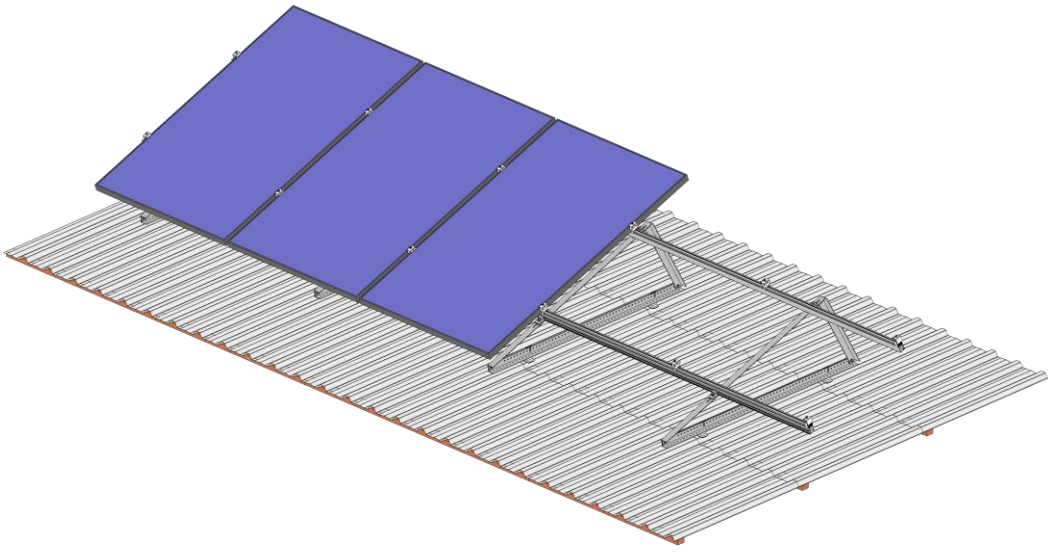
s-rack
SOLAR MOUNTING SYSTEMS

Tripod

Installation Manual



Contents:

1. Introduction

1.1. Short Description

The S-Rack Tripod system is a mounting system for the installation of PV modules on pitched and flat roofs. The high-level of pre-assembly of the Tripod system reduces the number of components involved resulting in shorter installation times.

1.2. About the Manual

Content

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

Sections 1 and 2 show an overview as well as detailed information about the Tripod 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. Hence, these tables take precedence over the installation manual in case of discrepancies between the two documents.
- The supplied material for the Tripod System according to the Bill of Materials (BOM).

The contents of these documents must be followed accordingly 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 this 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 this document. 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 Tripod 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 reported to S-Rack Australia Pty Ltd immediately.

2.1. System Overview

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

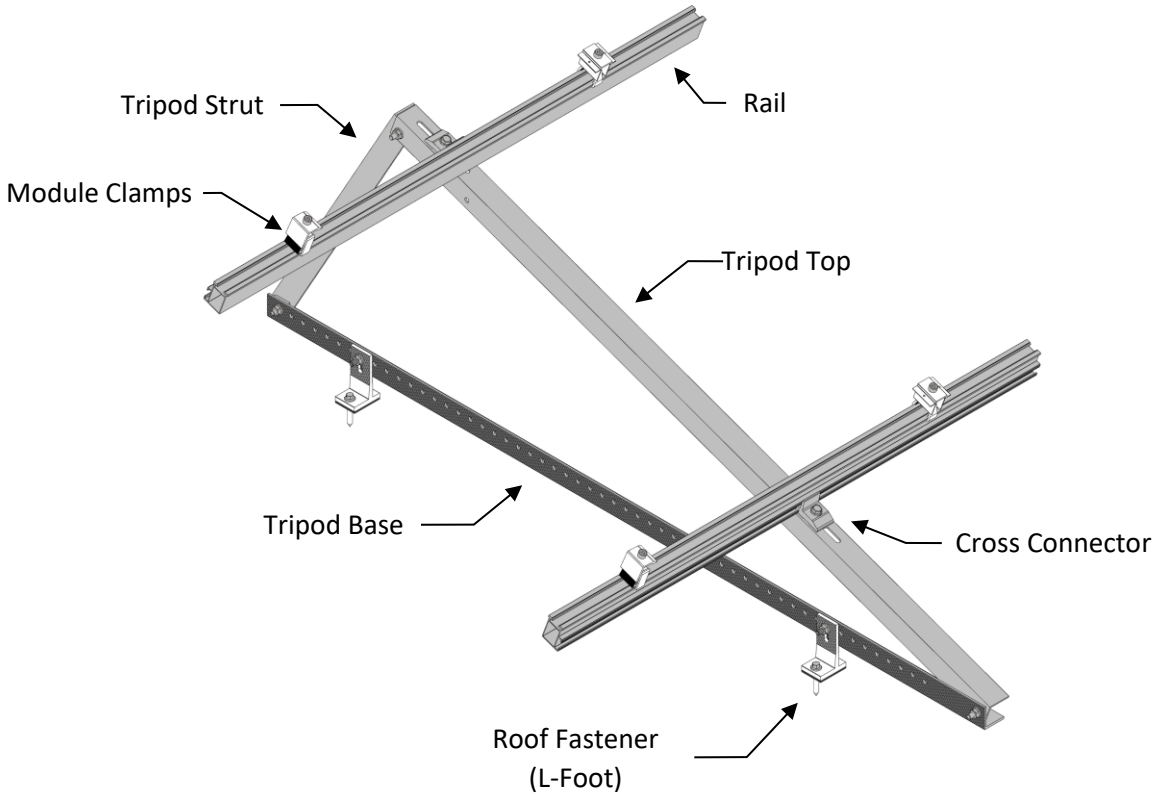
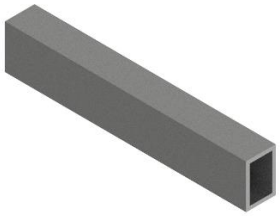
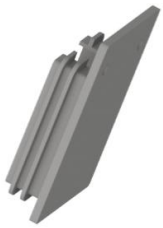
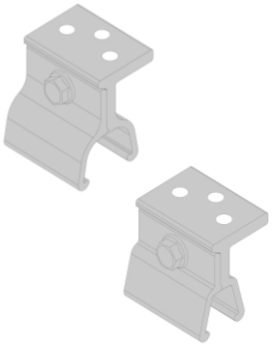


Image 2.1-1 - System Overview of the Tripod System

2.2. Component Details

Overview of System Components			
 ST-AK 7/47 Rail	 Connector for ST-AK 7/47	 Module Mid Clamp	 Module End Clamp
 L-Foot (for Tin Roof)	 End Cap for ST-AK 7/47	 Tripod Support	 Kliplok Clamps

2.3. Technical Data

Application	**Pitched roof, flat 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**
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

Tripod 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 Tripod 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 Tripod System, 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 structural requirements and roof types.

4.1. L-Foot Installation

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

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

Mounting Steps

1. Determine position of the rails and roof fasteners.
2. Drill through the roof cladding at the planned location and use supplied screw to fix 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.

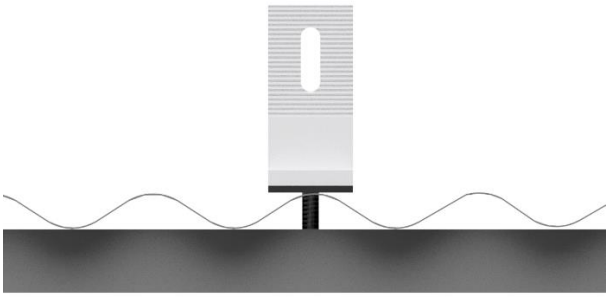


Image 4.2-2 Mounted L-Foot

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.

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.

5. Tripod Assembly

Installation Steps

Assemble Tripod and connect to the installed roof fastener. Use adjustment holes on Tripod Base when necessary. Struts come in different lengths to suit different tilt angle ranges.

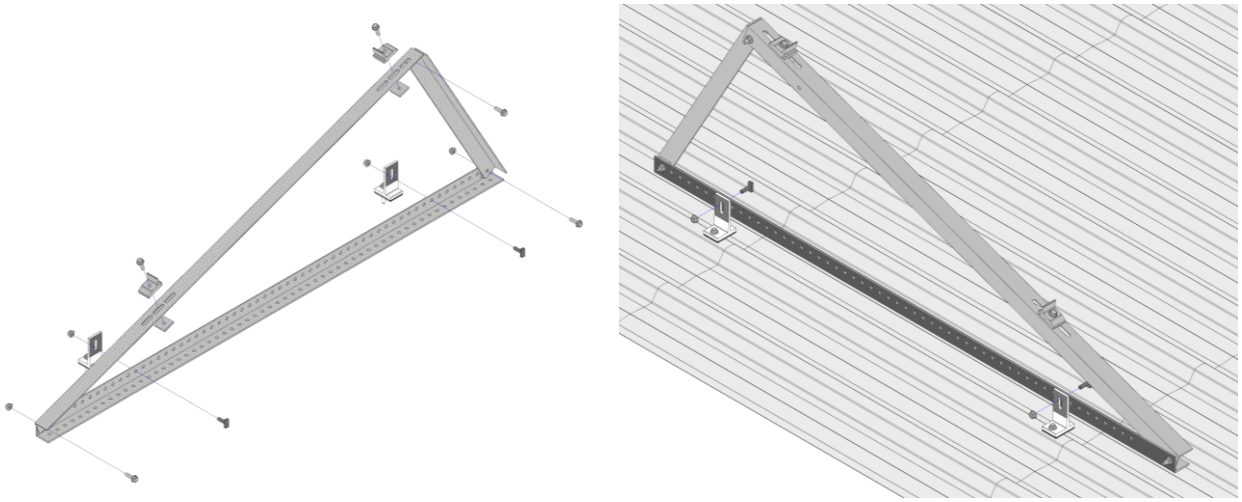


Image 5.1 – General Structure of the Tripod System

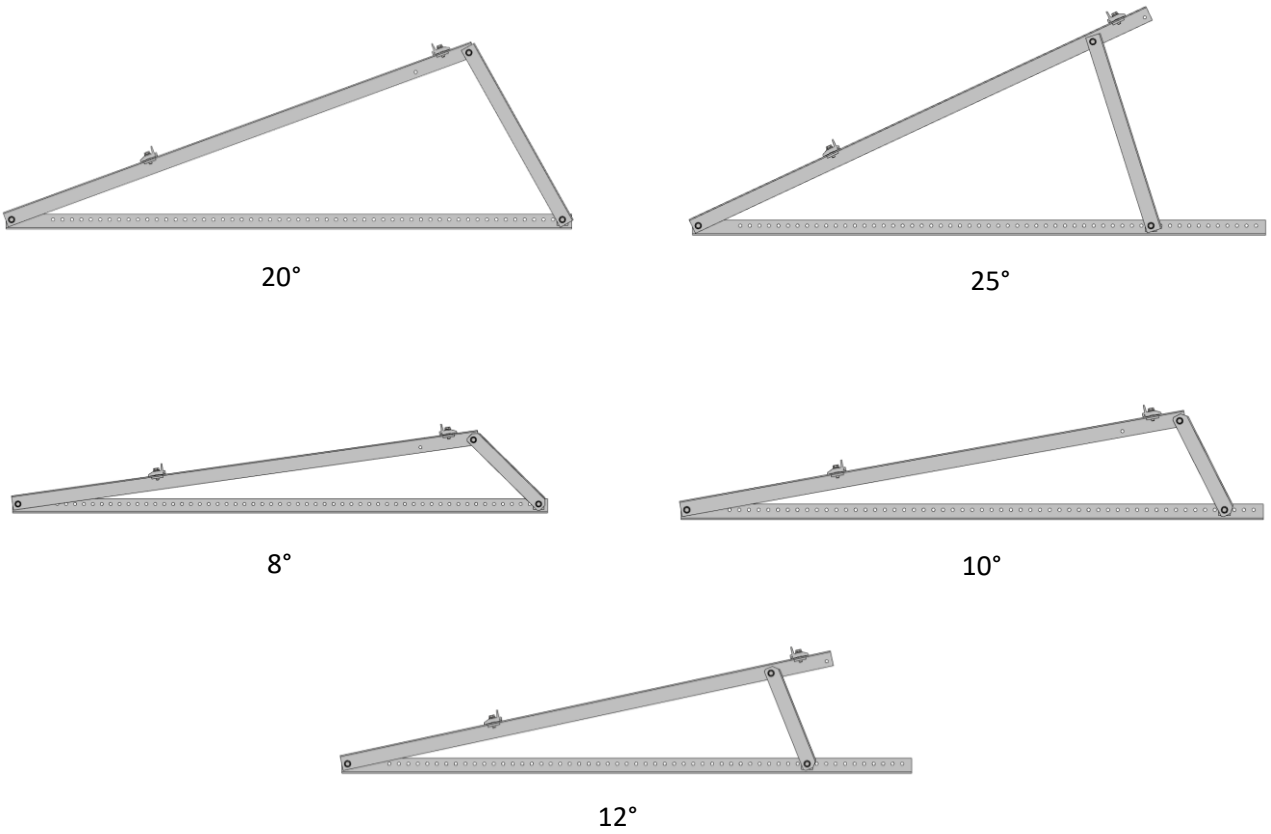


Image 5.2 – Multiple Configurations of the Tripod System

6. Rail Installation

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

6.1. Rail Placing and Alignment

Mounting Steps

1. Position the rail horizontally on top of the Tripod assembly and align side channel with the cross connector.
2. Loosen cross connector on Tripod assembly and clamp side channel of the rail to the cross connector
3. Tighten the lock nuts ensuring proper tightening torques are observed. (20Nm)
4. Repeat process for all rails

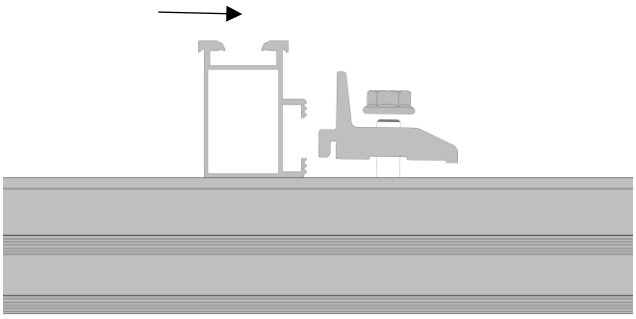


Image 6.1-1 Inserting the Rail into the Cross Connector

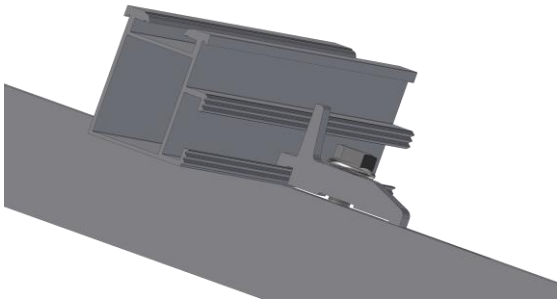


Image 6.1-2 Rail Connected to the Tripod

6.2. Rail Connector

Rail connectors are provided to link 2 individual 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.

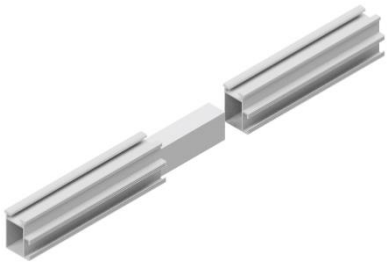


Image 6.2-1 Connecting 2 Rails Using the Connector

Image 6.2-2 Securing Rails to Rail Connector with Self-tapping Screws

6.3. End Caps

Mounting Steps

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

Image 6.3-1 Rail with Installed End Cap

7. Module Clamp Installation

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

Module End Clamps are installed on 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 module clamp at the top of the base rail.
2. Wedge one side of outer click onto one side of the base rail.
3. Push the module clamp down to snap 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 PV modules to fall and be damaged.

Mount all module clamps in accordance with the instructions.

Image 7.1 Module Clamp Installation

8. Module Installation

Modules are installed on rails one by one, beginning on one side. Modules are installed in portrait orientation.

8.1. Module Installation – Portrait

1. Fasten a module end clamp onto each rail.

2. Place the first PV module on rails and slide module frame against end clamp. With the module's clamping points correctly positioned under end clamps, tighten 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 previously installed module frame. Place 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.

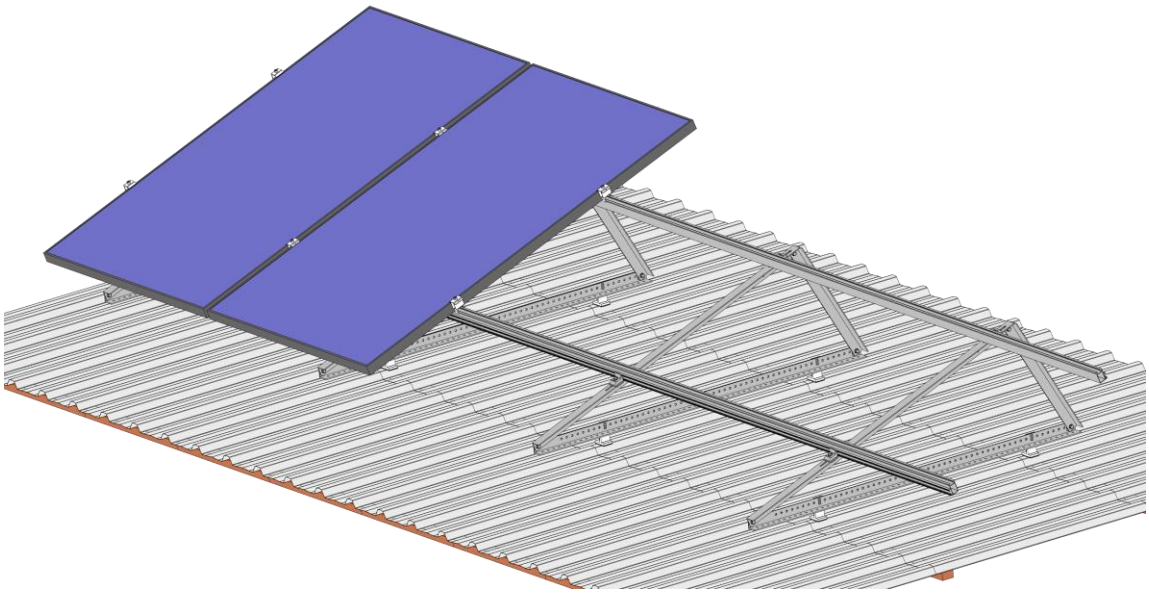


Image 8.1 – Sample Portrait Installation

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

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 multilple 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.

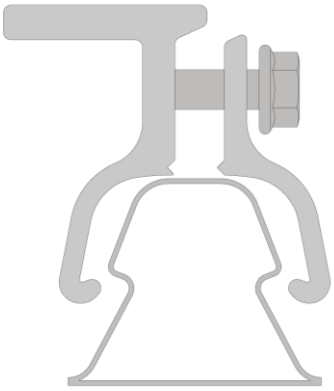
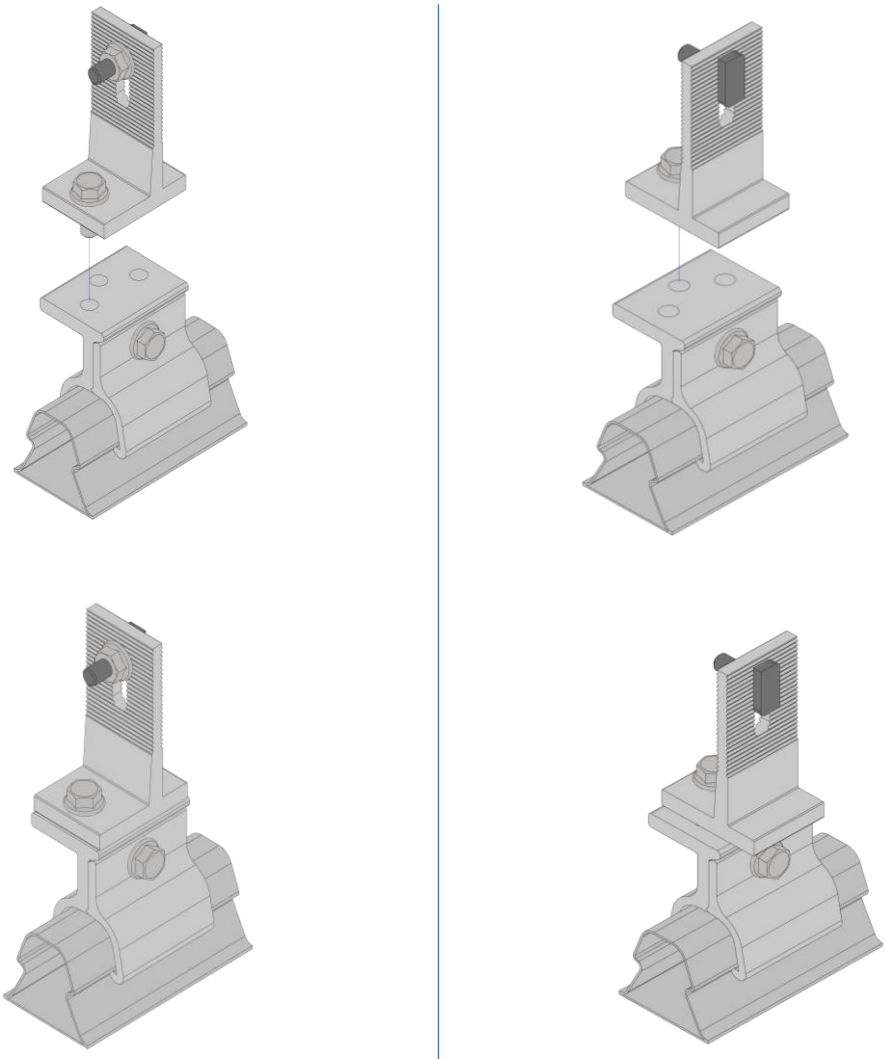


Image 9.1-1 Sample Kliplok Clamp Installation



Orientation 1 *Orientation 2*

Image 9.1-2 L-foot Installation on Kliplok Clamp

10. Maintenance

When properly assembled, the Tripod 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 Tripod System structure. Maintenance and repair of other PV system components should be carried out in accordance with the respective manufacturers' recommendations.

10.1. 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.

10.2. 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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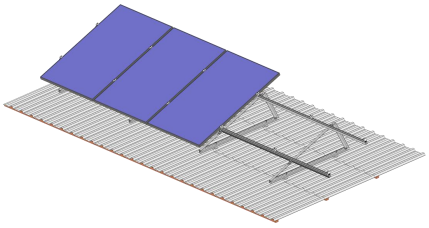

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