

Grounding System

Code-Compliant Planning and Installation Guide V 1.1
Complying with AS/NZS1170.2-2011 AMDT 2-2016



Introduction

The Clenergy PV-ezRack® Grounding system provides important guide for installers to achieve earthing continuity from PV modules to earthing cable. It includes two important parts: grounding clips layout design and grounding lug installation.

Please review this manual thoroughly before installing PV-ezRack® Grounding system.

The PV-ezRack® Grounding system parts, when installed in accordance with this guide, will be structurally sound and will meet the AS/NZS1170.2:2011 Amdt 2- 2016 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 Australia via email on tech@clenergy.com.au, or contacting your local distributor in Australia.

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Product Warranty:

Please refer [PV-ezRack® Product Warranty](#) on our website.

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);
- Recycling: Recycle: according to the local relative statute.
- Removal: Reverse installation process.
- Ensuring that there are no less than two professionals working on panel installation;
- Ensuring the installation of related electrical equipment is performed by licenced electricians;
- Ensuring safe installation of all electrical aspects of the PV array, this includes adequate earth bonding of the PV array and PV-ezRack® SolarRoof components as required in AS/NZS 5033: 2021;
- Verifying the compatibility of the installation considering preventing electrochemical corrosion between dissimilar metals. This may occur between structures, fasteners and PV modules, as detailed in AS/NZS 5033: 2021.

Tools and Components

Tools

				
<p>Screw Driver with 6 mm Hex Head drive bit</p>	<p>Tape</p>	<p>String & Marker Pen</p>	<p>Spanner</p>	<p>Torque Spanner</p>

Components

				
<p>ER-EC-ST Standard End Clamp</p>	<p>ER-IC-ST Standard Inter Clamp</p>	<p>C-U/30/46-G Universal Clamp with Grounding clip</p>	<p>C-U/30/46 Universal Clamp</p>	<p>ER-EC-DU35/40 End Clamp, Dual 35 or 40mm</p>
				
<p>ER-EC-DU40/46 End Clamp, Dual 40 or 46mm</p>	<p>EZ-GL-ST/UC Grounding lug with U-shape copper channel</p>	<p>EZ-GC-ST Grounding Clip</p>		

Installation Instructions

PV Module Clamps Installation

The guide below is for PV module clamps installation. For PV Module installation, please follow manual provided by the manufacturer.

Before module and clamps installation, it is important to arrange how to position grounding clips to achieve earthing continuity between each PV modules and rails. The Clenergy recommends three different methods for Grounding Clips Layout Arrangement.

Method 1: "Even and Odd"

- When there is an even number of PV Modules in each row, install the grounding clips at the positions marked X in Figure 1, where the number of Grounding Clips = number of PV Modules. Figure shows 4 x PV Modules requiring 4 x grounding clips.

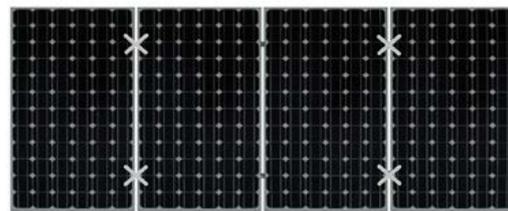


Figure 1

- When there is an odd number of PV Modules in each row, install grounding clips at positions marked X in Figure 2, where the number of Grounding Clips = number of PV Modules + 1. Figure shows 5 x PV Modules requiring 6 x grounding clips.

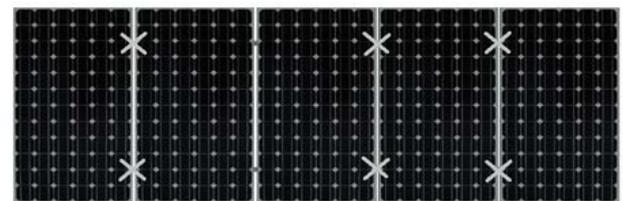


Figure 2

Method 2: "Zig Zag"

Install the grounding clips at the positions marked X in Figure 3, where the number of Grounding Clips = number of PV Modules + 1. Figure shows 5 x PV Modules requiring 6 x grounding clips.

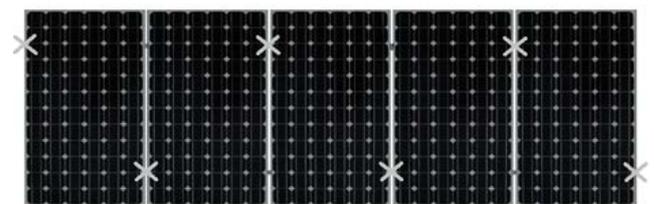


Figure 3 "Zig Zag" Grounding Clips Layout

Notes:

- Please consult local PV Module supplier to check whether "Zig Zag" grounding clips layout has any effect on PV modules.
- Grounding clips are not suitable for Dual End Clamp.

Method 3: "All Inter Clamps"

Install the grounding clips at the positions marked X in Figure 4, where the number of Grounding Clips = (number of PV Modules -1) x 2. Figure shows 5 x PV Modules requiring 8 x grounding clips.

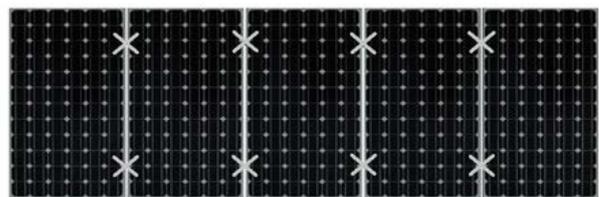


Figure 4 "All Inter Clamps" Grounding Clips Layout

Important Notes for any of method above:

- When replacing defective PV Modules, it is required to replace the grounding clips under the defective PV Modules;
- When removing defective PV Modules, it is required to keep sufficient grounding clips to maintain all other PV modules’ earthing continuity with the rail. It is required to install grounding clips under end clamps when necessary to achieve this;
- For array requiring more than 2 rows of rails, the layout and quantity of grounding clips are the same as those for 2 rows of rails.

There are two types of clamps for PV Modules Installation.

Option 1: Standard Inter and End Clamps

Place the first PV Module on the Rail according to your plan, and fix it in place using the End Clamps. Then fasten lightly as shown in Figure 5. If arranging grounding clips using “Zig Zag” layout method above, a grounding clip needs to be installed under an end clamp as shown in Figure 6.

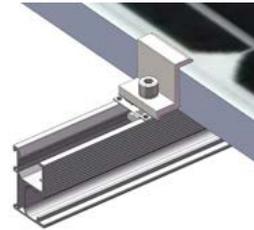


Figure 5



Figure 6

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 Figure 7.

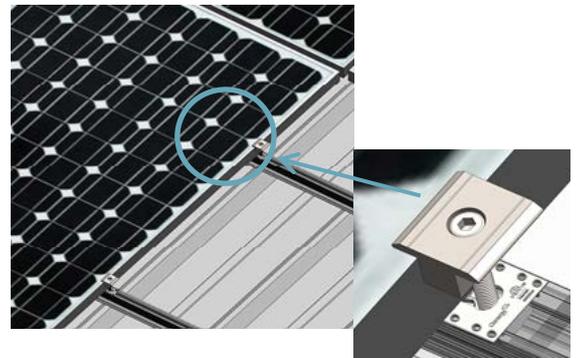


Figure 7

Loosely place the next framed PV Module into the other side of the Inter Clamp and Grounding Clip as shown in Figure 8.

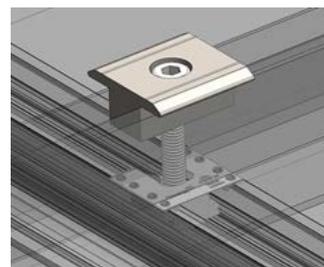


Figure 8

Important Notes:

- To fix the Grounding Clip properly, ensure the frames of PV Modules are completely pressed against End and Inter Clamps and Grounding Clips. Visually check that Grounding Clips are positioned properly;
- Grounding Clips are intended for SINGLE USE ONLY! Only fasten the bolts down with recommended torque of 16-20 N·m when the position of the PV Module is finalized. (Only slightly tighten bolts to keep PV Modules in place prior to the final check).

Option 2: Universal Clamps

Turning the top plate of the Universal Clamp to switch the functionality between End and Inter Clamp as shown in Figure 9.

Note: Universal Clamp with part number of C-U/30/46 has no pre-fitted grounding clip and Universal Clamp with part number of C-U/30/46-G has pre-fitted grounding clip. Please use one of grounding clips layout arrangement methods above to position them correctly.

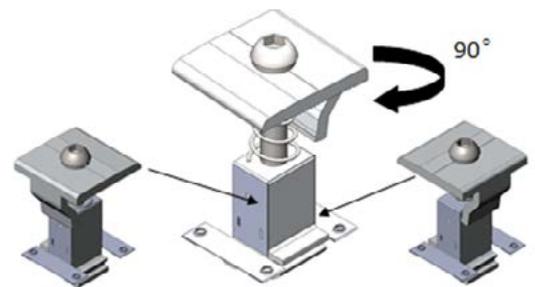


Figure 9

Incline the Universal Clamp to fit the lower channel of clamp against the lower rib of the Rail and press module of the Universal Clamp to click in the rail channel. Please make sure the upper channel of clamp fits against the upper rib of rail as shown in Figure 10.

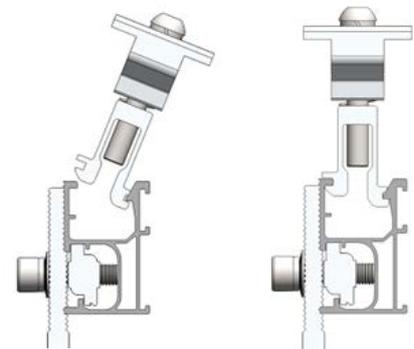


Figure 10

Note: Before clicking in, make sure there is enough room between two "claws" of the module otherwise it needs to screw up the bolt as shown in Figure 11.

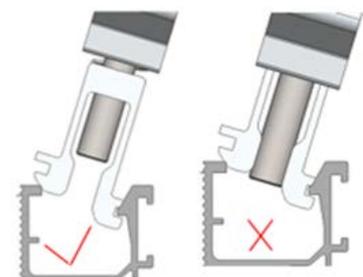


Figure 11

Place the first PV Module on the Rails and apply the Universal Clamp as the End Clamp and fasten slightly. Make sure the frame of the PV Module is fully in contact with the Universal Clamp as shown in Figures 12 and 13. Visually check the Universal Clamp and PV module are properly installed.

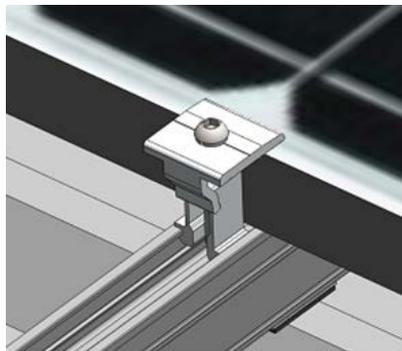


Figure 12

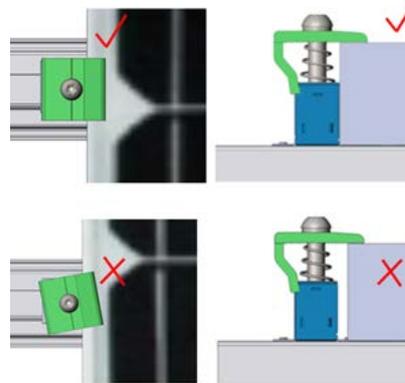


Figure 13

When using as an Inter Clamp, click the Universal Clamp into the rail channel and slightly lift the framed PV Module to ensure the Grounding Clip is properly positioned as shown in Figure 14.

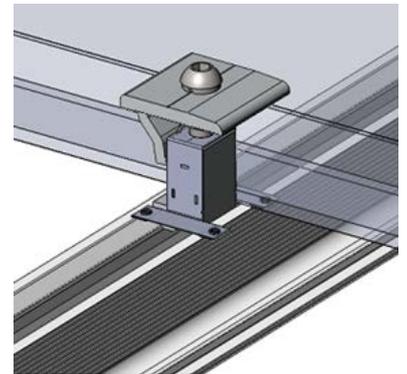


Figure 14

Loosely place the next framed PV Module into the other side of the Universal Clamp. Ensure the Grounding Clip is properly positioned, and the frame of the PV Module is in proper contact with Universal Clamp as shown in Figures 15 and 16.

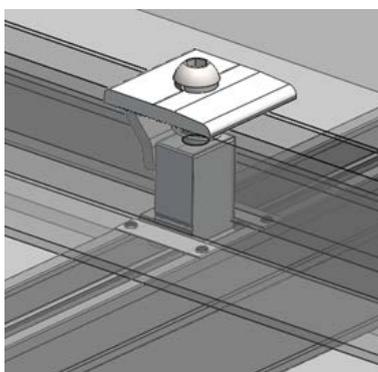


Figure 15

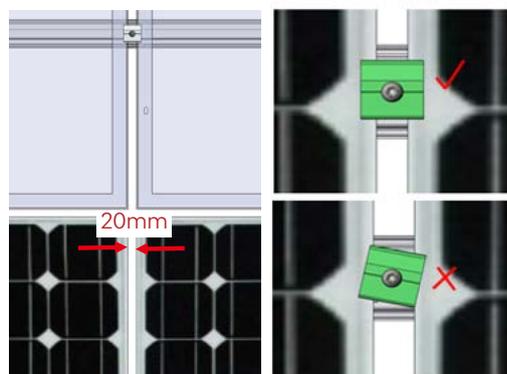


Figure 16

Note: The gap between two adjacent PV Modules generated by universal clamp is 20mm. The recommend torque for Universal Clamp as End Clamp is 13-14 N·m. The recommend torque for Universal Clamps as Inter Clamp is 16-20

Grounding Lug Installation

It is required to install one Grounding Lug per row of rail. The recommended fasten torque of the bolt M8*25 is 16~20 N·m.

Once grounding lug fixing with rail, insert U-Shape Copper Channel into grounding lug as shown in Figure 17. Strip earthing cable (the maximum size is 10 mm²), insert the conductor into the Copper Channel and tighten the bolt M6*14 with 5~6 N·m to ensure the earthing cable is tight.

Note: Please check the electrical resistance between rail and earthing cable conductor to ensure the bonding is made.

There are three options for Grounding Lug installation.

Option 1

Fix the Grounding Lug into the top channel of Rail as shown in Figure 18.



Figure 17



Figure 18

Option 2

Fix the Grounding Lug into the top channel of Rail where just under the PV Module as shown in Figure 19. Total height of grounding lug allows installation under 30 mm high PV module.

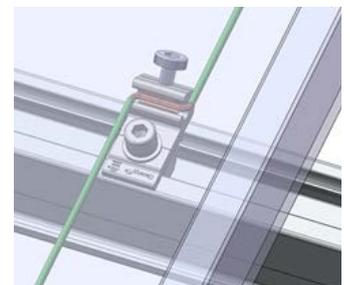


Figure 19

Option 3

Fix the Grounding Lug at the side channel of Rail as shown in Figure 20.

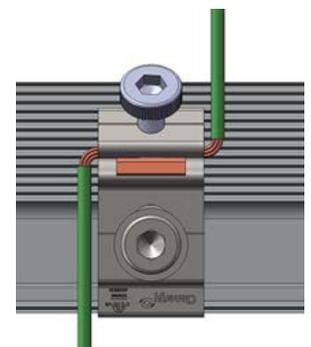


Figure 20



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