

Rooftop Parallel Installation Manual



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1. Introduction

1.1. Short Description

The S-Rack Rooftop Parallel system is a mounting system for the installation of PV modules on pitched roofs. It consists of aluminium support rails and all the necessary components for securing the modules to the rails and the rails to the roof allowing for both portrait and landscape installation of the modules.

1.2. About the Manual

Content

These instructions provide important information regarding components, system, planning and safety warnings when handling the Rooftop Parallel System.

Sections 1 and 2 show an overview as well as detailed information about the Rooftop Parallel System and its components. Section 3 provides the basic planning information. The remaining sections provide detailed system assembly and installation instructions.

Installation Manual Validity

This installation manual is only valid in conjunction with:

- S-Rack Australia Pty Ltd's Terms and Conditions. This document applies to all contracts and agreements for all products and services offered by S-Rack Australia Pty Ltd.
- Spacing Tables. These documents show all the project specific installation details. Therefore, these tables take precedence over the installation manual in case of discrepancies between the two documents.
- The supplied material for the Rooftop Parallel System according to the Bill of Materials (BOM).

The content of these documents must be followed during installation for the S-Rack Australia Pty Ltd warranty to apply.

Please read and check the Installation Manual, Spacing Tables and Bill of Materials carefully prior to any installation, maintenance, and disassembly work.

All necessary information regarding installation, maintenance and disassembly will be provided. If you have any questions after having read these documents, please contact S-Rack Australia Pty Ltd.

Target Group

Skilled and trained personnel.

Skilled/Trained Personnel

An individual who has acquired professional training and as such, capable of executing installation, maintenance and disassembly work properly.

Guidance Notes

Please see below installation guidance notes.

Symbols:



Important information and useful tips



Additional information and hints to make the installation process easier

1.3. Warnings

The following are used in the installation manual to indicate safety-related information. These include:

- Warning Symbols
- Signal words which identify the hazard level
- Information about the type and source of the hazard
- Information about the potential consequences if the hazard is disregarded
- Measures to prevent injuries and damage to property

The signal words of the warnings respectively indicate one of the following hazard levels:

 DANGER	Indicates a potentially fatal danger which may result in death or serious injury if ignored.
 WARNING	Indicates a potentially dangerous situation which may result in serious injury or damage to property if ignored.
 CAUTION	Indicates a potentially dangerous situation which may result in injuries or damage to property if ignored.
 ATTENTION	Indicates potential danger which can result in damage to property if ignored

1.4. Safety

Safety instructions for S-Rack Australia Pty Ltd products are included in the documents. Do not use the products in a manner other than its intended function.

It is the responsibility of the customer to ensure that all general and specific safety instructions are followed.

In addition, please observe the specific safety instructions provided in this Installation Manual for all installation work. The specific safety instructions are positioned in each case directly with the respective installation steps.

2. Technical Description

This section provides a breakdown of the Rooftop Parallel System and its components. Upon delivery of the system, check to ensure that all parts and components adhere to the BOM and spacing tables. Any items missing or damaged must be notified to S-Rack Australia Pty Ltd immediately.

2.1. System Overview

An overview of the Rooftop Parallel System can be seen below (Image 2.1-1). Please note that some components can vary depending on project-specific requirements.

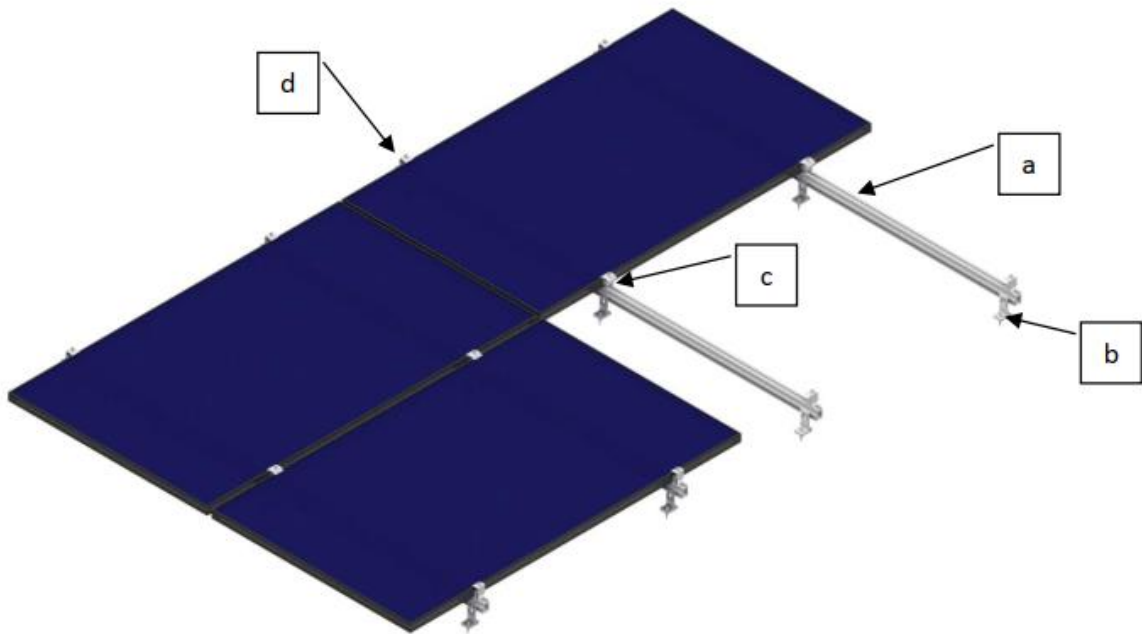


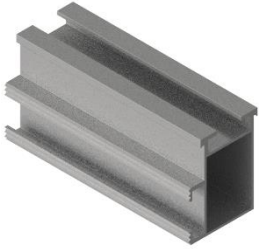
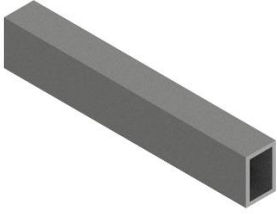




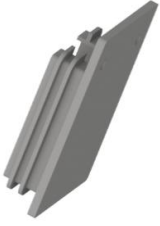
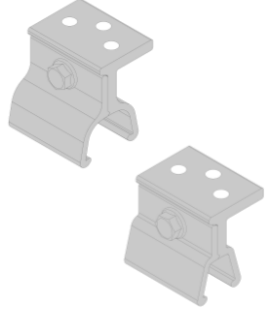
Image 2.1-1 - System Overview of the Rooftop Parallel System

Rooftop Parallel System Components:

- a. Base Rail
- b. L-Foot/Roof Hook
- c. Module Mid Clamp
- d. Module End Clamp
- e. Rail Connector*
- f. End Cap*

*not shown in overview

2.2. Component Details

Overview of System Components			
 <p>ST-AK 7/47 Rail</p>	 <p>Connector for ST-AK 7/47</p>	 <p>Module Mid Clamp</p>	 <p>Module End Clamp</p>
 <p>L-Foot (for Tin Roof)</p>	 <p>Roof Hook (for Tile Roof)</p>	 <p>End Cap for ST-AK 7/47</p>	 <p>Kliplok Clamps</p>

2.3. Technical Data

Application	Pitched roof
Roof Cladding	Suitable for most types of roof cladding
Roof Slope	Up to 30°*
Building Height	Up to 20m*
PV Module	Framed
Module Orientation	Portrait, Landscape
Array Size	Any size possible
Distance between Roof Fixing Points	Up to 2m*
Standards	AS/NZS1170.2:2011
Material	Aluminium, Stainless steel
Warranty	10 years**

*Different maximum values may apply, depending on site, building, type of roof and module type.

**Please refer to S-Rack Australia Pty Ltd Terms and Conditions.

3. Important Installation Information

3.1. Conditions of Use

The Rooftop Parallel System is designed with different on-roof fasteners for various types of roofs. The suitability of the materials must therefore be verified for each system.

3.2. Mounting Preparations

S-Rack Australia Pty Ltd recommends inquiring first on the local conditions before ordering the Rooftop Parallel System. In particular:

- Roof Structure
- Dimensions, material, quality and spacing between rafter/purlins
- Irregularities with rafter purlins spacing
- Type and quality of roofing



DANGER

Risk of fatal injury from damage to roof

Excessive loads can severely damage the roof.

Before mounting and installation, please ensure that the building and roof cladding meet the increased structural requirements for the PV system and the mounting operation.



DANGER

Risk of fatal injury from falling objects

Parts falling from the roof can result in serious injuries or death.

Before commencing with installation, please ensure that the material used meets the structural requirements of the site.

3.3. Required Tools

In order to mount the Rooftop Parallel, the following tools are required:

- Power Drill/Electric Screwdriver with 75mm adapter
- Folding Rule/Measuring Tape
- Angle Measuring Tool (Protractor)
- Spirit Level or Laser Level Tool
- 5mm Allen key

4. Roof Fastener Installation

Roof fasteners are fixed to the roof structure and serve as a connector to the rails. The required spacing between roof fasteners and type of roof fastener to be used depends on the structural requirements and roof type.

4.1. Roof Hook Installation

Mounting Steps

1. Determine the position of the rails and the roof fasteners.
2. Push up or remove the roof tiles at the appropriate points.
3. Prepare the fastening points of the substructure for roof fastener mounting. Ensure enough load-bearing, wide and level contact surface.
4. Position and align the roof hook to the rafter. Ensure that the roof hook is not pressing against the roof tile. Fasten using the 2 provided screws.
5. Once the roof hook is properly secured, reinstall the roof tiles.

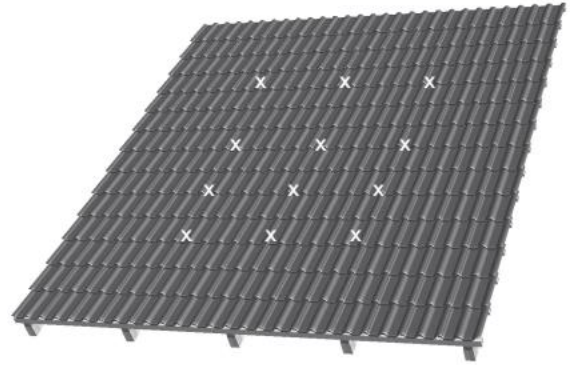


Image 4.1-1 Preparing Roof Substructure

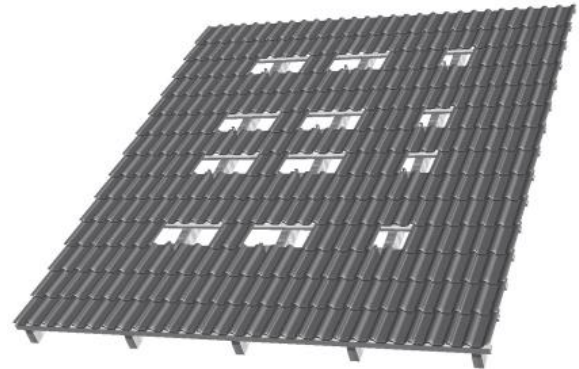


Image 4.1-2 Removing Roof Tiles at Appropriate Points

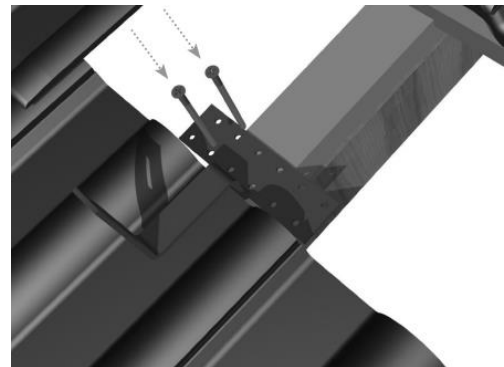


Image 4.1-3 Fastening the Roof hook with Screws



CAUTION

Damage to building and PV system due to incorrect mounting.

Incorrect spacing between roof fasteners can cause damage to the building and PV system.

Ensure correct spacing between roof fasteners is followed.

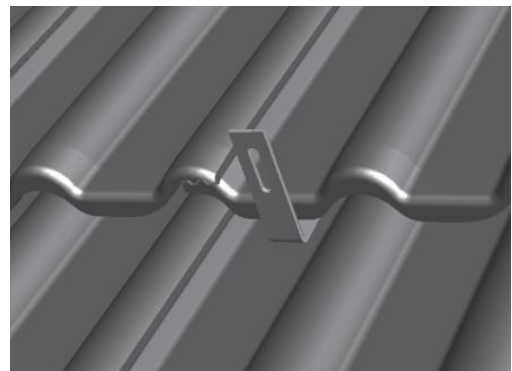


Image 4.1-4 Roof Tile Reinstalled

4.2. L-Foot Installation

For installation on corrugated tin roof cladding, the L-Foot roof fastener is used.

Mounting Steps

1. Determine the position of the rails and the roof fasteners.
2. Drill through the roof cladding at the planned location and use the supplied screw to fix the L-Foot to the roof purlin.
3. When fastening the screw, sufficiently tighten the screw making sure to avoid deforming the corrugation of the roof cladding.



CAUTION

Damage to building from leaking

Incorrectly installed roof hooks and incorrect reinstallation of roof cladding can result in leakages.

Prior to installation, make sure to choose a suitable roof fastener variant for the roof.

When mounting roof fasteners, adhere precisely to the mounting instructions.



Image 4.2-1 L-Foot on Corrugated Tin Roof Cladding

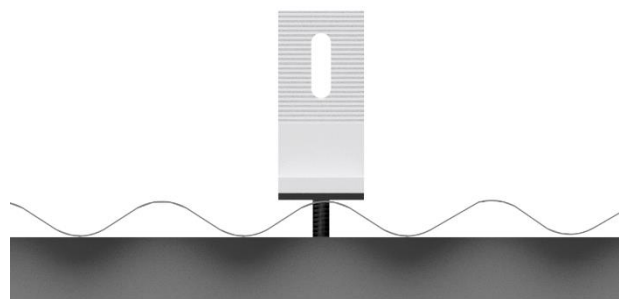


Image 4.2-2 Mounted L-Foot

5. Rail Installation

The rails serve as module support and are available in different lengths depending on the system configuration.

5.1. Rail Placing and Alignment

Mounting Steps

1. Loosen the T-head bolt and nut included in the Roof Hook/L-Footer.
2. Hold the rail against the Roof Hook/L-Footer and insert the T-head bolt in the side channel of the base rail. Repeat for all Roof Hook/L-Footer in the system.
3. Align the rails using chalk line or spirit level.
4. Tighten the lock nuts and ensure that the T-head bolts are positioned correctly in the rail channel. Observe proper tightening torques. (16Nm)

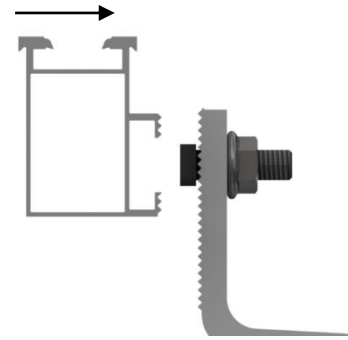


Image 5.1-1 Inserting the T-head Bolt to the Rail Side Channel

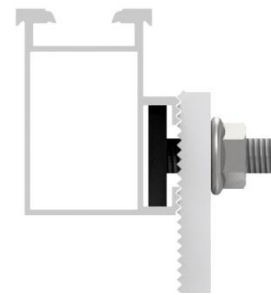


Image 5.1-2 Rail Connected to the Roof Fastener

5.2. Rail Connector

Rail connectors are provided to link 2 individual base rails.

Mounting Steps

1. Insert ½ of rail connector into the first rail.
2. Fix the rail to the connector by securing it with a self-tapping screw at the back side of the rail.
3. Slide the next rail onto the other half of the rail connector and secure with a self-tapping screw.

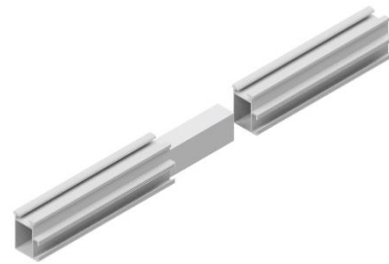


Image 5.2-1 Connecting 2 Rails Using the Connector

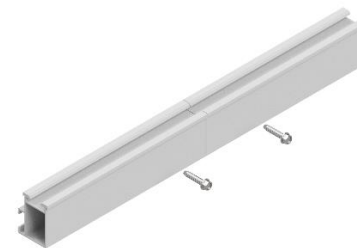


Image 5.2-2 Securing Rails to Rail Connector with Self-tapping Screws

5.3. End Caps

Mounting Steps

From the outside, push the end caps onto both ends of the rails.

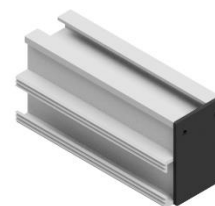


Image 5.3-1 Rail with Installed End Cap

6. Module Clamp Installation

Module clamps are used to secure the PV modules to the rail and use an outer click to fasten the clamps to the rail.

Module End Clamps are installed at both ends of a rail.

Module Mid Clamps are installed in-between PV modules along the rails, holding them in place

Mounting Steps

1. Place the module clamp at the top of the base rail.
2. Wedge one side of the outer click onto one side of the base rail.
3. Push the module clamp down to snap the other side of the outer click onto the other side of the base rail.
4. Tighten the bolt using the recommended torque settings. (12Nm)



CAUTION

Material damage due to incorrect installation

Incorrectly mounted module clamps can cause the PV modules to fall and be damaged.

Mount all module clamps in accordance with the instructions.



Image 6-1 Module Clamp Installation

7. Module Installation

The modules are installed on the rails one by one, beginning at one side. Modules can be installed in either portrait or landscape orientation.

7.1. Module Installation – Portrait

1. Fasten a module end clamp onto each rail.
2. Place the first PV module on the rails and slide the module frame against the end clamp. With the module's clamping points correctly positioned under the end clamps, tighten the end clamps onto the module frame.
3. Place a module mid clamp onto each rail. Push it flush against the module, ensuring the clamp body rests on top of the previously installed module frame. Place the next module on the rail and slide it against the mid clamps.
4. Repeat the above steps for the rest of the row of modules. At the end of a row, install an end clamp on the outside of the last module to complete the row.

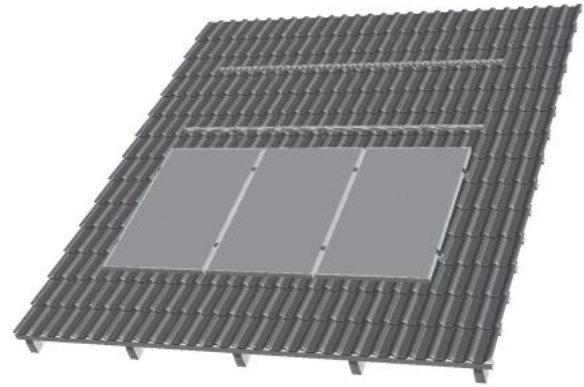


Image 7.1-1 Sample Portrait Installation

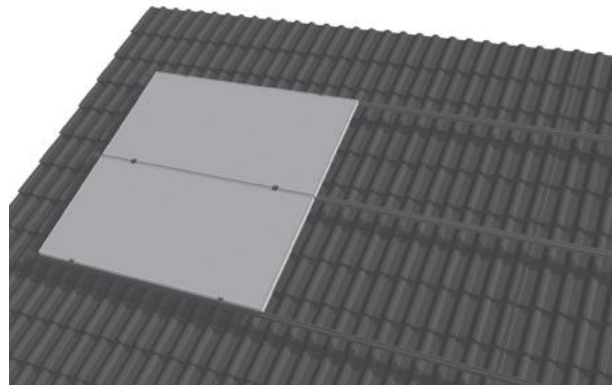


Image 7.2-1 Sample Landscape Installation

7.2. Module Installation – Landscape

1. Place a module end clamp onto the bottom module rail.
2. Place the first PV module on the rails and slide the module frame against the end clamp. With the module's clamping points correctly positioned under the end clamps, tighten the end clamps onto the module frame.
3. Place a module mid clamp onto each rail. Push it flush against the module, ensuring the clamp body rests on top of the previously installed module frame. Place the next module on the rail and slide it against the mid clamps.
4. Repeat the above steps until the top rail is reached. At the end of a column, install an end clamp on the outside of the last module to complete the column.
5. Repeat steps 1-4 to install another column of modules.

Hint!



Use of a spare module clamp or other item as a spacing gauge between the modules columns ensures that the spaces between columns are the same.

8. Cross Rail Installation

In some cases, depending on the project-specific structural requirements or certain roof conditions, a cross-rail layout can be utilized. In a cross-rail set-up, cross rail connectors are used to connect the bottom layer base rail to the upper rail layer.

1. With the base layer already installed, place and align a rail at an angle of 90° over the previously mounted rail layer.
2. Hook the cross-rail connector into the side channel of the upper rail and position in such a way that the T-head bolt of the cross-connector fits into the top channel of the base rail.
3. Adjust the T-head bolt so that the head locks into place in the top channel of the base rail.
4. Tighten the nut to secure the 2 rails together. Observe proper tightening torques (20Nm).
5. Install a cross-connector for every base rail intersected by the upper rail.
6. Repeat steps 1-5 until all upper rails are installed.



Image 8.1-1 – Upper Rail Perpendicular to the Base Rails

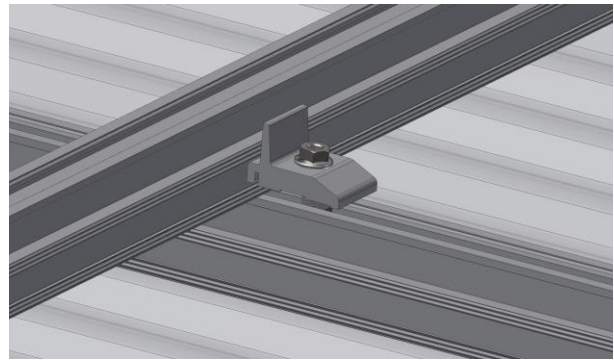


Image 8.1-2 – Upper and Base Rails with a Cross-Connector

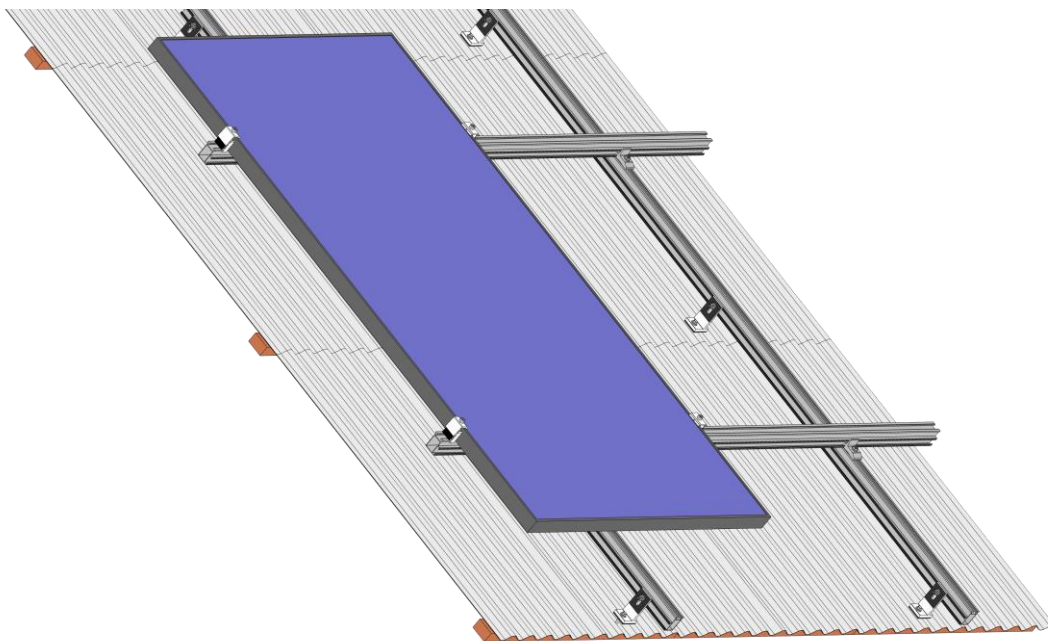


Image 8.1-3 – Sample Cross-Rail Installation

9. Kliplok Clamp Installation

For roof mount installation requiring a non-penetrating solution, Kliplok clamps can be used. Kliplok Clamps can be attached on different types of Kliplok roof cladding and have been designed to work in conjunction with our Rooftop Systems.

1. Install Kliplok clamp to the as shown on Image 9.1-1. Sufficiently tighten the bolt making sure to avoid deforming the roof cladding.
2. Once the Kliplok clamp is securely installed on the roof, install the L-foot on top of the Kliplok clamp. The Kliplok clamp has multiple holes that can be used to orient the L-foot as shown in Image 9.1-2.
3. Repeat steps 1-2 until all Kliplok clamps are installed.

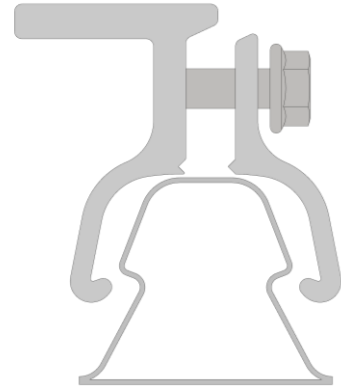


Image 9.1-1 Sample Kliplok Clamp Installation

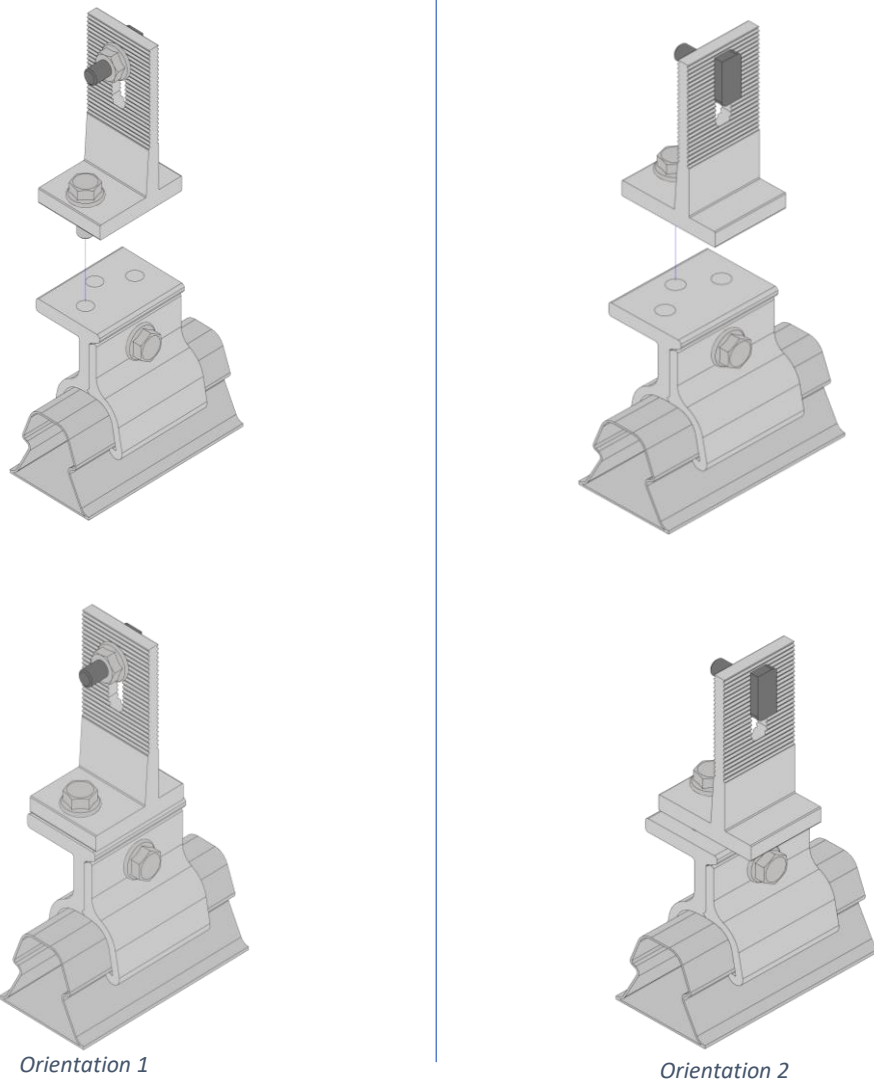


Image 9.1-2 L-foot Installation on Kliplok Clamp

10. Maintenance

When properly assembled, the Rooftop Parallel System is a reliable and trouble-free system that requires minimal maintenance. Nevertheless, S-Rack Australia Pty Ltd recommends performing regular inspections and creating a maintenance schedule. By doing so, potential problems can be detected and resolved before they can become serious, ensuring the system's excellent long-term durability and reliability.

The following procedure pertains only to the Rooftop Parallel System structure. Maintenance and repair of other PV system components should be carried out in accordance with the respective manufacturers' recommendations.

9.1. Inspection

The system should be visually inspected for obvious loose connections, missing components, modules which appear to have shifted, vegetation overgrowth, wind-blown debris, and other indications of abnormality annually. Any problems detected at this time should be addressed and repaired as necessary.

9.2. Testing

After one year in service, it is good practice to check the torque settings of a representative sample of system connections including module clamps and rail clamps. Do not exceed the recommended torque settings. If a disproportionate number of loose connections (more than 10% of connections) are found, it may be an indication of an improper assembly and it may be necessary to take comprehensive corrective action.

S-Rack Australia Pty Ltd recommends keeping records of connections sampled each year and checking untested connections in the succeeding years. Once all connections have been tested, sample sizes and test frequency can be reduced.



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