

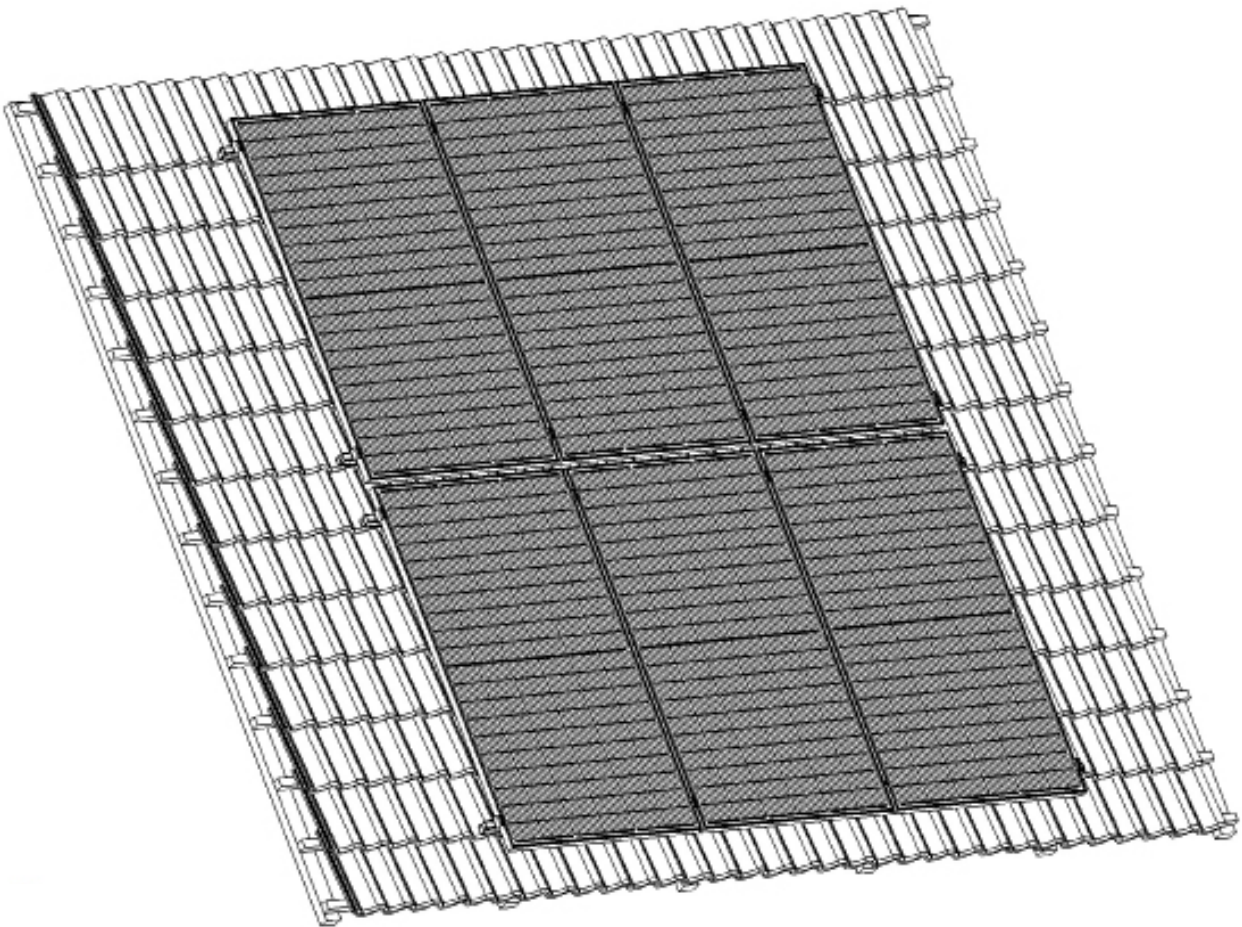


## Installation Manual

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# Apex R6 Pitched Roof Mounting System

### Portrait & Landscape Orientation





## **Contact Information**

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## **Other Information**

This manual is an integral part of the unit. Please read the manual carefully before installation, operation or maintenance. Keep this manual for future reference.

Product information is subject to change without notice. All trademarks are recognized as the property of their respective owners.

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# 1. Introduction

The main purpose of this installation manual is to provide instructions and detailed procedures for installing and maintaining Autarco pitched roof mounting system based on R6 type rails on buildings up to 20m in height.

## 1.1 Safety Symbols



**DANGER!** A danger symbol indicates a hazardous situation, which if not avoided, will result in death or serious injury.



**WARNING!** Indicates a hazardous situation which, if not avoided, can result in serious injury.



**ATTENTION!** Attention statements are used to indicate where a part of the process or equipment has a special requirement. Attention statements should be followed at all times.

## 1.2 Target Audience

This manual is intended for qualified personnel who installs an Autarco solar PV solution with R6 pitched roof mounting systems. Before any further action, the installer must first read all safety regulations and be aware of the potential danger to operate high-voltage devices such as PV modules.



**ATTENTION!** Qualified personnel means a person with valid license from the local authority for:

- Installing electrical equipment and PV power systems (up to 1000 V)
- Applying all applicable installation codes and using personal protective equipment (PPE)
- Analyzing and reducing the hazards involved in performing electrical work

### 1.3 Mounting Models Covered

The R6 rail is installed on a pitched roof using one of the following Autarco pitched roof mounts:

<b>Mounting hooks for Tile roofs</b>	
M2.AR6THX1	Apex R6 adjustable roof hook for portrait or landscape installs on tile roofs Adjustable from 31 to 47 mm tile thickness
M2.AR6THX1-XL	Apex R6 adjustable roof hook for portrait or landscape installs on tile roofs Adjustable from 44 to 60 mm tile thickness
M2.AR6THX1-XXL	Apex R6 adjustable roof hook for portrait or landscape installs on tile roofs Adjustable from 59 to 75 mm tile thickness
M2.AR6THSX1	Apex R6 adjustable screw hook for portrait or landscape installs on tile roofs Adjustable from 107 to 143 mm tile thickness
M2.AR6XT35-VLOW	Apex R6 adjustable screw hook for landscape installs on tile roofs
M2.AR6TH2	Apex R6 Steel roof hook #2 for portrait installs on tile roofs
M2.AR6TH4	Apex R6 Steel roof hook #4 for landscape installs on tile roofs
M2.AR6TH5	Apex R6 Steel roof hook #5 for portrait installs on slate roofs
<b>Mounts for corrugated roofs</b>	
M2.AR6WC	Apex R6 Waveclip for landscape installs on corrugated roofs
M2.AR6HBS	Apex R6 Hangerbolt for portrait or landscape installs on corrugated roofs with steel purlins
M2.AR6HBW	Apex R6 Hangerbolt for portrait or landscape installs on corrugated roofs with wooden purlins
<b>Bracket for standing seam roofs</b>	
M2.AR6SSB	Apex R6 mounting bracket for portrait or landscape installs on standing seam roofs
<b>Universal Hook</b>	
M2.AR6LHOOK	Apex R6 L-Hook connector for portrait or landscape orientations

Further information on the types of roof mounting hooks are available online at [www.autarco.com/downloads/](http://www.autarco.com/downloads/)

## 2. Preparing for Installation

### 2.1 Safety Instructions



DANGER! Do not install during severe or sub-zero weather conditions.



WARNING! Never step or sit on the glass surface of a solar module. The glass may break, resulting in shock or bodily injury. The module may also stop generating power.



WARNING! Always use the supplied parts to attach the solar modules and mounts. Use of other parts is dangerous and may cause the solar modules or mounts to loosen or fall.



DANGER! Do not install this system on a roof with pitch > 60 degrees.



WARNING! The installation, maintenance, recycling and disposal of the mounting components must be performed by qualified personnel in compliance with national and local standards and regulations.

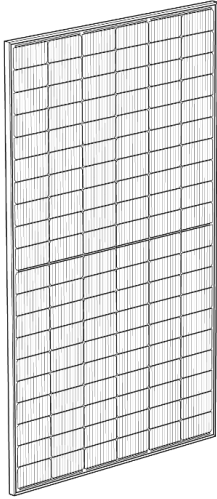


WARNING! Always install modules onto a minimum of two rails which are parallel to the shorter side of the module. Otherwise, loosening of the modules may occur due to expansion or contraction of the rails under varying heat.

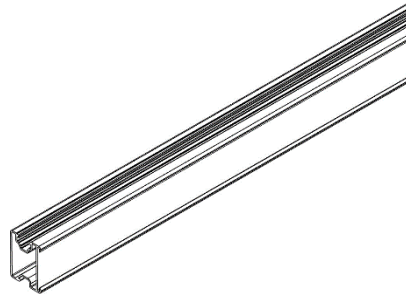
Any unauthorized actions including modification of product functionality of any form will affect the validation of warranty service; Autarco may deny the obligation of warranty service accordingly.

## 2.2 Package Contents

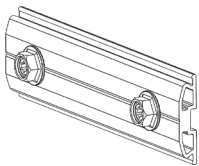
- ① Solar Modules  
S1.MHJ / MHL / TBJ



- ② R6 Rail  
M1.AR6L3300 / 3580 / 4350 / 4730



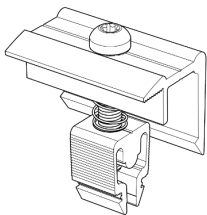
- ③ Splice Connector  
M1.AR6RJ



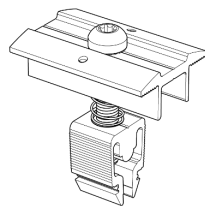
- ④ End Cap  
M1.AR6CAP



- ⑤ End clamp  
M1.AR6(B)EC



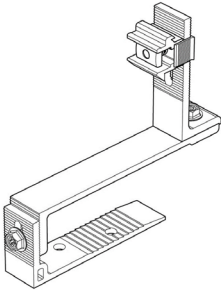
- ⑥ Middle Clamp  
M1.AR6(B)MC



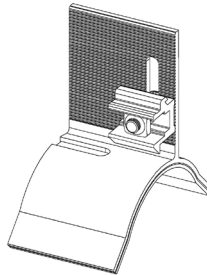


In this manual, we will use the M2.AR6THX1 Mounting Hook (7a) as an example which can also be converted into any other type of hook or mount, from (7b) to (7h).

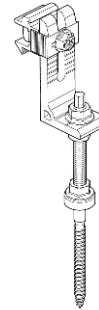
(7a) THX1 Hook  
M2.AR6THX1 / XL / XXL



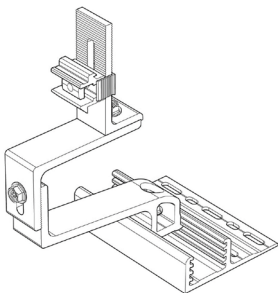
(7b) Waveclip  
M2.AR6WC



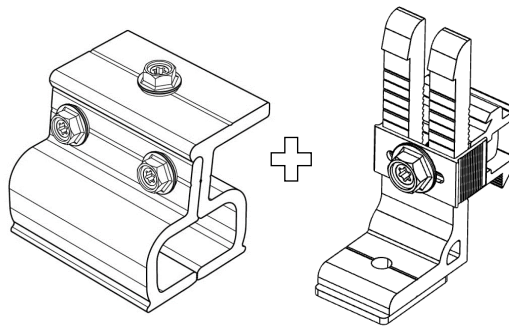
(7c) Hangerbolt  
M2.AR6HBS / HBW



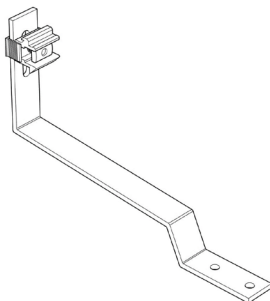
(7d) Screw Hook  
M2.AR6THSX



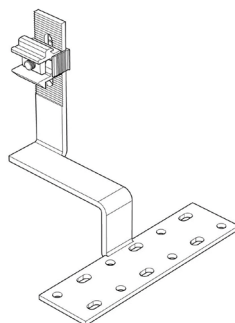
(7e) Standing seam + L-Hook  
M2.AR6SSB + M2.AR6LHOOK



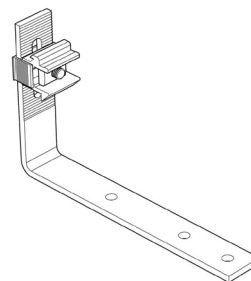
(7f) Roof Hook #2  
M2.AR6TH2



(7g) Roof Hook #4  
M2.AR6TH4



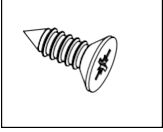
(7h) Roof Hook #5  
M2.AR6TH5



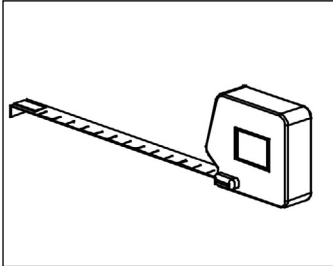
Please note the component numberings as they will be referenced in the installation section.

## 2.3 Tools & Materials Required

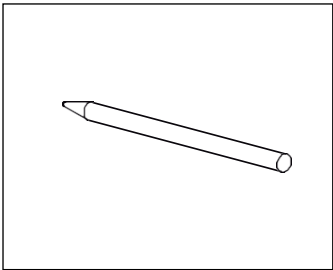
- Ⓐ Wood Mounting Screw (maximum major diameter, 8.5mm)  
e.g. Self-Tapping Screw ST6,3x19



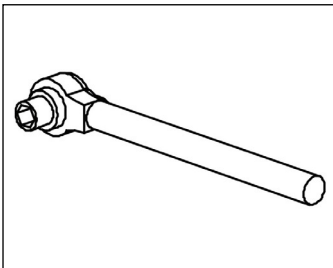
- Ⓑ Tape Measure



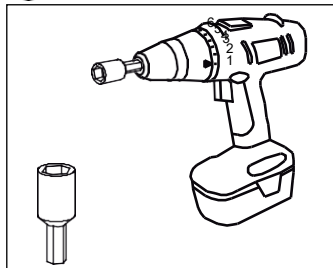
- Ⓒ Marker or Chalk



- Ⓓ1 Ratchet

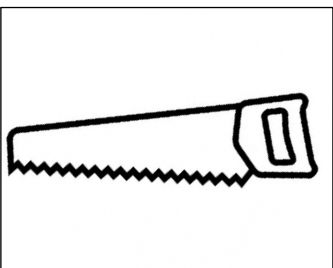


- Ⓓ2 Electric Screw Driver



OR

- Ⓔ Saw

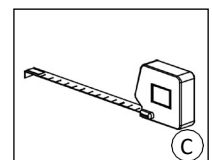
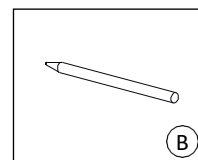
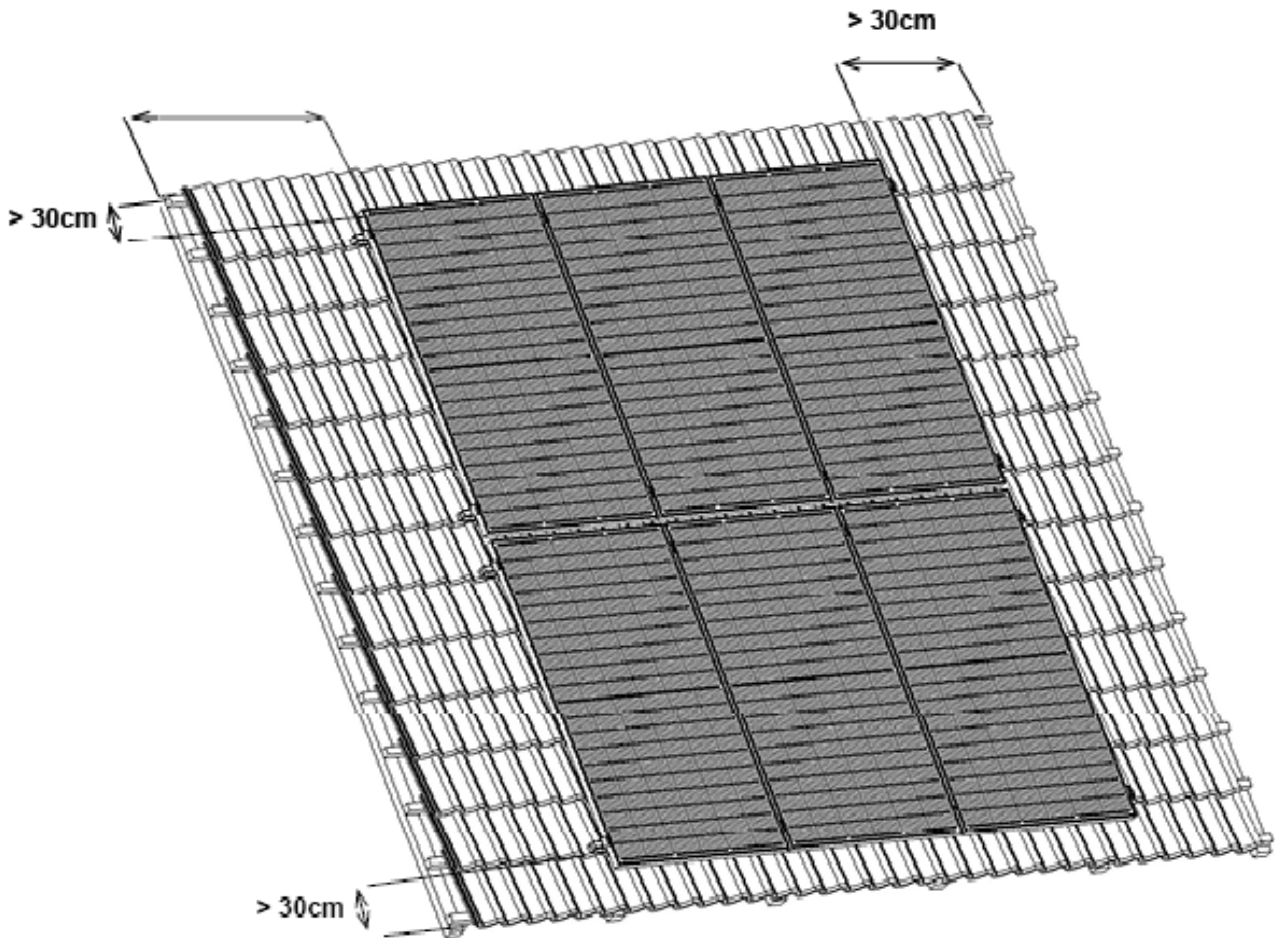


## 2.4 Solar Panel Position Guideline



ATTENTION! DO NOT install this system on a roof with pitch  $> 60$  degrees.

The minimum clearance of solar panels from the roof edges, gutters and ridges is typically 30cm (please check with your local building regulations before proceeding).



## 2.5 Hooks and Rails Position Guideline

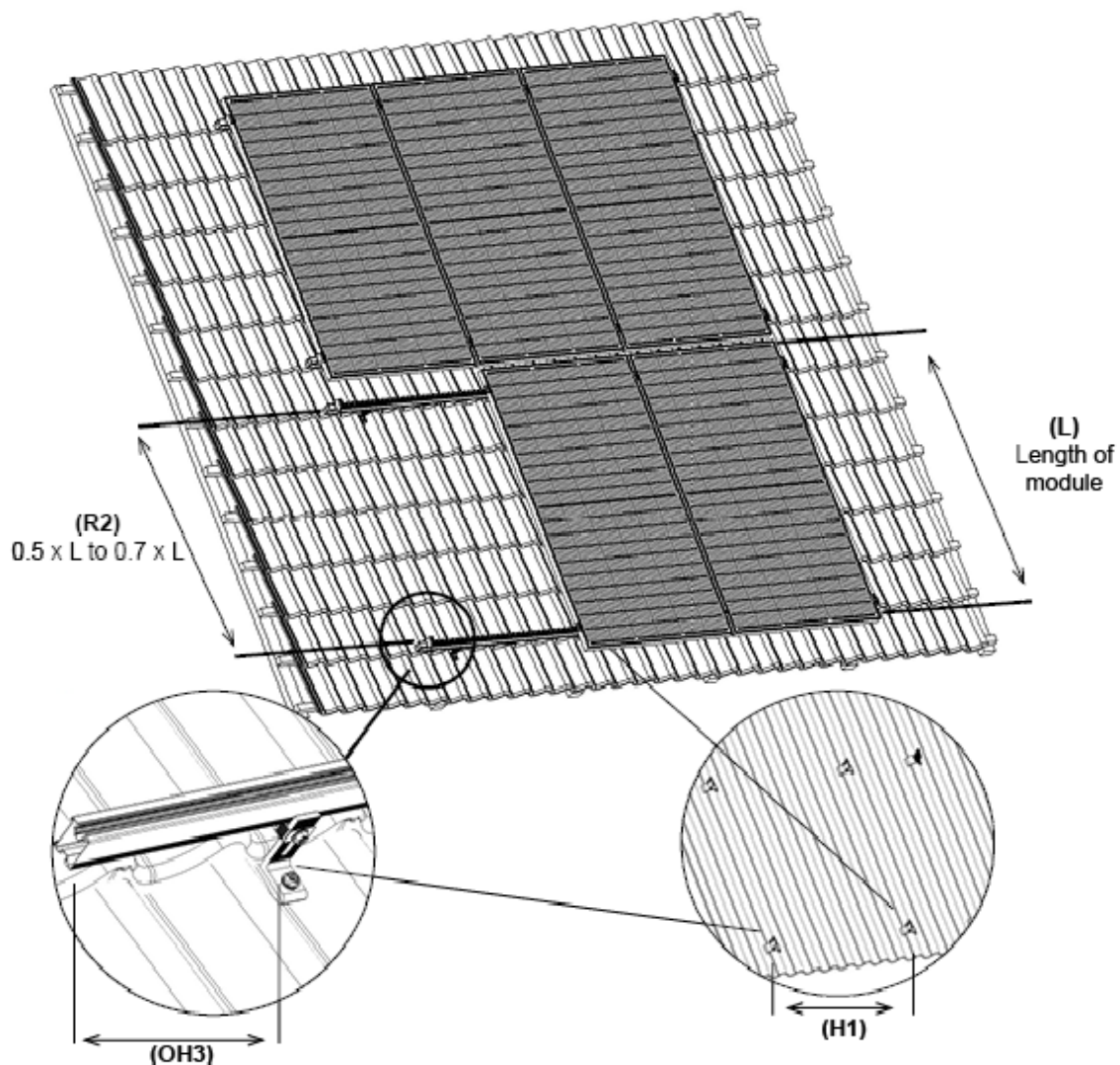
Before proceeding with the installation, make sure the hooks and rails are installed according to the dimensions given below. This can be different per product:

- The maximum distance between two successive hooks (**H1**) is 120cm, but typically 60-80cm.  
*Refer to our calculator for the specific value.*
- The distance between rails (**R2**) is between 0.5 and 0.7 times the length of the module (**L**). Please check the allowed clamping position in the Solar Panel Installation Manual.  
*Refer to the 'Mounting' section of your module's manual for the specific values.*
- The maximum rail overhang distance (**OH3**) is 30cm.

As a quick guide, you may also use below table as a reference for installing Autarco modules:

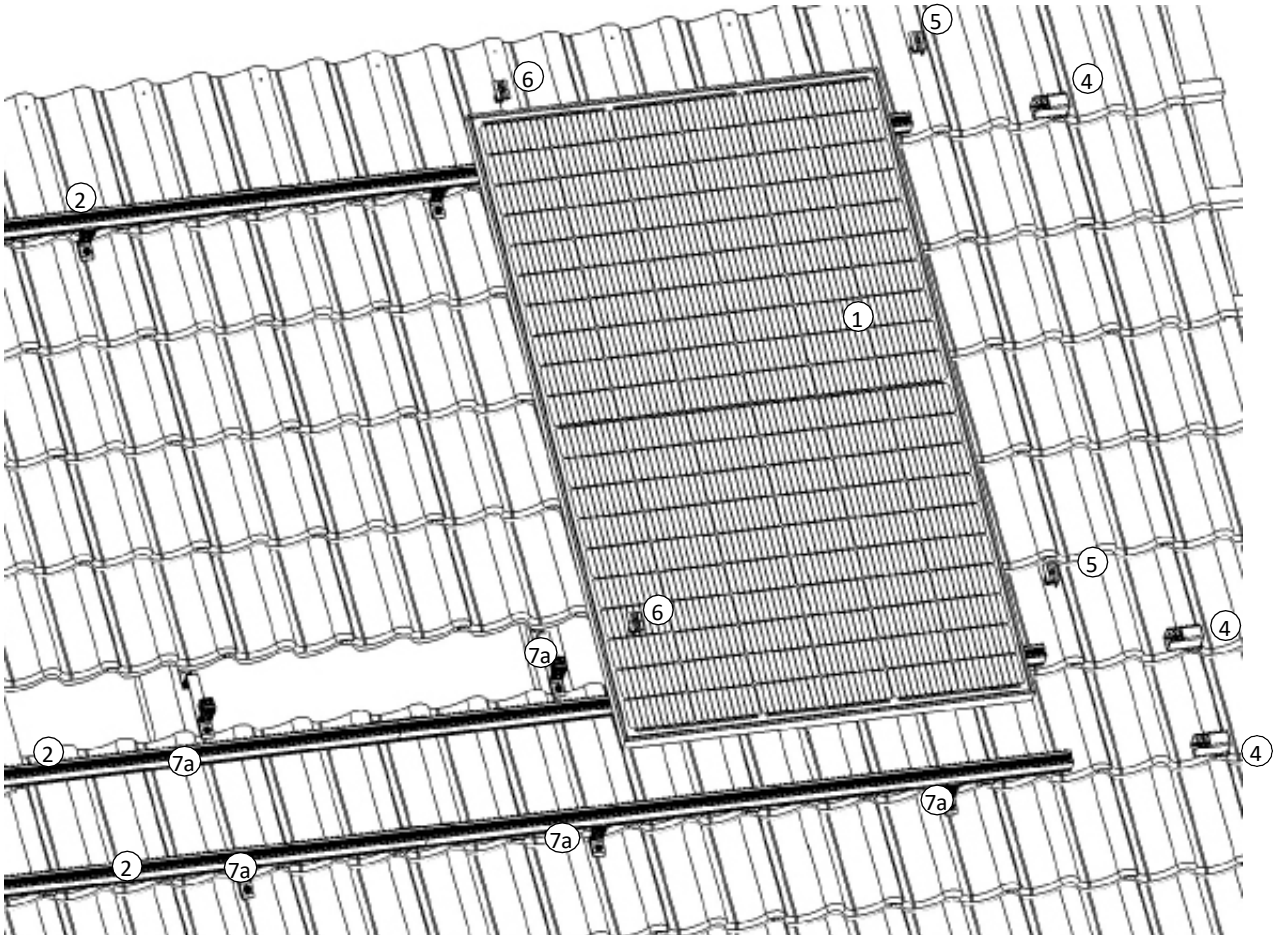
Autarco Module	Module Dimension (mm)			Minimum Distance	Maximum Distance
MHJ / TBJ / TJ Series	1722	1134	R1	0.52 x L	0.63 x L
MHL / TBL / TL Series	1903	1134		0.45 x L	0.66 x L

The values for Hook Distance (**H1**) and Overhang Distance (**OH3**) are determined by wind zone, height of the building and terrain code.



## 3. Installation

Exploded view of the R6 Mounting System. See pages 7 and 8 for component numberings.



An overview of the installation steps for the R6 Mounting System in exact order:

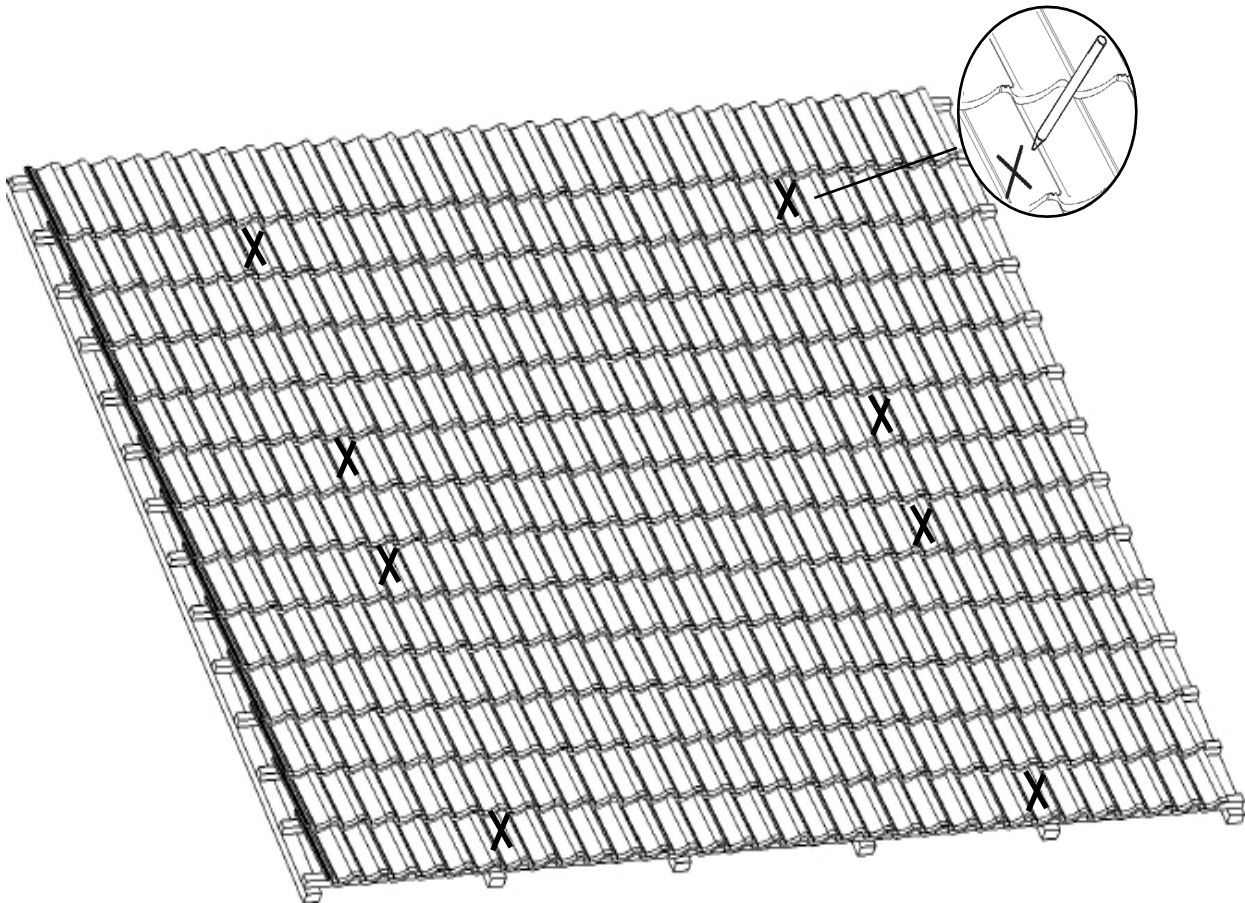
- 3.1 Marking the position of mounting hooks
- 3.2 Mounting hooks onto the roof
- 3.3 Attaching rails onto the hooks
- 3.4 Clamping modules into the rails
- 3.5 Installation complete



### 3.1 Marking the position of mounting hooks

**Step 1** – Measure and identify the position of the mounting hooks using a measuring tool (C).  
 see section 2.5 (Pg 10) for the recommended hook (H1) and rail (R2) distances

**Step 2** – Use a chalk or marker pen (B) to mark the roof tile that will be removed for mounting.  
 This is the tile directly above the tile that the hook mounts onto.  
 Use the same procedure to mark on a corrugated or standing seam roof.



## 3.2 Mounting hooks onto the roof

Autarco offers various types of roof hooks depending on rafter, batten, corrugated roof and tile specifications. In this manual we illustrate the installation procedure for the **M2.AR6THX1 Hook (7a)** and the **M2.AR6LHOOK**.

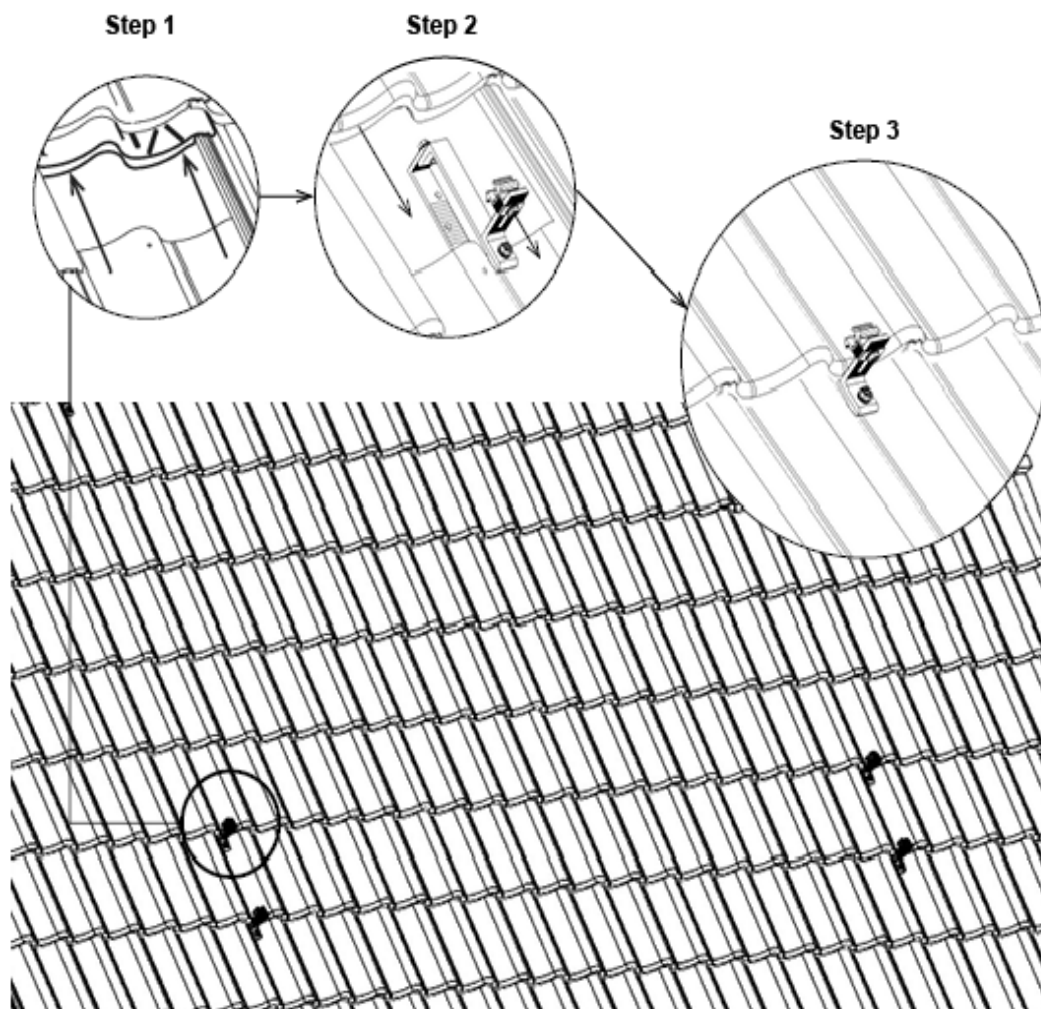
**Step 1** – Remove the roof tiles marked in 3.1, by sliding it upwards and under the roof tile immediately above.

For THX1 Hook (7a)

**Step 2**– Fit the M2.AR6THX1.1 Hook (7a) onto the trough of the roof tile (downward curve of the tile). The hook should secure both the roof tile and the batten.

For corrugated and standing seam roofs, fix the mounts as marked in Section 3.1.

**Step 3** – Slide the removed roof tile back in place.



## Orientation of the hooks

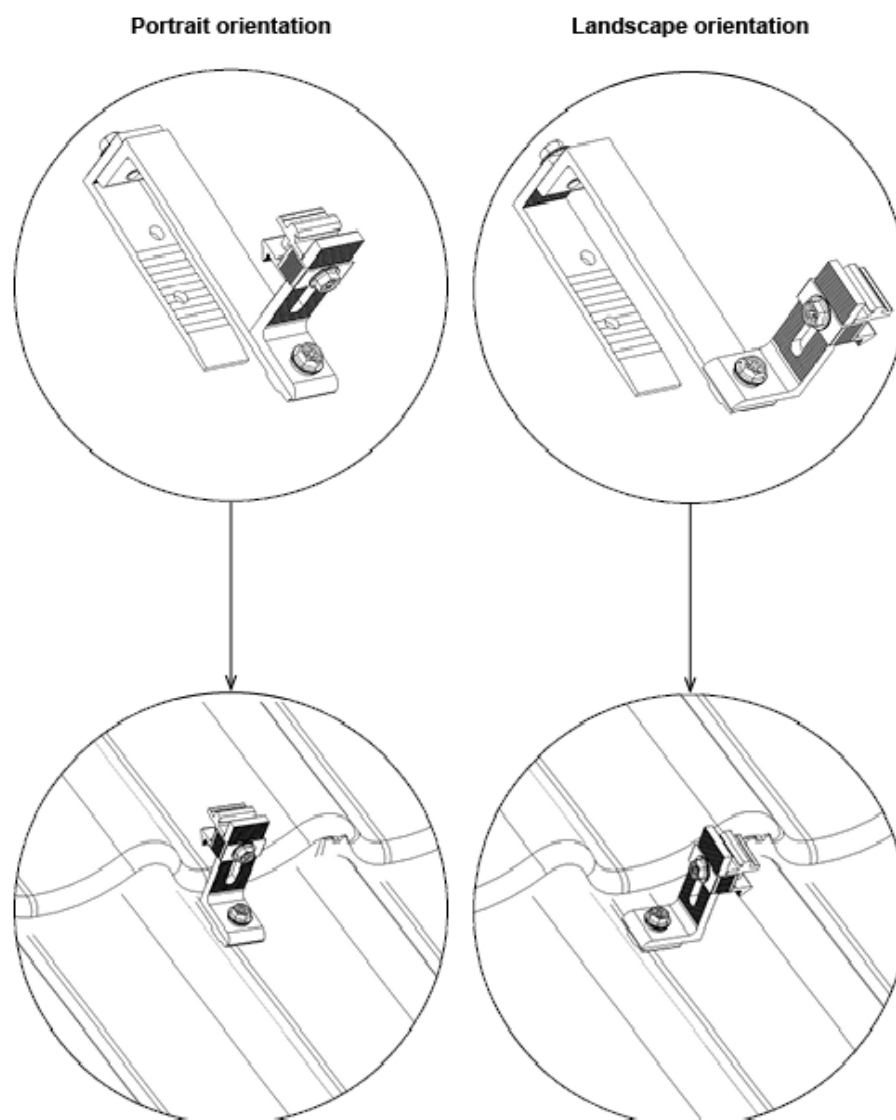
**Step 1** – Adjust the orientation of the bracket portrait or landscape by untightening the screw and repositioning the bracket before retightening the screw.

**Step 2** – Place your rail over the bracket attachment.

**Step 3** – Adjust the height of the bracket attachment.

**Step 4** – Push down on the rail until you hear a click.

**Step 5** – Tighten the screw on the attachment.





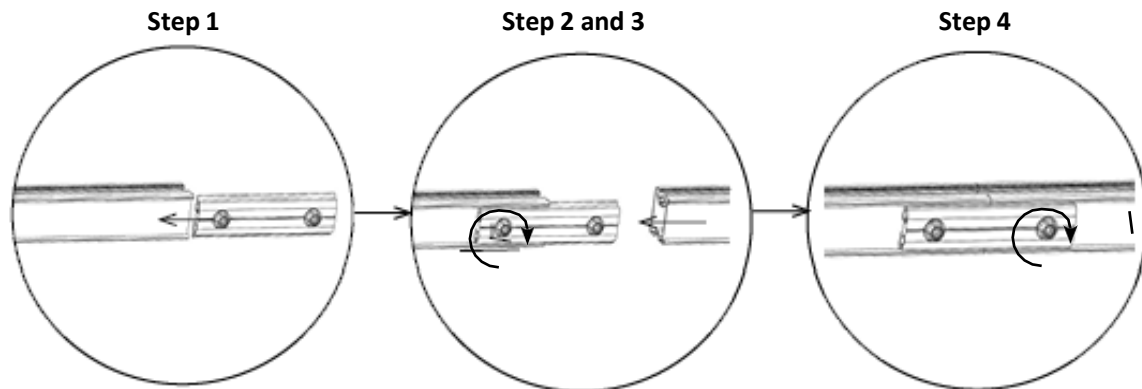
## 3.3 Attaching rails onto the hooks

**Step 1** – Connect two or more R6 rails by sliding one extremity of the rail splice in the rail channel.

**Step 2** – Tighten the screw to anchor to the rail.

**Step 3** – Slide the second rail over the other extremity of the rail splice.

**Step 4** – Tighten the second screw to secure the second rail in place.

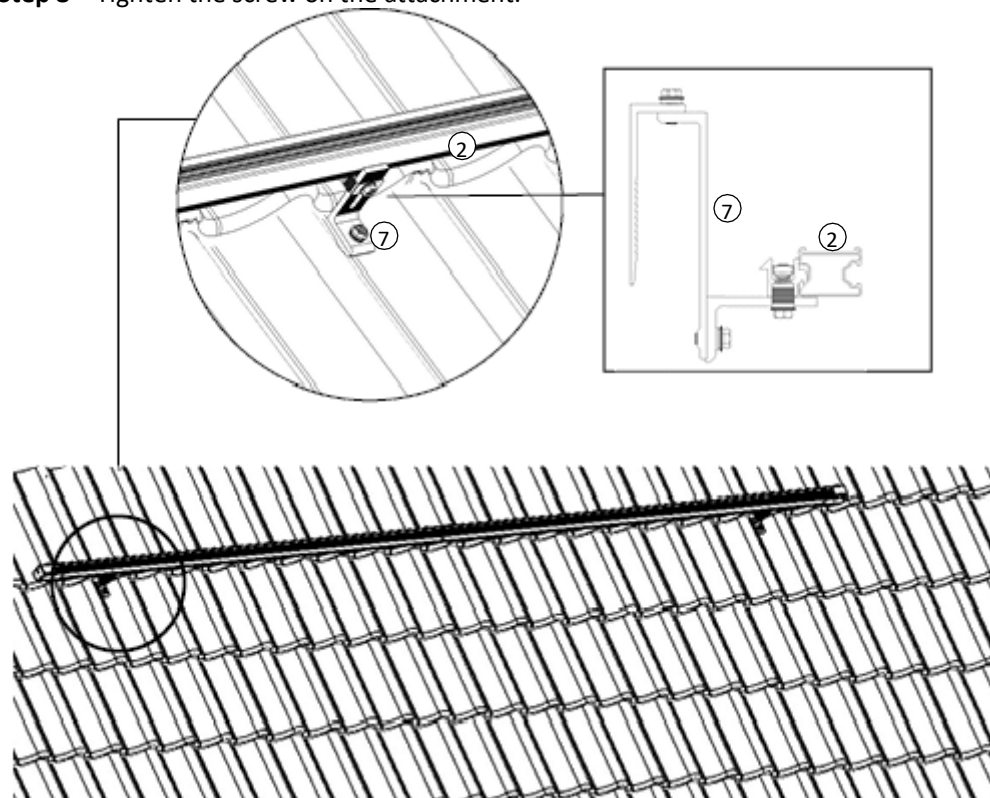


**Step 5** – Adjust the orientation of the bracket by untightening the screw and repositioning the bracket before retightening the screw.

**Step 6** – Place your rail over the bracket attachment and adjust the height of the bracket attachment.

**Step 7** – Push down on the rail until you hear a click.

**Step 8** – Tighten the screw on the attachment.



## 3.4 Clamping modules into the rails

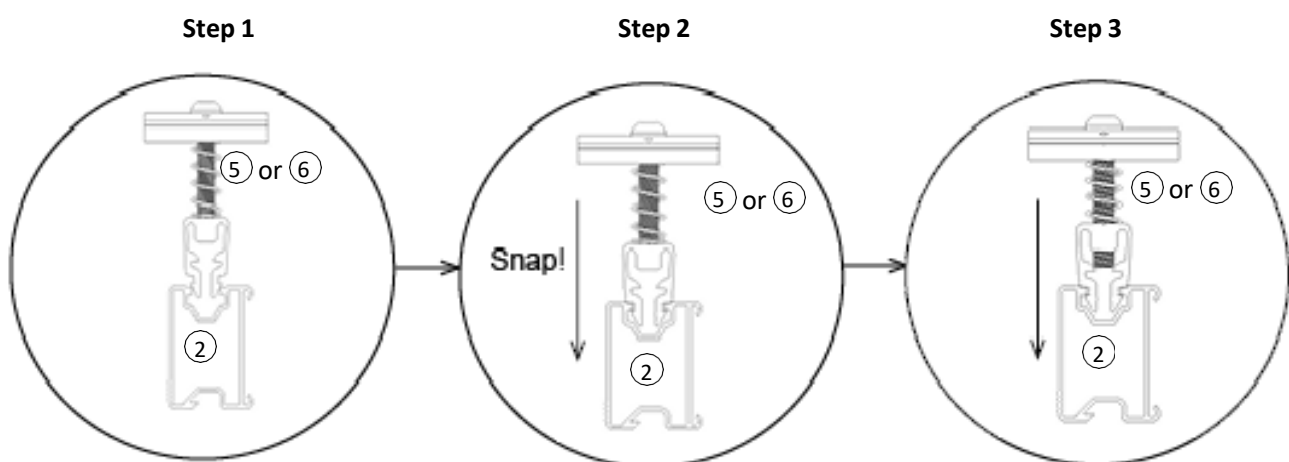
### 3.4.1 How to assemble clamps onto the rails

End clamps (5) and middle clamps (6) can be easily 'snapped' into the rails using the steps given below. We use the middle clamp (6) in this illustration, but the steps are exactly the same for end clamps (5).

**Step 1** – Hinge both legs of the clamp into the rail.

**Step 2** – Press firmly down to snap the hinged legs in place.

**Step 3** – Slide the clamp into the desired position on the rail and screw bolt to fix position.



### 3.4.2 Anchoring the rails (portrait & landscape):

**Step 1** – Adjust the orientation of the bracket portrait or landscape by untightening the screw and repositioning the bracket before retightening the screw.

**Step 2** – Place your rail over the bracket attachment.

**Step 3** – Adjust the height of the bracket attachment.

**Step 4** – Push down on the rail until you hear a click.

**Step 5** – Tighten the screw on the attachment.

## 3.4.3 Installing first module onto the rails with end clamps

- Step 1** – Assemble the end clamps (5) (see 3.4.1) into the R6 rails (2). Make sure less than 4cm of the rail is protruding outwards from the end clamp.
- Step 2** – Position the solar module (1) in portrait on the rails and align against the end clamps (5).
- Step 3** – Tighten the screws preassembled on the end clamps (5) to fix the solar module (1) onto the rails.
- Step 4** – Slide the end caps (3) onto the rail to secure the end clamps (5).  
use the wire slot on the rail to tuck away any wires or cables (Fig. 1)

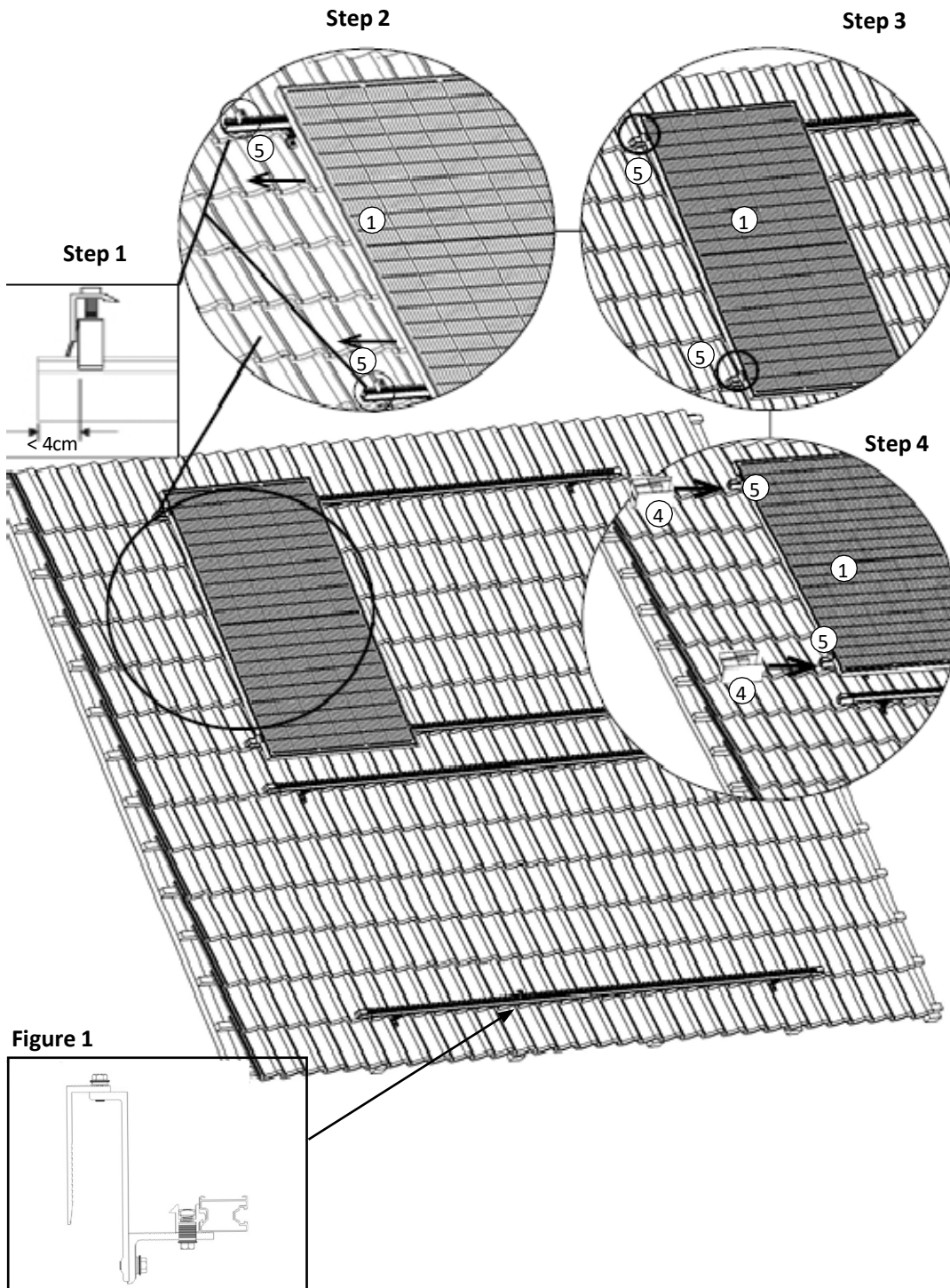
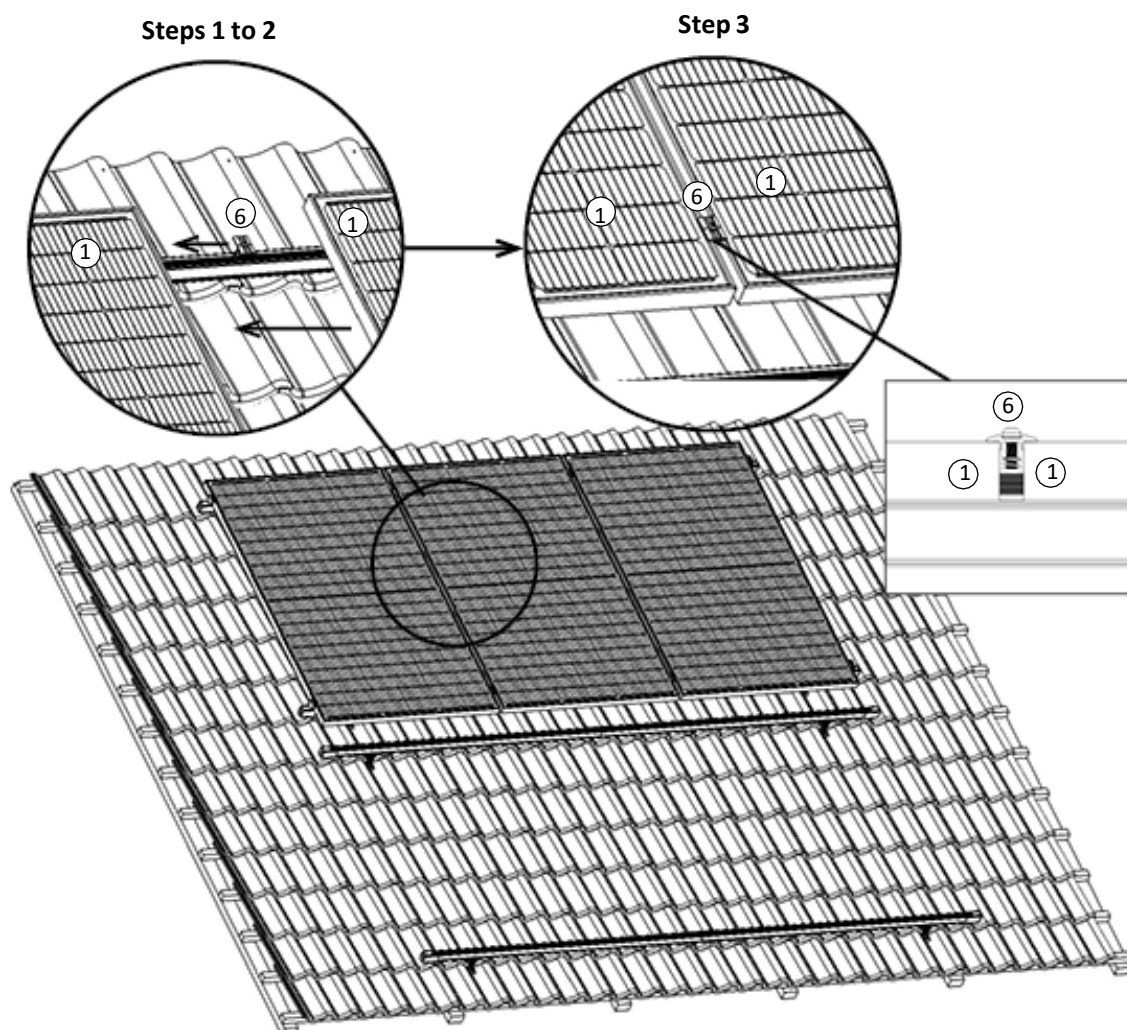


Figure 1

### 3.4.4 Installing modules onto the rails with middle clamps

- Step 1** – Assemble the middle clamps ⑥ (see 3.4.1) into the R6 rails and slide the middle clamps left to align with the adjacent module ①. Do not tighten the clamps yet.
- Step 2** – Position the solar module ① in portrait on the rails and align against the middle clamps ⑥.
- Step 3** – Tighten the preassembled screws on the middle clamps ⑥ to fix the solar module ① onto the rails.
- Step 4** – Repeat steps 1 to 3 until the final solar module along the rails is installed.





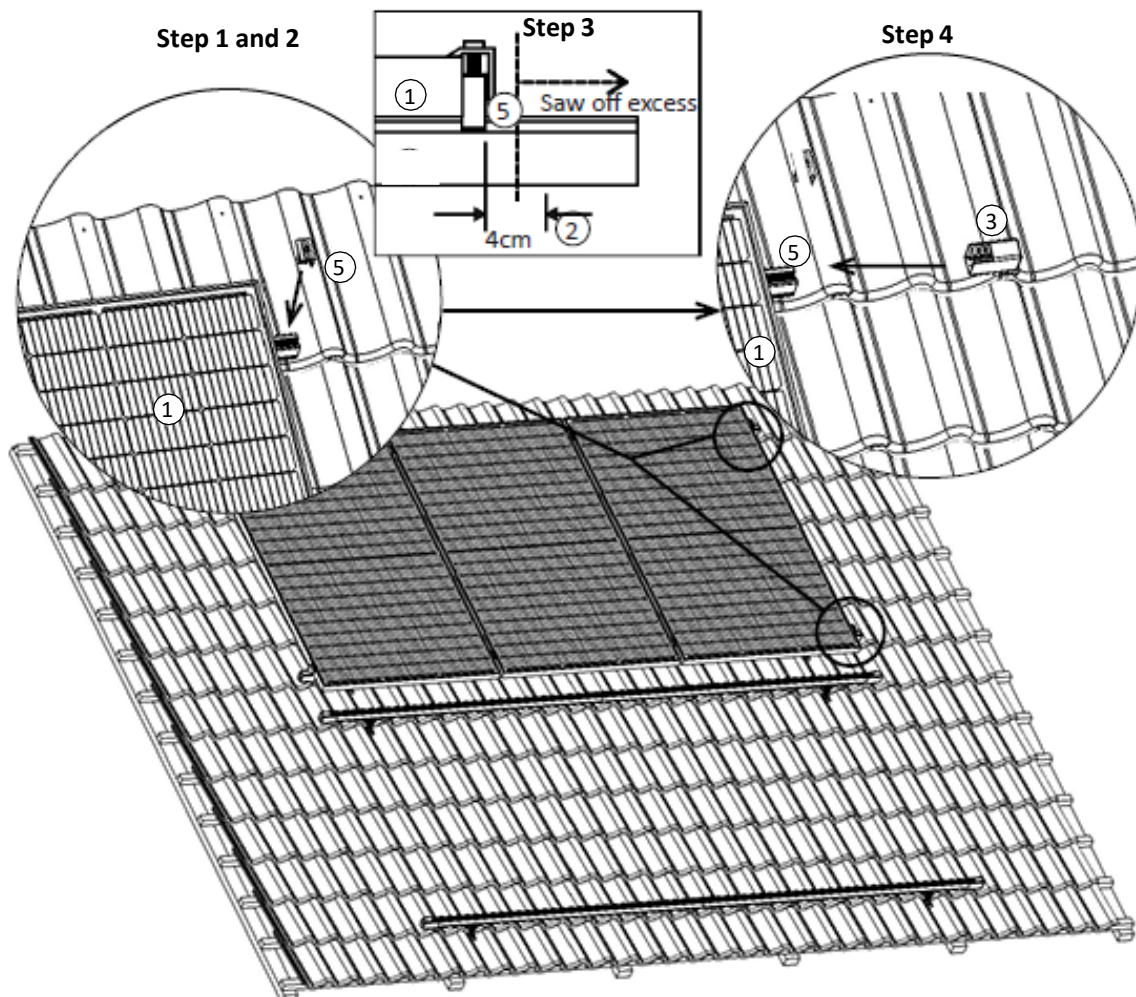
## 3.4.5 Securing final module with end clamps

**Step 1** – Assemble the end clamps (5) (see 3.4.1) into the R6 rails and slide the end clamps left to align with the final module (1).

**Step 2** – Tighten the screws preassembled on the end clamps (5) to fix the solar module (1) onto the rails (2).

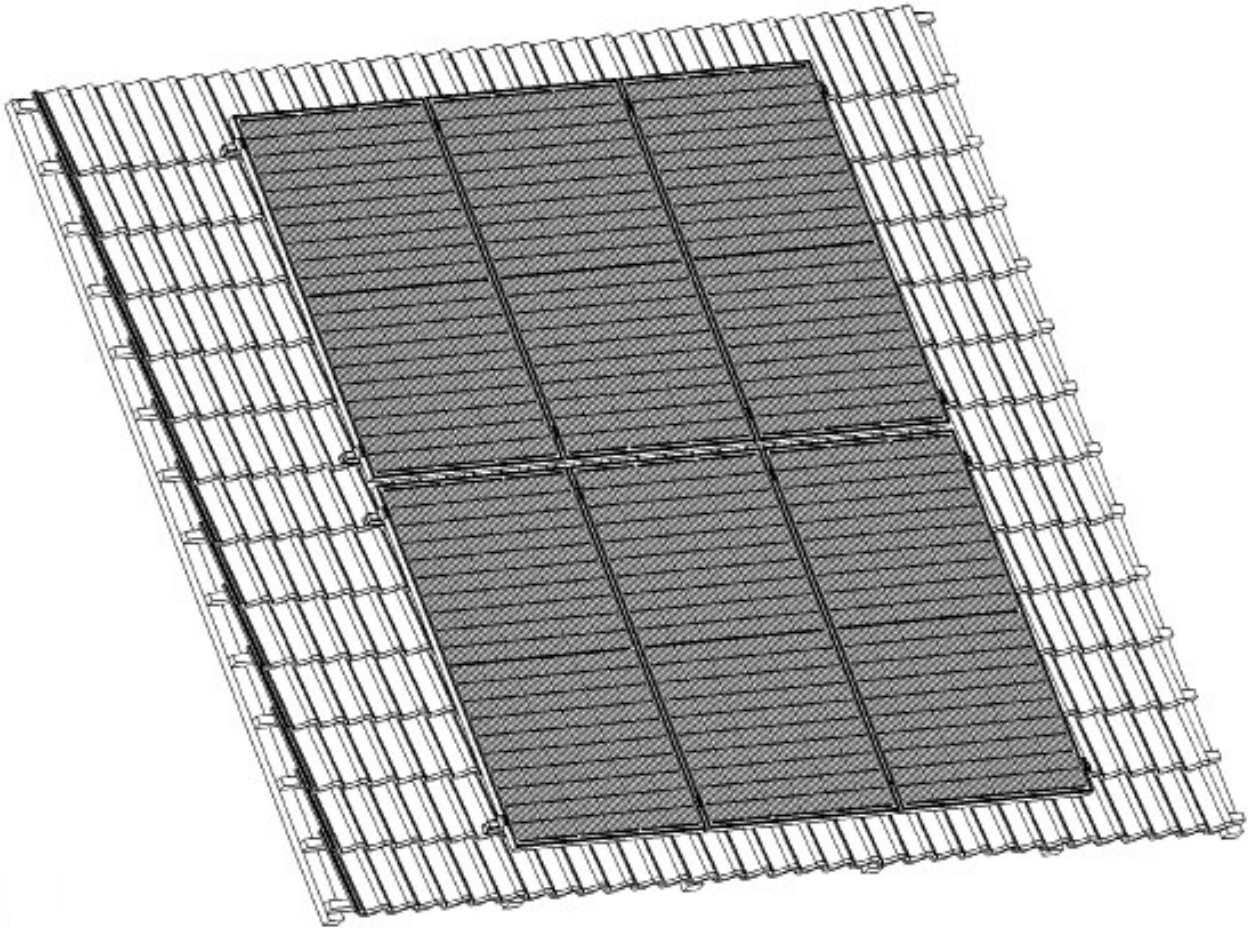
**Step 3** – If the rail is protruding outwards more than 4cm from the end clamp, saw off the excess rail.

**Step 4** – Slide the end caps (3) onto the rail to secure the end clamps (5).



### 3.5 Installation complete

Repeat installation sections 3.4.2 to 3.4.4 to complete remaining rows of rails.



The installation is now complete!

## 4. Disposal

To comply with European Directive 2002/96/EC on waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Ignoring this EU Directive may have severe effects on the environment and your health.