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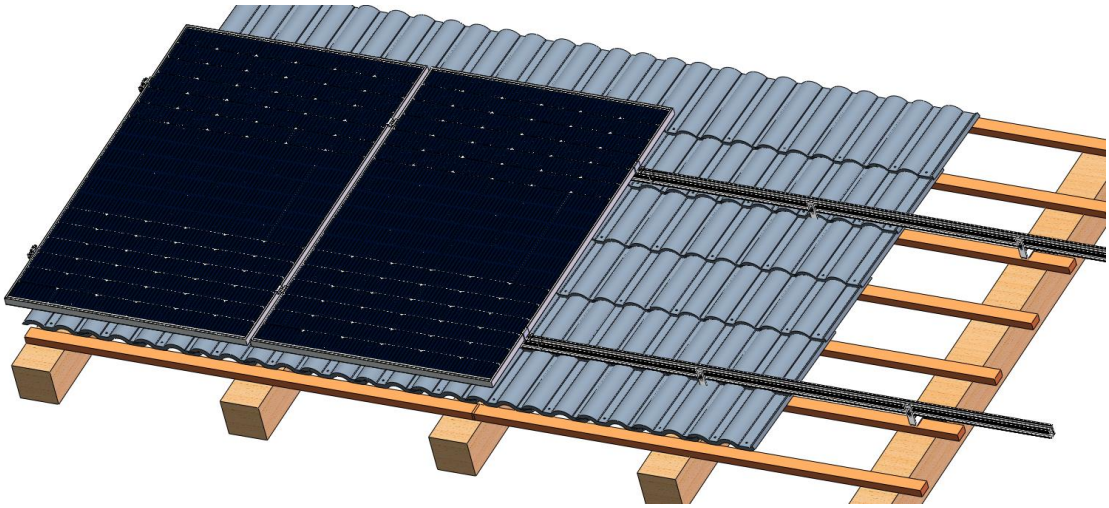
Haitai Solar

Installation Use and Maintenance Instructions of Roman Tile Roof Mounting System (TRM-A)

Solar Mounting System name: Roman Tile Roof Mounting System
Solar Mounting System reference number: TRM-A

Version 3.5

Document Reference No.: TRM-A-IM



Date of issue: 2025.02.02

Content

I. Safety Precautions

Thank you for purchasing Haitai solar mounting system products. Please refer to this installation manual before installation, operation, maintenance, and inspection.

●Cautions

・The installation is limited to those who have professional experience and can carry out construction according to the specified items

・Please abide by national or local building regulations and environmental protection regulations.

・Please comply with the regulations on the prevention of industrial accidents and the relevant regulations of the insurance union.

・Please wear safety clothes. (Especially protective helmets, boots and gloves)

・There must be at least 2 operators during installation to prevent accidents.

・Please always prepare at least one installation manual while installing.

■ While working at heights, please set up scaffolds and carry out construction after eliminating the danger of falling. Please use gloves and seat belts.
■ In order to prevent accidents and malfunctions, please do not arbitrarily change the product style.
■ Please be careful not to damage the cross section or sharp corners of the mold.
■ Please make sure fasteners are all tightened, like bolts, nuts, self-tapping screws, etc.
■ Please be careful not to touch the profile section while working on electrical wiring and grounding constructions, which may damage the wiring.
■ Please do not use damaged, malfunctioning or deformed products in case injury or accident happens
■ Please avoid strong collisions in case any deformations and scratches occurred.
■ This manual is related to the installation of the mounting system. Please consider the mounting system during the construction of the foundation, components, inverters, and electrical wrings.

II. Introduction

Haitai's Roman Tile Roof Mounting System is a roof photovoltaic support system applied to tile roof. The whole system has fewer accessories, which saves the user's installation time and costs. It is an efficient solution for large-scale tile roof projects.

Compatible roof type: Pitched roof
Installation type: Above roof installation
Compatible solar panel type: Solar PV panel mounting
Permissible panel orientation: Portrait installation
Permissible solar panel dimensions: maximum panel length and width 1722x1134 mm and thickness 30~40 mm
Compatible roof pitch range: 17.5°- 40°
Compatible roof substructure: minimum wood rafter size of 83.4 mm wide and 80 mm deep
Compatible roof coverings: Single lap interlocking roman tile

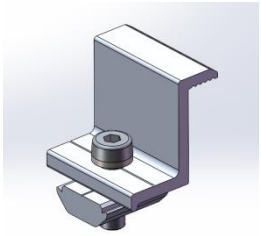
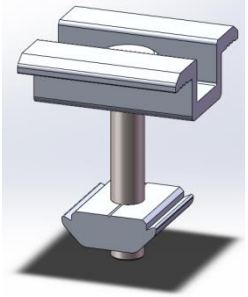
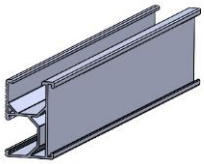
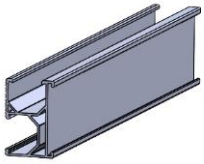
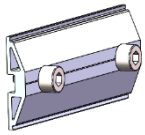
Maximum design wind uplift resistance for 2 panels array (total area 3.91 m^2)

Limit State	Partial Factor	Design Uplift Resistance (Pa)
Serviceability	1.0	751

III. Installation Tool

Tool	Use
Drill Driver with 10mm Bi-Hex socket	Driving Tapping screw ST6.3x80-G into wood rafter when attaching roof hook
Socket wrench and 6mm (H6) hex-bit socket	Tightening the Hex socket cap screw of the rail connector when connect two short rails together; Tightening the Hex socket cap screw of the roof hook when attaching the rail to the roof hook; Tightening the Hex socket cap screw of the module clamps; Tightening the Hex socket cap screw (M8x25) of grounding lug.
Socket wrench and 5mm (H5) hex-bit socket	Tightening the Hex socket cap screw (M6x16) of grounding lug
Torque wrench (Capable of 8-20 Nm)	Tightening rail connector nut and module clamp screw to the correct torque

IV. Component & List

Main parts list			
			
End clamp 30-40mm HEC-08	Mid clamp 30-40mm HMC-01	Rail 1800mm HRR-02-1800	Rail 600mm HRR-02-600
			
Rail connector HRJ-02	Roman Tile roof hook HHK-01	Tapping screw ST6.3x80-G ST6.3x80-G	Earthing clip HGC-01
			
Grounding lug HGL-01			

#	Component Name	Component Part Number	Component Technical Drawing Reference Number and version	Component Material – type and grade/composition	Component mass (kg)
1	Mid clamp 30-40mm	HMC-01	HMC-01 V1.1 HTM-01 V1.2 M8x40 V1.3 M8-SW V1.2 M8-FW V1.1	Various, refer to technical drawing	0.055kg/pc
2	End clamp 30-40mm	HEC-08	HEC-08 V1.1 HTM-01 V1.2 M8x25 V1.3 M8-SW V1.2 M8-FW V1.1	Various, refer to technical drawing	0.055kg/pc
3	Rail 1800mm	HRR-02-1800	HRR-02-1800 V1.1	AL6005-T5	1.336kg/pc
4	Rail 600mm	HRR-02-600	HRR-02-600 V1.1	AL6005-T5	0.445kg/pc
5	Rail connector	HRJ-02	HRJ-02 V1.1 M8x16 V1.3	Various, refer to technical drawing	0.085kg/pc
6	Roman Tile roof hook	HHK-01	HHK-01 V1.1 HTM-01 V1.2 M8x25 V1.3 M8-SW V1.2 M8-FW V1.1	Various, refer to technical drawing	0.524kg/pc
7	Earthing clip	HGC-01	HGC-01 V1.1	SUS304	0.001kg/pc
8	Grounding lug	HGL-01	HGL-01 V1.1 HGC-03 V1.1 HTM-01 V1.2 M6x16 V1.3 M8x25 V1.3 M8-SW V1.2 M8-FW V1.1	Various, refer to technical drawing	0.047kg/pc
9	Tapping screw ST6.3x80-G	ST6.3x80-G	ST6.3x80-G V1.1	SUS304	0.018kg/pc

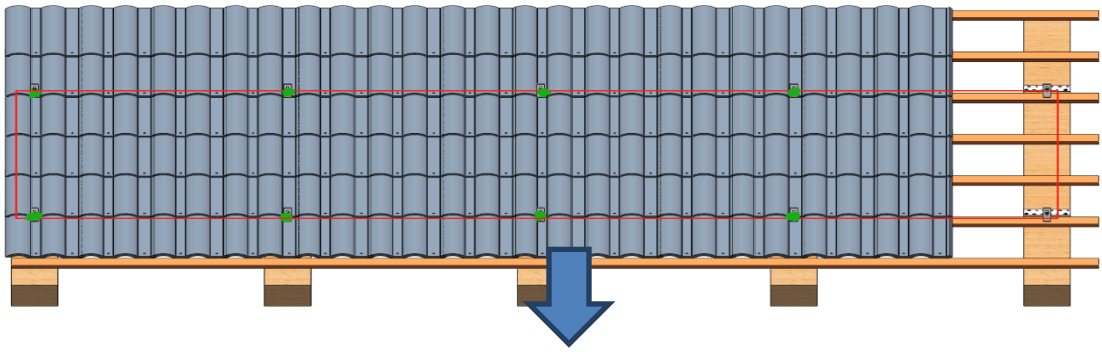
V. Installation Instructions

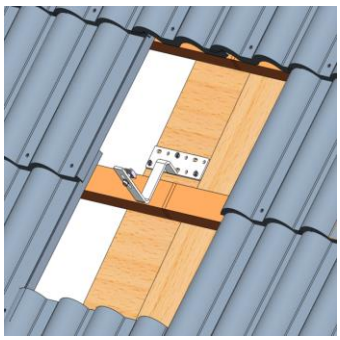
1. Roman Tile roof hook + rail

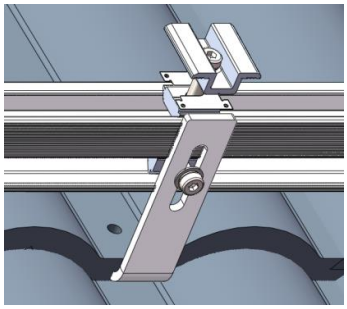
(1) Install the roof hook (HHK-01)

Marking the position of hooks (HHK-01) according to the drawing，make sure all hooks are on the same horizontal line. Install the hooks accordingly and fasten them to beams by self-tapping screws.

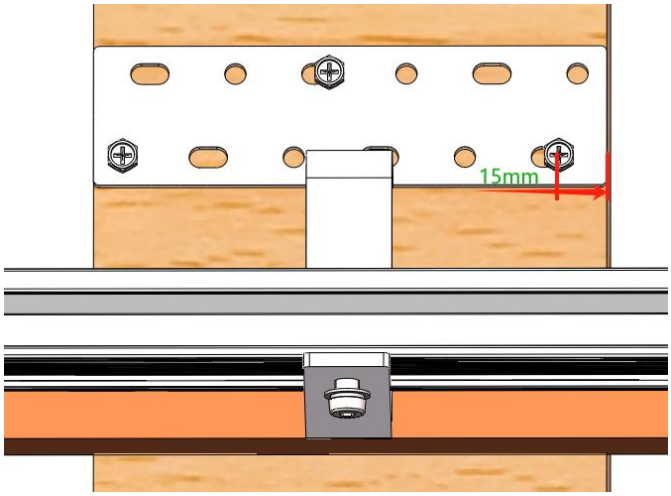
a. Choose and mark the installation position based on the same horizontal line
Note:
Maximum horizontal distance between tile roof hook center is 1000mm
Maximum vertical distance between module clamp bolt center is 1200mm

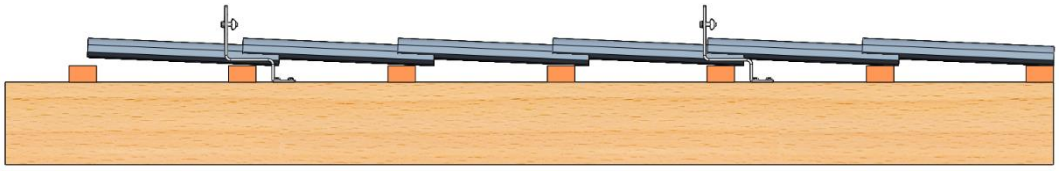






b. Install the hook HHK-01 on marked position. The hook HHK-01 base is perpendicular to the wooden edge and is fixed in the center position of beams using 3 self-tapping screws by drill driver. Minimum distance from tapping screws to rafter edge shall be 15mm.
Note: The hooks must be positioned so that the hook arm is over/under the flat part of the roman tile only.


15mm



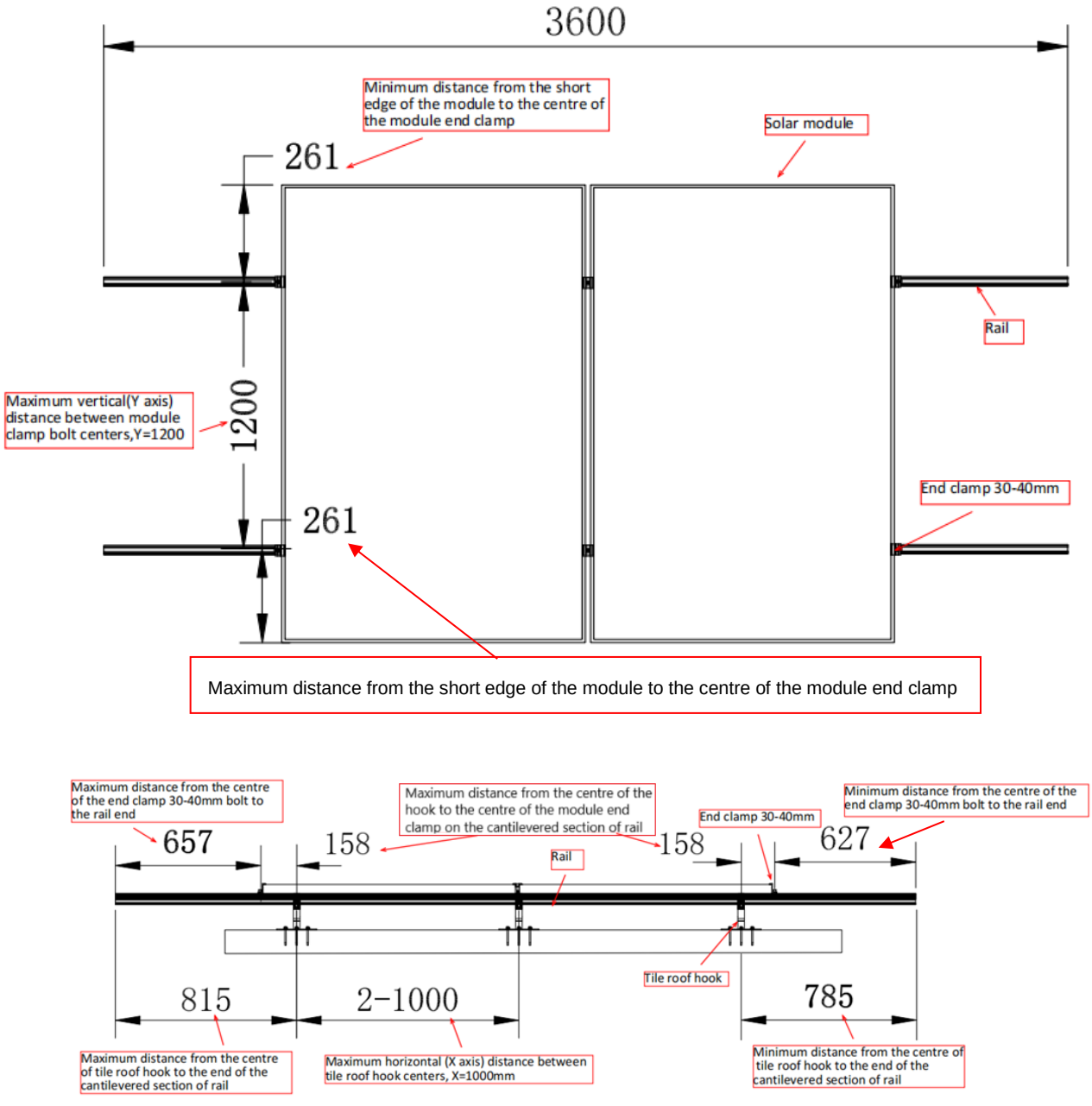


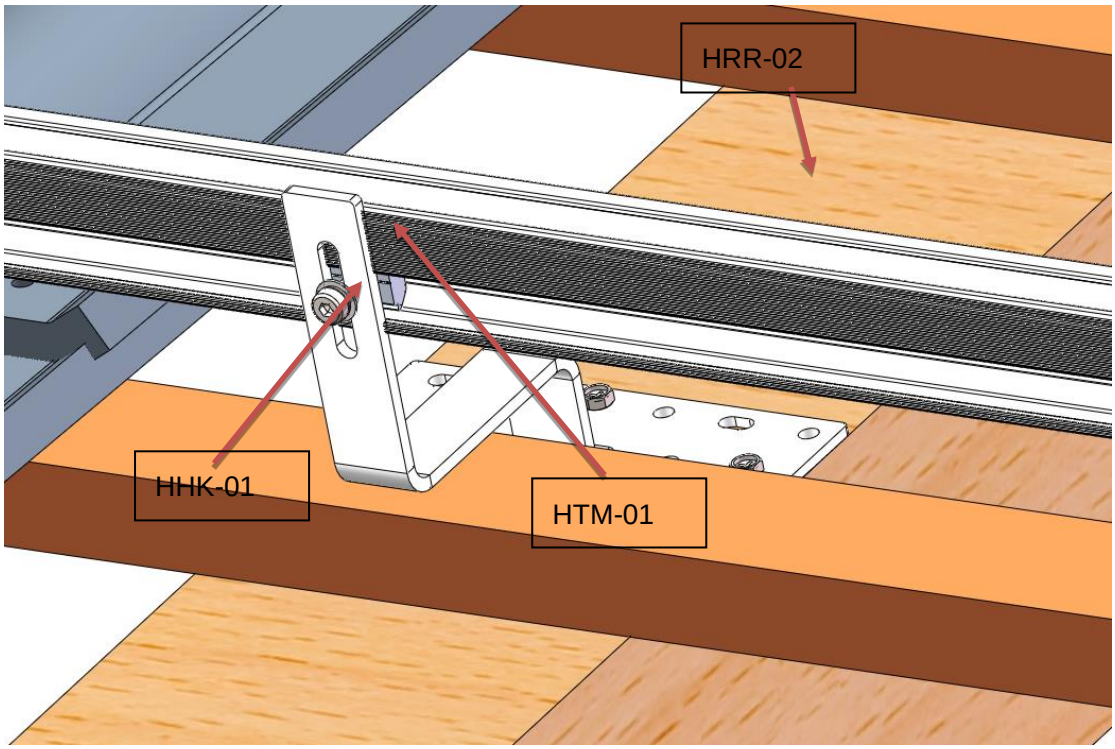
Figure of the actual position of Roman Tile roof hook and panel clamp

（2）Install rail

(2-1) Put the rail onto the hook, fix them by using T module HTM-01 with socket wrench and 6mm (H6) hex-bit socket

Note: Required tightening torque of hook: 8 N·m

Note:
Maximum distance from the centre of the tile roof hook to the end of the cantilevered section of rail is 815mm;
Minimum distance from the centre of the tile roof hook to the end of the cantilevered section of rail is 785mm;

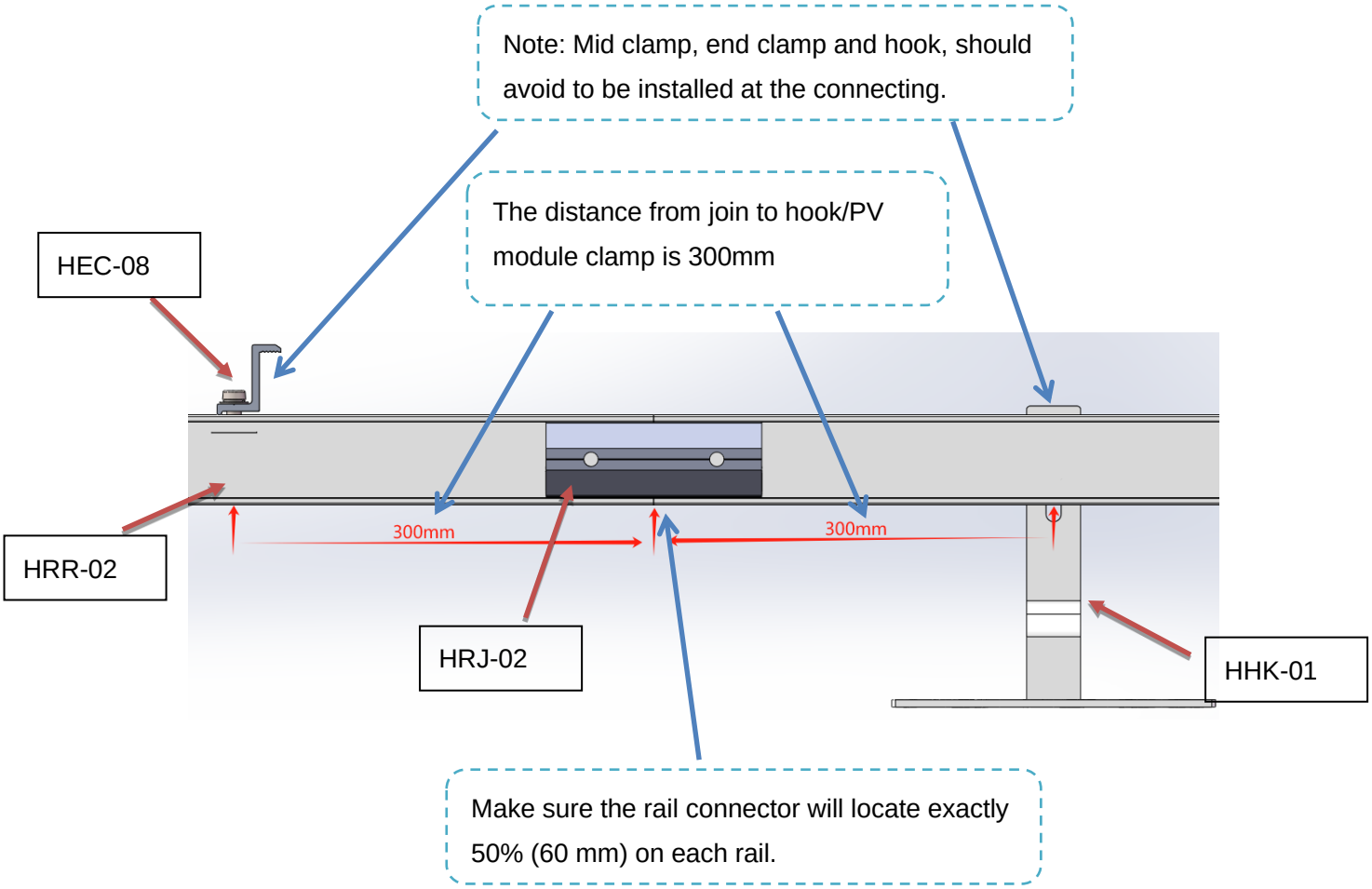


(2-2) Connect rail: Long rail should be connected by rail connector HRJ-02 with Socket wrench and 6mm (H6) hex-bit socket

Note: Required tightening torque for rail connector: 18 N·m

System Limitations

Mid clamp, end clamp and hook, should avoid to be installed at the connecting joint. The distance from join to hook/PV module clamp is 300mm

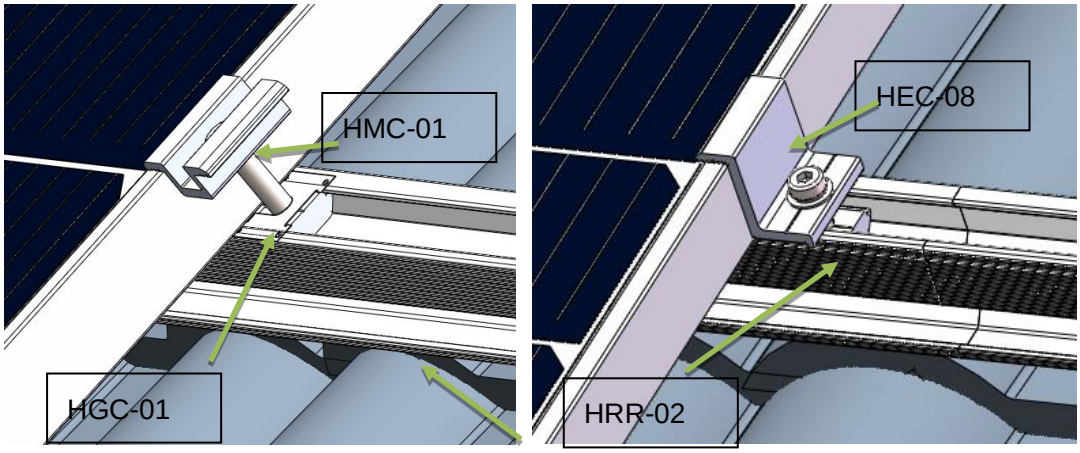


（3）Install PV module

Put the PV module onto the rail according to the drawing, fix them by using end clamp HEC-08 and mid clamp HMC-01 by Socket wrench and 6mm (H6) hex-bit socket.

Note: Required tightening torque for mid/end clamp: 8 N·m

a. Put the PV module onto the rail HRR-02, long side is perpendicular to the rail, fix them onto rail with HEC-08 and HMC-01

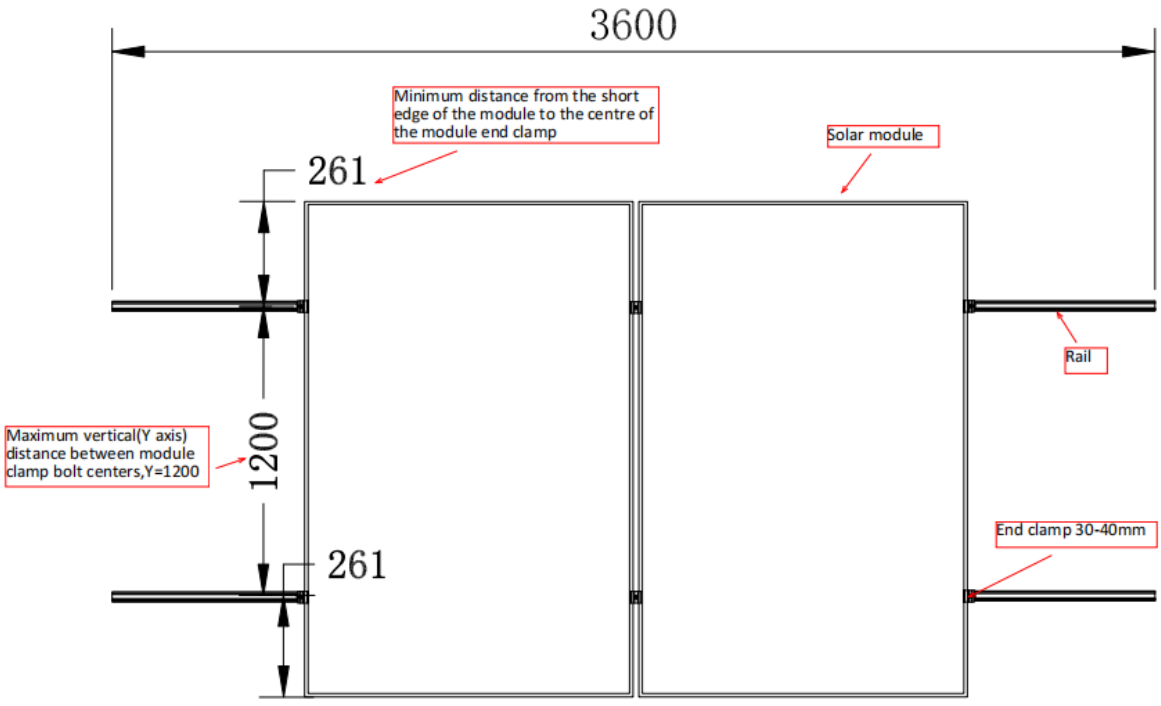


Note:
Maximum distance from the centre of the hook to the centre of the module end clamp on the cantilevered section of rail is 158 mm

Minimum distance from the short edge of the module to the centre of the module end clamp bolt is 261mm

Maximum distance from the short edge of the module to the centre of the module end clamp bolt is 261mm

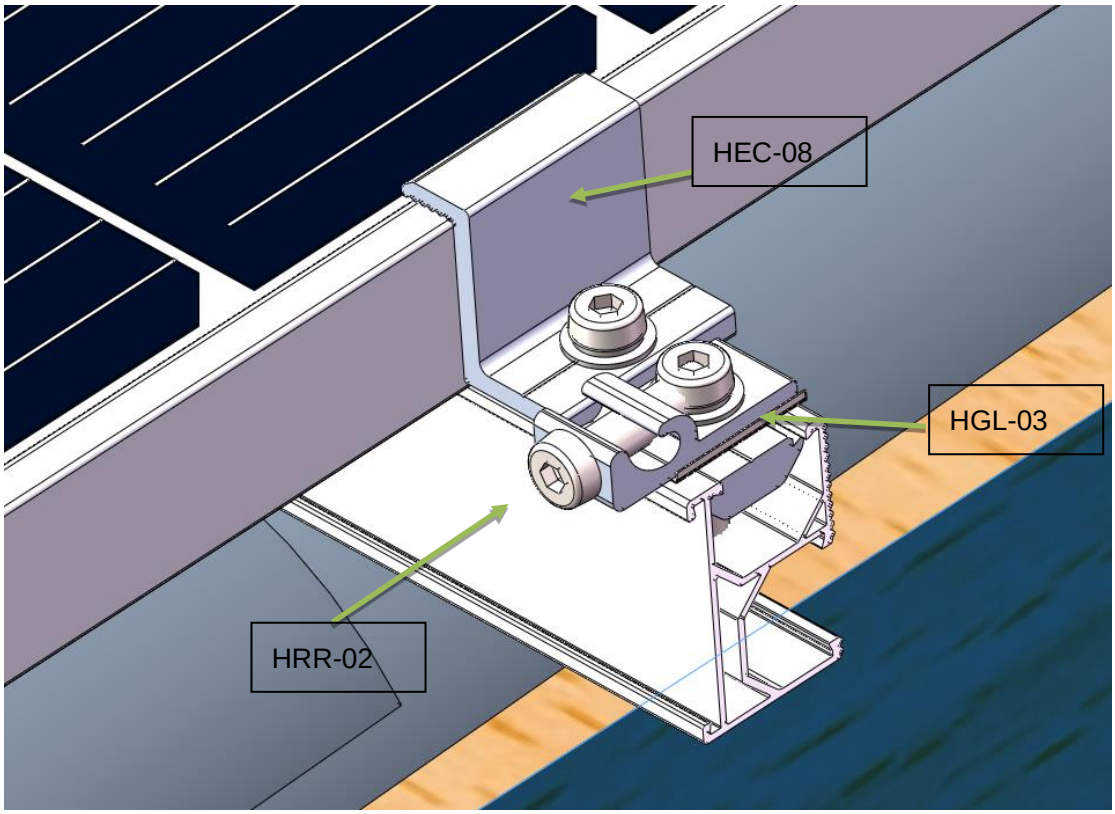
Details can follow below drawing for reference:



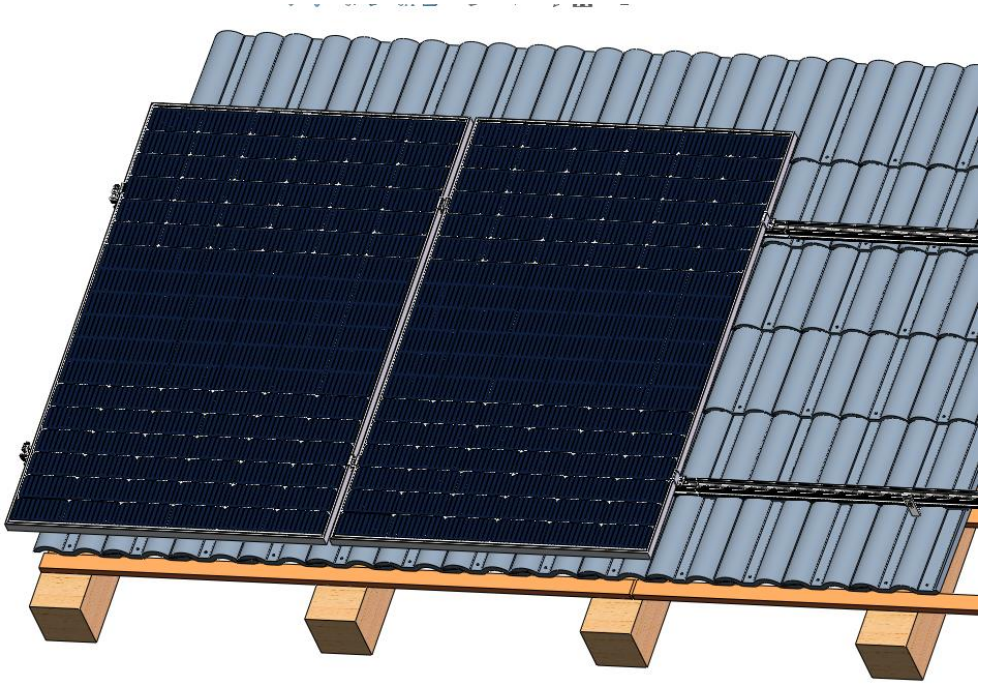
b. Install grounding system

Using Socket wrench and 6mm (H6) hex-bit socket and 5mm(H5) hex-bit socket used to tighten the M8x25 and M6x16 hex-bit socket cap screw.

Note: Required tightening torque for grounding lug: 8 N·m



c. Overall View



VI. Installation Precautions

1.Install PV module

The installation instructions are as per the PV module dimensions 1722*1134*30 mm which was tested by laboratory.

2.Fastener

Because of the good ductility for stainless steel, fasteners have big difference with carbon steel one in nature. If used in inappropriate way, it will result in bolts and nuts being locked-up. To avoid this situation, please follow the solutions below:

2.1. Reducing the friction coefficient：

(1) Ensure that the screw thread surface is clean (no dust, gravel etc.)
(2) Use wax or lubricant during installation. (Such as grease, 40 # engine oil);

2.2. Correct method of operation：

(1) Must be perpendicular to the axis of the screw thread when screwing, can never be tilt.
(2) During the tightening process, strength needs to be even.
(3) Use torque wrenches or socket wrenches, if possible, avoid using adjustable wrenches or electric wrenches. (If so, pls try to reduce the speed.)
(4) Do not use it when the temperature is high. Do not use it with high-speed spin to avoid being locked-up due to the rapid rise of temperature. (Such as electric wrench, etc.)
(5) Required tightening torque: Pls see detailed installation step.

VII. Maintenance Instructions

1. Background

Roof solar panel mounts are essential components of solar power systems, and their proper operation is crucial for the efficiency of the system. Regular maintenance of the mounts is necessary to ensure the long-term stable operation of the solar system.

2. Maintenance Schedule

It is recommended to conduct regular inspections and maintenance of roof solar panel mounts, typically on a quarterly basis, to ensure the system's normal operation.

3. Maintenance Procedures

(1) Cleaning: Regularly clean the mounts from dust, debris, etc., to ensure the effectiveness of sunlight exposure on the solar panels.
(2) Check Connections: Periodically inspect the mount's connections, including bolts, nuts, etc., to ensure they are securely fastened and free from looseness.
(3) Rust Prevention: If rust is observed on metal components of the mounts, promptly remove it and apply rust prevention treatment to extend the mounts' lifespan.
(4) Inspect Mount Structure: Regularly check the structure of the mounts for deformations, cracks, etc., and promptly repair or replace as necessary.
(5)Safety Inspection: Maintenance personnel should prioritize safety during maintenance operations, using safety harnesses, etc., and ensuring a safe working environment.

4. Maintenance Methods

(1) Cleaning Method: Use a soft brush or cloth to wipe the mount's surface, using clean water or a mild detergent. Avoid using corrosive chemicals.

(2) Connection Check: Use wrenches or similar tools to check the tightness of connections. Tighten any loose components promptly.
(3) Rust Prevention: Use sandpaper or rust-proof paint to remove rust and apply rust-proof paint afterward.
(4) Structure Inspection: Conduct visual inspections of the mount's structure regularly and take appropriate measures to repair or replace any damaged components.
(5) Safety Measures: Wear helmets, gloves, and other personal protective equipment during maintenance operations, ensuring no slipping or falling hazards.

5. Precautions

(1) Follow Operating Procedures: Maintenance personnel should adhere to operating procedures to avoid unnecessary safety incidents.
(2) Regular Training: Maintenance personnel should undergo regular training to stay updated on the latest maintenance techniques and safety knowledge.
(3) Maintain Records: Keep records of each maintenance session, including the date, maintenance tasks performed, identified issues, and solutions.
(4) Professional Maintenance: If severe issues are identified with the mounts, contact professional technicians promptly for repair or replacement.

VIII. Company information

Certificate holder's name: HAITAI SOLAR SYSTEM CO., LTD
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