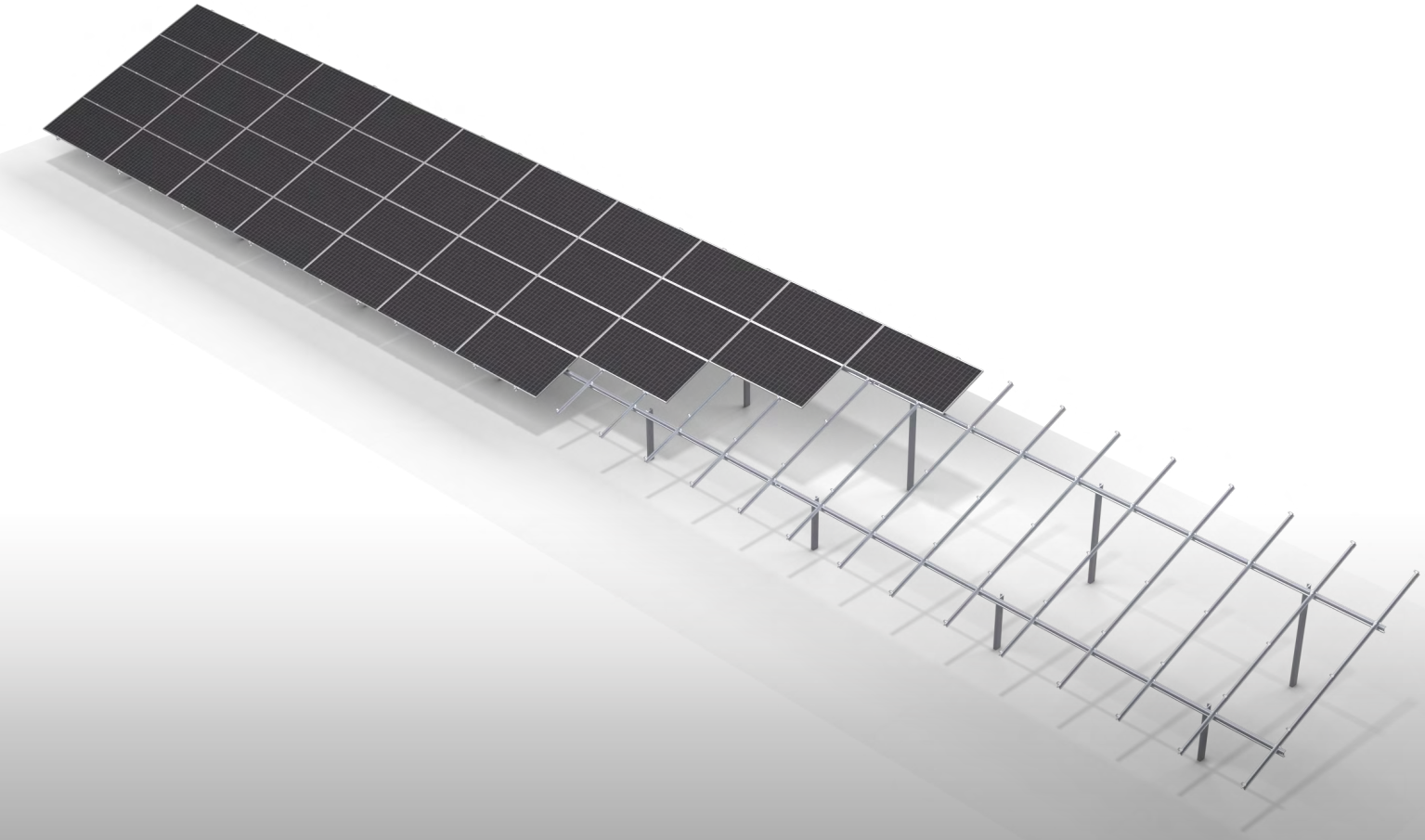
PV-ezRACK®

# SolarTerrace Ikon

**Document No.: PZ85-IM01-10**
**Version: V1.0**



SOLAR TERRACE

Last Updated - Feb. 2025

# Introduction

The Clenergy PVezRack® SolarTerrace Ikon is an optimal ground mounting solution designed for commercial and utility scale PV installations. Its innovative and efficient design, including quick positioning for panels, swift clamps for structure, back-locked panels, and self-grounding systems, enables effortless and safe installation on all terrains. This solution not only facilitates shorter station construction periods, but also delivers higher ROI and lower LCOE.

Please review this manual thoroughly before installing PVezRack® SolarTerrace Ikon. This manual provides:
1) Simple introduction of the installation relating to SolarTerrace Ikon Mounting systems.
2) Planning and installation instructions for SolarTerrace Ikon.

## List of contents



Structural integrity of the PVezRack® SolarTerrace Ikon parts will be compliant with the Eurocodes, ASCE 7-16, JISC 8955 and AS/NZS 1170.2:2011 (R2016) standards when installed correctly. Make sure to comply with the relevant Occupational Health and Safety regulations when carrying any installation. Also, make sure to comply with other relevant State or Federal regulations.

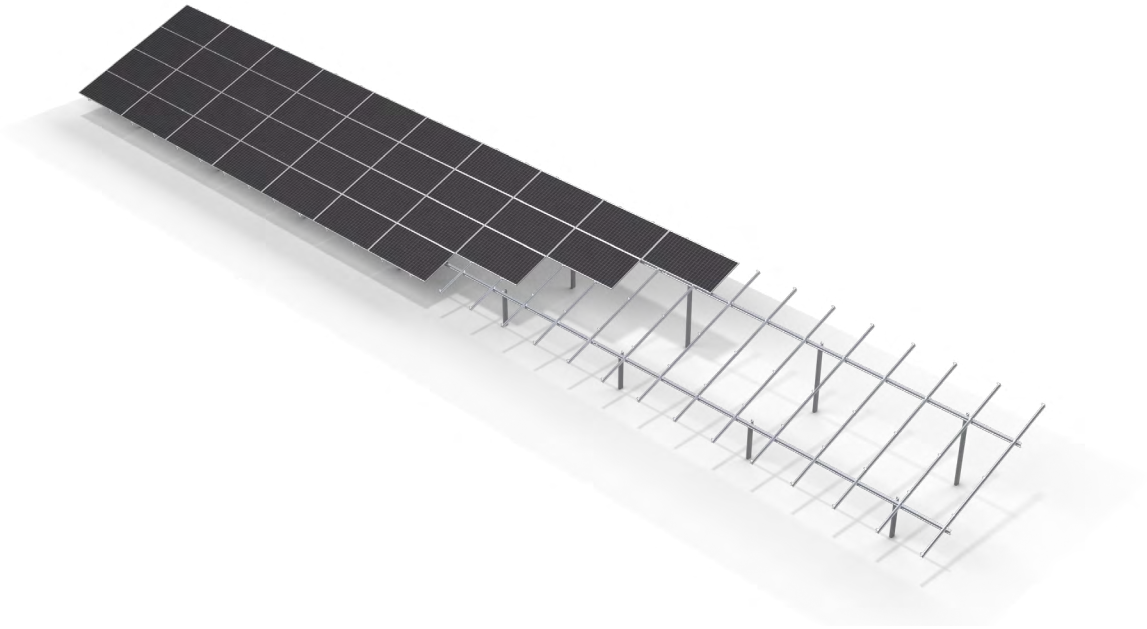
Always check you are using the latest version of this Installation manual. To do that, contact your local distributor or contact Clenergy via www.clenergy.com.cn.

## The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual;
- Ensuring that PVezRack® and other products are appropriate for the particular installation and the installation environment;
- Using only PVezRack® parts and installer-supplied parts as specified by the PVezRack® project plan. (substitution of parts may void the warranty and invalidate the letter of certification);
- Recycling: Recycle according to the local relative statute;
- Removal: Reverse installation process;
- Ensure that there are no less than two professionals working on panel installation;
- Ensure the installation of related electrical equipment is performed by qualified personnel.For the electronic components, refer to the relative instruction manual (eg. inverter);
- Ensuring safe installation of all electrical aspects of the PV array.

# Overview

## Technical Details



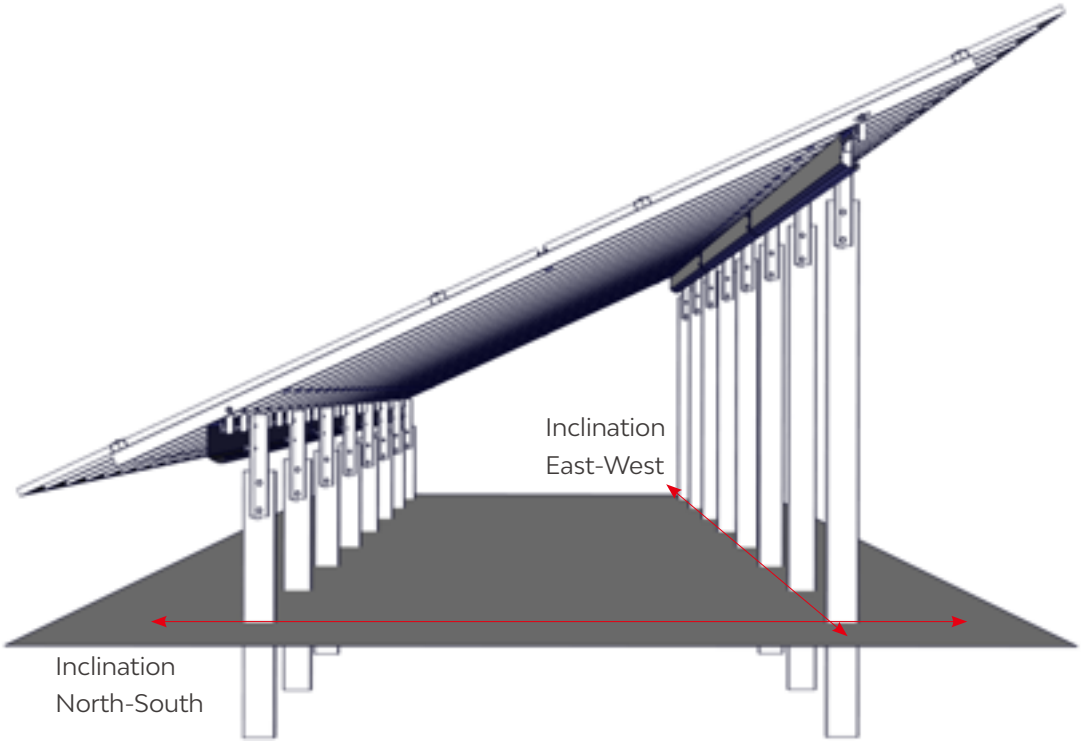
| | |
|---|---|
| Panel Orientation | 4 Landscape |
| Wind Load | Refer to the "General Assembly Drawing" |
| Snow Load | Refer to the "General Assembly Drawing" |
| Tilt Angle | Refer to the "General Assembly Drawing" |
| Foundation | Ramming |
| Material | Post: HDG<br>Crossbeam: ZAM (Zinc-Aluminum-Magnesium) Steel<br>Purlin: ZAM (Zinc-Aluminum-Magnesium) Steel<br>Fastener: SUS304 or HDG |
| Terrain Adaptability | N-S: Unlimited<br>E-W: Up to 30% slope |
| Post Span | Perimeter Rows: Refer to the "General Assembly Drawing"<br>Interior Rows: Refer to the "General Assembly Drawing" |
| Table Length | Refer to the "General Assembly Drawing" |
| Standard | EURCODE 0-9 \| AS NZS 1170.2 \| ASCE 7-16 \| JISC 8955 |
| Certification | CE, TUV, Wind Tunnel Test |
| Warranty | 12 years |

# Installation Tool

| | | | | |
|---|---|---|---|---|
|  M8 Socket |  M12 Socket |  M8/M12 Socket Wrench |  Electric Auto-Wrenc |  M12 Wrench |
|  M8/12 Torque Wrench (Torque Ranger: 10-100N•m) |  Inclinator |  String |  Tape |  Hammer |
|  Mark Pen |  Total Station or Equivalent Instrument | | | |

The installation tool is not in the scope of supply.

# Precautions in the Process of Installation



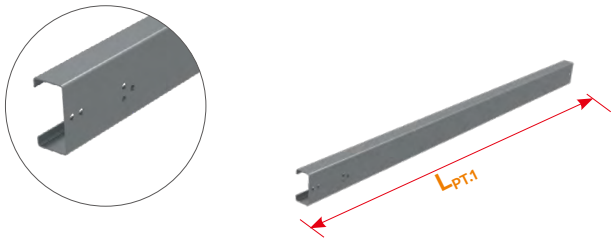

- Before unpacking, check the quantity of each package is consistent with the label, if there is an abnormality, please take a photo and contact Clenergy immediately. If the quantity is less after unpacking and installation, Clenergy will no longer replenish the goods free of charge.Before installation, the size and appearance of the product should be checked, if any abnormalities are found, please give the feedback to Clenergy engineer immediately. If installation continues, Clenergy will not be responsible for rework costs and relevant losses.
- Using professional scaffolding poles to build PVezRack® SolarTerrace Ikon installation platforms, material placement racks, etc., and equipping the necessary shelves or ladders for high-altitude work. Each component of PVezRack® SolarTerrace Ikon such as posts, crossbeams, purlins cannot be used to construct auxiliary installations. It is also not allow to use any parts of PVezRack® SolarTerrace Ikon to build a temporary frame to carry items, etc., resulting in the deformation of the parts.
- It is strictly forbidden to drag PVezRack® SolarTerrace Ikon components on site. The surface of the product should be prevented from rubbing with other items, which cause the zinc layer to fall off and cause rust, etc. If this leads to abnormal appearance, Clenergy will void the warranty. High-altitude work and water operation should avoid fasteners and products falling from high places, if they fall, they should be picked up immediately to avoid the product being covered by surface dust, rainwater, etc. If this leads to a shortage of product materials, Clenergy will not give free replenishment. If the zinc layer falls off due to wrong or improper operation, knocking on the product, etc., the construction team needs to immediately correct and remove rust and spray zinc for repair.
- Each component of PVezRack® SolarTerrace Ikon such as posts, crossbeams, purlins, and so on should be installed correctly, and the product itself should not be torsionally deformed, welded, have internal stress, inclined torsional force, etc. So each component should be adjusted to eliminate deformation, internal stress, torsion and other abnormalities before the components can be installed. Otherwise Clenergy will void the warranty.

- In the actual installation on site, if the angle of the component, the ground clearance, the span of the piles, the distance between the north and south of the piles, the height of the pile upper the ground, and the angle of the all orientation inclination of the ground are inconsistent with the parameters of the drawing, please give the feedback to Clenergy engineer immediately. If installation continues, Clenergy will not be responsible for rework costs and relevant losses.
- The torque of fasteners should be strictly in accordance with the installation instructions.
- During the installation process, if it is found that the surface of the bracket product is stained with other foreign objects such as mud and lubricating oil, it needs to be cleaned before installation. If you need to cut, drill or otherwise transform the bracket products due to the undulating terrain and foundation deviation, please contact the Clenergy engineer, and the transformation can only operate after confirmation, and operate according to the local and the requirements of this installation instruction, otherwise Clenergy will void the warranty.
- Most of PVezRack® SolarTerrace Ikon components are metal products, please pay attention to the length, port metal burrs, weight, etc., to avoid bumping into personnel, if there is any injury causing, please seek medical attention immediately.

# List

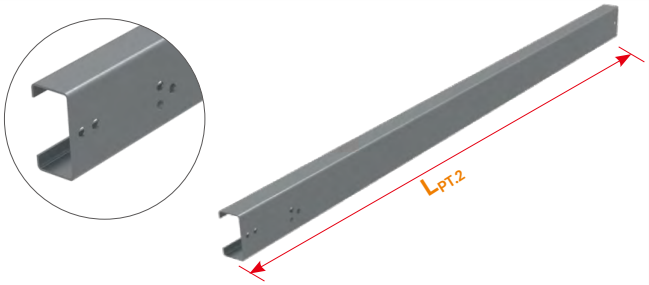
## SolarTerrace Ikon

### A Front Post C140x70x20x3.0x$L_{PT.1}$




Detailed dimensions $L_{PT.1}$ refer to "General Assembly Drawing".

### B Rear Post C140x70x20x3.0x$L_{PT.2}$




Detailed dimensions $L_{PT.2}$ refer to "General Assembly Drawing"

### C Post Connector

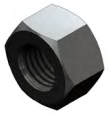
### D Crossbeam Clamp L50

### E Hex Bolt M12x45

### F Plain Washer 12x24

### G Spring Washer 12

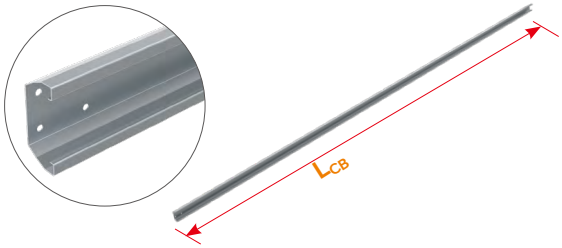
### H Hexagon Nut M 12



### I Hex Flange Bolt M12x30

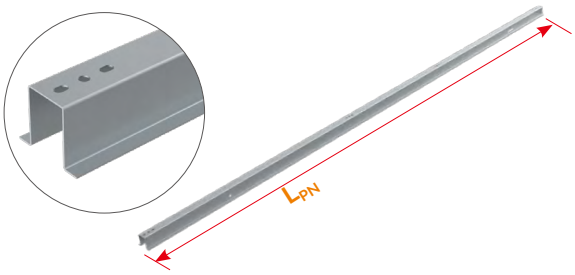
### J Crossbeam Splice C170-L300

### K Crossbeam C170x70x25x2.0-$L_{CB}$




Detailed dimensions $L_{CB}$ refer to "General Assembly Drawing".

### L Purlin




Detailed dimensions $L_{PN}$ refer to "General Assembly Drawing".

### M End Clamp MAC

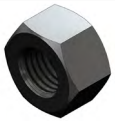
### N Inter Clamp MAC

### P Mushroom Hex Square Neck Bolt M8x60

### Q Large Plain WasHex 8x24

### R Spring Washer 8

### S Hexagon Nut M8



### T Purlin Anchor

### U Side Purlin Anchor

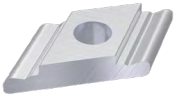
### V Hex Flange Bolt M12x65

## Jig

### ① Toroda Rail

### ② Purlin Positioning Clip

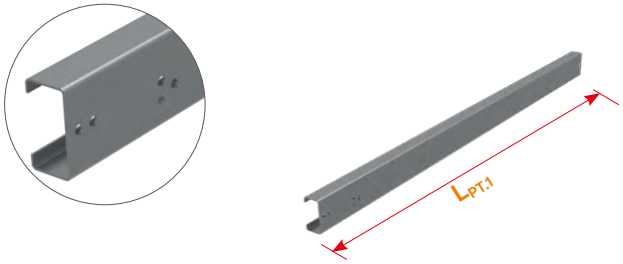
### ③ Diamond module



### ④ Hex Bolt M8x20

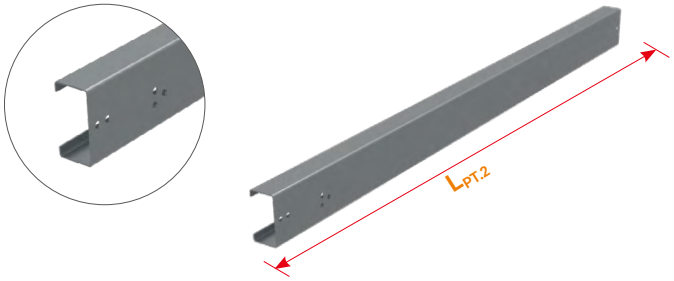
# Step 1: Ramming Post

**A Front Post C140x70x20x3.0x$L_{PT.1}$**




Quantity and Detailed dimensions $L_{PT.1}$ refer to "General Assembly Drawing".

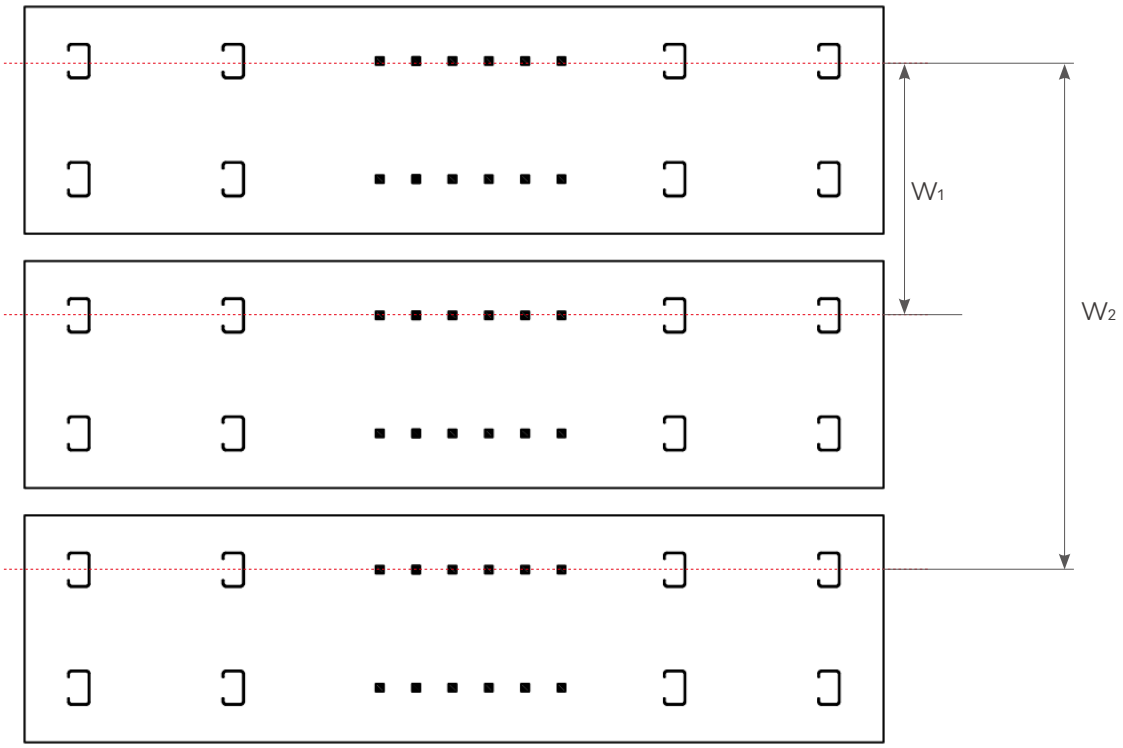
**B Rear Post C140x70x20x3.0x$L_{PT.2}$**




Quantity and Detailed dimensions LPT.2 refer to "General Assembly Drawing".

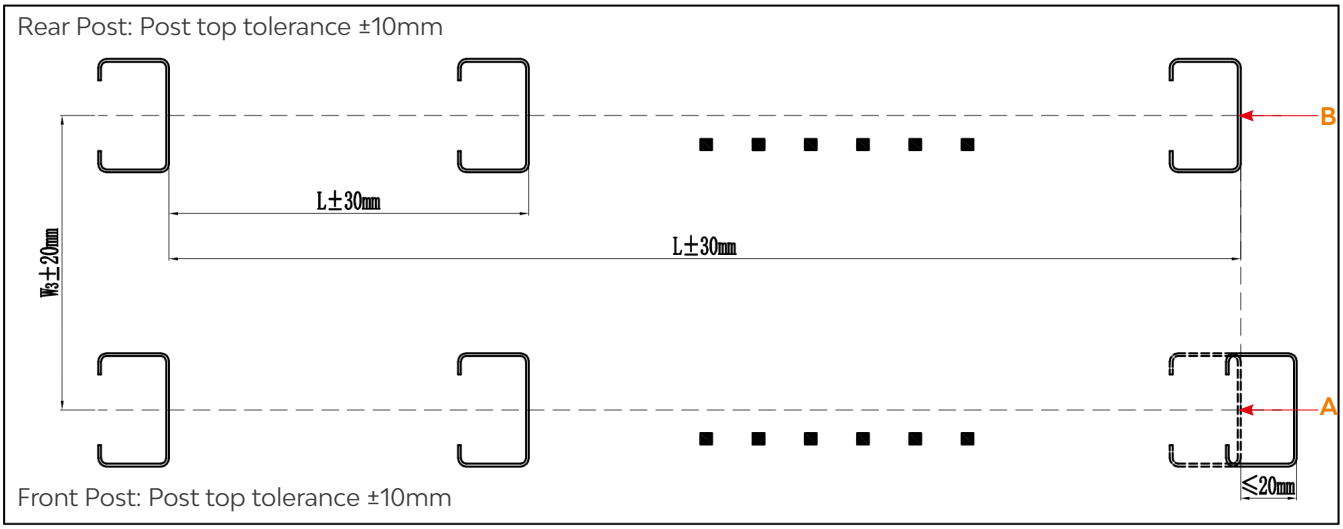
## Table Spacing Tolerance

E (Northern Hemisphere)
W (Southern Hemisphere)
Top View

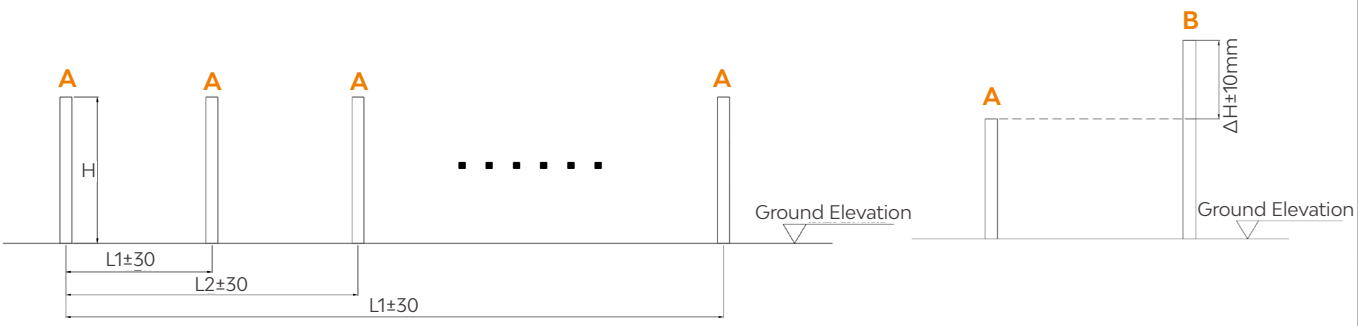



Notice:
1. The distance $W_1$/$W_2$ between front and back table refer to the "Layout" (not in the scope of supply).
2. Pay attention to the post orientation when installing the post.
3. If structure cannot be installed due to the spacing error of the posts, the posts need to be re-installed.
4. All installation errors must meet requirements, otherwise, the normal operation will be affected.

## Post Spacing in a Flat




Top View

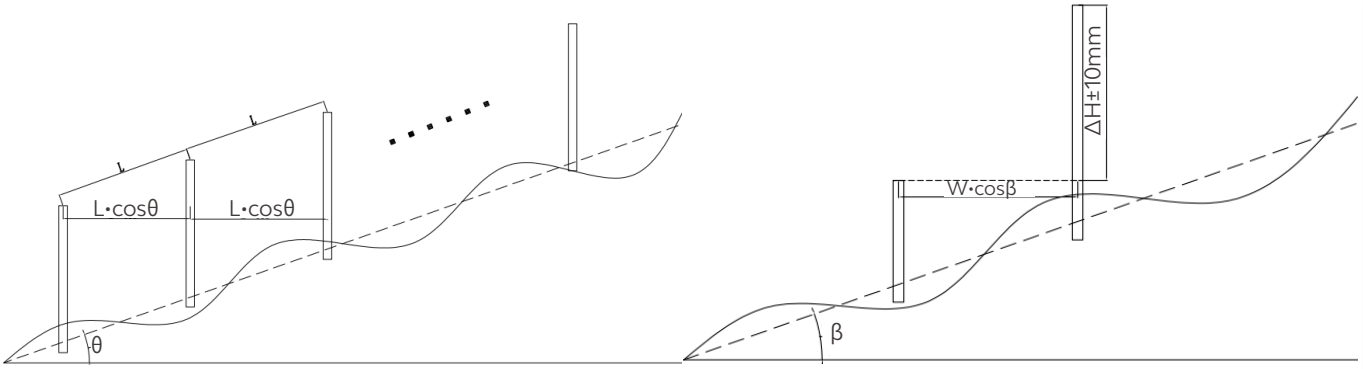



Front View

Side View

Notice:
1. The distance $W_1$ between front and back post can be adjusted to ±20mm, this adjustment cannot be added or reduced, refer to the "General Assembly Drawing".
2. Pay attention to the post orientation when installing the post.
3. Install the most side post first, and then install other posts in a east-west direction. In the absence of a slope, the post spacing detailed dimensions L refer to the "General Assembly Drawing". When there is a θ° or β°slope, the post spacing refer to the manual "3.1.2 Post Spacing in Slope".
4. The allowable value of the adjustable position of the post top is: south-north ±10mm. Base on the side post, the east-west adjustment of other post is ±30mm, this adjustment cannot be added or reduced.

## Post Spacing in Slope




Front View

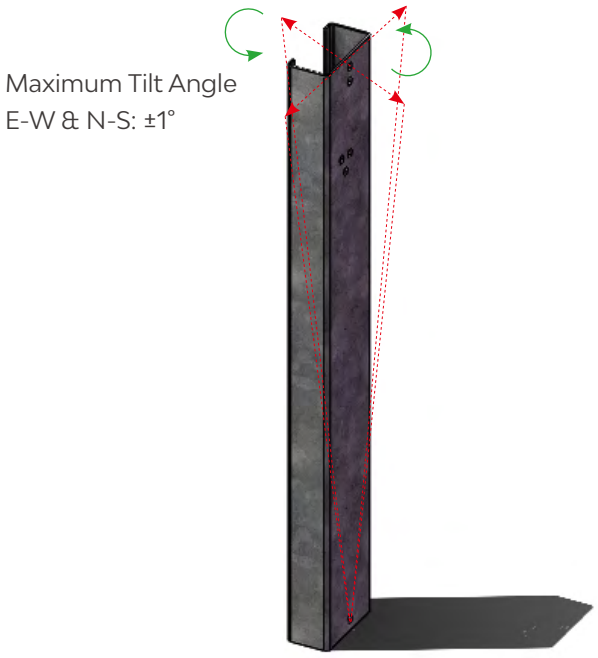
Side View

Notice:
1. The height of post from the ground after ramming is H±5, detailed dimensions H refer to the “General Assembly Drawing”.
2. The height difference ΔH between front and back post can be adjusted to ±10mm, Detailed dimensions ΔH refer to the drawing.
3. In the absence of a slope, the post spacing detailed dimensions L and H refer to the drawing.When there is a θ° W-E slope, the post spacing should be L·cosθ. When there is a β° S-N slope, the height difference ΔH stays the same.
4. All installation errors must meet requirements, otherwise, the normal operation will be affected.

## Post – Ramming Allowed Tolerances

Maximum Torsion Angle: ±1°

Maximum Tilt Angle
E-W & N-S: ±1°



Notice:
1. When installing the Posts, it is necessary to adjust the other posts based on the most side post.
2. The above data is the adjustment amount of a single post and all adjustment amounts are not allowed to add up.

# Step 2: Post Connector Assy.

**C** Post Connector 1 pcs

**D** Crossbeam Clamp L50 2 pcs

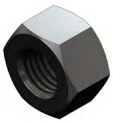
## Hex Bolt Assy. M12x45

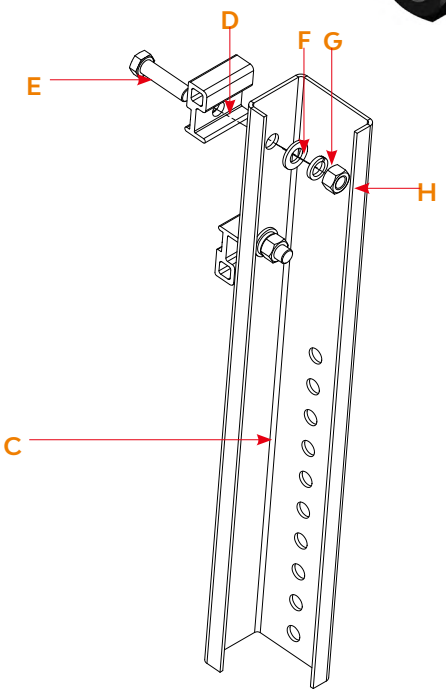
**E** Hex Bolt M12x45 2 pcs

**F** Plain Washer 12x24 2 pcs

**G** Spring Washer 12 2 pcs

**H** Hexagon Nut M 12 2 pcs






**Attention**

- Don't Tighten

Notice:
1. The angle between Post and Post Connector is adjustable, which is infinite angle adjustment by Crossbeam Clamp.
2. Ensure that all bolt heads face the same direction. Don't tighten the Hex Bolt Assy. M12x45.

# Step 3: Post & Post Connector

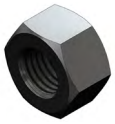
## Hex Bolt Assy. M12x30

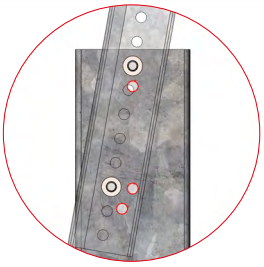
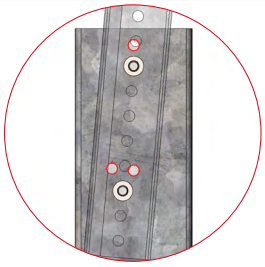
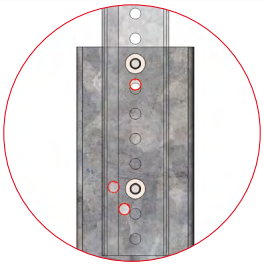
**I** Hex Flange Bolt M12x30 2 pcs

**F** Plain Washer 12x24 2 pcs

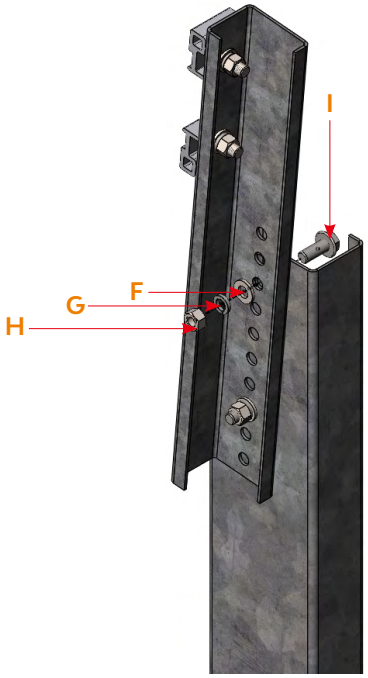
**G** Spring Washer 12 2 pcs

**H** Hexagon Nut M 12 2 pcs



| Install Angel Of "General Assemble Drawing" | 15° | 20°/30° | 25°/35° |
|---|---|---|---|
| Position of Post & Post Connector |  |  |  |

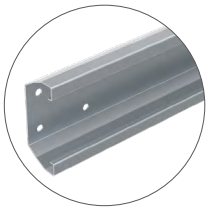
| Specification | Torque |
|---|---|
| Hex Bolt Assy. M12x30 | 50-55N·m |

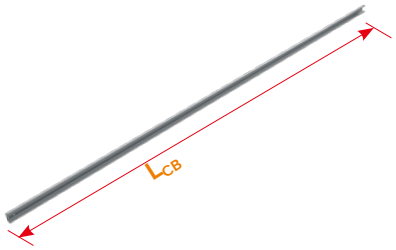



Notice:
1. Ensure that all bolt heads face the same direction.
2.Pre-tightening torque of Hex Bolt Assy. M12x30: 50-55N·m.

# Step 4: Crossbeam & Crossbeam Splice

**K Crossbeam C170x70x25x2.0-$L_{CB}$ 2 pcs**






Quantity and Detailed dimensions $L_{CB}$ refer to "General Assembly Drawing".

**J Crossbeam Splice C170-L300 1 pcs**

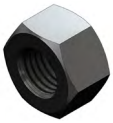
## Hex Bolt Assy. M12x30

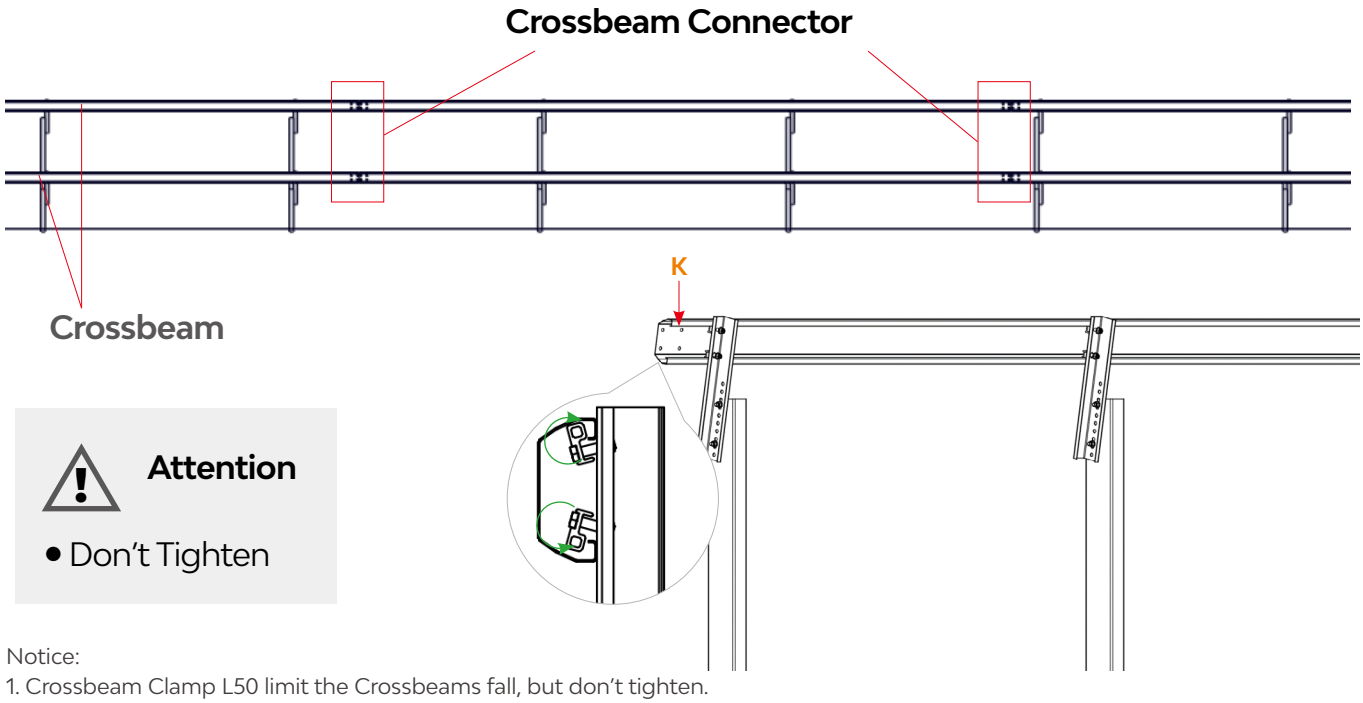
**I Hex Flange Bolt M12x30 8 pcs**

**F Plain Washer 12x24 8 pcs**

**G Spring Washer 12 8 pcs**

**H Hexagon Nut M 12 8 pcs**

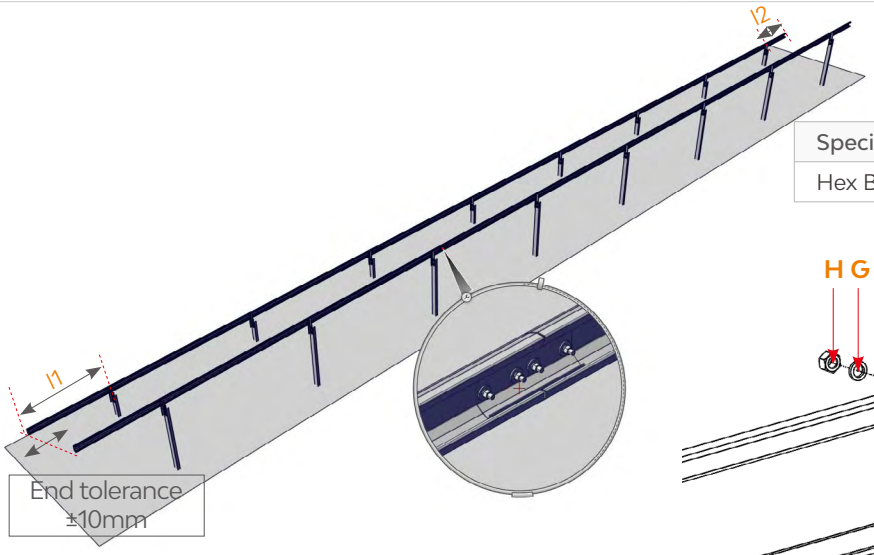




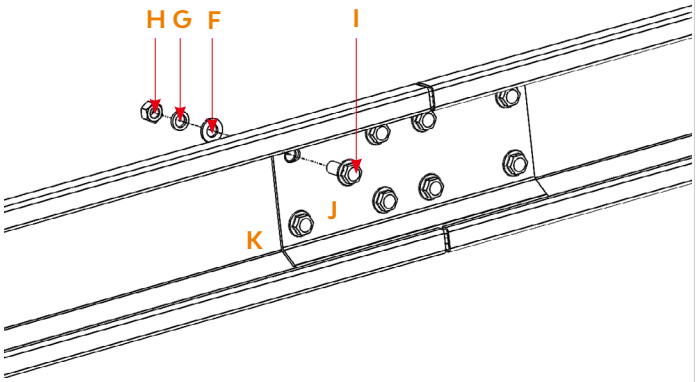

**Attention**

- Don't Tighten

Notice:
1. Crossbeam Clamp L50 limit the Crossbeams fall, but don't tighten.

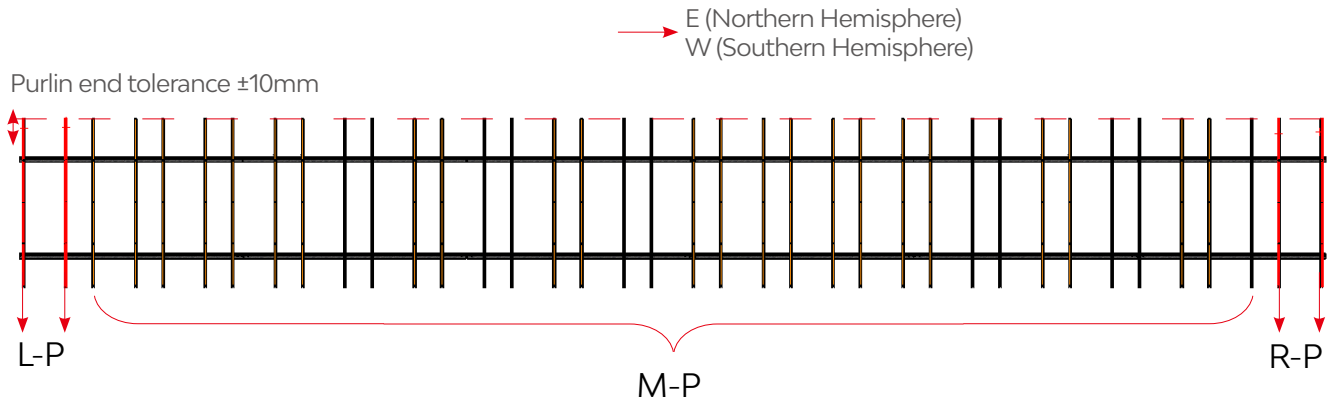



| Specification | Torque |
|---|---|
| Hex Bolt Assy. M12x30 | 50-55N·m |




Notice:
1. The overhang l1 and l2 of Crossbeam can be adjusted to ±10mm, this adjustment cannot be added or reduced, refer to the "General Assembly Drawing".
2. Ensure that each row of Crossbeam is on the same horizontal line, and the alignment of the end is ±10mm.
3. Tighten all M12x30 bolt assemblies after adjusting the Crossbeam.
4. Pre-tightening torque of the M12x30 bolt assembly: 50-55N·m, Ensure that all bolt heads face the same direction.

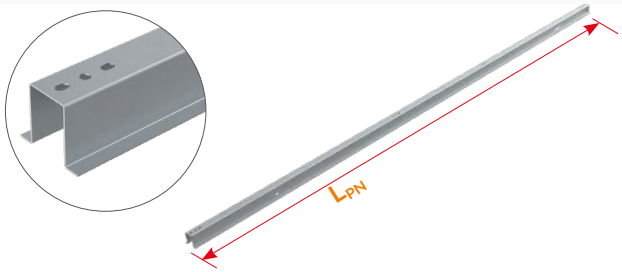
# STEP 5: Purlin Layout




Notice:
1.The quantity of Middle Purlin (M-P) refer to the "General Assembly Drawing".

# Step 6: Purlin Assy.

**L** Purlin 2 pcs




**M** End Clamp MAC 4 pcs

**N** Inter Clamp MAC 6 pcs

**T** Purlin Anchor 2 pcs

**U** Side Purlin Anchor 2 pcs

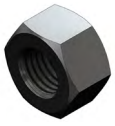
## Bolt Assy. M8x60

**P** Mushroom Hex Square Neck Bolt M8x60 10 pcs

**Q** Large Plain WasHex 8x24 10 pcs

**R** Spring Washer 8 10 pcs

**S** Hexagon Nut M8 10 pcs



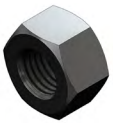
## Hex Bolt Assy. M12x65

**V** Hex Flange Bolt M12x65 4 pcs

**F** Plain Washer 12x24 4 pcs

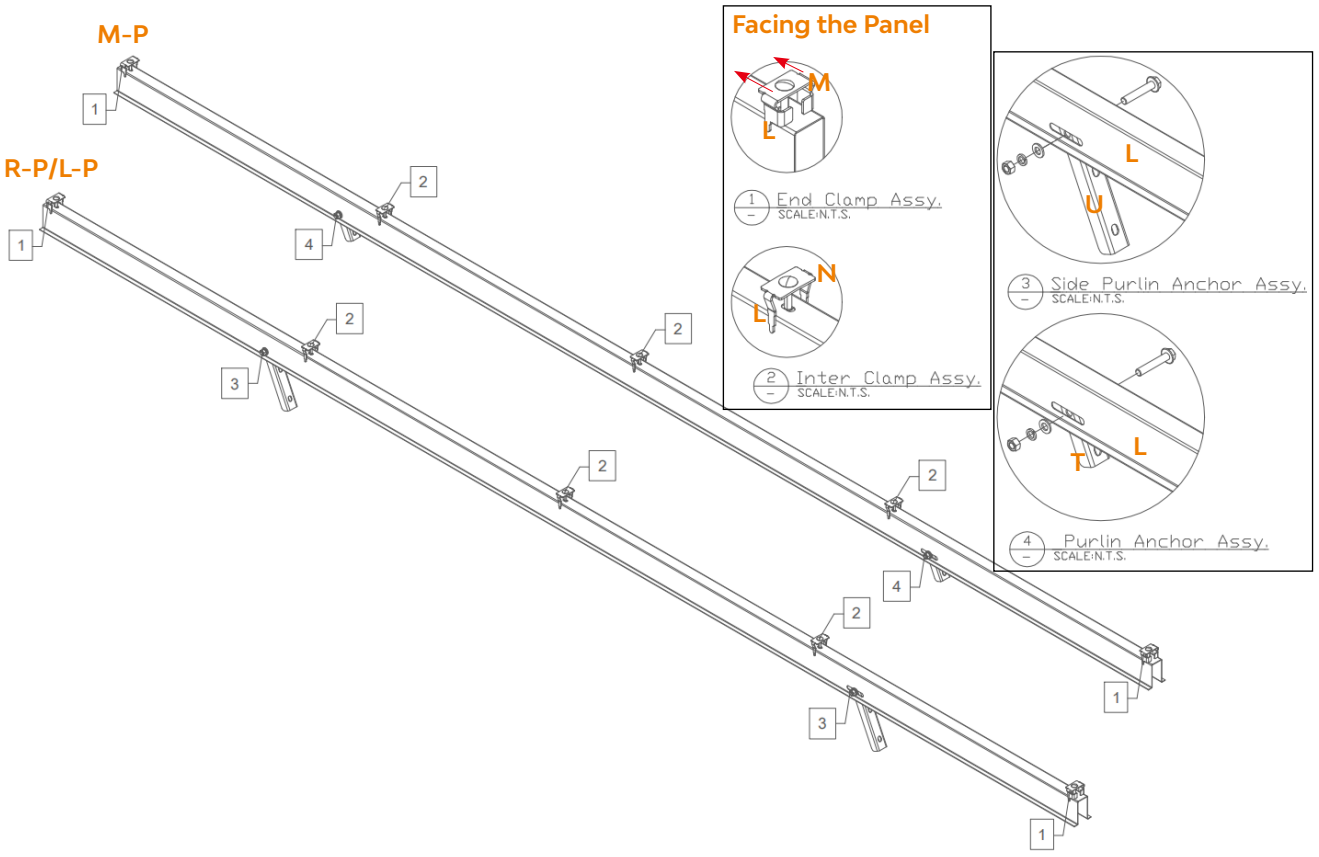
**G** Spring Washer 12 4 pcs

**H** Hexagon Nut M 12 4 pcs



**Bolt Assy. M8x60**

**Hex Bolt Assy. M12x65**




**Attention**

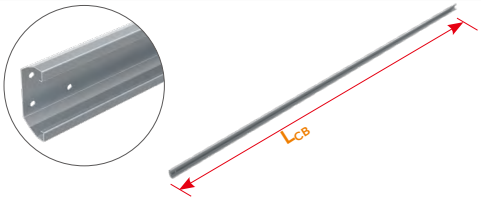
- Don't Tighten

Notice:
1. Ensure the End Clamp facing the Panel.
2. Don't tighten all Bolt Assy.

# Step 7: Purlin & Crossbeam

**D** Crossbeam Clamp L50 6 pcs

**K** Crossbeam C170x70x25x2.0-$L_{CB}$



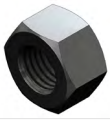

Quantity and Detailed dimensions $L_{CB}$ refer to "General Assembly Drawing".

## Hex Bolt Assy. M12x45

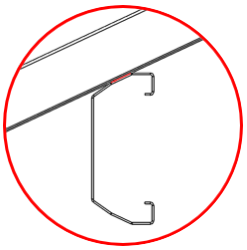
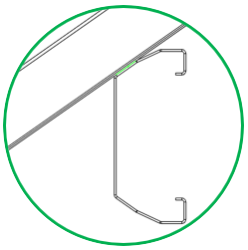
**F** Plain Washer 12x24 6 pcs

**G** Spring Washer 12 6 pcs

**H** Hexagon Nut M 12 6 pcs

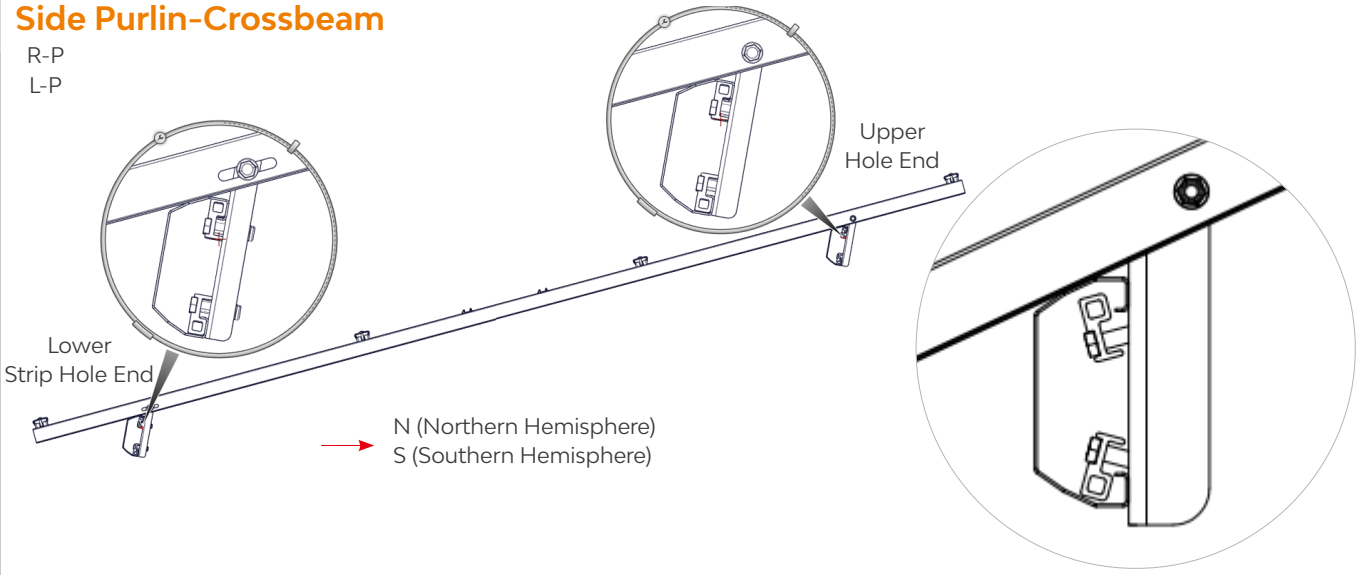


**E** Hex Bolt Assy. M12x45 6 pcs

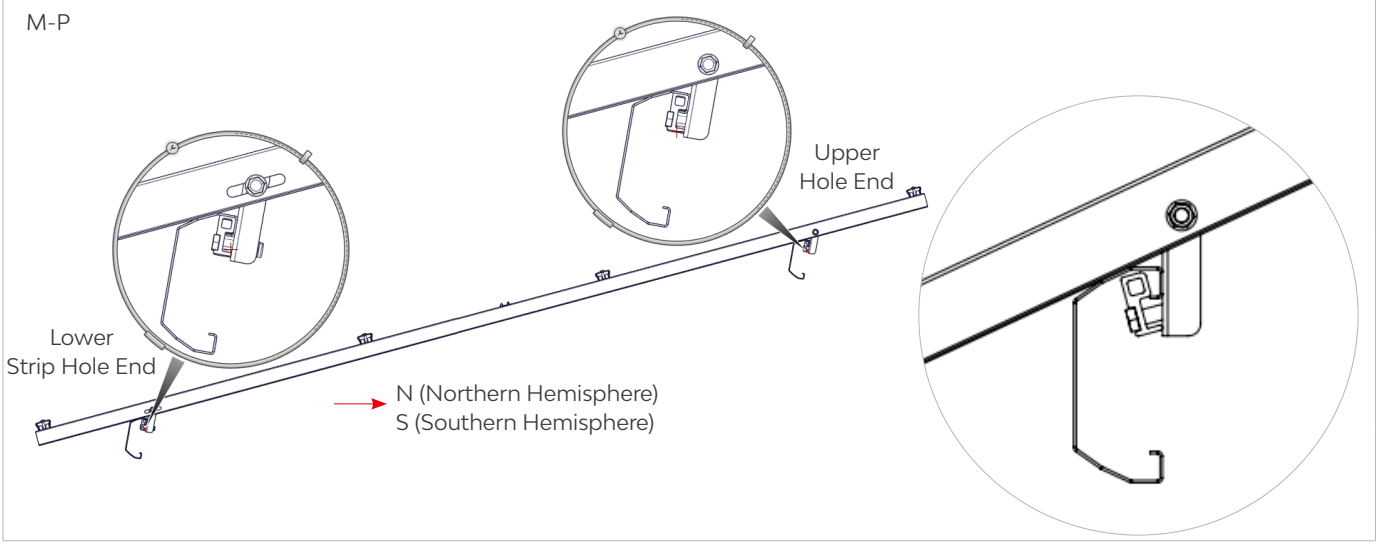
| Install Angel Of "General Assemble Drawing" | 15°-25° | 26°-35° |
|---|---|---|
| Position of Crossbeam-Purlin |  |  |

## Side Purlin-Crossbeam

R-P
L-P



## Middle Purlin-Crossbeam

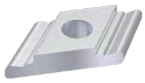


# Step 8: Purlin Position

① Toroda Rail 1 pcs

② Purlin Positioning Clip 3 pcs

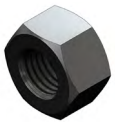
③ Diamond module 3 pcs

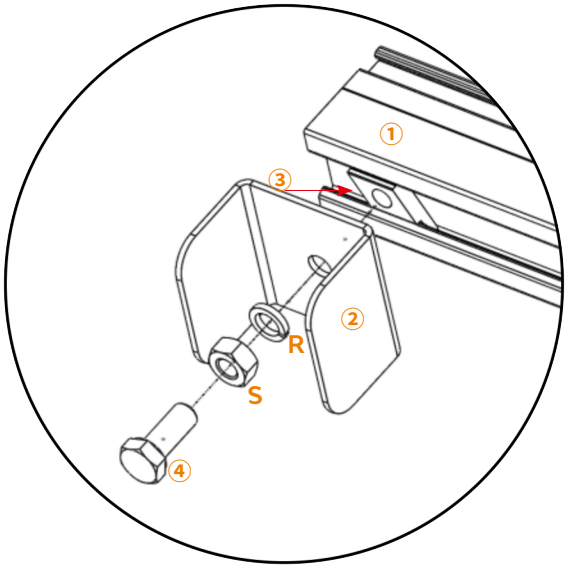


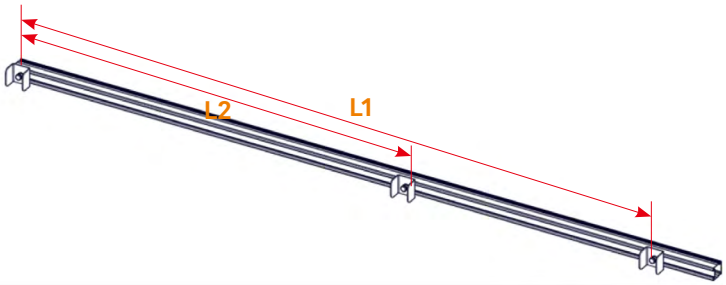
④ Hex Bolt M8x20 3 pcs

R Spring Washer 8 3 pcs

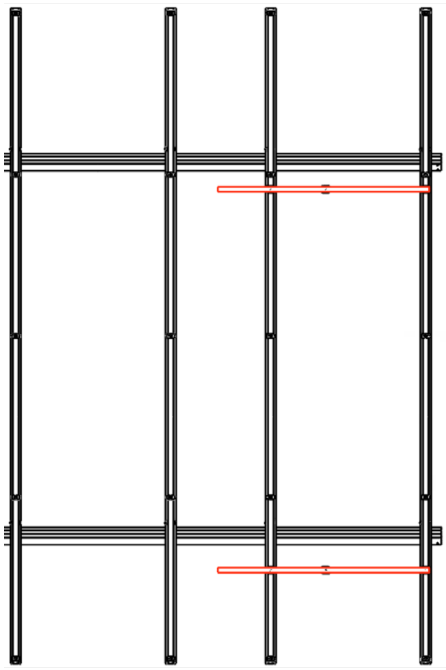
S Hexagon Nut M8 3 pcs

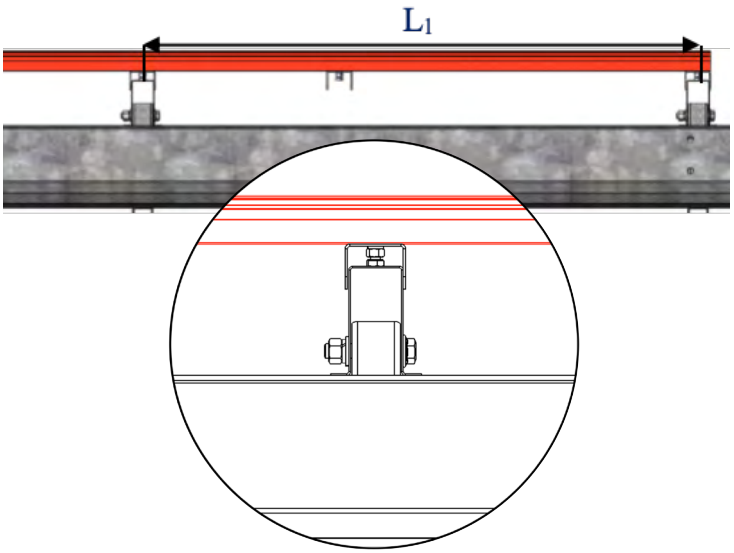


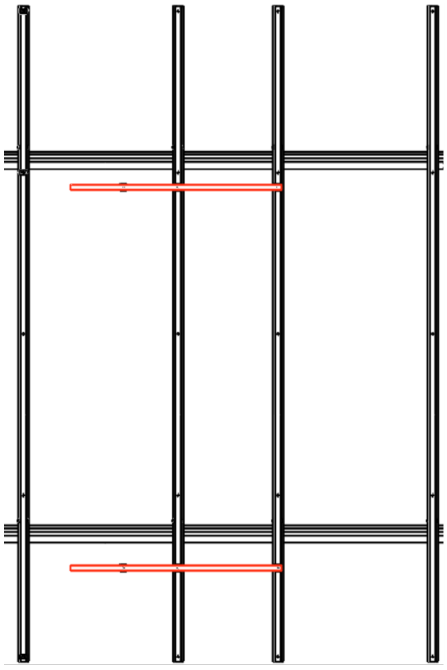


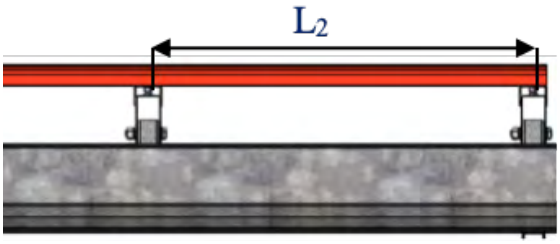




| Specification | Torque |
|---|---|
| Hex Bolt Assy. M8*20 | 15-18N.mm |





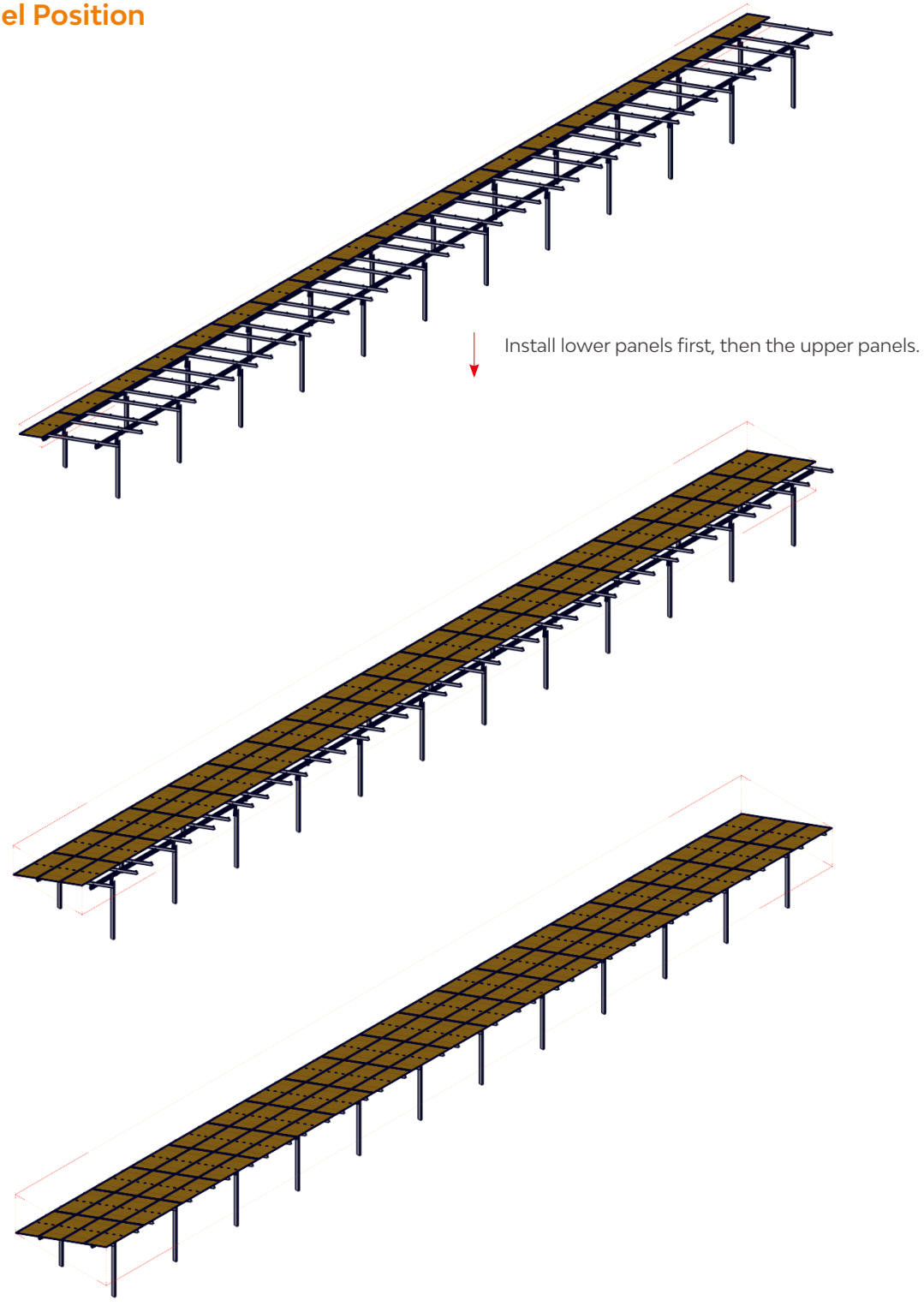


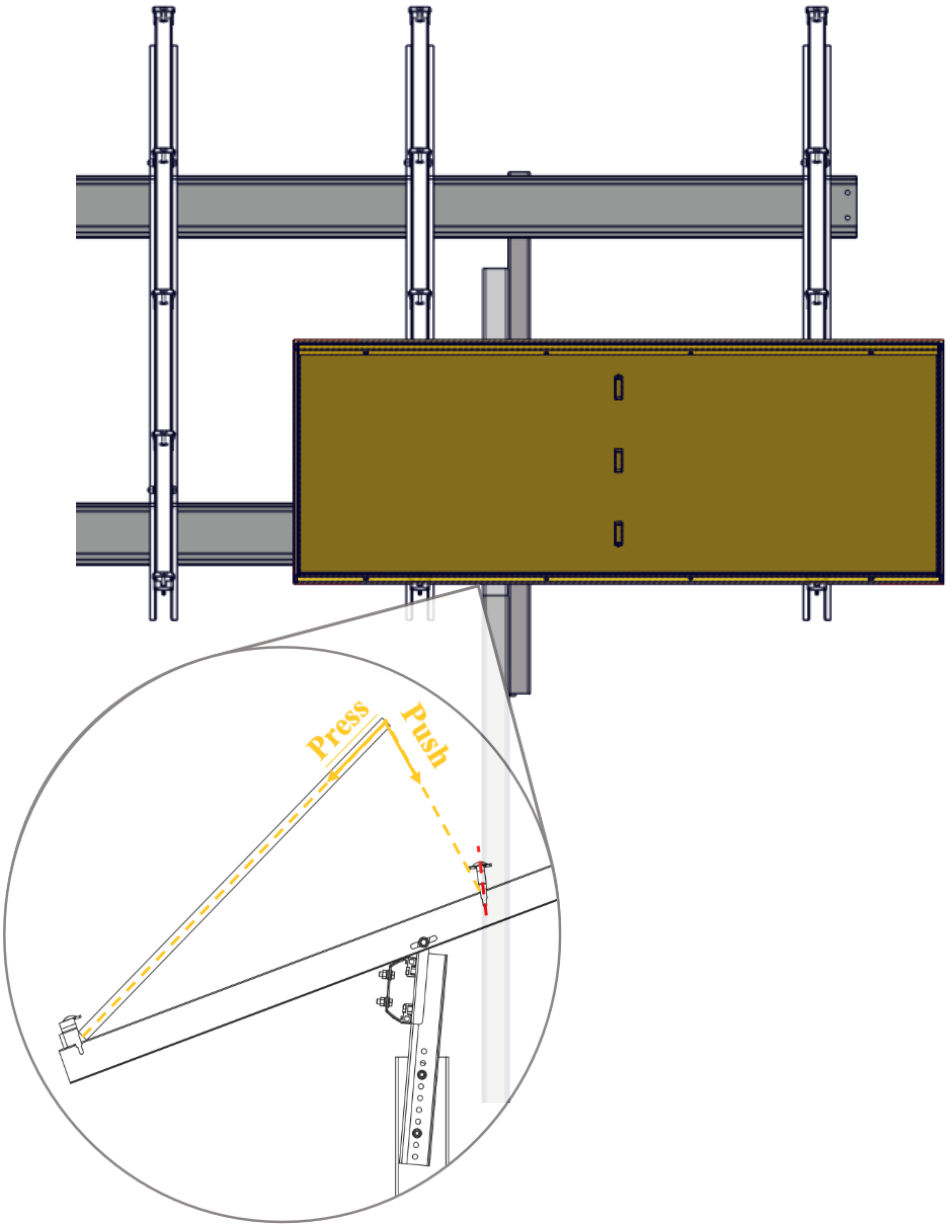

| Fastening Position | Specification | Torque |
|---|---|---|
| Purlin Anchor & Crossbeam | Hex Bolt Assy. M12x45 | 40-45N·m |
| Purlin Anchor & Purlin | Hex Bolt Assy. M12x65 | 40-45N·m |

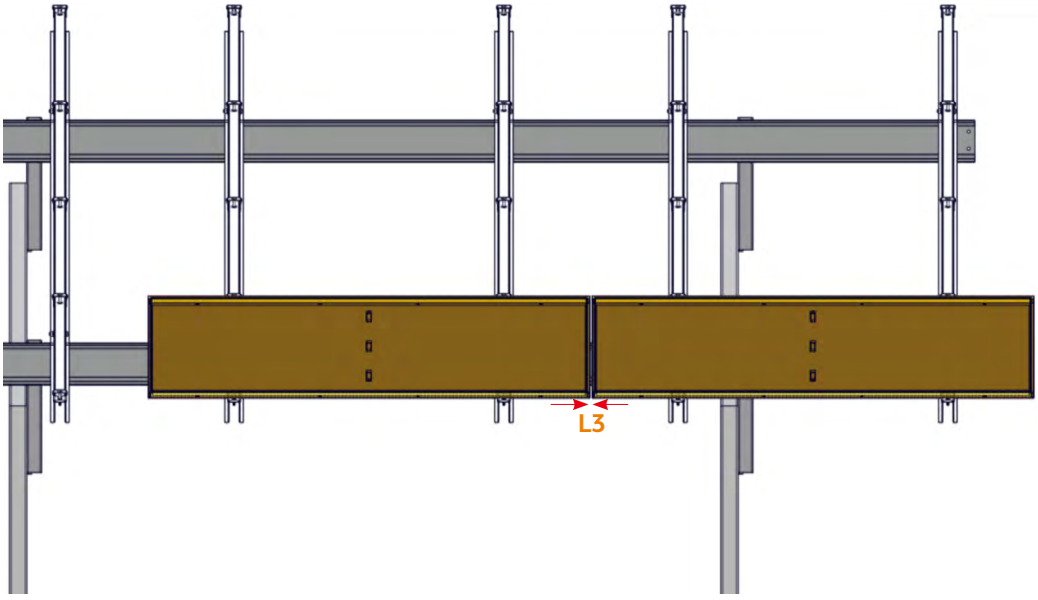
Notice:
1. Detailed dimensions L1 and L2 refer to the “General Assembly Drawing”.
2. After purlin adjustment, Pre-tightening torque of the M12x45 bolt assembly: 40-45N·m, to fix the purlin anchor and crossbeam. Pre-tightening torque of the M12x65 bolt assembly: 40-45N·m, to fix the purlin anchor and purlin. Ensure that all bolt heads face the same direction.
3.Ensure that each row of purlin is on the same horizontal line, and the alignment of the end of the purlin is ±10mm. The error is absolute error, not relative error, and can not generate cumulative error.

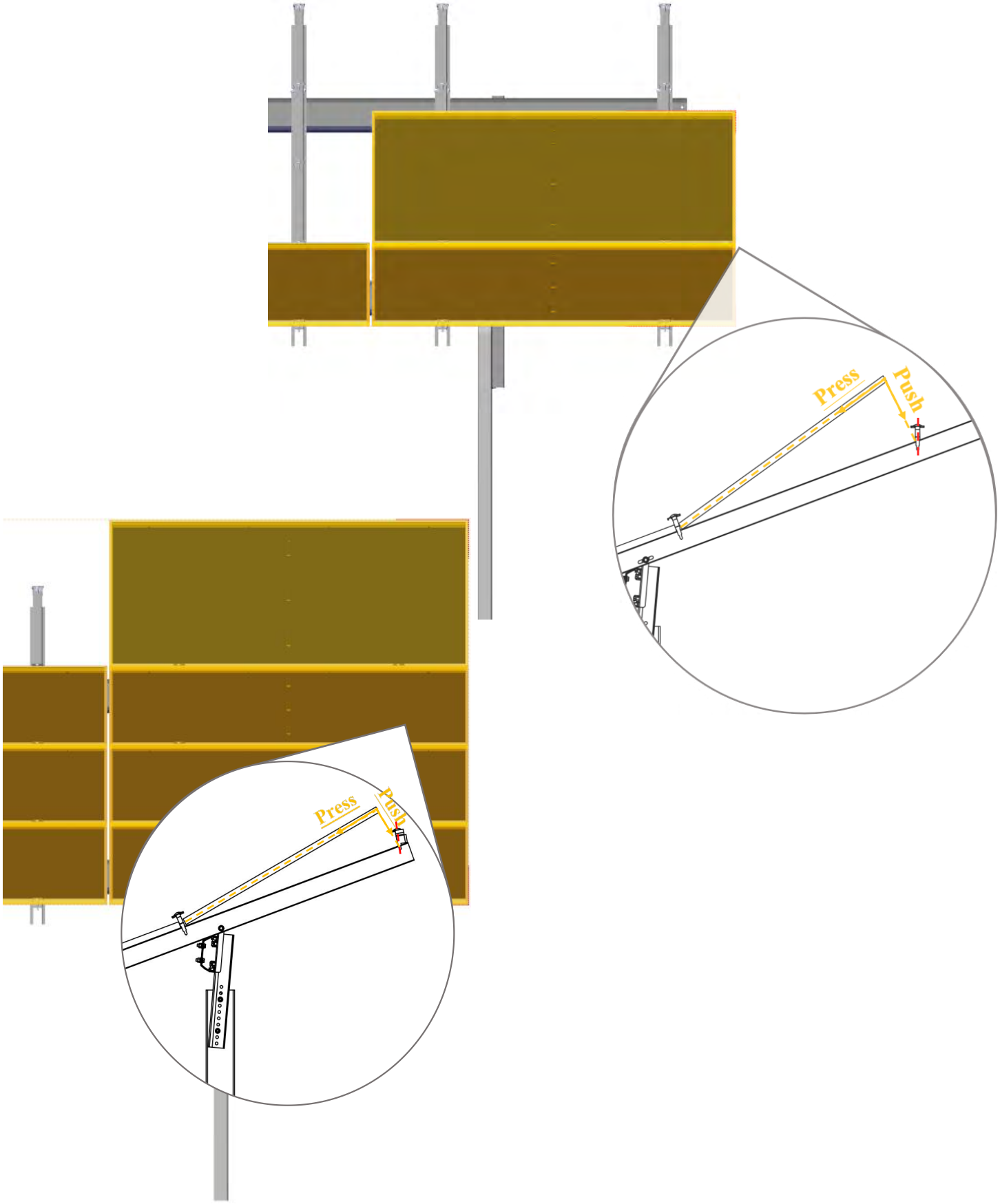
# Step 9: Panel

## Panel Position




Press
Push

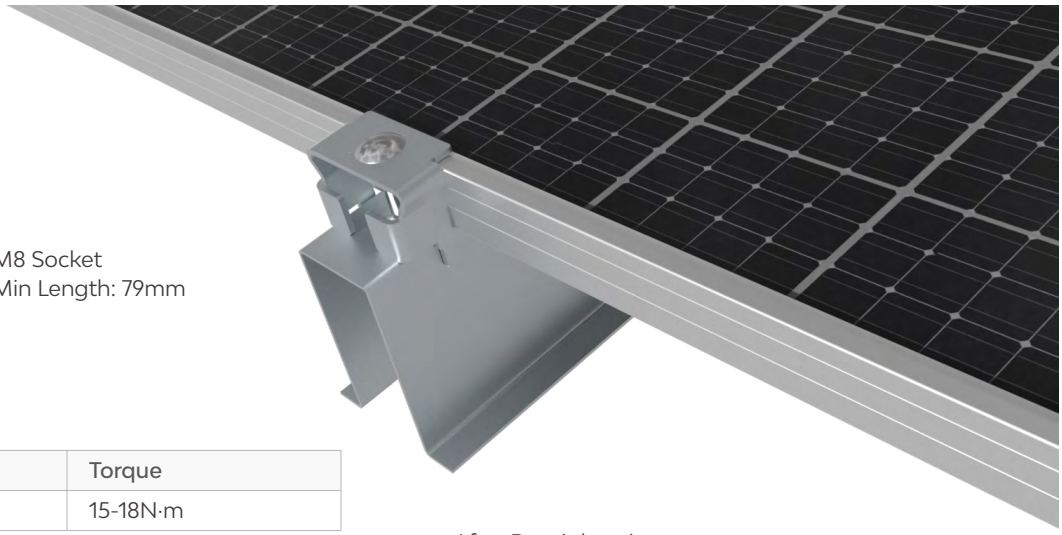

L3




Notice:
1. After panels are installed, pre-tightening torque of Hex Bolt Assy. M8x60: 15-18N•m.
2. Panel Positioning Shim is only an auxiliary installation tool. Do not hang panels for a long time without fixing them.

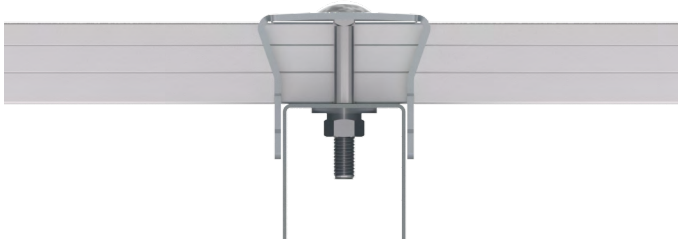
## Pre-tightening of Bolt Assy. M8x60

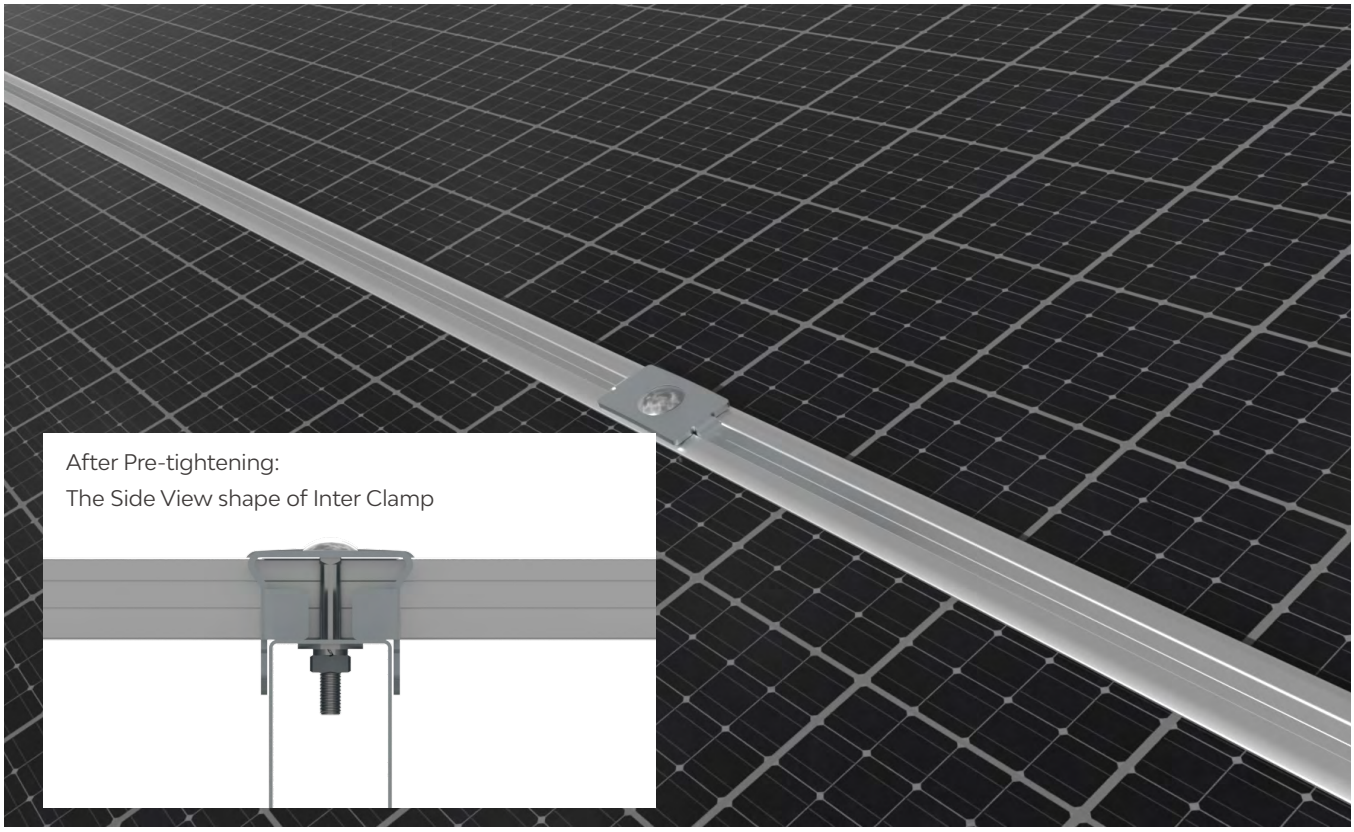
M8 Socket
Min Length: 79mm



| Specification | Torque |
|---|---|
| Hex Bolt Assy. M8*60 | 15-18N·m |

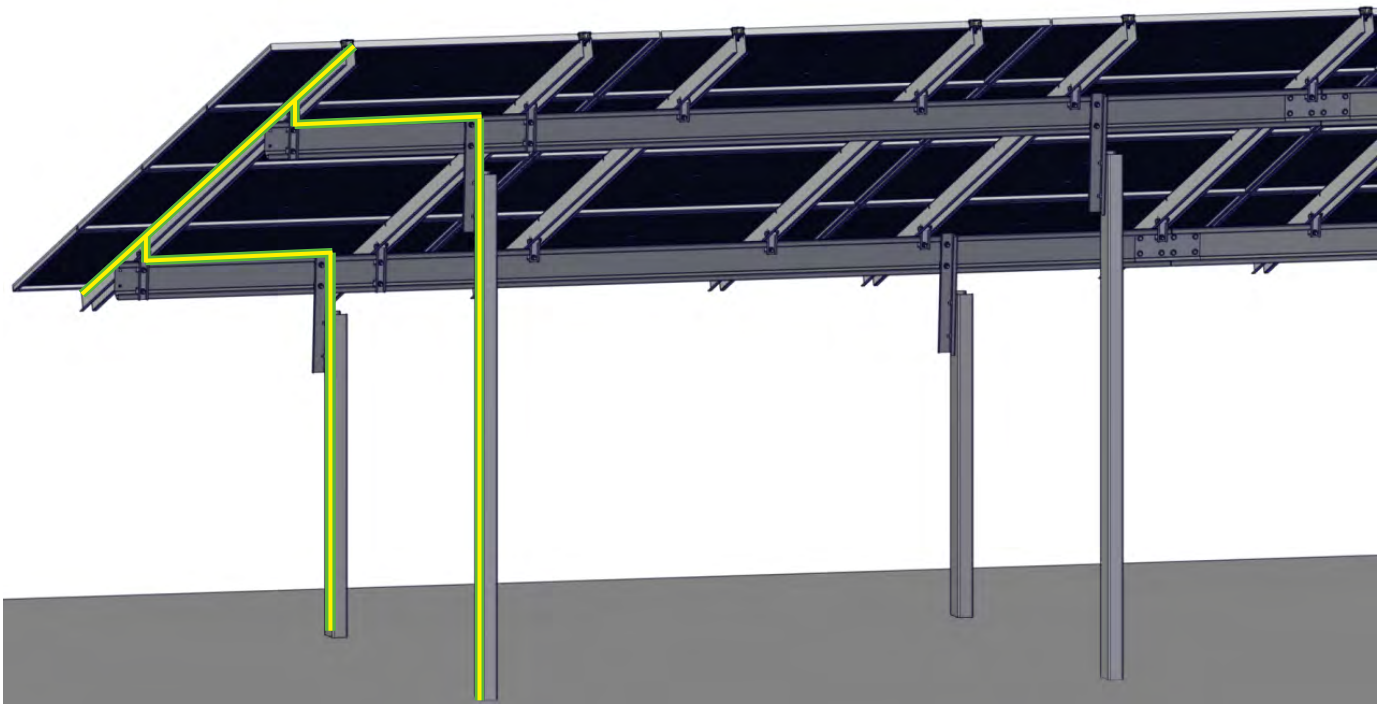
After Pre-tightening:
The Side View shape of End Clamp





After Pre-tightening:
The Side View shape of Inter Clamp

# STEP 10: Earth Grounding Path



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