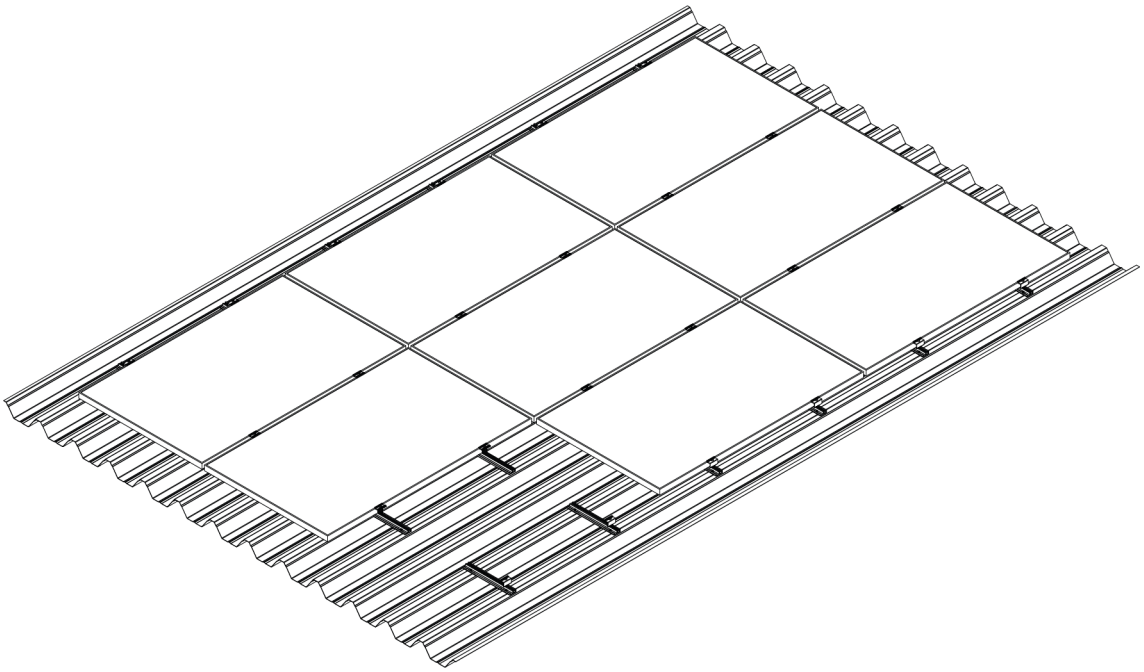
AEROCOMPACT®



CompactMETAL

TL25/38

Assembly Instructions

Version: 03
Language: English | Original language: German
Original installation instructions

Important! Read carefully before installation!

INTELLIGENT SOLAR RACKING

Legal Notice

Subject to changes due to technical improvements. These assembly instructions correspond to the technical status of the delivered product and not to the current development status at the manufacturer.

If pages or parts of the assembly instructions are missing, please contact the manufacturer's address given below.

The original language of these assembly instructions is German. Any assembly instructions in another language are a translation of the assembly instructions in German.

Manufacturer

AEROCOMPACT® Holding
Sonnenstraße 10
A 6822 Satteins | Austria

office@aerocompact.com
www.aerocompact.com

Update

This manual is subject to change without notice. This does not represent any obligation on the part of the manufacturer.

Creation date

01/2022

TOC

ABOUT THIS DOCUMENT

These installation instructions describe the procedure for installing the product. Read these assembly instructions carefully before starting the assembly. Follow the instructions carefully to ensure correct installation of the product.

Applicable Documents

The following documents are a part of these installation instructions and are absolutely necessary for the correct assembly of the system:

- Project report from AEROTOOL
- Planning documents and drawings

Explanation of Symbols

In order to make these assembly instructions easy to understand, uniform safety instructions, symbols, terms and abbreviations are used. The following symbols indicate notes which are not relevant to safety, but which make working with the assembly instructions easier.

- ✓ Requirements for an action are depicted with this symbol. Make sure that all requirements are met before you carry out the following actions.
- ▶ Action steps are depicted with this symbol. Carry out the steps in the specified order.
- ☑ The result of the action is depicted with this symbol.

ℹ This note provides useful information for a smooth assembly of the product.

Symbols in Illustrations

Activities

Certain activities are required to carry out the assembly. These activities are shown in the illustrations with the following symbols.


Check AEROTOOL planning documents


Visual inspection


Activity by hand


Observe right angle


Optional component,
optional installation method

Tools

Certain tools are required to carry out the assembly. These tools are shown in the illustrations with the following symbols.


Measuring tape, measure


Pencil, mark


Chalk line


Cordless screwdriver, screwdriver


Torque wrench,
Observe torque


Drilling machine, drill

Target group

These installation instructions are intended for trained personnel who are familiar with the installation of photovoltaic systems. The personnel should also be familiar with working on roofs and know the local regulations regarding work safety. The personnel must also observe the instructions in the Safety chapter.

Appropriate use

The TL25/38 system is designed exclusively for installing PV modules on metal roofs consisting of trapezoidal sheets.

The system must be properly installed in accordance with these installation instructions.

PV modules used with the TL25/38 system should be approved by the module manufacturer. AEROCOMPACT accepts no liability for loss of performance or damage of any kind to the PV modules.

Any other use of the TL25/38 system is considered improper.

Liability, Warranty, Guarantee

These assembly instructions and the project report supplied with the product are integral parts of the product. The information, data and instructions given in the assembly instructions were up to date at the time of printing. No claims can be made for products already delivered that deviate from the information, illustrations and descriptions.

The project report supplied with the system contains the static/ structural calculation related to the location. If the module layout on the roof changes due to local conditions, e.g. unforeseen interference areas, the structural analysis must be recalculated. The Aerocompact system is designed and planned with the Aerotool software.

Aerocompact accepts no liability for damage and malfunctions caused by:

- improper use
- use of non-certified components.
- unauthorized modifications to the product.
- improper handling of the product.

- Installation errors
- Failure to comply with the installation instructions or planning documents.

Guarantee

The warranty period for the system is 25 years. The warranty period for galvanized steel parts is 10 years. The guarantee is only valid if the installation is carried out professionally and all system components are purchased from Aerocompact. If the assembly instructions or the planning documents are disregarded, the warranty will be invalidated.

Photovoltaic racking systems are not maintenance-free. Carry out maintenance annually and immediately after unusual weather events, e.g., after heavy storms or heavy snowfall, etc. If the maintenance is not carried out at the specified interval, the warranty will become void.

General information on liability

We point out that the product is sold within the framework of a purchase agreement. Assembly/installation by the purchaser or third parties is not carried out on behalf of or for Aerocompact and must be carried out by qualified personnel strictly in accordance with the installation instructions. The Aerocompact system must be designed and planned with the AEROTOOL software. Aerocompact is not responsible for the project-related structural integrity of the roof structure, for obtaining and documenting the roof manufacturer's approval for the installation of the corresponding fasteners on the respective roof (in terms of warranties), nor for the professional execution.

Errors and damage as well as limited or insufficient functionality of the system due to incorrect installation and/or installation that deviates from the installation instructions and/or the project report (AEROTOOL) exclude any material defect for which Aerocompact is responsible. In the event of improper handling, the buyer's rights of warranty for material defects shall not longer be valid. The system warranty is only valid if all system components are purchased from Aerocompact.

Systems with clamping on the short module side

For a system with a clamp on the short side of the module, it is assumed that the module may also be used in this mounting form (clamp on the short sides of the module). This release can either be generally available as part of the module installation instructions or can be given by the module manufacturer for specific projects.

SAFETY

Requirements of personnel

The person must be physically and mentally fit. Under no circumstances must the installation personnel be under the influence of medication, alcohol or drugs.
Persons who are not healthy and fit must not work on roofs.

Personnel who are in training must only carry out work under the supervision of qualified personnel who are authorized to train personnel.

Working safely

The company carrying out the installation is responsible for ensuring that the local regulations for work safety and accident prevention are observed.

Breakthrough protection

Roof windows, skylights, large ventilation flaps etc. often cannot withstand the weight or impact of a person. Such objects must be secured in a similar way as the edge of the roof.
Corrugated fibre cement roofs can be prone to breakthrough over the entire surface. Define walking routes and secure them with load distribution measures.
On roofing or roof structures that do not have sufficient load-bearing capacity (e.g. thin sheets, corrugated fibre cement), always work with load distribution aids.

Climbing aids

Only use suitable, intact and tested ladders. Set up and secure ladders according to instructions.
Separate rules apply to mechanical climbing aids (lifts, lifting platforms, ...).
Never use the PV mounting system as a climbing aid.

Weather conditions

In case of unsuitable weather conditions, work on the roof must not be continued any longer than necessary - or not started at all.

Never carry out assembly work in strong winds. Strong wind exerts enormous forces on the large-area PV modules. There is a risk that a module could be torn off the roof and people could be injured.

Never work in wet conditions or at temperatures below the freezing point. Depending on the roof pitch there is a risk of slipping.

Dangers from the environment

Keep sufficient distance from overhead electrical lines. The following distances must be observed:

1 m to 1,000 V
3 m: 1,000 to 11,000 V
4 m: 11,000 to 22,000 V
5 m: 22,000 to 38,000 V
> 5 m: if the voltage is unknown

Protection against falling objects

Areas below the roof on which work is being carried out must be protected from any falling objects. Where this does not succeed, affected areas must be closed to the public.

Persons involved in the construction project must wear safety helmets.

Personal protective equipment (PPE)

Personal protective equipment is required to prevent injuries during assembly work.


Wear protective goggles when drilling.


Wear safety boots.

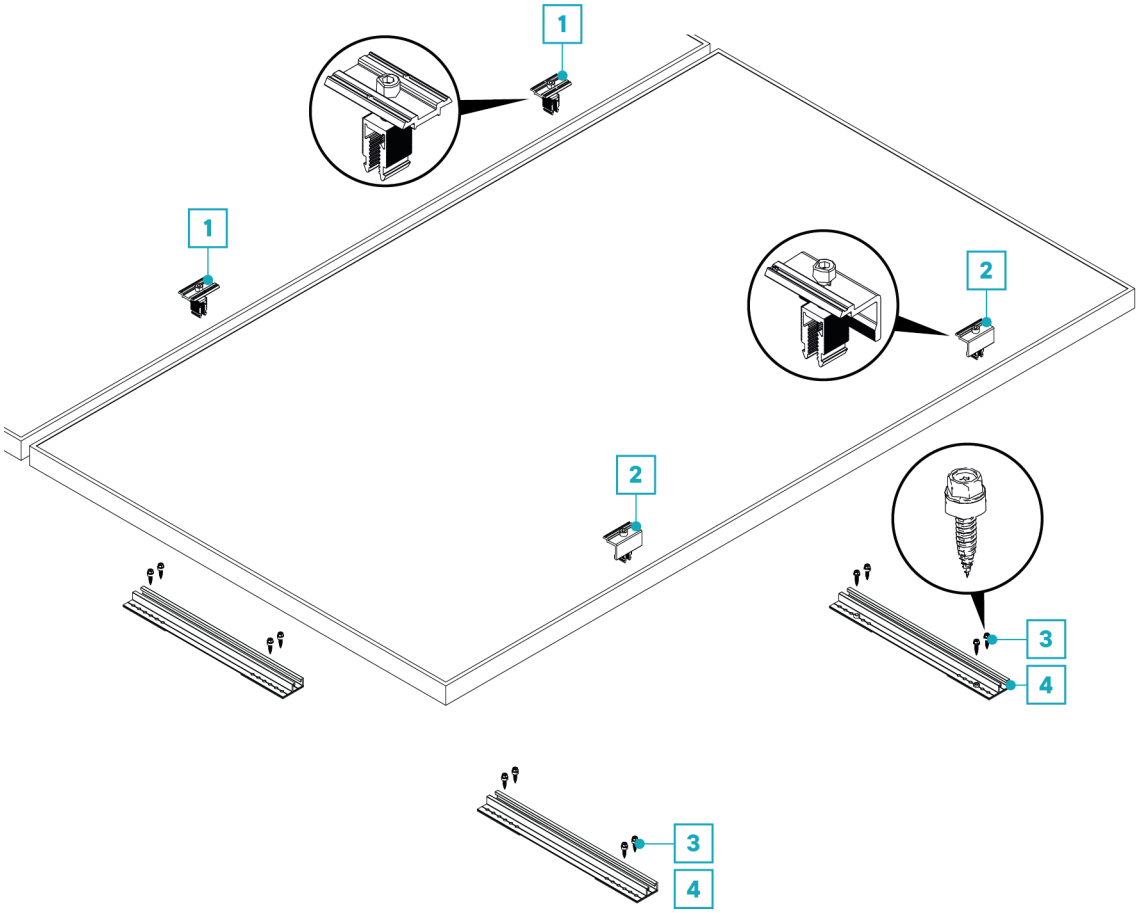

Wear cut-resistant work gloves during assembly.


Helmets are required for all persons involved on the construction site.


Use fall protection.

SYSTEM OVERVIEW

Basic Components TL system



1 Mid-Clamp | CLM10

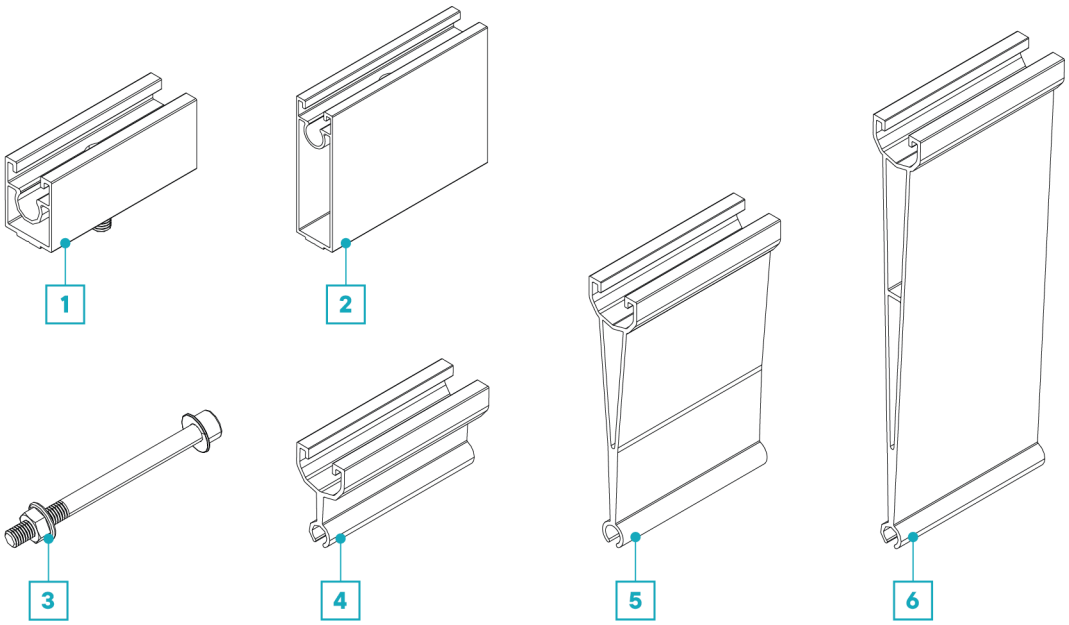
2 End-Clamp | CLE10

3 Metal Sheet Screw* | EJOT JF3-2-5,5x25 E11

4 Trapezoidal Metal Sheet Bridge at 9.8" (250 mm), at 15.0" (380 mm) | TL25, TL38

* This component is intended for single use.

Accessories



1 Height Adapter 1.3 in (33 mm) | EL05 Elevation

2 Height Adapter 3.3 in (83 mm) | EL10 Elevation

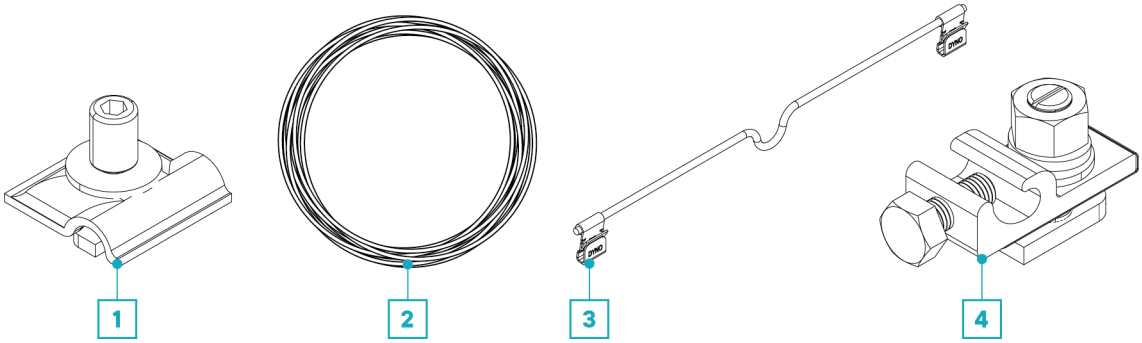
3 Safety Bolt | LSP

4 Front Tilt Adapter 0.8 in (20 mm) | PS Pitch

5 Rear Tilt Adapter 3.9 in (100 mm) | PM Pitch

6 Rear Tilt Adapter 7.0 in (180 mm) | PL Pitch

Bonding and Grounding Accessories



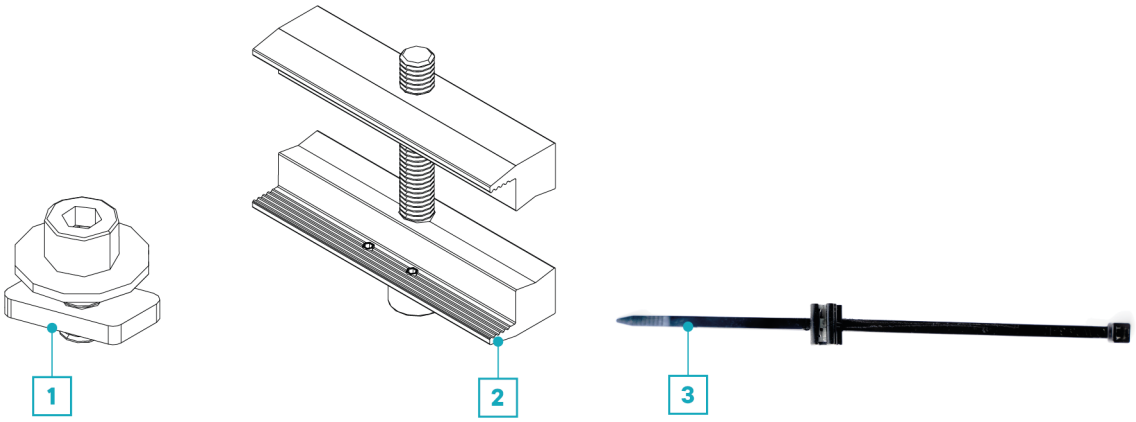
1 Grounding Clamp 8 - 10 mm | WCL8-10

2 Aluminium Wire 8 mm for Grounding | AWR8 (please use properly sized copper wire in the USA)

3 8" Bonding Jumper (follows UL 476 or UL 2703 requirements) | BJ8

4 Grounding lug with T-bolt (follows UL 476 or UL 2703 requirements) | GL18T

Module Accessories

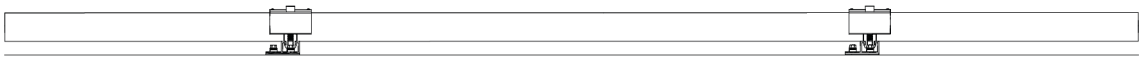


1 Microinverter T-Bolt Assembly for Top Rail-Channel | MA-RA

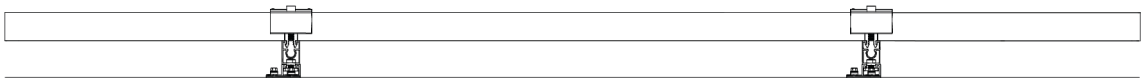
2 Microinverter Clamp for Module Frame | MA-MO

3 Cable Tie Clip for Module Frame | CLP-M

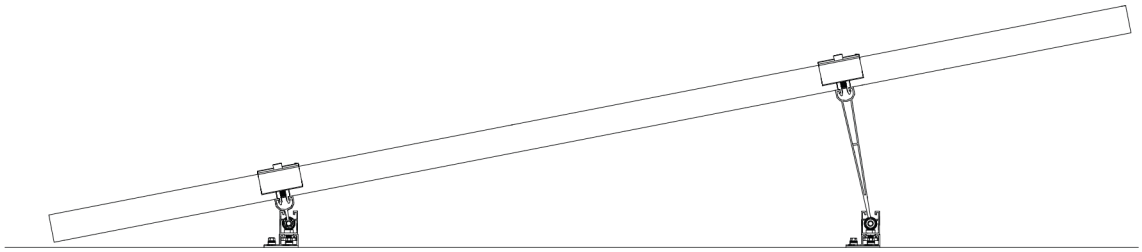
Installation Options



Installing the modules directly on the trapezoidal metal sheet bridge



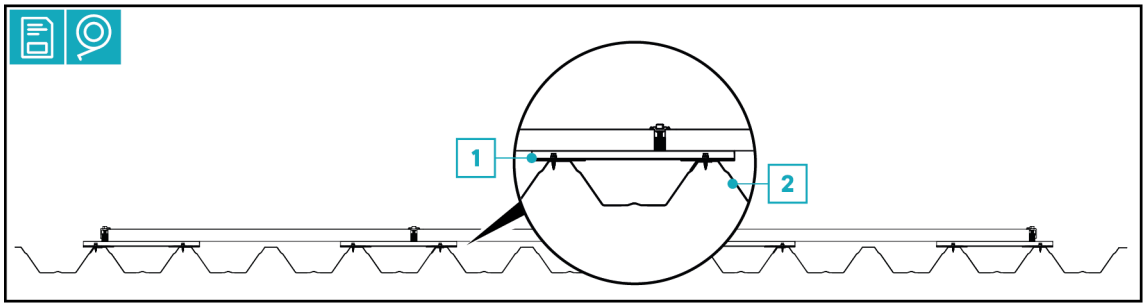
Installing the modules on the EL05/EL10 height adapter



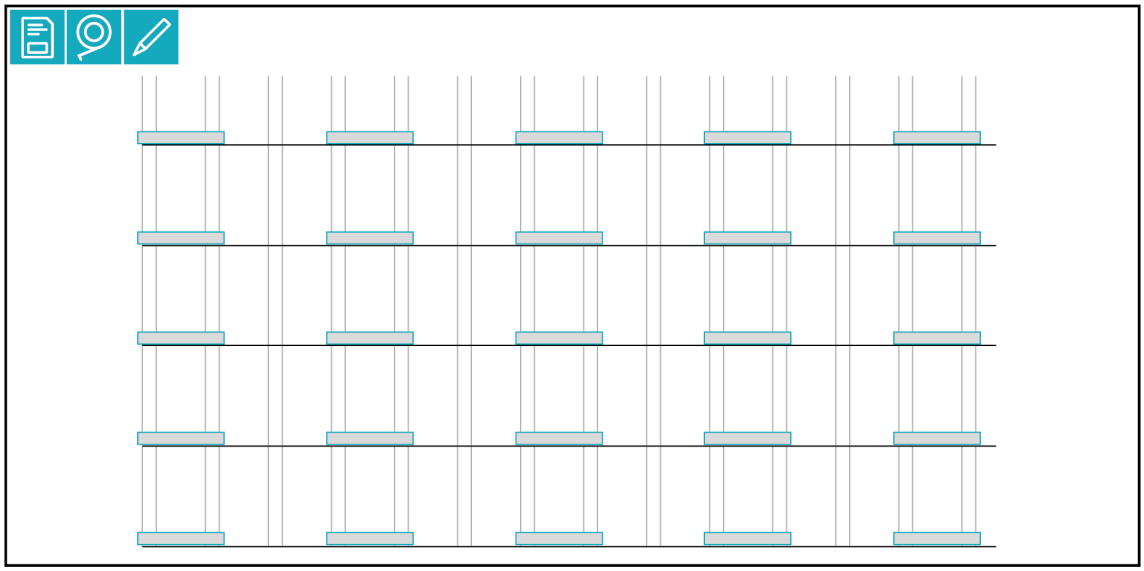
Installing the modules on the PS, PM/PL tilt adapters

ASSEMBLY

Measure the area



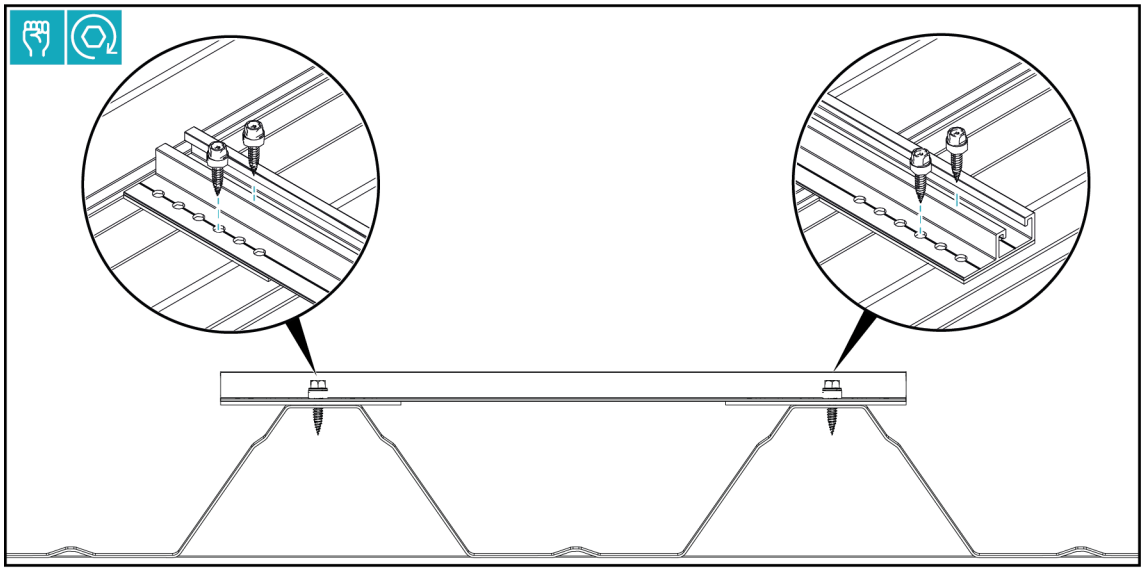
The trapezoidal metal sheet bridge 1 is installed across two peaks. 2. The distance between the rails depends on the width of the modules and the distance between the peaks.



- Take the dimensions of the array field from the Aerotool planning documents.
- Determine module size.
- Determine the distances between the peaks.
- Determine and mark the positions of the short rails.

Install the trapezoidal metal sheet bridge

ⓘ For exact alignment of the trapezoidal metal sheet bridges, use a rail or similar aid as a guide.

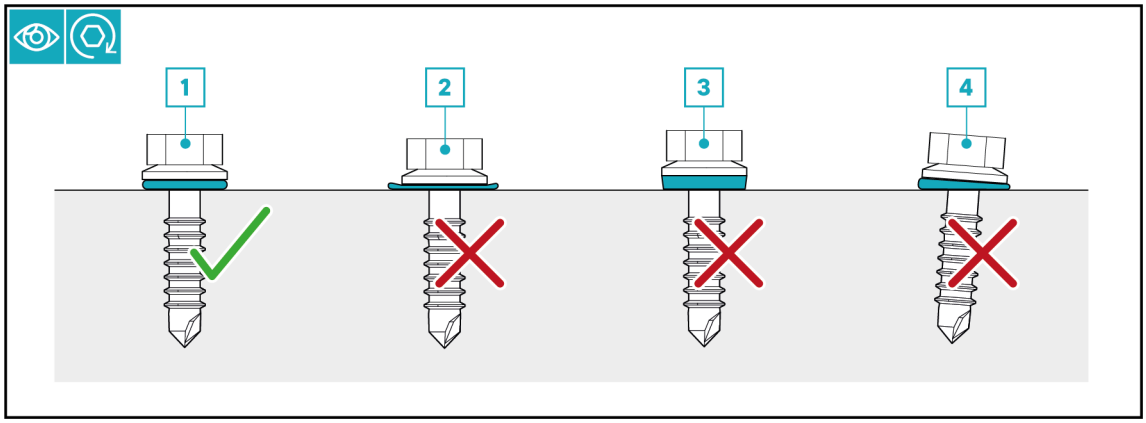


- Position the trapezoidal metal sheet bridges according to the markings.
- Use the appropriate holes depending on the distance between the peaks.
- Fasten each trapezoidal metal sheet bridge with 4 metal sheet screws.
- Tighten the screws until the gasket bends equally all around (see picture below). Do not over-tighten.

Tighten metal screws with attached EPDM washer

ⓘ Mount metal screws with EPDM washer always with mechanical depth stop.

ⓘ Ensure sealing: Tighten the screws until the seal is compressed evenly all around. The seal should be compressed by approx. 30 %.

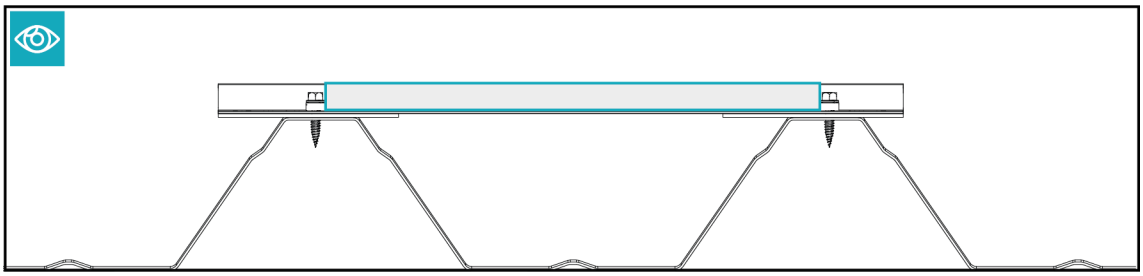


1 correct
2 screw is tightened too tight
3 screw is not tightened enough
4 screw is tightened unevenly

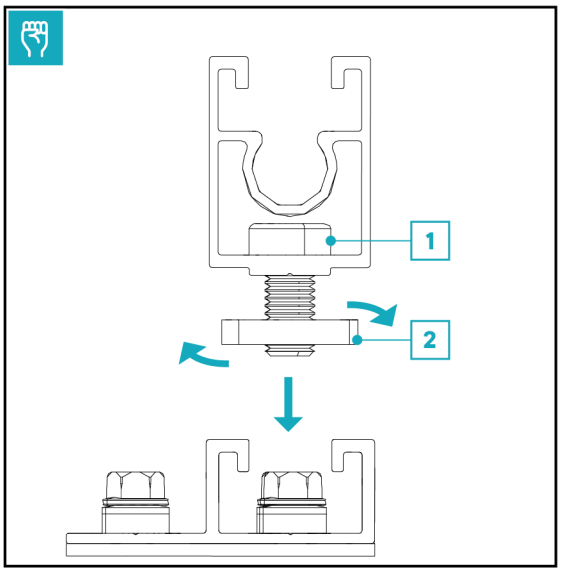
Install height adapter (optional)

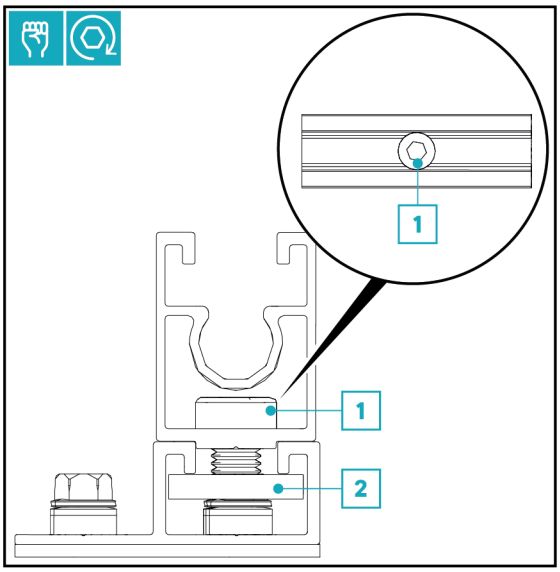
Use height adapters to achieve a greater distance between the roof surface and the modules.

Depending on the module size, determine the exact position of the height adapter on the trapezoidal metal sheet bridge.



The height adapter may only be mounted in the area between the metal screws.



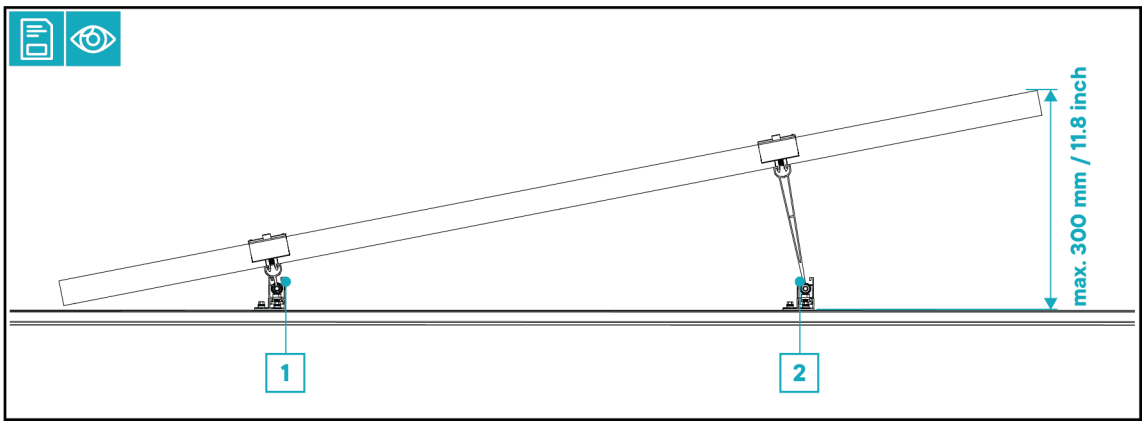


- Install the height adapter on the trapezoidal metal sheet bridge:
  Place the T-Bolt [2] into the mounting channel.
- Tighten the screws with 15 Nm or 11 ft lb.

Installing the tilt adapter (optional)

Installation options

Using the Pitch products, modules can have an additional tilt of 5° to 15°.



1 Front: EL05 height adapter with PS tilt adapter

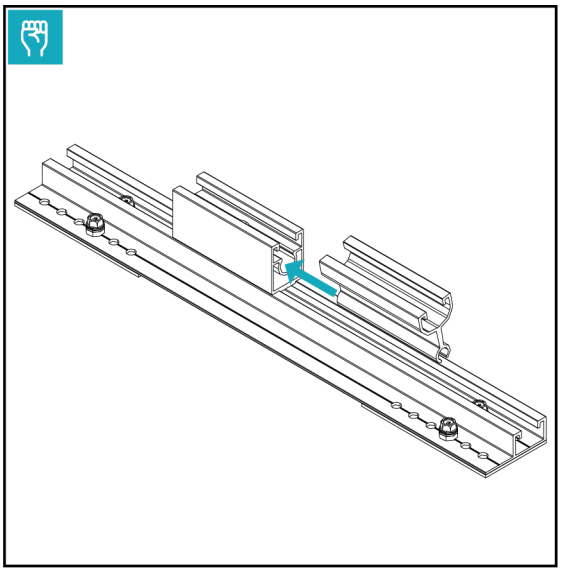
2 Rear: EL05 height adapter with PM/PL tilt adapter

The height of the elevation must not exceed 300 mm.

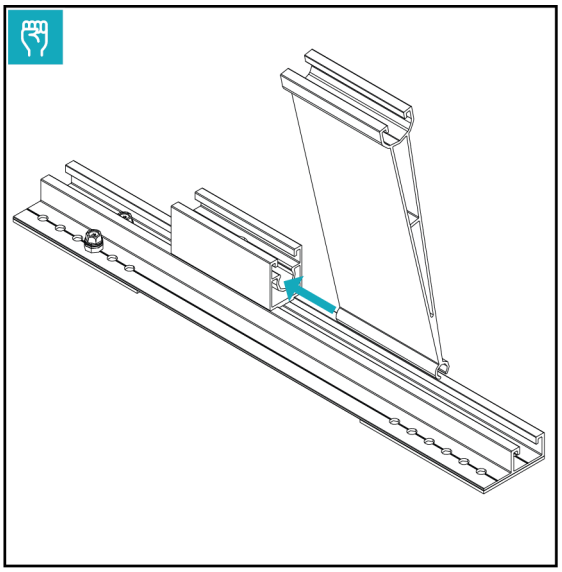
Installing the tilt adapter

The tilt adapters are only installed in combination with the EL05 height adapter.

Option PS

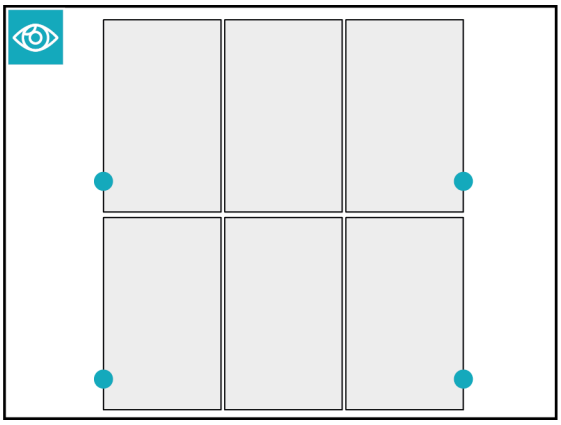


Option PM/PL

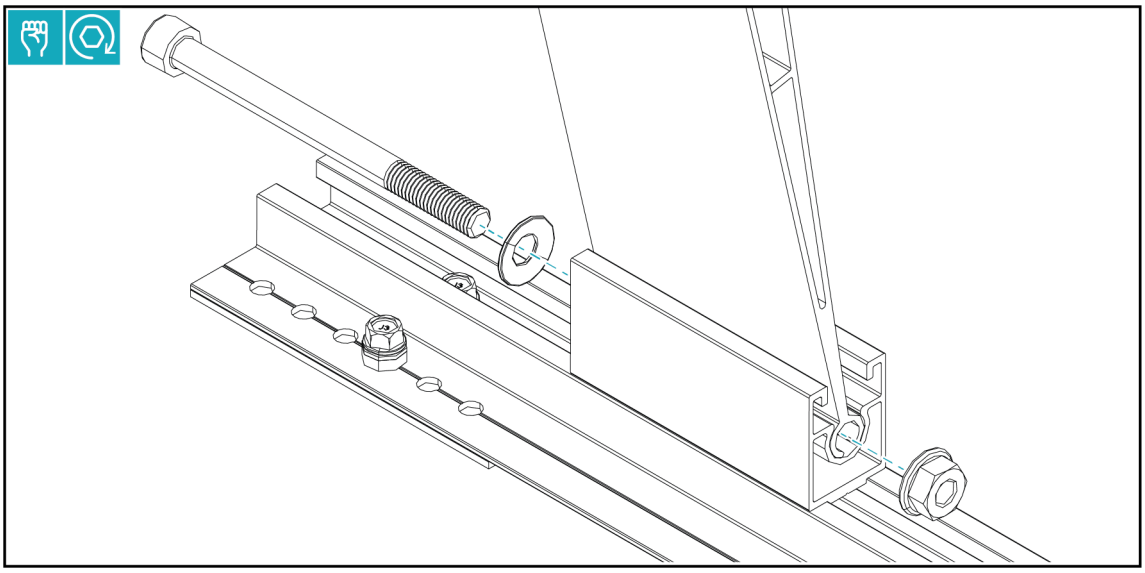


Attach tilt adapter to EL05 height adapter as required.

Attach the safety bolt.



ℹ The LSP safety bolt is attached to each back EL05 height adapter (1 x per module), where a module end clamp is mounted.

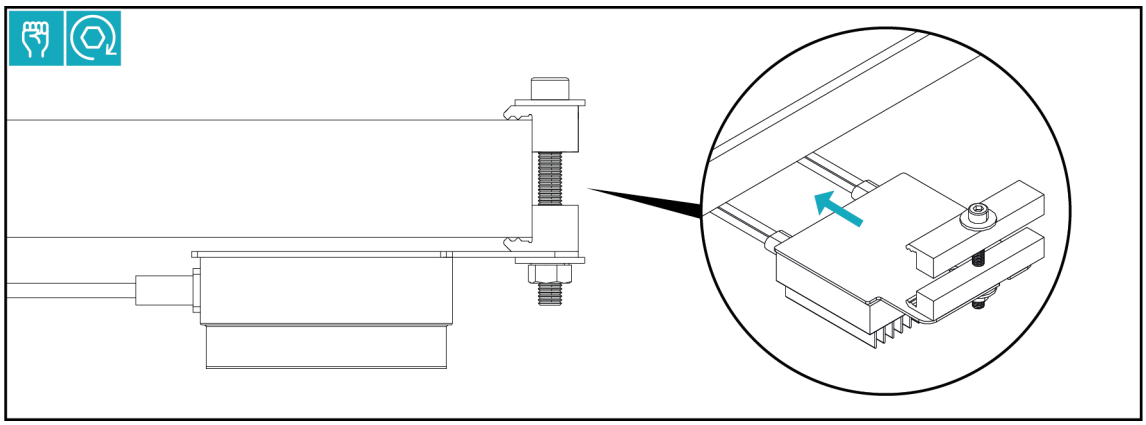


☑ Use the safety bolt to secure each tilt adapter to the height adapter on the starting and ending rows of an array.

Install microinverter (optional)

Mount microinverter with the microinverter clamp (MA-MO) onto the module frame.

ℹ The microinverter is installed directly onto the module frame.



Install the microinverter onto the module according to the module manufacturer's instructions.

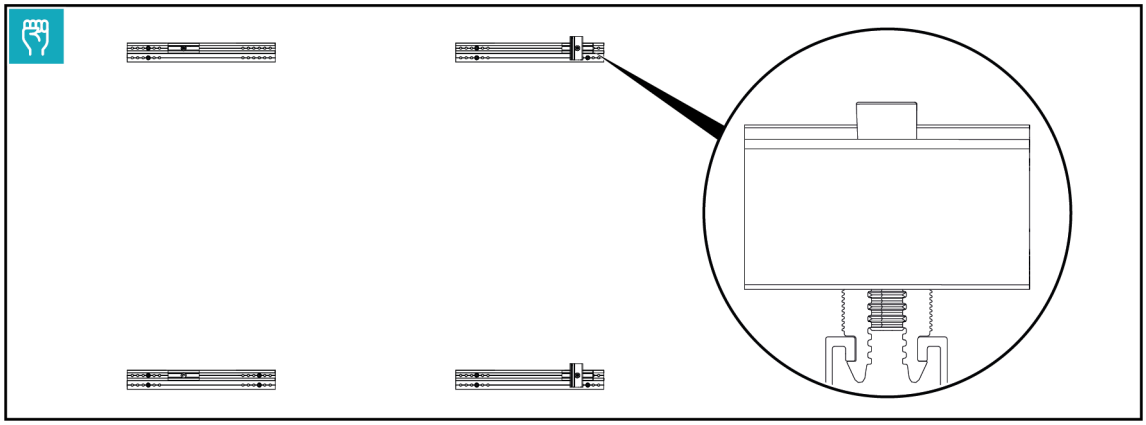
Installing modules

Depending on the accessories used, the following options are available:
Installing the modules on the trapezoidal metal sheet bridges.
Installing the modules on the height adapters.
Installing the modules on the tilt adapters.

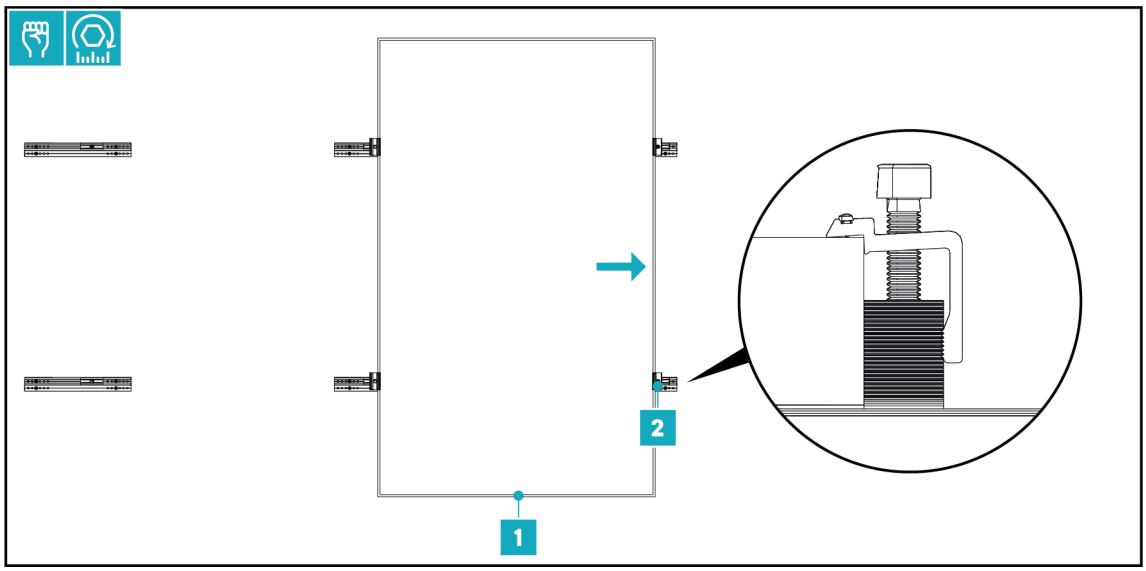
When installing the modules, make sure that the module clamps are placed as centrally as possible on the adapters.

Do not enter the modules under any circumstances.

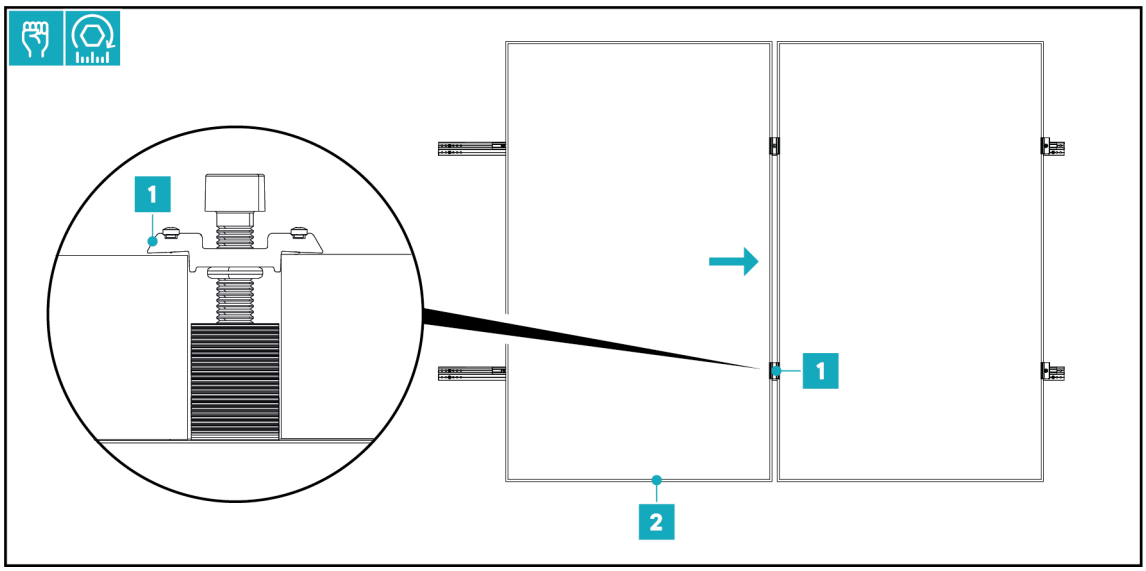
Spans and cantilevers need to be in accordance with the structural design as issued in the AEROTOOL report. Refer to the AEROTOOL report for the exact positions of the module clamps.



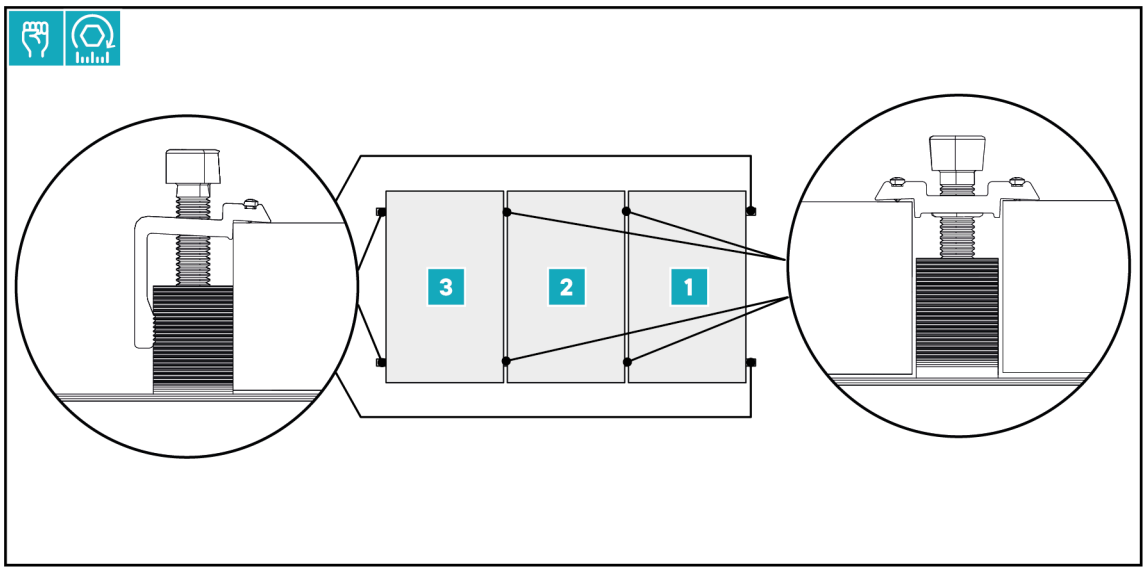
Attach end-clamps to the edge of the module field.



- Place the module 1.
- Tighten the screws of the end-clamps with 15 Nm or 11 ft lbs. 2



- After the first module, attach the mid-clamps 1.
- Place the next module 2.
- Tighten the screws of the mid-clamps to 15 Nm or 11 ft lbs.



- Continue placing the modules row by row.
- Make sure that the modules are installed in a line.
- Tighten the screws of the end-clamps with 15 Nm or 11 ft lb each.

Reposition / replace clamps

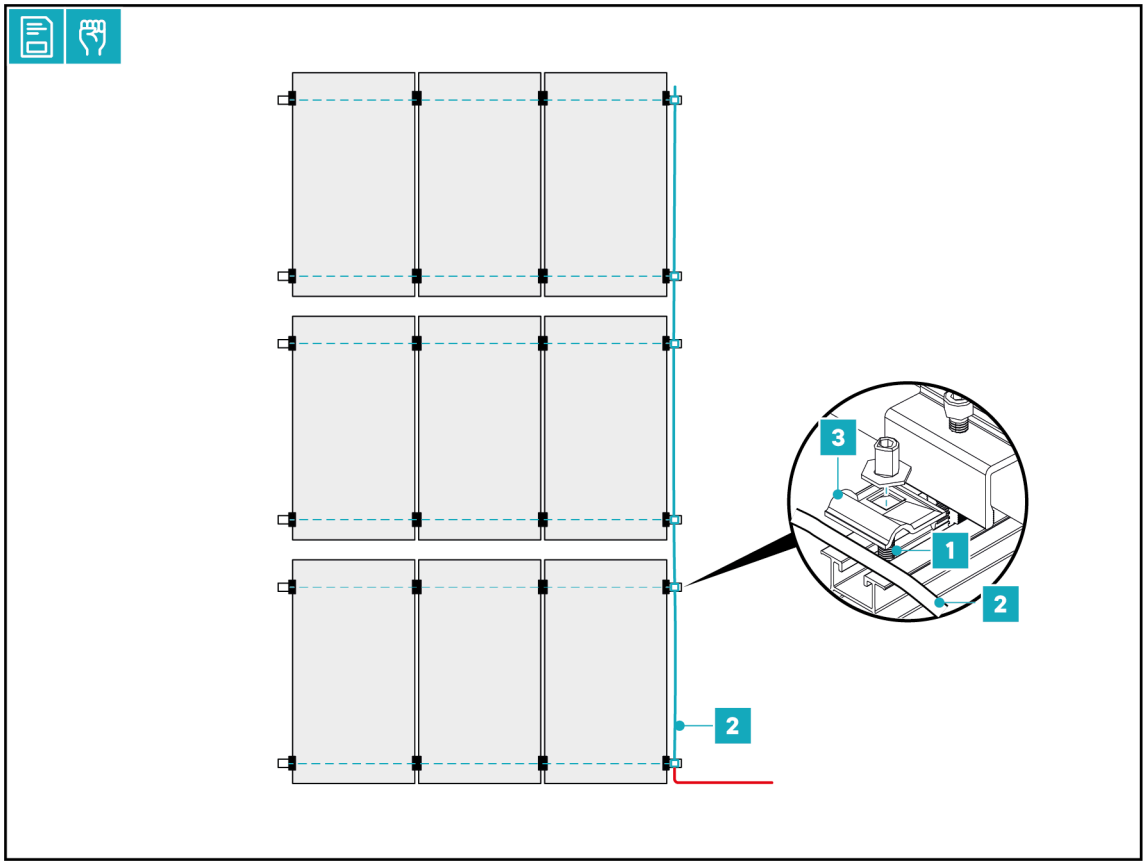
- Demount clamp: Unscrew the screw at the clamp completely.
- Depending on the mounting situation, squeeze the clamp laterally and pull it out or pull it laterally out of the rail.

Bonding

For bonding, AEROCOMPACT provides the bonding wire clamp as an accessory (NOT VALID IN THE USA). These are each mounted on the support rails.

Dependent on the mounting setting, each module row is bonded by the module clamps with grounding pins.

Potential equalization (not USA-compliant)



Bonding modules through module clamps with grounding pins

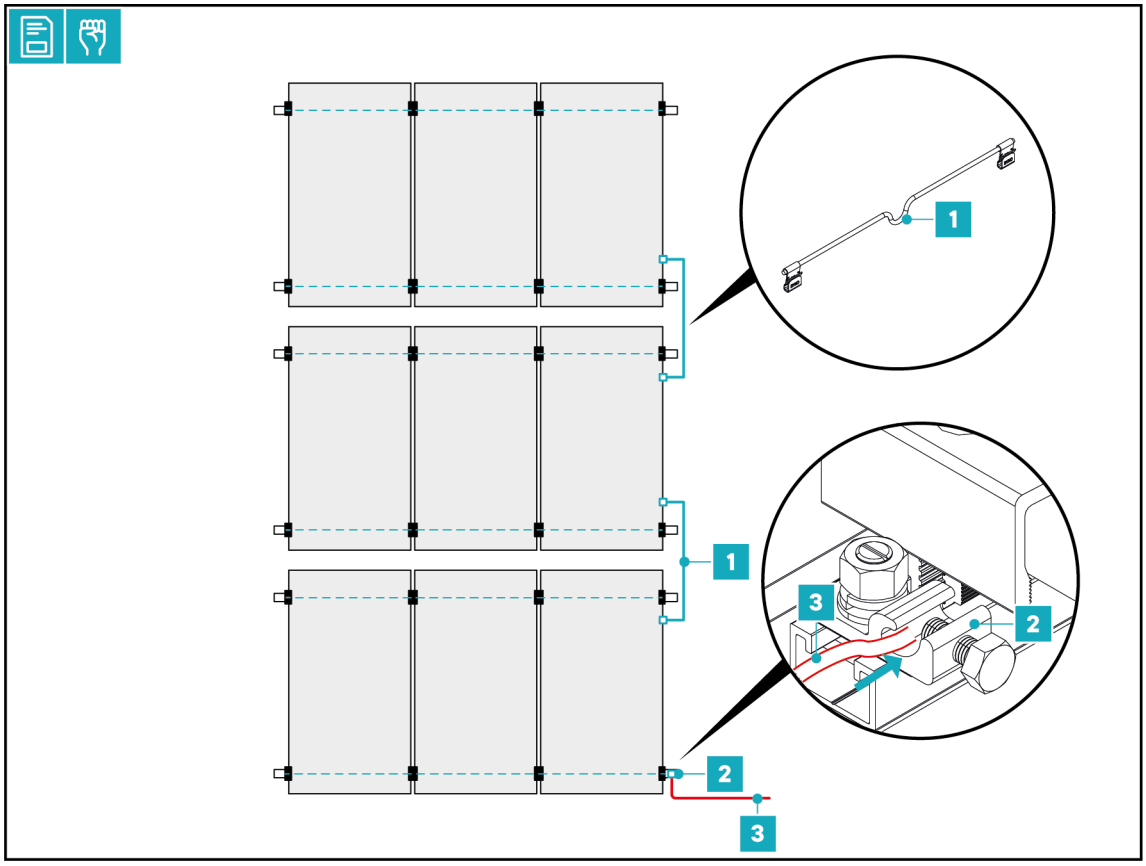
Bonding the individual module rows

Grounding the array by terminating to on-site ground

- Attach the T-Bolt Assembly 1 to the rail.
- Place the grounding wire 2 onto the rails.
- Attach the clamp 3 and tighten with the nut.
- Tighten the nut with 15 Nm or 11 ft lb.
- Connect the wire 2 to the on-site ground.

Potential equalization with grounding lug and bonding jumper (USA-compliant)

Depending on the installation, the modules per row are connected to each other by the module clamps.



Bonding modules through module clamps with grounding pins

Bonding the individual module rows

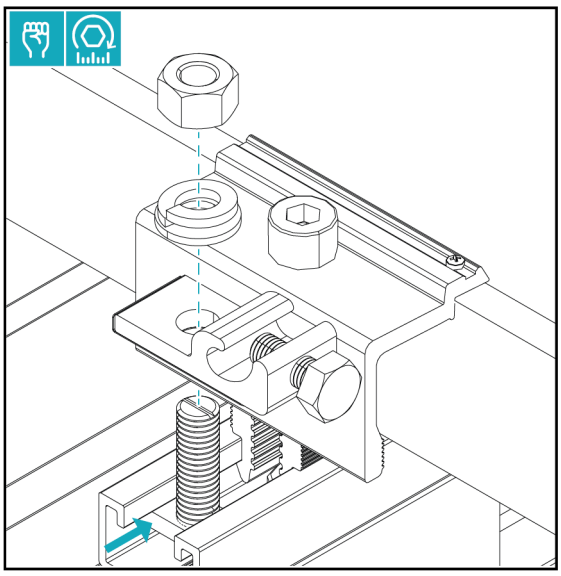
Grounding the array by terminating to on-site ground

For grounding and bonding, use components conforming to UL 467 or UL 2703 (bonding jumper, grounding lug, copper wire).

The detailed assembly of the bonding jumper is described in the manufacturer's assembly instructions.

- Bonding module rows with a bonding jumper 1.
- Terminate the array to on-site ground 3 with the Grounding Lug 2.

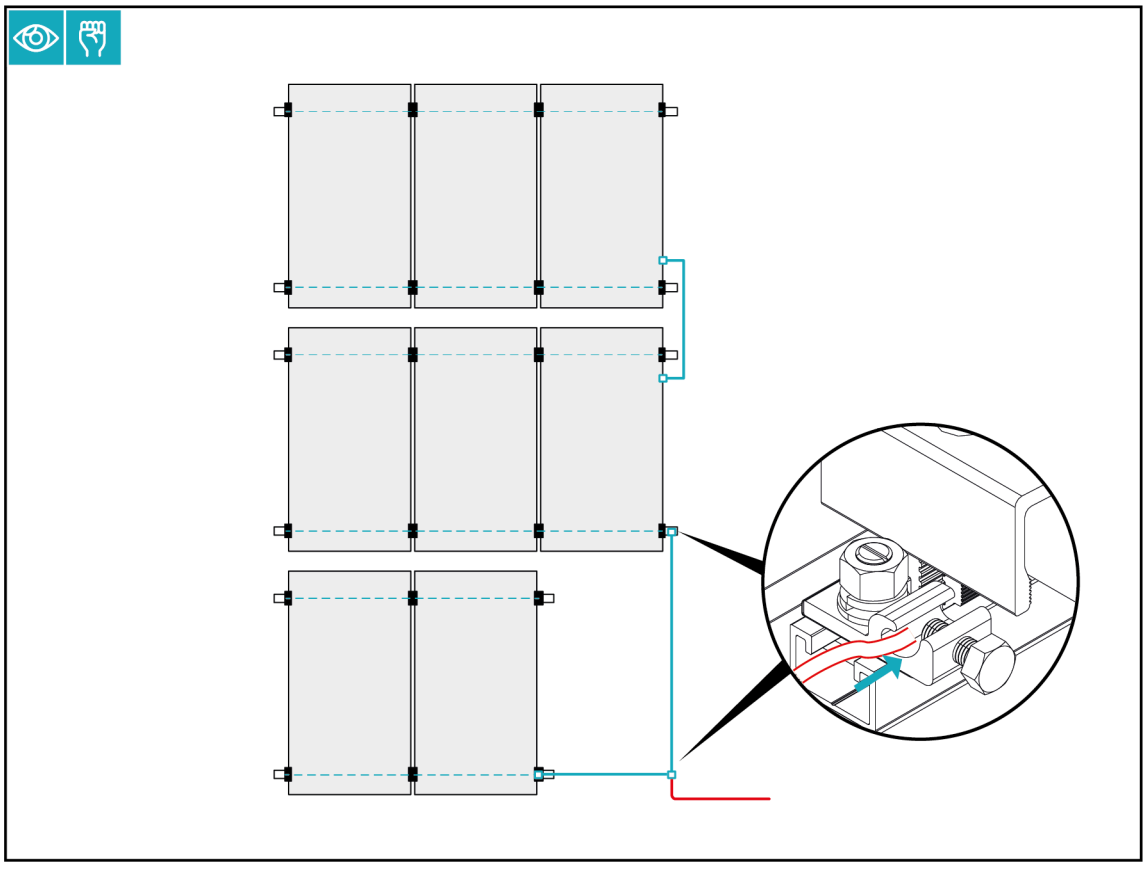
Grounding lug installation



- Attach the T-Bolt Assembly to the rail.
- Connect the Grounding Lug as shown.
- Tighten the nut with 15 Nm or 11 ft lb.

Potential equalization during maintenance

Heads up!
In case of a module removal, a temporary grounding lug and wire will be required to attach the remaining modules with each other and maintain an appropriate bonding path.



TL25/38

MAINTENANCE

To prevent personal injury and property damage, the system must be inspected regularly by qualified personnel. The operator of the equipment must perform the following maintenance items once a year.

A test of the system is necessary after severe weather events (e.g. wind storm, snow, hail, etc.) as well as after extreme events such as a hurricane or earthquake.

Complete System

- Check all components of the system for damage.
- Replace damaged components as soon as possible.

Fittings

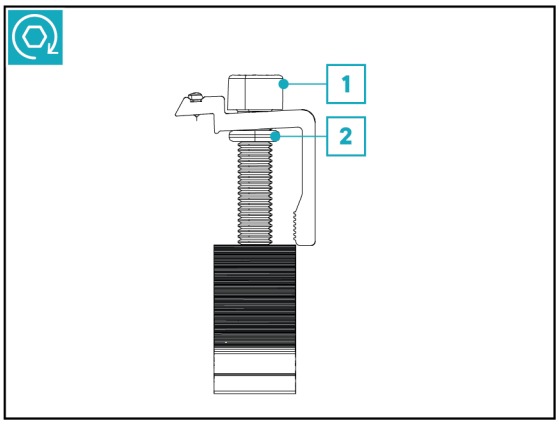
- Check all screw connections.
- Tighten loose screw connections. Confirm the tightening torque according to the assembly instructions.

DISMANTLING

Disassemble components

Disassembling the system: Carry out the assembly steps in reverse order.

Dismantle clamps



- Completely unscrew the screw 1 on the clamp.
- If clamps are re-installed:
  Make sure that the O-ring 2 is not lost.

APPENDIX

Declaration of Conformity TL

CE
21

Manufacturer:	**AEROCOMPACT®**
Designation:	**Metal roof system CompactMETAL trapezoidal metal sheet bridge**
Identification code:	**CompactMETAL TL**
Harmonised standard:	**EN 1090**
Certification body:	**2397**

To the declaration of performance

UL Certification Notes

The CompactMETAL system is certified by SolarPTL, LLC for grounding/bonding, fire classification, and mechanical loading. SolarPTL, LLC is a Nationally Recognized Testing Laboratory (NRTL).

The CompactMETAL grounding method conforms to ANSI/UL 2703, and is approved for use with photovoltaic modules listed under ANSI/UL 1703 and/or ANSI/UL 61730, whichever applies, and complies with the National Electrical Code, ANSI/NFPA 70. The individual parts within the solar array need to be electrically bonded to existing DC ground paths via the use of a UL 467 approved grounding lug and via UL 467 approved bonding jumpers. The conductor size, type and temperature rating should be selected in accordance with NEC 690.45 and NEC 250.122.1. The primary evaluation for grounding and/or mounting was performed with the PV module type(s) listed below.

- VSUN330-72P

Specific evaluations of other modules can be provided upon request and at cost (a minimum of two modules are required). In addition, more than four attachment points per module can be set to account for wind, snow, and other types of loading.

For the fire rating / testing requirements for metal roofs, there is an exception in ANSI/UL 2703 section 11.1 that exempts fire testing and provides a Class A rating when the following conditions are met:

- Type 1, Type 2, or Type 3 modules as defined by UL 1703 or UL 61730-2;
- 98% by weight of the racking is non-combustible per ASTM E136;
- Installed over a Class A roof assembly of non-combustible roof covering, such as clay tile, concrete tile, metal panels made from steel, minimum 28 Ga ferrous panels or shingles.

CompactMETAL meeting the above conditions shall be identified as having a Class A fire rating.

Load Rating

The CompactMETAL system design load ratings for a 72 cell PV module are:
a) Upward: 50 psf / 2.4 kPa
b) Downward: 71 psf / 3.4 kPa
c) Down-slope 10 psf / 0.48 kPa

Tested loads:a) Upward: 75 psf / 3.6 kPa
b) Downward: 106.5 psf / 5.1 kPa
c) Down-slope: 15 psf / 0.72 kPa