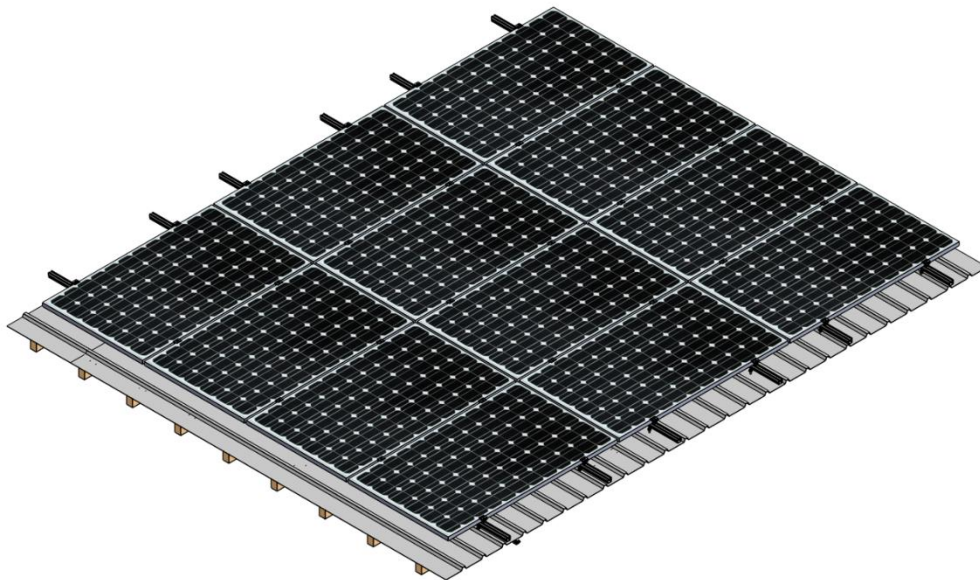


SolarRoof Pro 2.0 Hanger Bolt

Code-Compliant Planning and Installation Guide V 1.3



Amendments

Issue No	Amendment Details	Date
1.0	First Publication	27/06/2024
1.1	Added instructions for pre-drilling holes	06/03/2025
1.2	Added torque setting notice for the hanger bolt	08/05/2025
1.3	Added concrete slab roof installation	06/06/2025

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1. Introduction

The Clenergy PVezRack® SolarRoof Pro 2.0 is a roof mounting solution suitable for most residential pitched roofs. Using our innovative rail, M module, and interface family, the SRP2.0 delivers a quick, safe, and cost effective solution for installers.

Please review this manual thoroughly before installing PVezRack® SolarRoof Pro 2.0. This manual provides: 1) Supporting documentation for building permit applications relating to PVezRack® SolarRoof Pro 2.0 PV Module Mounting System, 2) Planning and installation instructions.

The PVezRack® SolarRoof Pro 2.0 parts, when installed in accordance with this guide, will be structurally sound and will meet the Eurocodes and VDI 6012 standard. During installation, and especially when working on the roof, please comply with the appropriate Occupational Health and Safety regulations. Please also pay attention to any other relevant State or Federal regulations. Please check that you are using the latest version of the Installation Manual, which you can do by contacting Clenergy via email on sales@clenergy.com.

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual;
- Ensuring that PV-ezRack and other products are appropriate for the particular installation and the installation environment;
- Using only PV-ezRack parts and installer-supplied parts as specified by the PV-ezRack project plan. (substitution of parts may void the warranty and invalidate the letter of certification);
- 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 licenced electricians.
- Ensuring safe installation of all electrical aspects of the PV array.
- Ensuring that the roof, its rafters/purlins, connections, and other structural support members can support the array under building live load conditions;
- Ensuring that screws to fix interfaces have adequate pull-out strength and shear capacities as installed;
- Maintaining the waterproof integrity of the roof, including selection of appropriate flashing;
- The installation need to comply with the regulations of the German Central Association of Roofers (ZVDH) for work on roofs.
- During the installation of supporting system, module installation shall take full consideration of fire risks. Please read and understand the solar module installation manual before system installation.
- For more regulations of the German Professional Association, see:

BGV A1-General rules

BGV A2-Power Systems and Equipment

BGV C22-Construction work

2. Tools & Components

2.1 Tools

Tools			
			
Angle Grinder with Stone Disk	Screw Driver (for M8 T40 screw)	Torque Spanner	Spanner
			
Tape	String	Marker Pen	

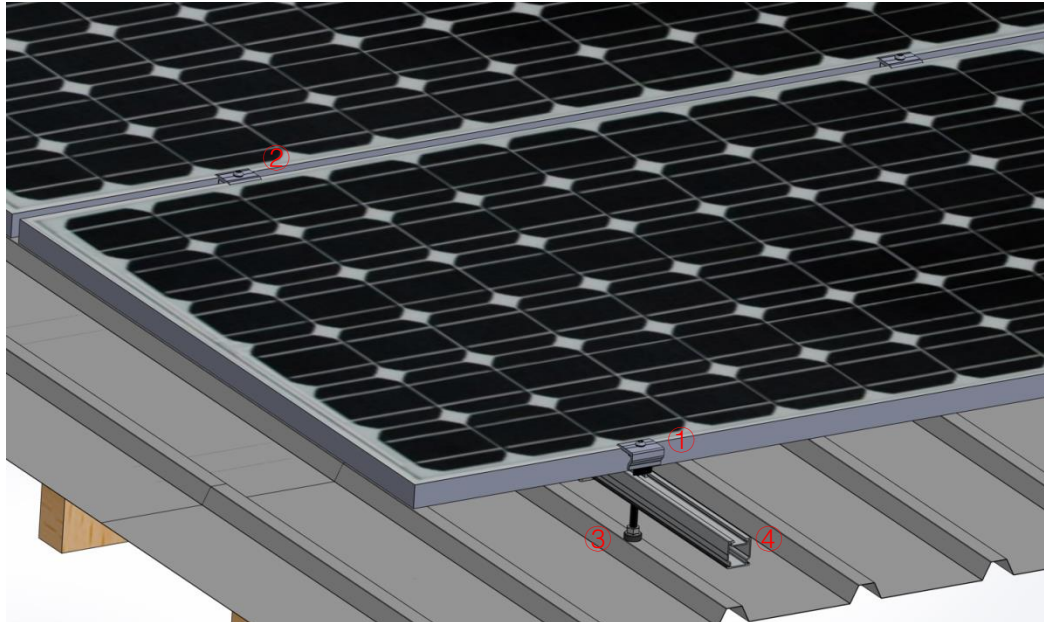
2.2 Components

Components			
			
EC-M28-46/L50 EC-M28-46/L50/MI EC-M28-46/L50/BA End Clamp 28-46mm with M module, Length 50mm	IC-M28-46/L50 IC-M28-46/L50/MI IC-M28-46/L50/BA Inter Clamp 28-46mm with M module, Length 50mm	ER-R-SRP11/TO/40 Toroda Rail 40	ER-SP-SRP11/TO/40 Splice for Toroda Rail 40, L200mm
			
ER-HB-10/200/TO Hanger Bolt M10*200mm	ER-HB-10/250/TO Hanger Bolt M10*250mm	ER-HB-12/300/TO Hanger Bolt M12*300mm	EZ-CAP-TO/40/G EZ-CAP-TO/40/B Cap for Toroda Rail 40
			
EZ-GL-TO/S Grounding Lug for Toroda Rail, side mount	GC-DT Grounding Clip	EZ-GL-TO Grounding Lug for Toroda Rail	

Components (not provided by Clenergy)			
			
Fisher Expansion plug SX GREEN UX GREEN			

3. System Overview

3.1 Overview of SolarRoof Pro 2.0



① End Clamp ② Inter Clamp ③ Hanger Bolt ④ TO40 Rail

3.2 Precautions during Stainless Steel Fastener Installation

Improper operation may lead to deadlock of Nuts and Bolts. The steps below should be applied to stainless steel nut and bolt assembly to reduce this risk.

3.2.1 General installation instructions:

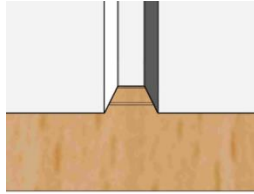
- (1) Apply force to fasteners in the direction of thread
- (2) Apply force uniformly, to maintain the required torque
- (3) Professional tools and tool belts are recommended
- (4) In some cases, fasteners could be seized over time. As an option, if want to avoid galling or seizing of thread, apply lubricant (grease or 40# engine oil) to fasteners prior to tightening.

3.3 Safe Torques

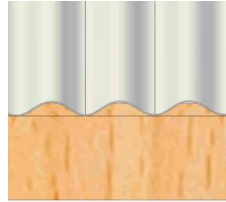
Please refer to safe torques defined in this guide as shown in Installation Instructions. In case power tools are required, Clenergy recommends the use of low speed only. High speed and impact drivers increase the risk of bolt galling (deadlock). If deadlock occurs and you need to cut fasteners, make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

3.4 System Specifications

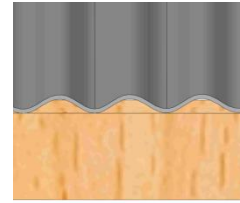
- Roof Type: Trapezoid and Corrugated sheet, Fibre cement sheet
- Substructure: Wooden beam
- Panel thickness: 28-46 mm



Trapezoid sheet



Corrugated sheet



Fibre cement sheet

4. Installation Instructions

4.1 Hanger Bolt Installation

4.1.1 Determine the positions of the Hanger Bolt according to your plans.

Before you start to install the Hangerbolt, please pre-drill the holes at the high points of the Sheet and purlin as shown in Figure 1, please refer to the following values for the hole diameters, the size of the holes must be larger than the diameter of the Hangerbolt

The hole diameters at the high point of sheet is
M10: 13mm
M12: 14mm

The hole diameters at the purlin is

M10: 7.0mm
M12: 8.5mm

The distance of the hole in the purlin from the edge of the purlin should be greater than three times the diameter of the Hangerbolt as show in Figure 3

M10: 30mm
M12: 36mm

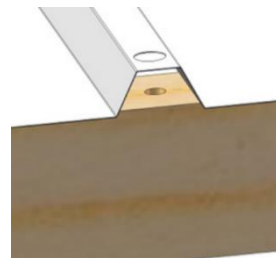


Figure 1

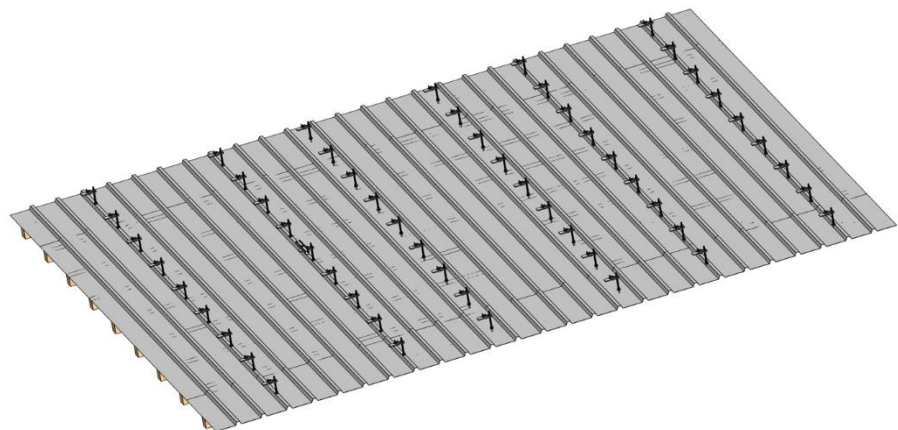


Figure 2

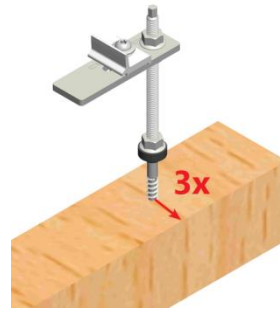


Figure 3

4.1.2 Adjust the position of rubber seal on the Hanger bolt to ensure hanger bolt have the depth as shown in figure 6 into the wood purlin

Drive and press the hanger bolt firmly in an axial manner to the wood purlin till the rubber seal is firmly flush on the tile and turn the nut down till touching the rubber seal. Please apply for low rotational speed of drive, preferably less than 300 rpm to reduce threads damage. Please turn another 4 threads cycle to press the rubber seal.

Note:
The recommended torque of M10 Hex Nut is 35-40N·m as shown in Figure 4.

Please refer to Figure 5 for tightening the waterproof gasket, to prevent under-tightening or over-tightening.

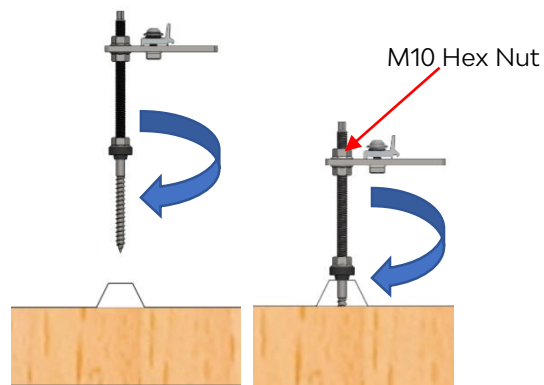


Figure 4

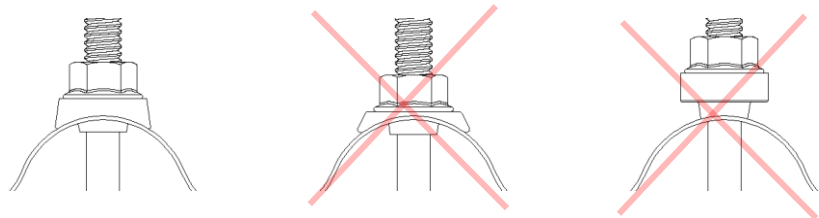


Figure 5

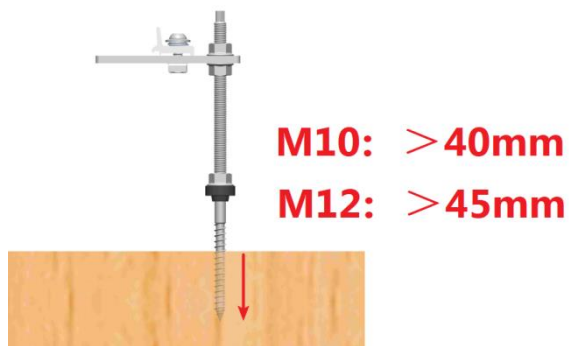


Figure 6

4.2 Rail Installation

4.2.1 To connect several rails together, slide half of the splice into the rear side of the rail, until it's stuck and fixed by the Connection Clip.

Then slide the next rail into the splice and get it fixed.

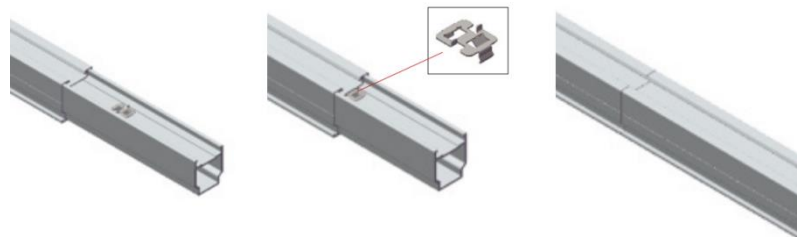


Figure 7

4.2.2 Lift up the rail clamp and insert the side of the rail to the rail clamp, and fasten the M8 Torx screw loosely with Torx L-key or the equivalent.

After adjust the rails properly, and fasten all M8 Torx screws tightly.

The recommended torque is 14N·m as shown in Figure 9.

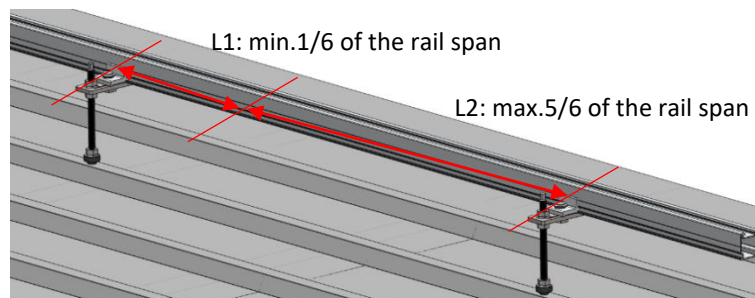


Figure 8



Figure 9

4.3 PV Module Installation

4.3.1 Place PV Modules on rails, fix with end clamps and inter clamps.
Click the M-module of the clamps into the top channel of rail as shown in the right figures.

Step 1: Place the first PV Module on rails according to your plan and apply the End Clamps to fix it and then fasten lightly using Torx L-key or the equivalent as shown in the right figures.

Notes:

The distance L from end clamp to the end of the rail shall be over 50mm.

Step 2: Slightly lift the PV Module and slide Inter Clamps and Grounding Clips into position.

The teeth on Grounding Clip will automatically align when the Inter

Clamp is properly installed as shown in the right figures.

Step 3: loosely place the next framed PV Module into the other side of the Inter Clamp and Grounding Clip as shown in the right figures.

Important Notes:

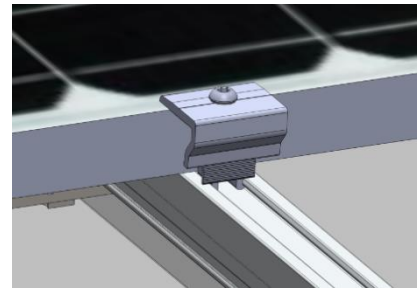


Figure 10



Incline



Click in



Press down

Figure 11

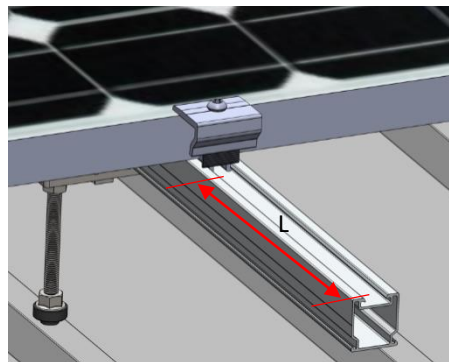
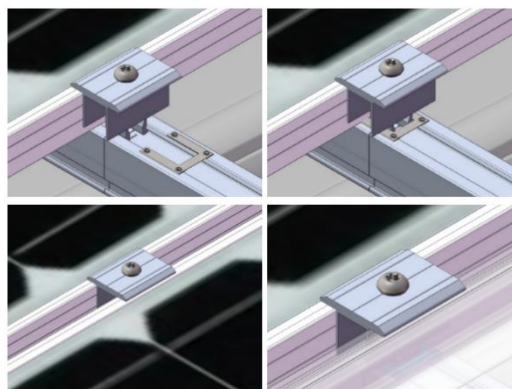


Figure 12



To fix the Grounding Clip properly, ensure the frames of PV Modules are completely pressed against the Inter Clamp and Grounding Clip.

Visually check that Grounding Clips are positioned properly.

- Grounding Clips are intended for SINGLE USE ONLY! - Only fasten the bolts down when the position of PV Module is finalized. (Only slightly tighten bolts to keep PV Modules in place prior to the final check)

Step 4: Maintain 20mm vertical gap and 20mm horizontal gap between the two adjacent rows of PV Modules.

You can use two Inter Clamps to separate two PV Modules, and remove after installation as shown in the right figures. Double check if all PV Modules are fixed properly. Fasten all the screws tightly with the recommended torque 14N·m.

PV module installation is completed as shown in the right figures.

Figure 13

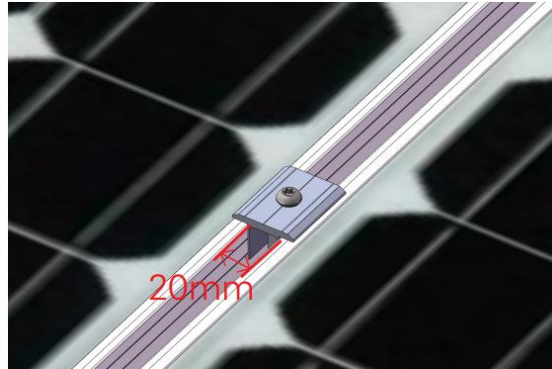


Figure 14

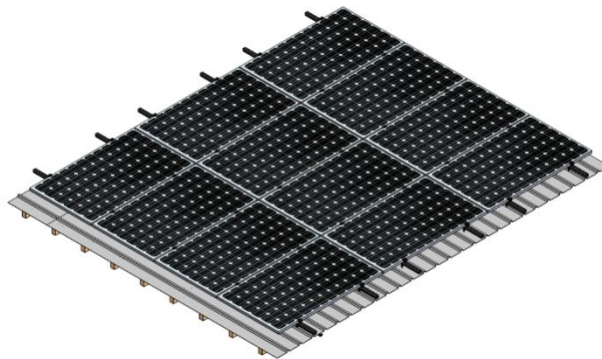


Figure 15

4.4 Grounding Lug Installation

4.4.1 Top Mount Grounding Lug

Slide the W module into the top channel of rail, and fasten the M8 Torx screw tightly with recommended torque of 14N·m.

Insert the copper wire/aluminum wire into the grounding lug and fasten the M8 Torx screw

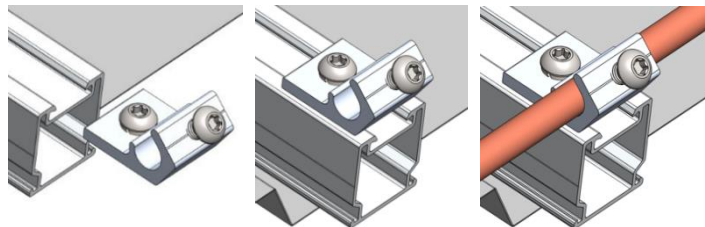


Figure 16 Top Mount Grounding Lug

tightly with recommended torque of 8N·m as shown in the figures on the right.

4.4.2 Side Mount Grounding Lug

Click the side mount grounding into the side channel of rail. And fasten with screw with recommended torque of 5N·m

Insert the copper wire/aluminum wire into the grounding lug and fasten the M8 Torx screw tightly with recommended torque of 8N·m as shown in the figures on the right.

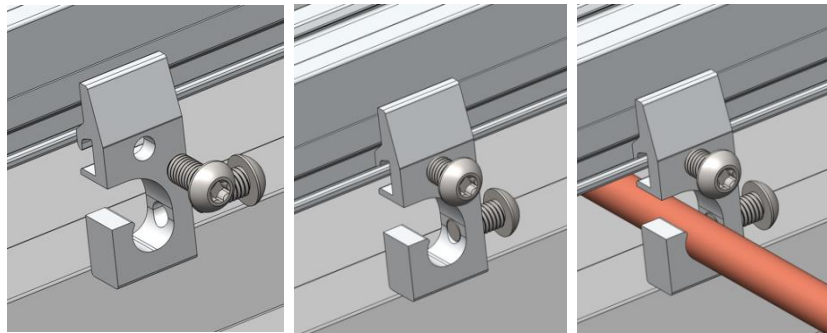


Figure 17 Side Mount Grounding Lug

4.5 Concrete Slab Roof Installation

4.5.1 Pre-drill a hole into the concrete slab roof together with the tile at the designated location. The hole diameter and depth should match the expansion plug specifications.

4.5.2 Clean out any dust or debris from the hole.

4.5.3 Insert the expansion plug into the hole.

4.5.4 Screw the hanger bolt into the expansion plug until it is firmly secured as shown in right figure.

