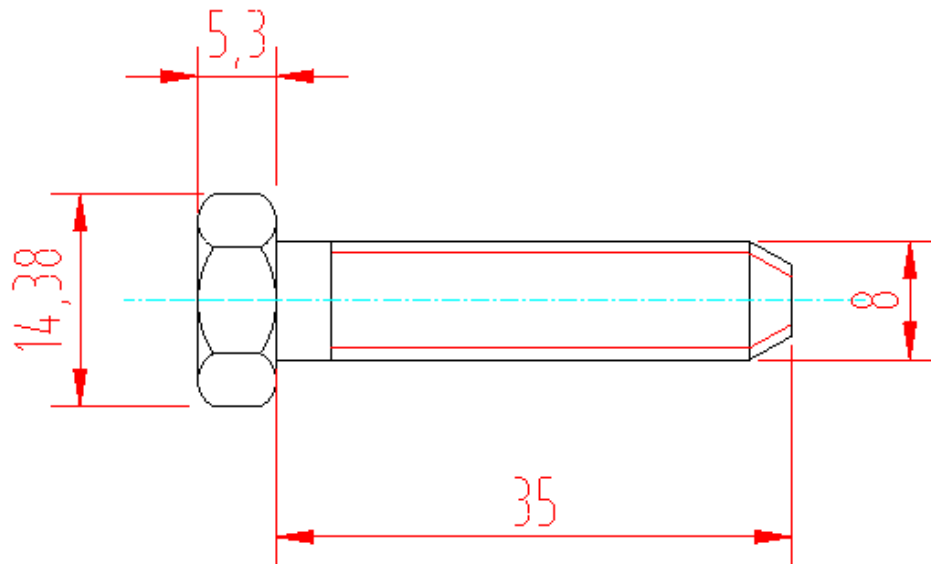
Mono-crystalline Cell Module

Poly- crystalline Cell Module



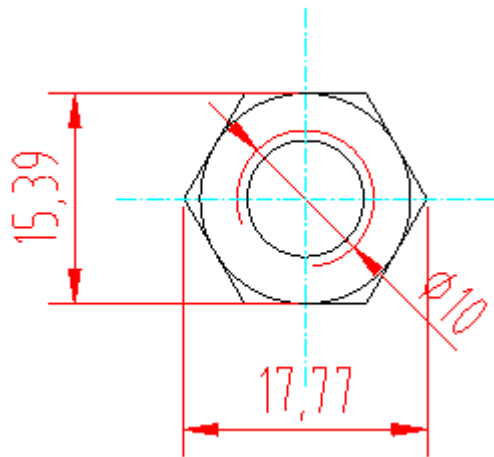
Accessory:

1 Hexagon Self-locking Bolt M8*35



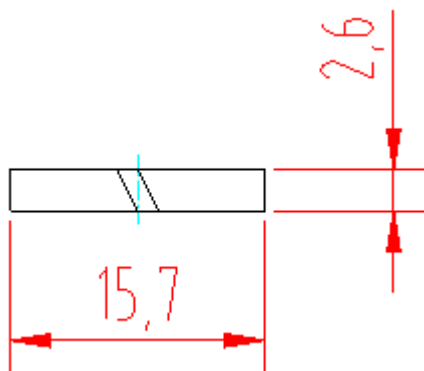
(mm)

2 Hexagon Nut M10



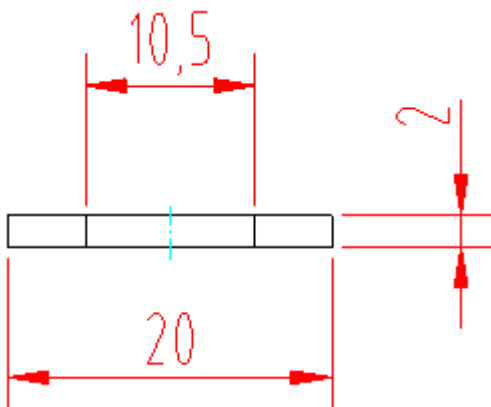
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3 Spring Washer M10



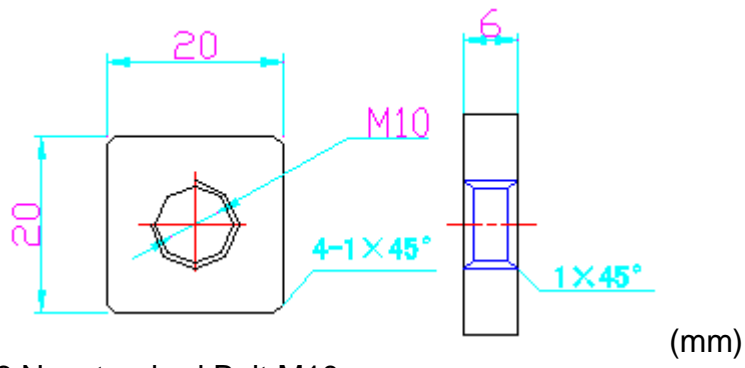
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4 Flat Washers M10

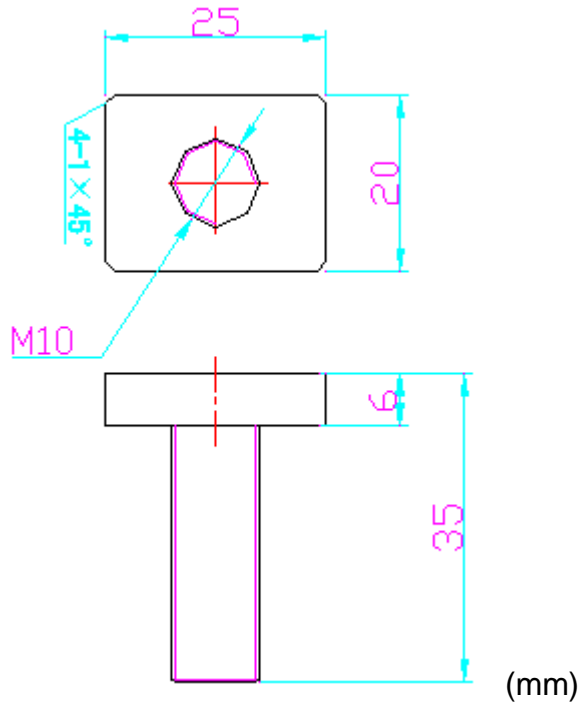


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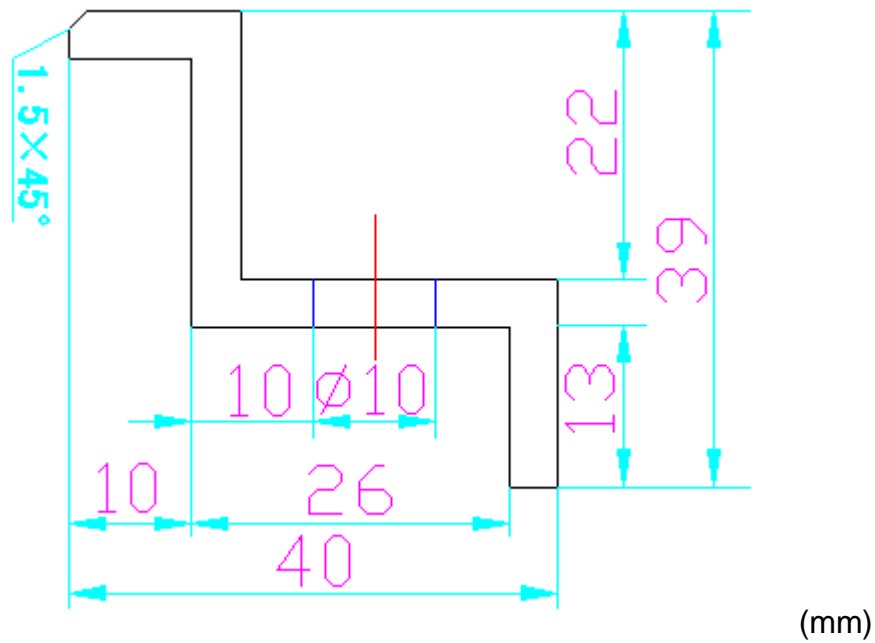
5 Nonstandard Nut M10



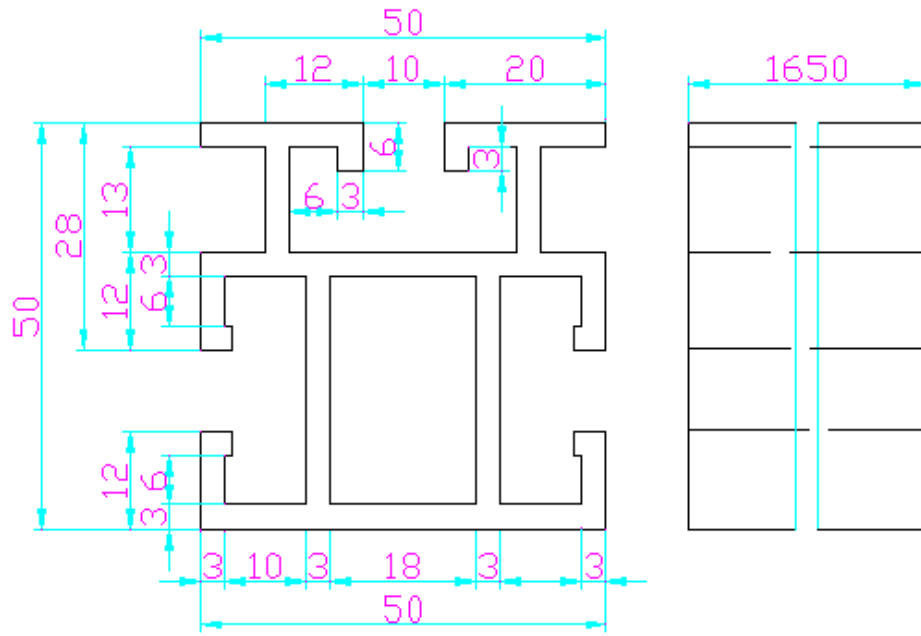
6 Nonstandard Bolt M10



7 Pressure Plate

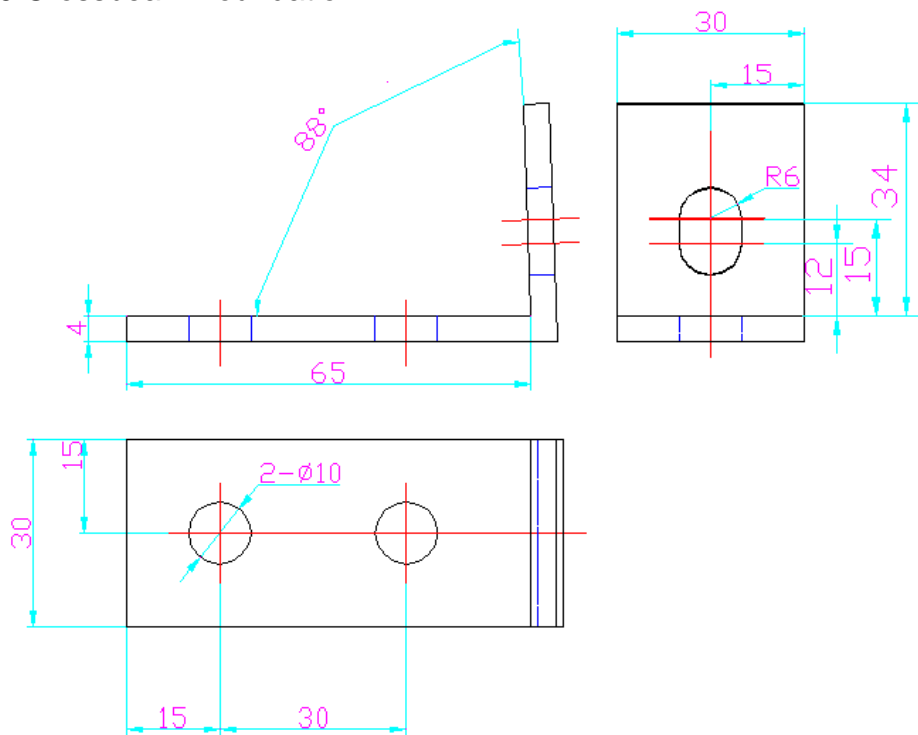


8 Crossbeam

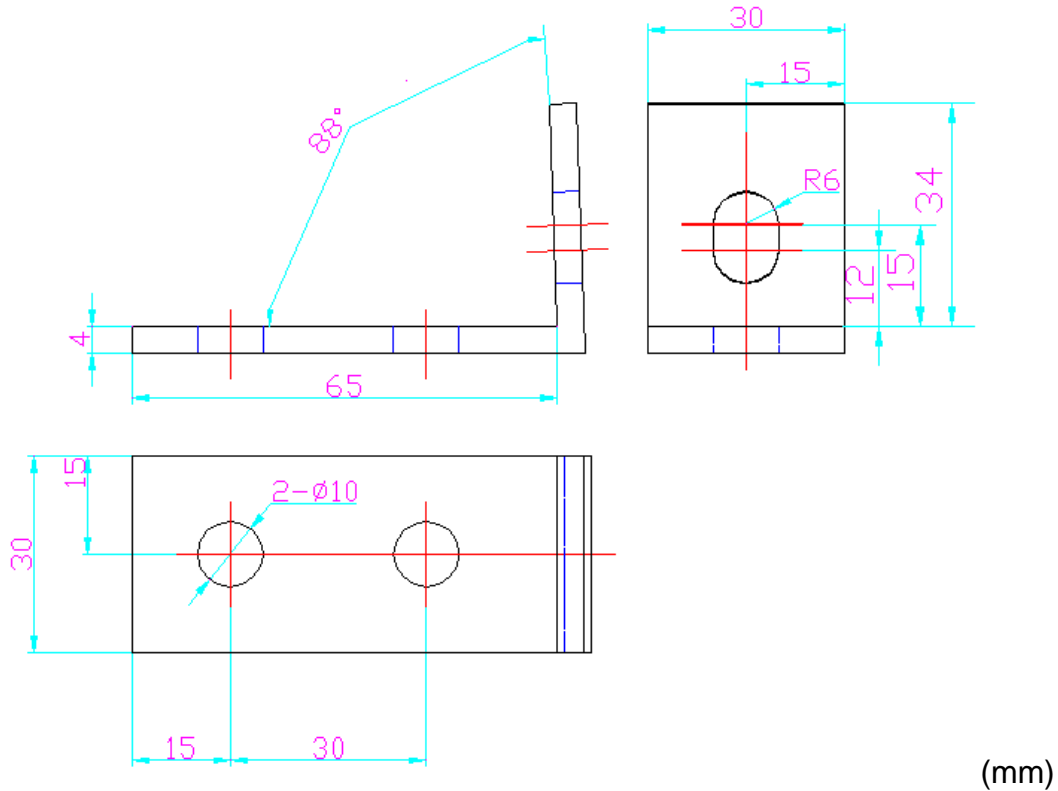


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9 Crossbeam Foundation



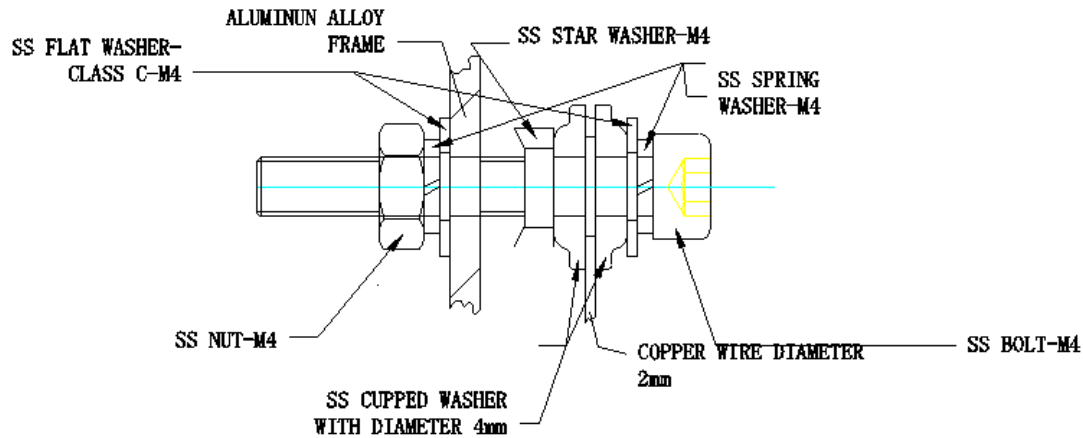
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Electrical Installation

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 overcurrent, 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

HAREON 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.

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- | 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 $\pm 10\%$ 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 Hareon's control; Hareon 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 Hareon 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 Hareon'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. Hareon reserves the right to change the manual, the product, the specifications, or product information sheets without prior notice.

Information about manufacturer:

Jiangyin Hareon Power Co., Ltd.

ADD: Huangtang Industrial Zone(Huanzhen North Road), Xuxiake Town, Jiangyin, Jiangsu, P.R. China

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. Subject to technical modifications without notice.