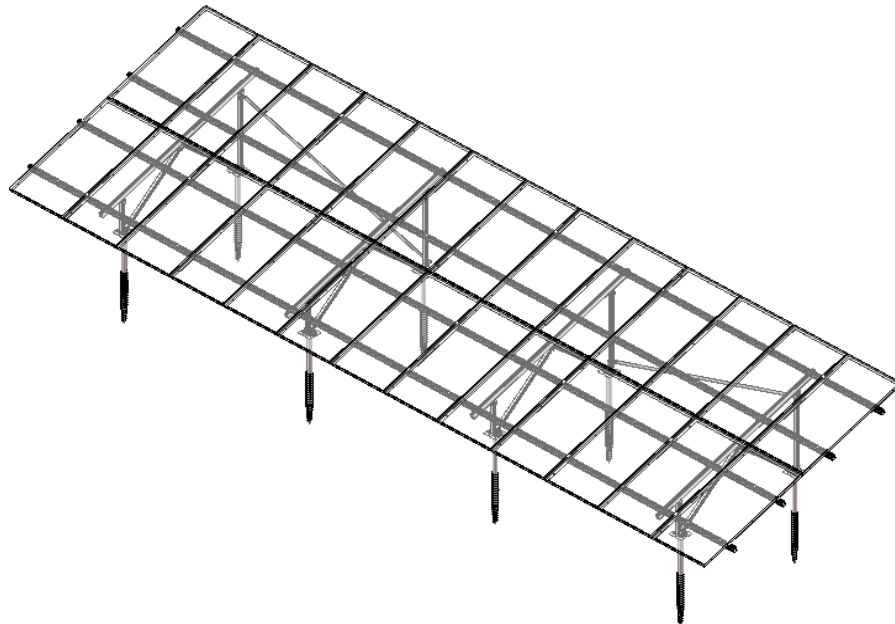


PV-ezRack

SolarTerrace Eco with TM Rail

Installation Guide V1.1

NO.: PZ02A-IM03-11



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1. Product Introduction

Clenergy PV-ezRack® SolarTerrace Eco (hereinafter referred to as ST Eco) is a pre-assembled ground PV-Module mounting system, which is suitable for large-scale commercial installation and multi-purpose installation. ST Eco has been developed as a mounting system for various PV-module. Innovative and unique ST Eco's M module groove track is convenient and help to improve the installation precision. Using high quality engineered components SolarTerrace Eco more suitable for areas with higher salinity, and saves developers and installers, time and money when delivering large scale projects.

Before system installation, please read the installation instruction manual carefully. The manual provides the following content: (1) simple introduction of installation; (2) product installation specification;

Please use it according to the installation instruction manual, which complies with GB50009-2012、JIS 8955-2017、ASCE7-10、ISO 14713 and other building codes. Please pay attention to safety when installing the product, and construct it according to local laws and regulations. You can confirm the latest installation instruction manual on www.clenergy.com.cn if necessary.

Installation personnel shall conform to the following specifications:

- Conform to all local or national construction specifications that can replace the manual;
- Guarantee that Clenergy rack products are applicable to specific installation and installation environment;
- Please use Clenergy's accessories and your installation tools. (Our company does not undertake any responsibility for other accessories that replace Clenergy's ones);
- Recycle according to local related laws;
- Disassembly is corresponding to installation steps;
- The number of solar plate installation personnel shall be not less than 2;
- Guarantee that installation of electric equipment is finished by professional electricians.

2. Tools & Components

2.1 Tools

Tools



Allen Key 6mm
(M8 Hexagon Socket Screw)



Socket Wrench
M8/M12



Torque Wrench



Electric Drill



5m Tape



Marker



String



Total Station or
Equivalent device

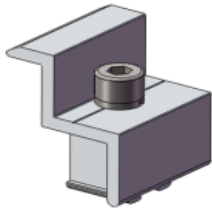


Pile Driver

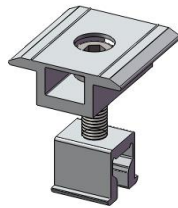
Note: The tools in the figure are only used for installation of rack system (not included in supply scope), please consult system installation personnel about installation of electronic parts.

2.2 Components

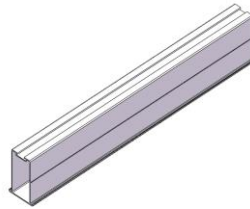
Components



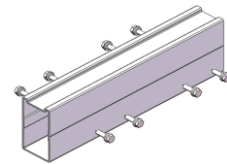
EC-M/OM
End Clamp



ICII-M
Inter Clamp II



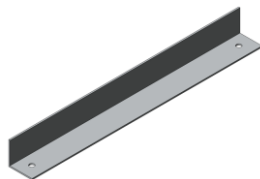
R-TM90/L
TM Rail



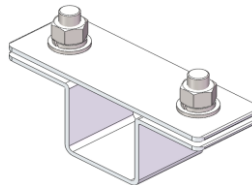
SP-LS90/M
Splice for TM Rail



S-STECO/W
Support (Pre-
assembled, W shape)



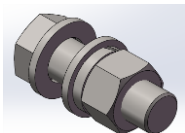
ER-AA-50/3560/8
Angle AL



CO-RT-55/50
Connector for
Rectangular Tube



GS-xx
Ground Screw



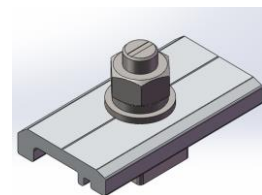
ER-HB-ST16/50A
Hexagonal Bolt
M16*50 (with nut and
washer)



S-STECO/N
Support (Pre-
assembled, N shape)



S-STECO/A
Support (Pre-
assembled, A
shape)



ER-RC II
Option-Rail Clamp II



BR-TM90/EW
East-West Adjustable
Bracket

Note: There are 3 types of Pre-assembled Support (W/N/A), which are selected according to the specific needs of the project.

2.3 Stainless Steel Fastener

Installation Precautions

Improper operation may lead to deadlock of Bolts and Nuts. Follow the steps below to reduce this risk

1. Reduce the friction coefficient:

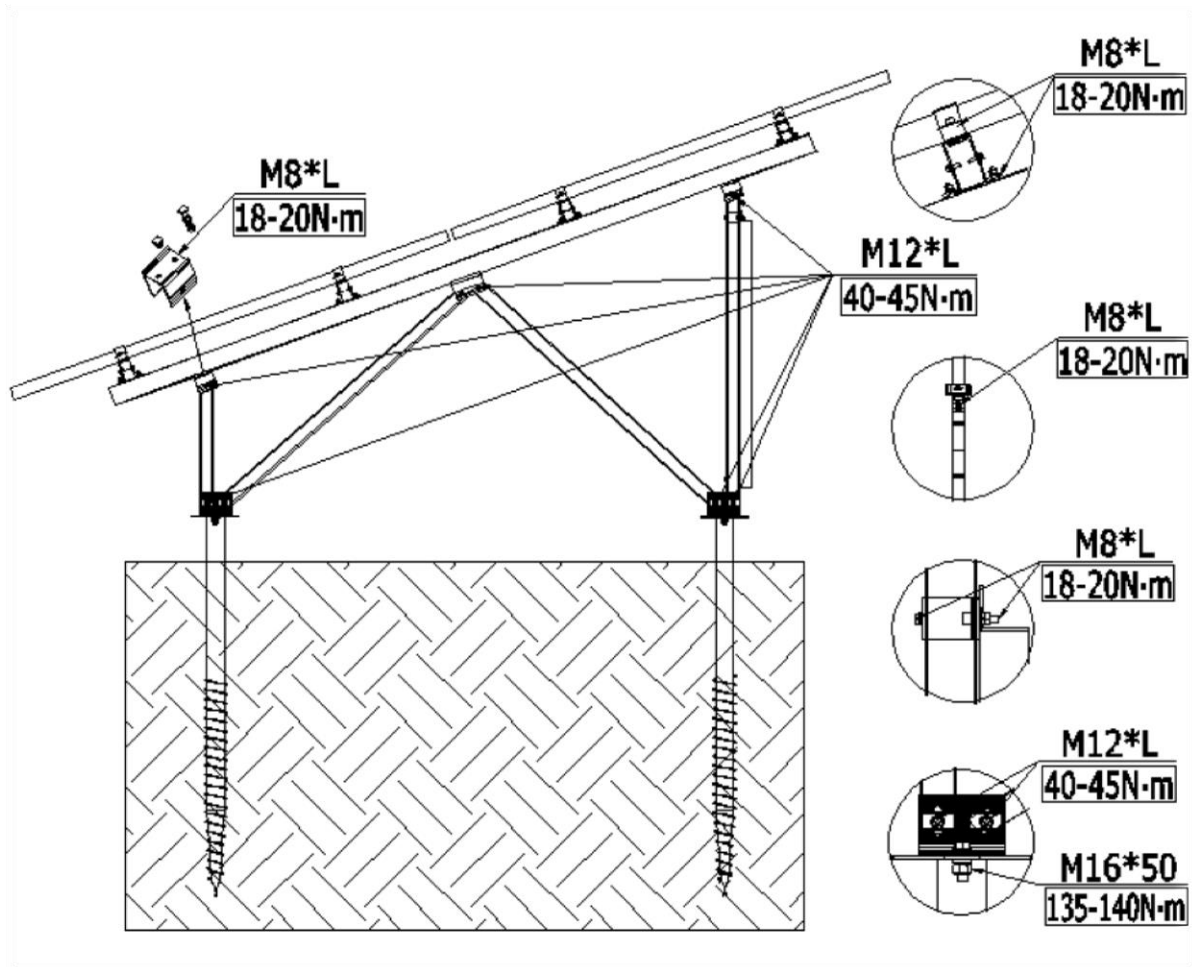
- (1) Ensure that the thread surface is clean (no dirt or contaminant)
- (2) Apply lubricant (grease or 40# engine oil) to fasteners prior tightening to avoid galling or seizing in the threads;

2. General installation instructions:

- (1) Apply force to fasteners in the direction of thread;
- (2) Apply force uniformly, to maintain required torque;
- (3) Professional tools and tool belts are recommended;
- (4) Avoid using electric tools for final tightening;
- (5) Avoid working at high temperatures,

3. Safe Torques

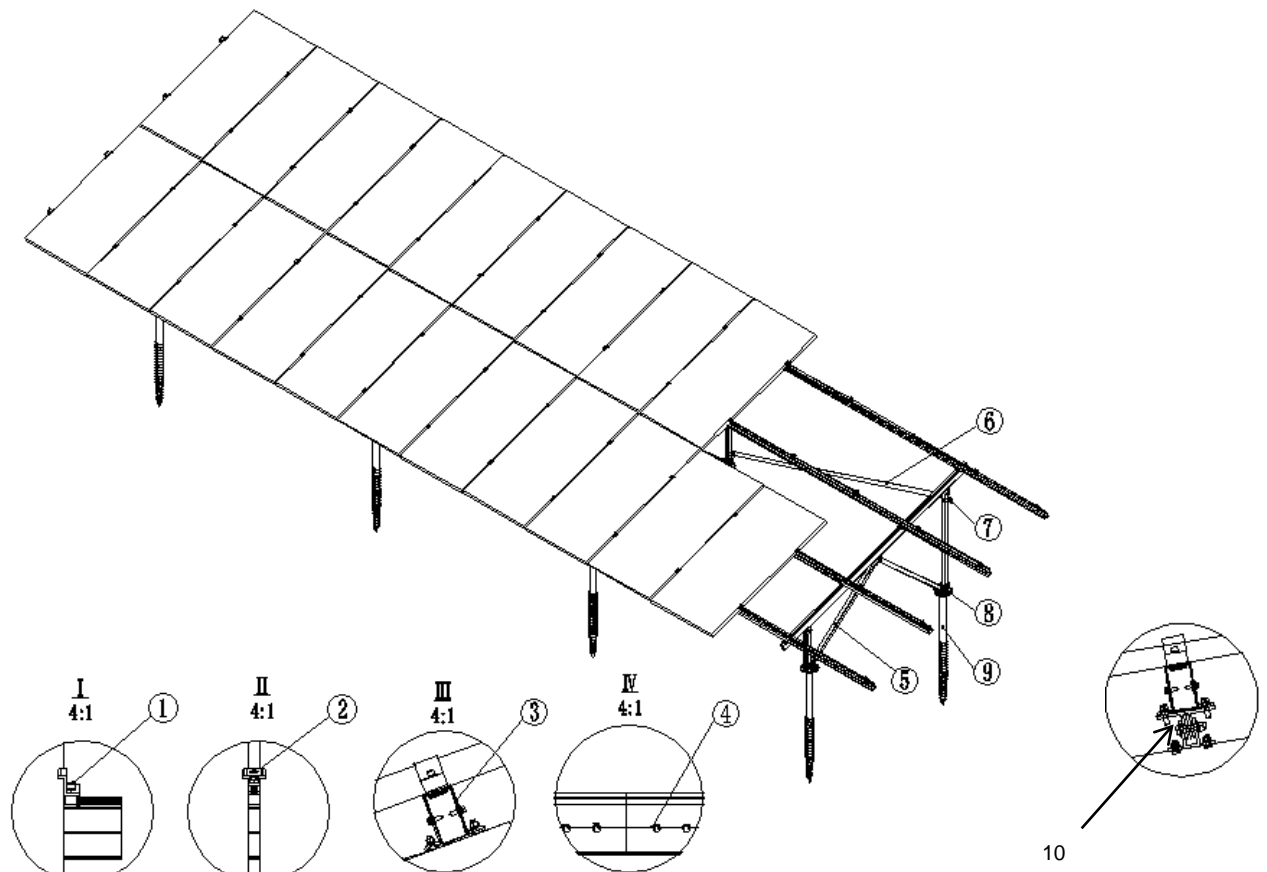
Please refer to safe torques defined in this guide as shown in below figure. In case power tools are required, Clenergy recommends the use of low speed only. High speed and impact drivers increase the risk of bolt galling (deadlock) If deadlock occurs and you need to cut fasteners please make sure that there is no load on the fastener before you cut it. Avoid damaging the anodized or galvanized surfaces.



Notes: Tighten the bolts after all the components in place, Repeat the lock and loosen, it will make bolt stuck.

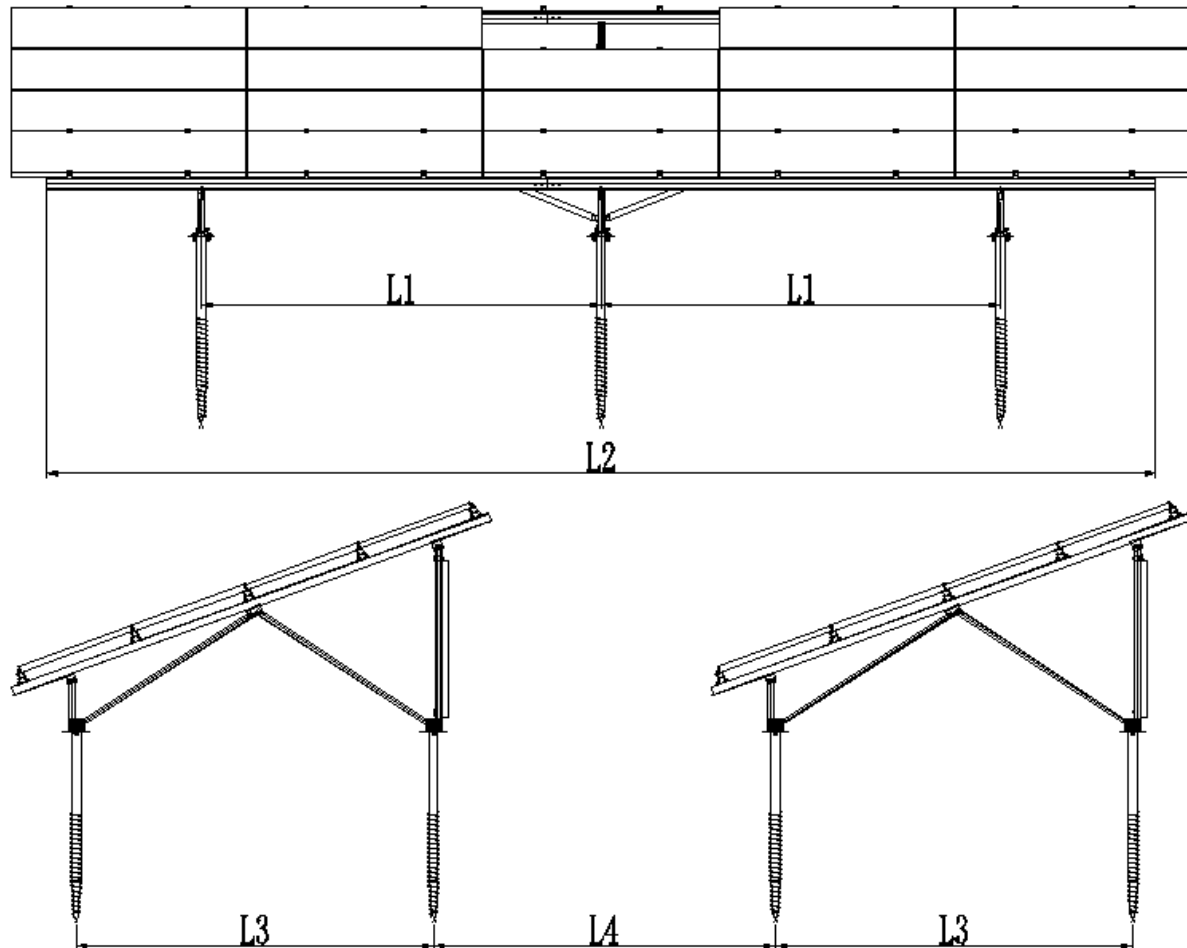
3. System Overview

3.1 Composition



- 1) End Clamp, with M-module
- 2) Inter Clamp II , with M-module
- 3) TM Rail
- 4) Splice for LS Rail
- 5) Pre-assembled Support W shape.
- 6) Angle AL (Option)
- 7) Connector for Rectangular Tube
- 8) Hexagonal Bolt M16*50 (with nut and washer)
- 9) Ground Screw (with Square flange)
- 10) East/West Adjustable Bracket for TM Rail

3.2 Installation Planning



Note: Specific size refers to project installation takes drawings as standard. The installation specification is only used as introduction of product installation method.

4. Installation Instructions

4.1 Ground screw Installation

4.1.1

Before the installation, please prepare necessary installation tools & products, and ensure that hydraulic pile driver can work normally in installation site. Read the relevant engineering materials; get the project layout information such as piling depth, column span, etc. If you have any questions, please contact and consult the customer service.

4.1.2 According to the installation planning, use Total station (or any instrument of similar functions) to carry out positioning mark and mark out the piling position of each ground screw. Check the mark position before piling, to ensure accuracy.

4.1.3 Make necessary adjustment to make sure that all ground screw are on the same level and are all aligned.

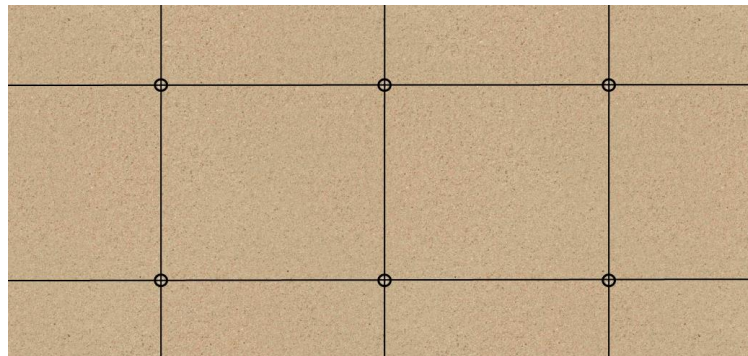
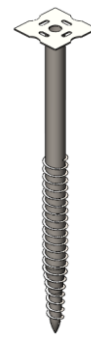


Figure1

Piling depth, horizontal and vertical position of Ground screws are determined by the engineering drawings of specific programs

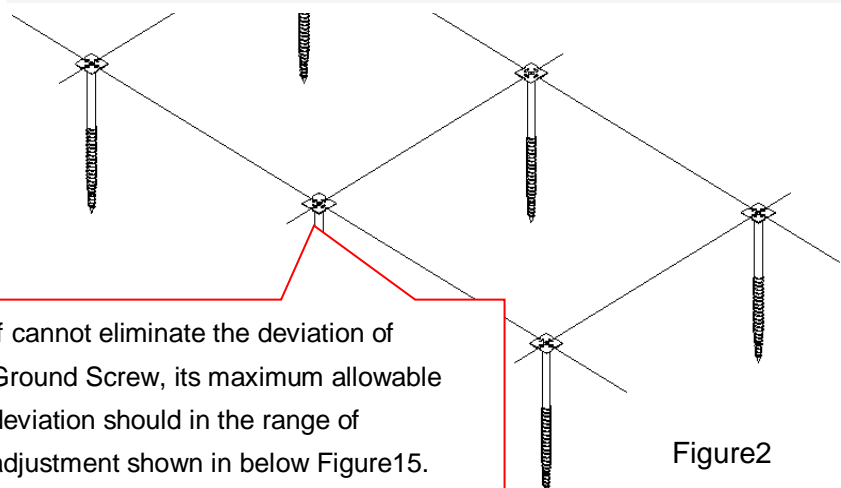


Figure2

4.2 Pre-assembled Support Installation

4.2.1 Before installing Pre-assembled Support, check the ground screws are on the same level and are all aligned.

4.2.2

To different engineer, there are 3 types of Pre-assembled Support:

W shape :

Before installation, it looks as shown Figure3.

Unfold the Rectangular Tubes as shown in Figure 4.

Unlock the M12*85 Bolts from the Slot U-Shape Joint. Insert the end of 2 free end Rectangular Tubes into the Slot U-Shape Joint. Lightly lock them with M12*85 Bolts. Here, please note the orientation of the 2 set of bolts, make sure their head are in the same side with other bolts. Rotate the Corrugated L-anchor Plates to make them in a same horizontal plane, as shown in Figure 6.

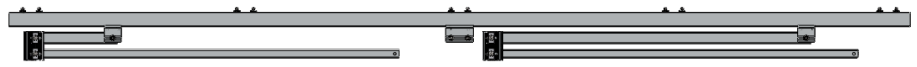


Figure3

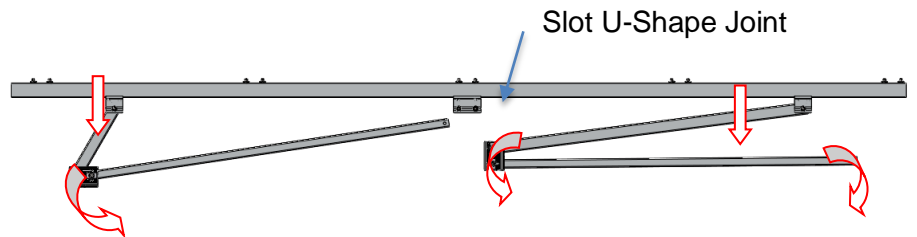


Figure4

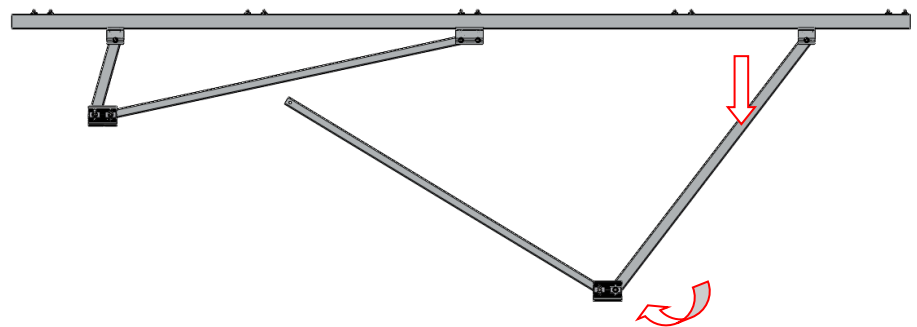


Figure5

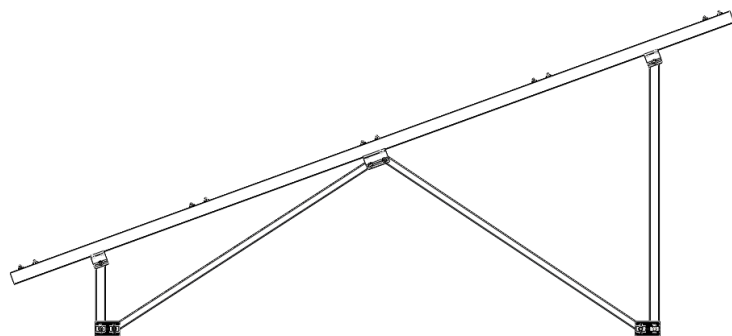


Figure6

N shape :

Before installation, it looks as shown Figure7.

Unfold the Rectangular Tubes as shown in Figure8.

Unlock the M12*85 Bolt from the free end Rectangular Tubes and insert it into the Slot U-Shape Joint. Lightly lock them with M12*85 Bolt. Here, please note the orientation of the bolt, make sure the head is in the same side with other bolts. Rotate the Corrugated L-anchor Plates to make them in a same horizontal plane, as shown in Figure10.

•

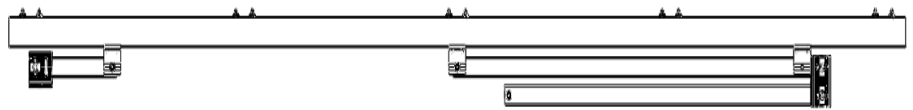


Figure7

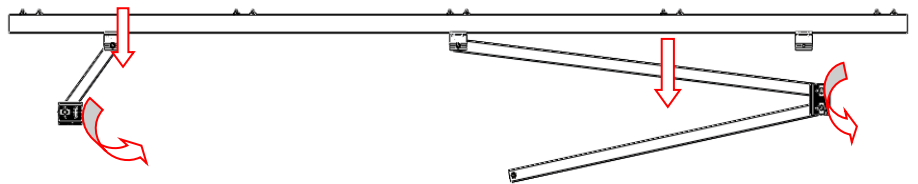


Figure8

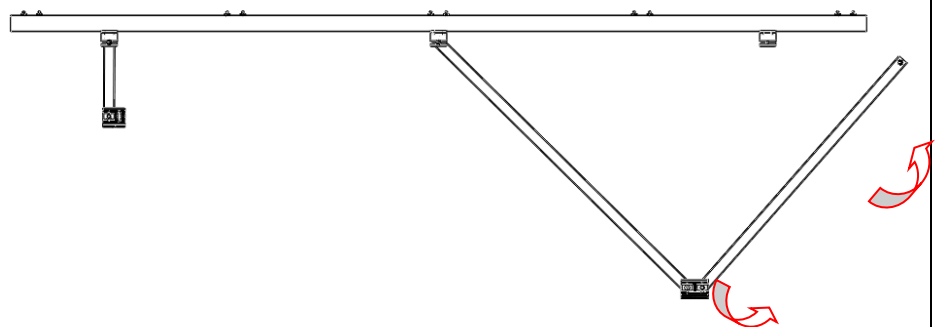


Figure9

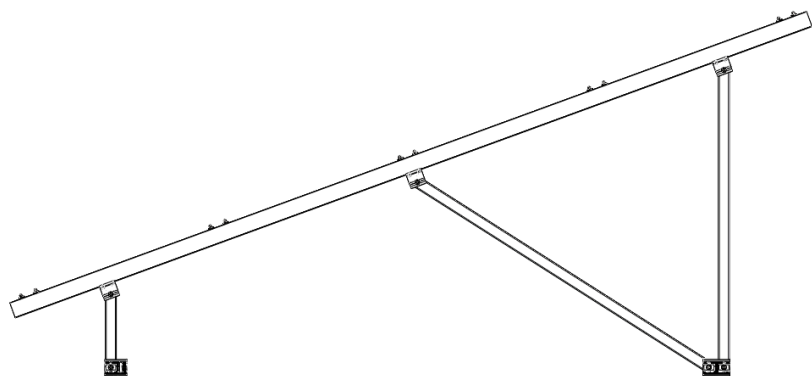


Figure10

A shape :

Before installation, it looks as shown Figure11.

Unfold the Rectangular Tubes as shown in Figure12.

Unlock the M12*85 Bolt from the Slot U-Shape Joint. Insert the free end Rectangular Tube into the Slot U-Shape Joint and lightly lock them with M12*85 Bolt. Here, please note the orientation of the bolt, make sure its head is in the same side with other bolts. Rotate the Corrugated L-anchor Plates to make them in a same horizontal plane, as shown in Figure 14.

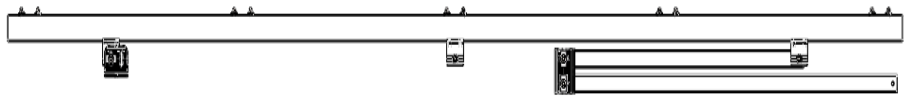


Figure11

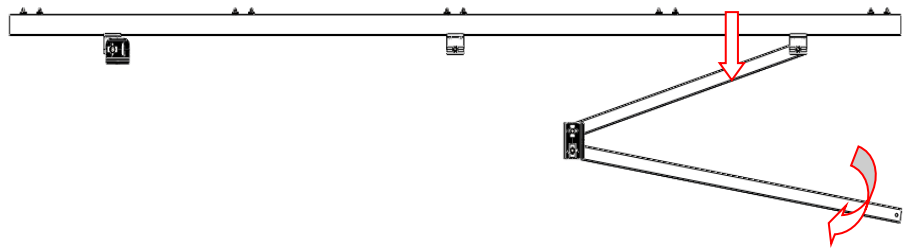


Figure12

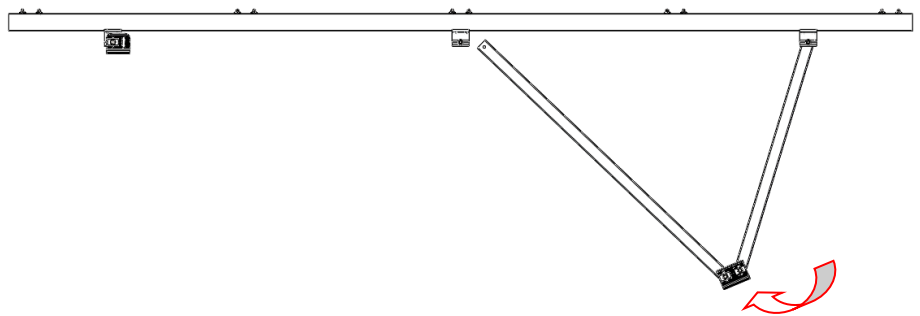


Figure13

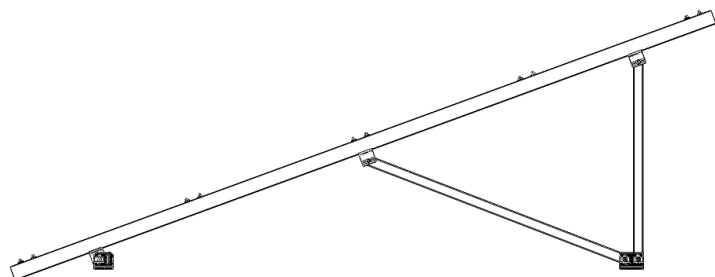


Figure14

4.2.3 Put the unfolded Pre-assembled Support on frank plates of Ground Screws and lock the L-anchor Plates with frank plates with M16 bolts. The up-down adjustable range of Front/Rear leg is $\pm 20\text{mm}$. The north-south adjustable range of Front/Rear leg is $\pm 16\text{mm}$

Recommended Torque:

M16: 135~150N•m

4.2.4 Fasten all bolts shown in Figure16. Check all bolts whether reach recommended torque.

Recommended Torque:

M8: 18~20 N•m

M12: 40~45 N•m

M16: 135~150N•m

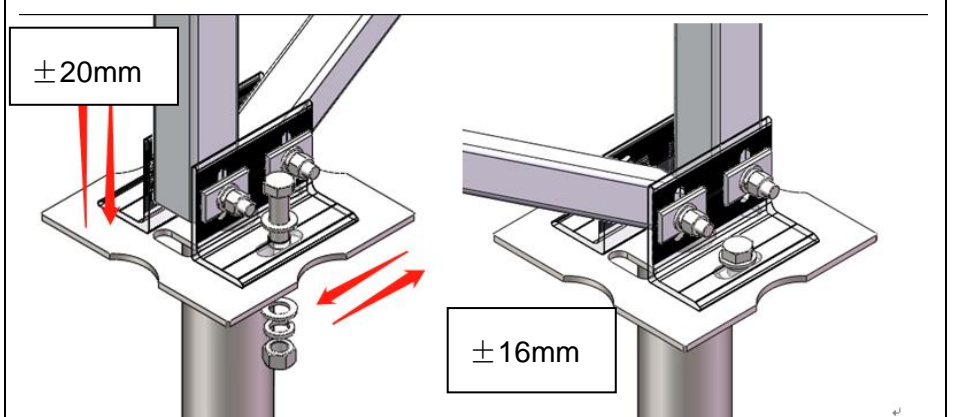


Figure15

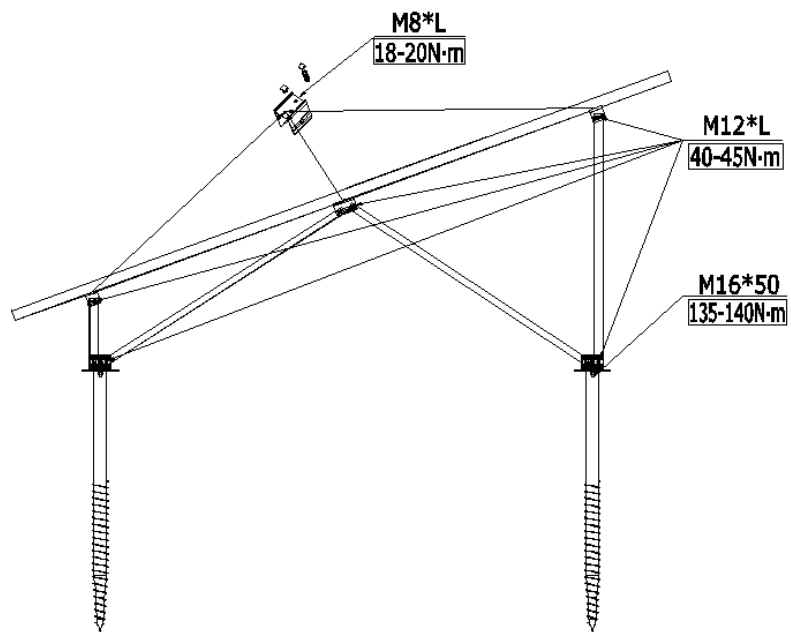


Figure16

4.2.5 According to engineering drawing, repeat the above operations to install other Pre-assembled Support. Ensure all the Two-Groove Square Girders of Pre-assembled Support are aligned and all Pre-assembled Support are parallel to each other. Unlock M16*50 or M12*100 bolts to adjust the position, if necessary, as shown in Figure14.

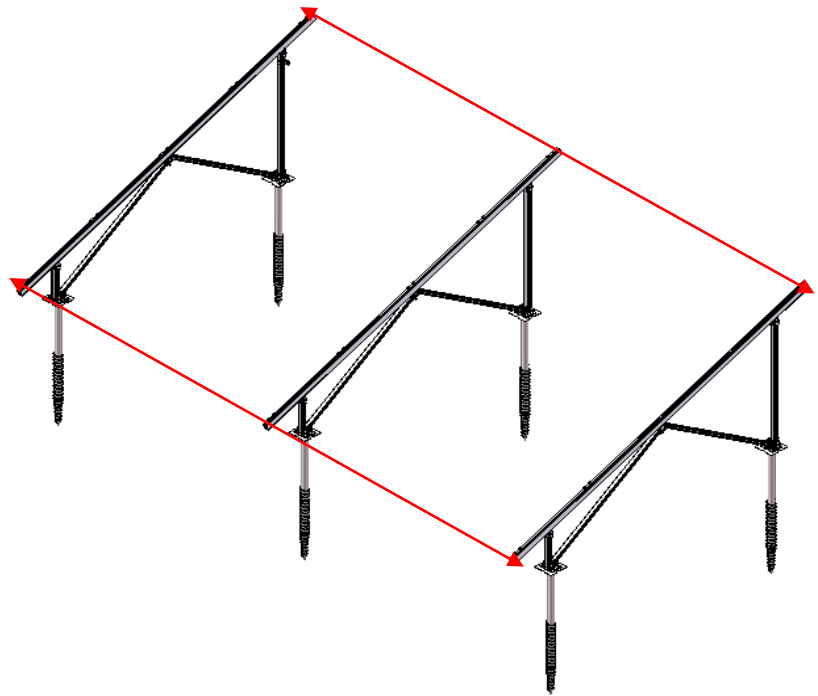


Figure17

4.3 East-West Adjustable Bracket Installation

4.3.1 Adjust the East-West Adjustable Bracket to the properly position and click the W Module into the slot of Girder as shown in Figure 18. Fasten the M8 Bolts slightly.

Recommend Torque for Bolts
M8: 18~20 N•m

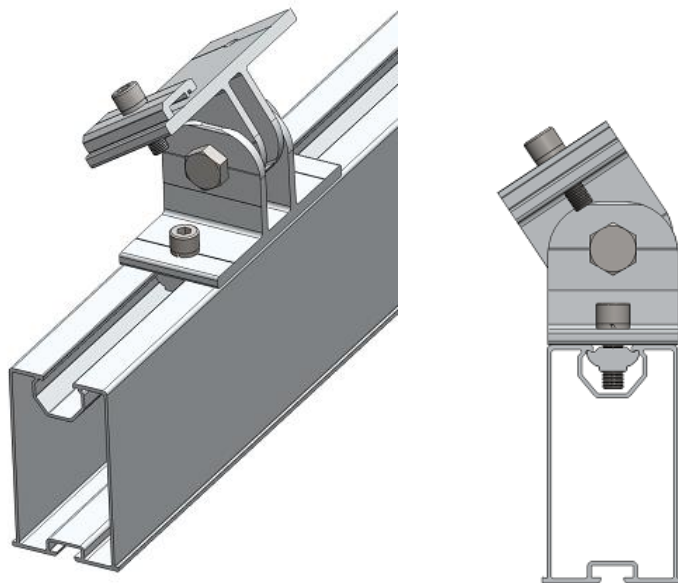


Figure18

4.3.2 Fix the rest of East-West Adjustable Brackets on Girders following the step 4.3.1. Adjust the positions of all East-West Adjustable Brackets and fasten with M8 Bolts assembly.

Recommend Torque for Bolts
M8: 18~20 N•m

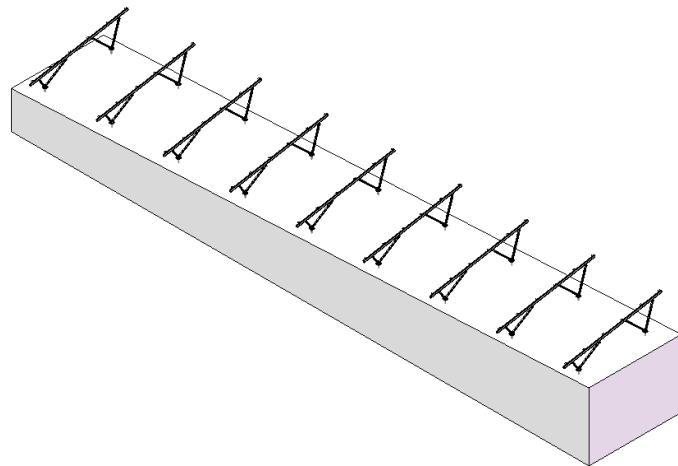


Figure19

4.4 Rail Installation

4.4.1 Before fix TM Rails on the Support, splice them to the required length with Splice for TM Rail.

Insert half of Splice into TM Rail and fasten with two sets of Self-tapping screws ST6.3*22 in each side of TM Rail, and then insert the other Splice into TM Rail and fasten with Self-tapping screws as shown in Figure 20.

NOTE: Please fasten the Self-tapping screw until its rubber washer attach the TM Rail tightly.

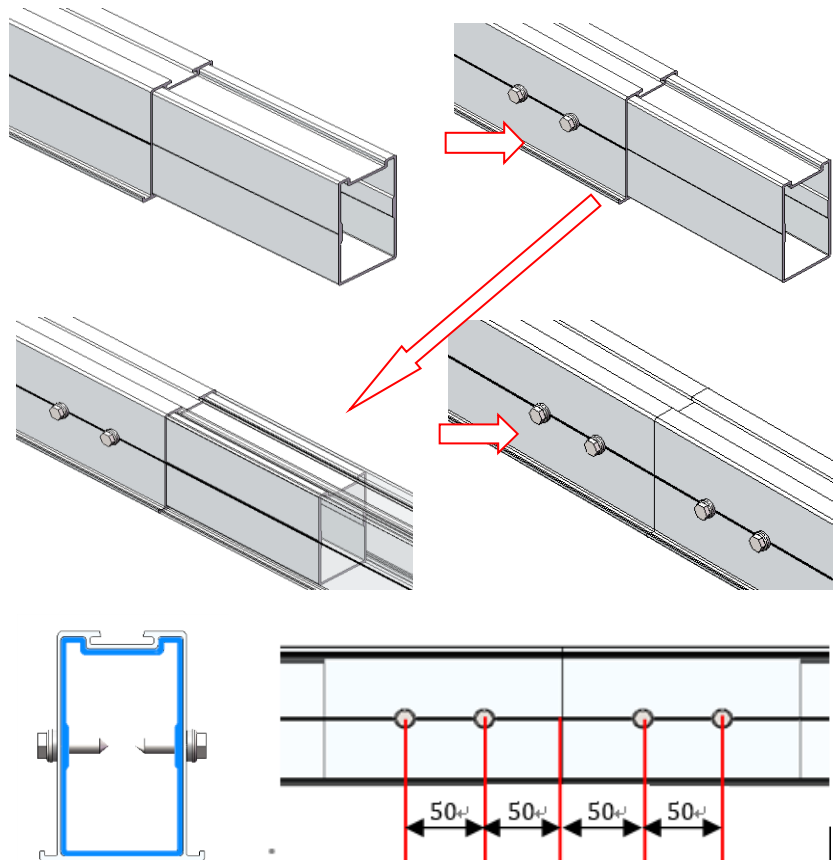


Figure20

4.4.2 Click one lower side of TM Rail on the East-West Adjustable Bracket and fasten with Rail Clamp. And fasten the other lower side of TM Rail with Rail Clamp as shown in Figure 21.

4.4.3 Place the TM Rail one by one on the planned positions.

4.4.4 Repeat above operations, install other TM Rails. Ensure the end faces of Rails are aligned and all Rails are at same height as shown in Figure 22. Now fasten all bolts tightly.

Recommended Torque:

M8: 18~20 N•m

Recommended Torque:

M12: 50~55N•m

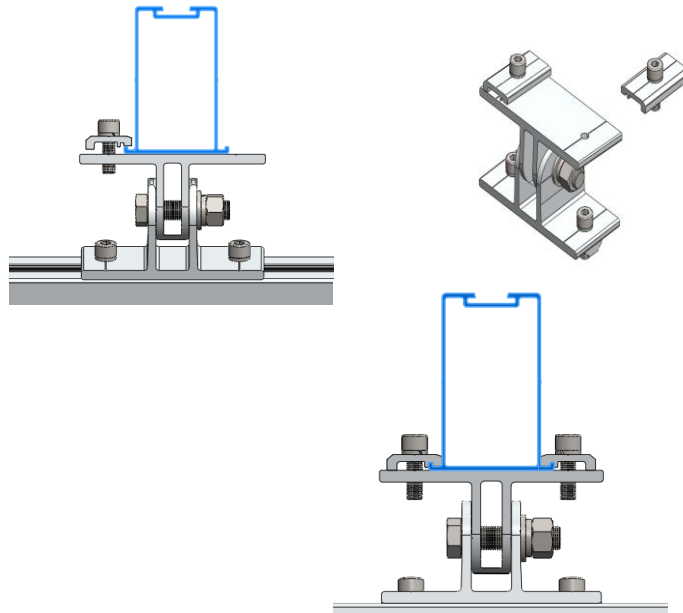


Figure 21

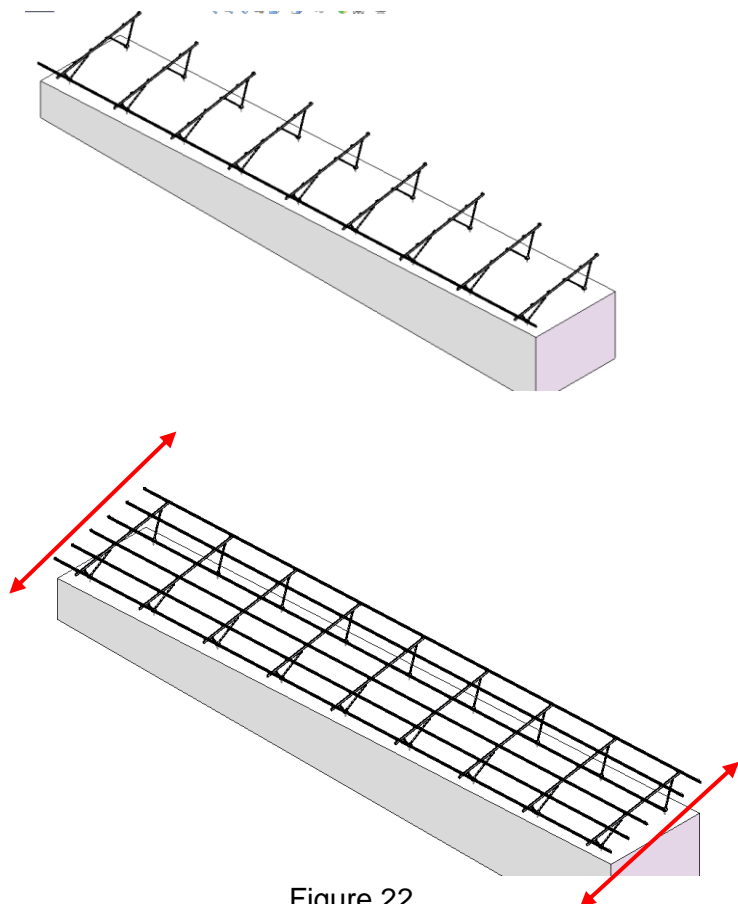


Figure 22

4.5 Angle AL Installation (Optional Parts)

4.5.1 According engineer plan, lightly lock Connector for Rectangular Tube on the rear leg of Support as shown in Figure 23. Insert M8*30 through the hole on Angel AL. Lightly lock another Connector for Rectangular Tube on the next span rear leg and adjust its position to lock the Angel AL and make it be in tension status. Use Self-tapping screw ST6.3*22 to fix Connector for Rectangular Tube and fasten all bolts as shown in Figure 24.

Note:

The quantity, position and tilt direction need to comply with the requirement on engineer drawings.

Recommended Torque:

M8: 18~20 N•m

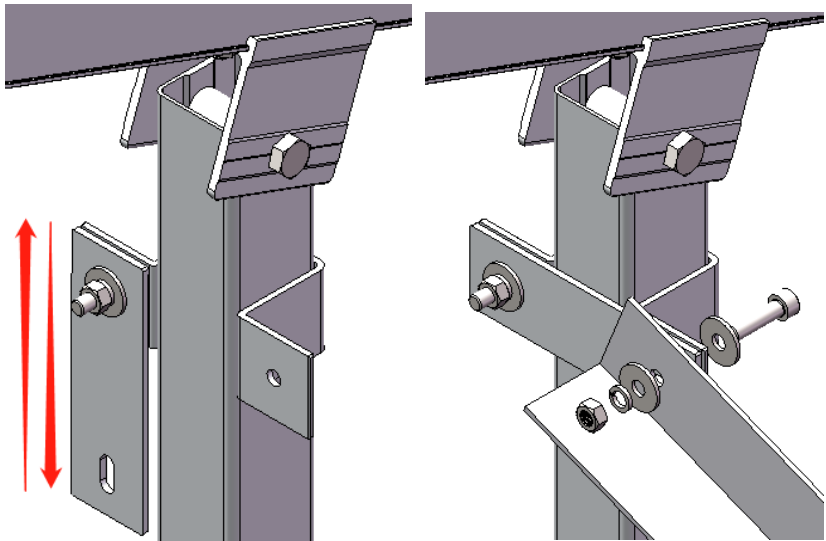


Figure23

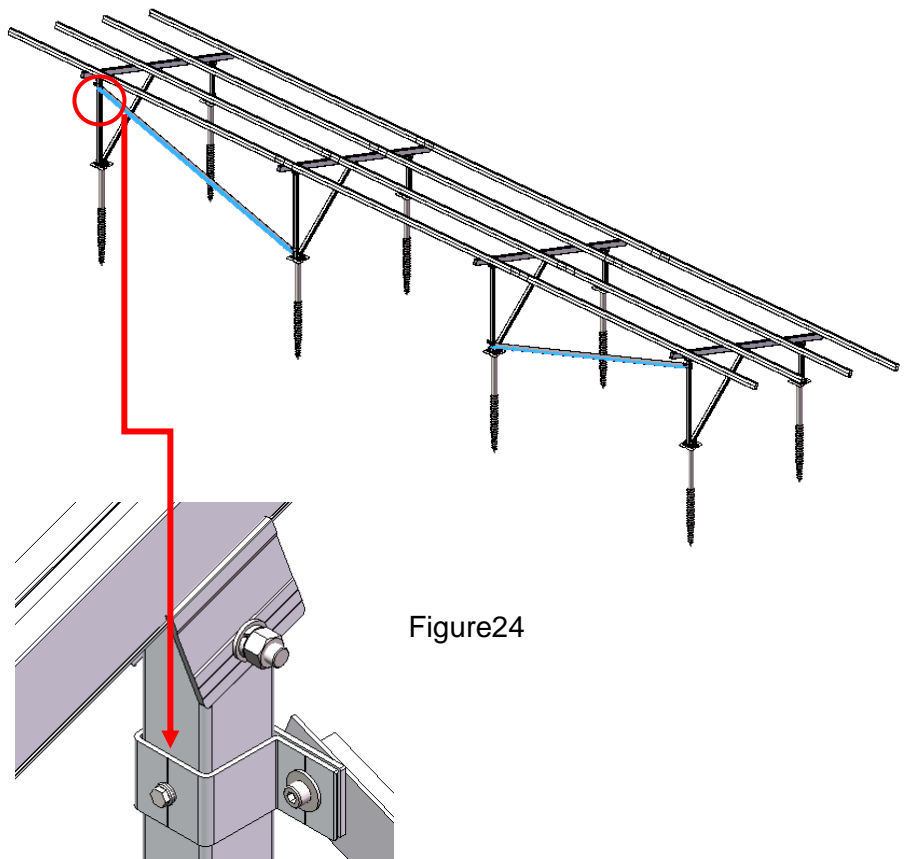


Figure24

4.6 PV Modules Installation

4.6.1 Tilt the Clamps with M-module and click the lower side of M-module into the channel of the Rail first, then press the other side of M-module into the channel as shown in Figure25.

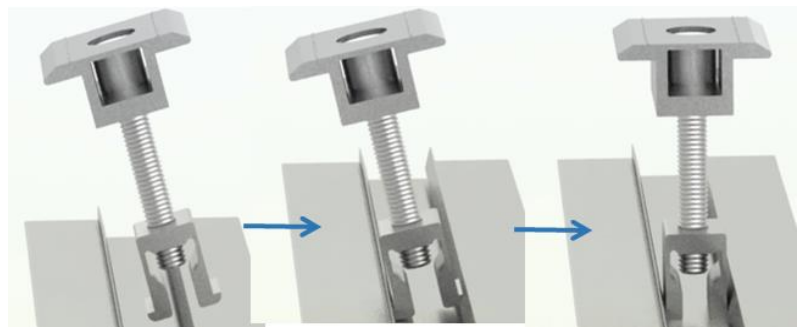
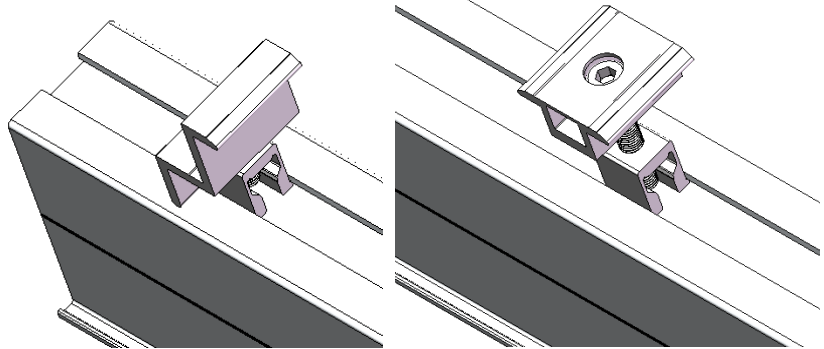
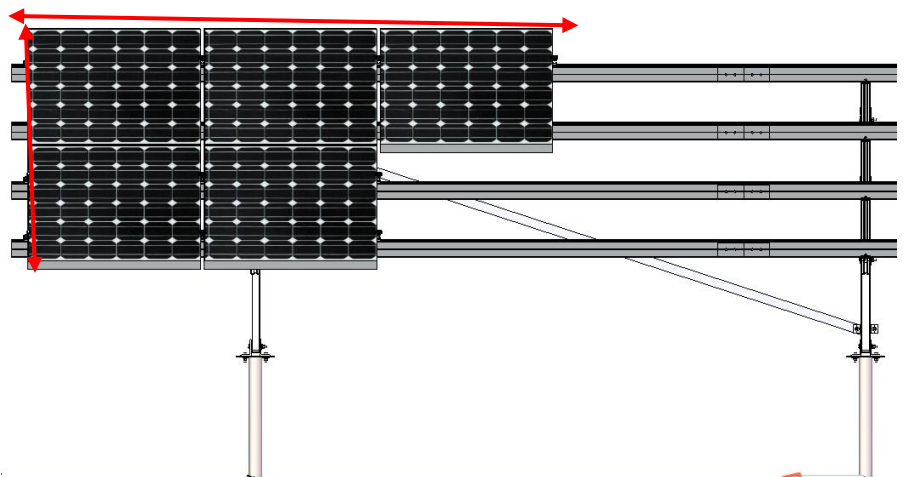


Figure25

4.6.2 It is suggested to install PV-Module from the left side, and use the End Clamp and Inter Clamp II to fix it. Stretch a String as a reference to align PV-Module. Adjust the PV-Modules to make their outside faces are in a line in both portrait and landscape orientation.



Recommended Torque:

M8: 18~20 N•m

Note:

Watch out the position that the bolt attached to the M-module, two legs of M-module should be open as shown in the figure26.

4.6.3 Fix the rest of PV-Module according to the sequence: from low to up, from left to right. Make the side faces of PV-Module tightly against Clamps, as shown in Figure27. Any adjacent side face of PV-Module keep the distance of 20mm, as shown in Figure27.

Note:

Put an Inter Clamp II at each side of PV-Module to keep the distance of 20mm and take them away after the PV-Module being fixed.

4.5.4 Now the installation of a single array is completed as shown in Figure 28.

Please recheck all bolts, and fasten them tightly

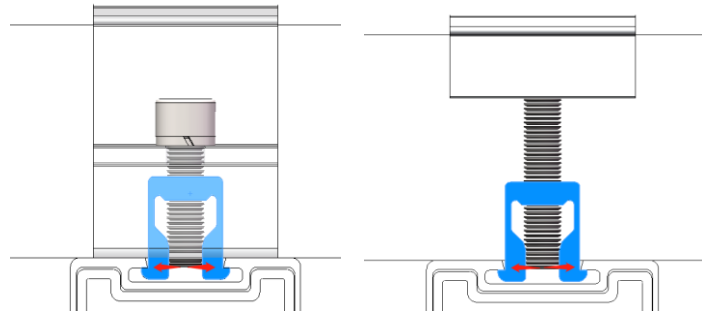


Figure26

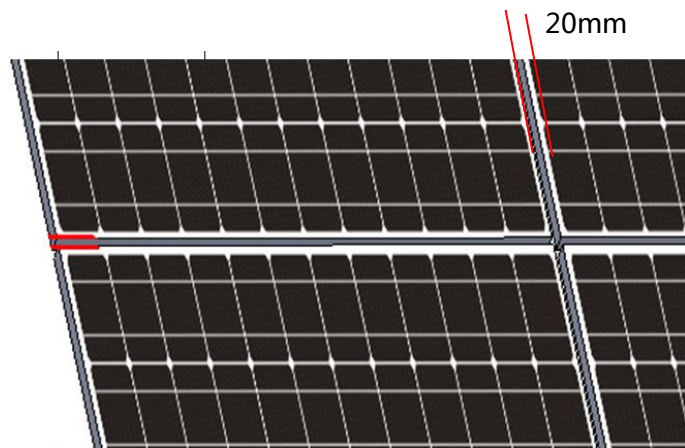


Figure 27

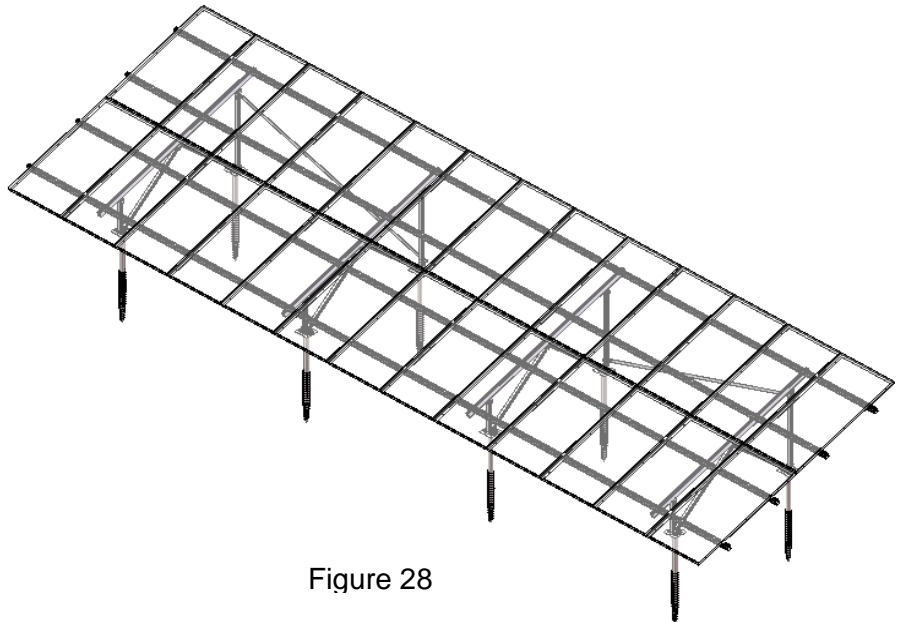


Figure 28