

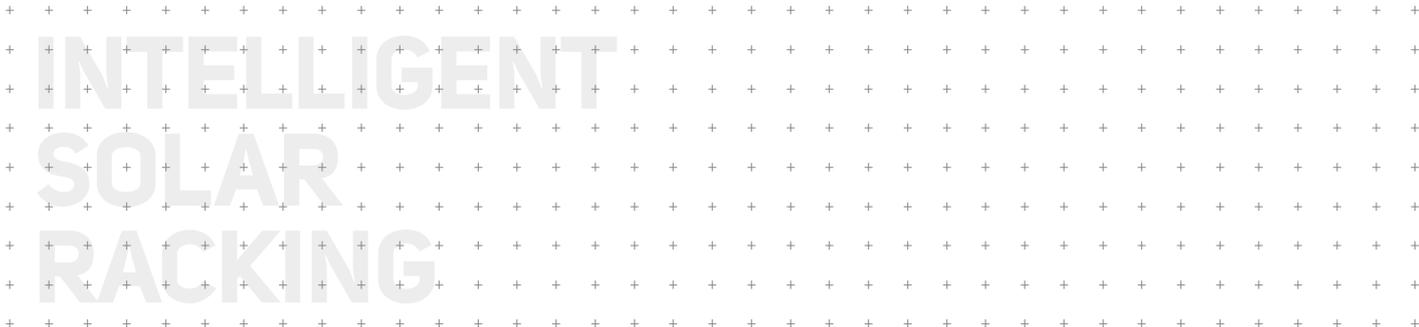
CompactFLAT

S10plus

Assembly Instructions

Version: 06
Language: English | Original language: German
Original installation instructions

Important! Read carefully before installation!



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 of 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.

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Update

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

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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



Cordless screwdriver, screwdriver



Pencil, mark



Torque wrench,
Observe torque



Chalk line



Drilling machine, drill



Scissors, tin snips, cut to size

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 CompactFLAT flat roof system is designed exclusively for installing PV modules on flat roofs or similar flat surfaces. The system must be properly installed in accordance with these installation instructions.

PV modules used with the CompactFLAT 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 CompactFLAT 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. Follow the position of the modules on the roof, the number and position of the building protection pads and the ballast distribution exactly according to the project report. 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 using 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 would like to point out that the flat roof system is being sold as part of a sales contract. Assembly/-processing 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 assembly 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 rights of the buyer due to a material defect shall expire. The system warranty is only valid if all system components are purchased from Aerocompact.

Systems with clamping on the short side of the module

For a system with a clamp on the short side of the module, it is assumed that the module may also be used with this installation method (clamp on the short sides of the module). This approval can either be generally available as part of the module certification or, under certain circumstances, can also be given by the module manufacturer on a project-specific basis.

Systems with roof protection pads

The roof protection pad included in the scope of delivery is matched to the roof surface defined in the project. Due to the many available roof surfaces on the market, the responsible designer should ensure the compatibility of and the coefficient of static friction between the protection pad and the roof surface of the building used in the design. The friction value is determined during the planning process with a coefficient of friction test.

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.



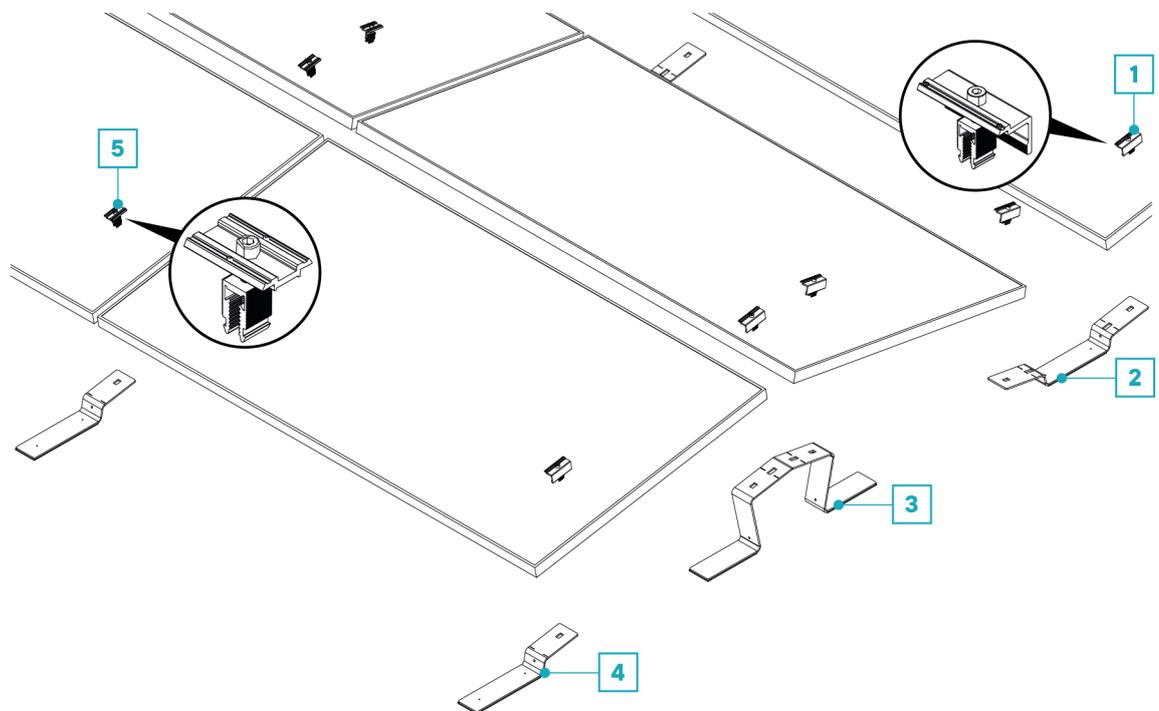
Helmets are required for all persons involved on the construction site.



Use fall protection.

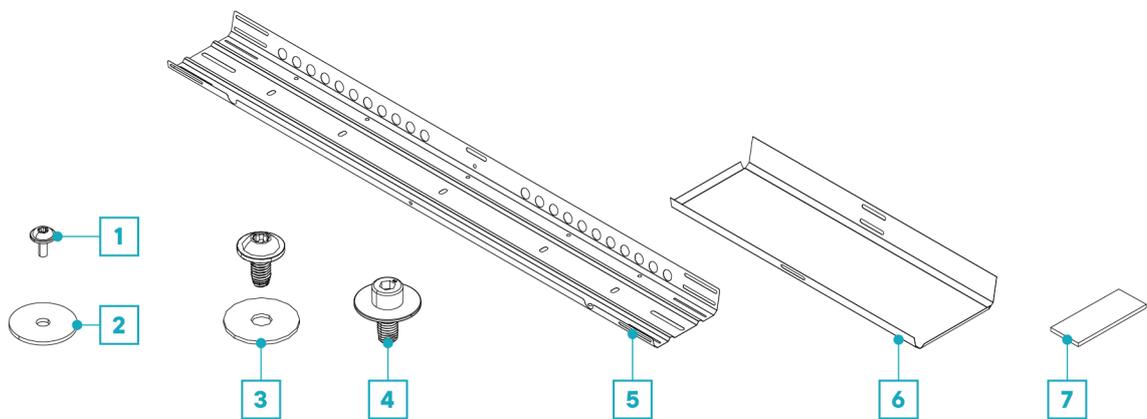
SYSTEM OVERVIEW

Basic components S10plus



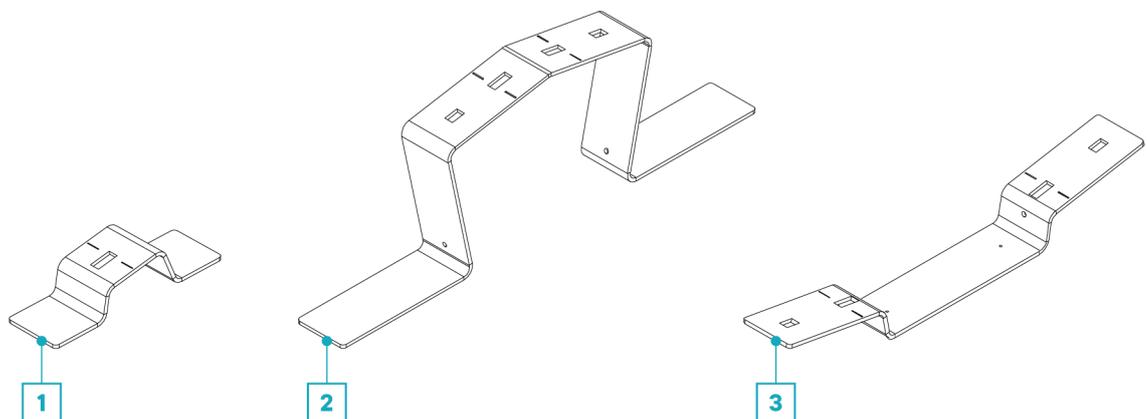
- 1 End clamp | CLE10
- 2 Connector, long, with/without roof protection pad | S10+CNL-PP, S10+CNL
Connector, short, with/without roof protection pad | S10+CNS-PP, S10+CNS
- 3 Middle bracket, with/without roof protection pad | S10+MB-PP, S10+MB
- 4 Front foot S10 with/without roof protection pad | S10FB-PP, S10FB
- 5 Middle clamp | CLM10

Ballasting



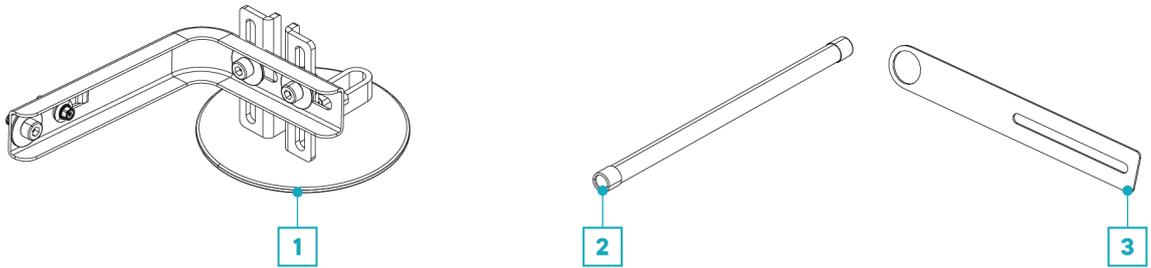
- 1 Thread-forming screw 4x8 | STS4x8 (optional for fastening the long ballast tray)
- 2 Washer 4.3/25 FW4.3/35 (optional for fastening the long ballast tray)
- 3 Thread-forming screw and washer | STS8x16, FW8.4/30 (optional)
- 4 Tapping combi screw M8x20 | SCS8x20 (optional)
- 5 Long ballast tray | BT-1800, BT-2050, BT-2300
- 6 Short ballast tray | BT-880
- 7 Roof protection pad for ballast blocks and ballast trays | PP200/80

Alpine supports



- 1 Front alpine support | S10FS
- 2 Center support, with/without roof protection pad | S10+MB-PP, S10+MB
- 3 Connector, long, with/without roof protection pad | S10+CNL-PP, S10+CNL
Connector, short, with/without roof protection pad | S10+CNS-PP, S10+CNS

Accessories



- 1 Anchor point attachment | APA
- 2 Cable conduit | CP-430, CP-620, CP-840
- 3 Bracket for cable conduit | BR-CP

Variations of CompactFLAT S10plus



Compact FLAT S10plus | 464 mm distance | 8° - 18° internal shading angle



Compact FLAT S10plus | 297 mm distance | 10° internal shading angle

S10plus

ASSEMBLY

Installation Instructions for Gravel Roofs

i The planning documents define whether the system is to be installed directly on the sealing or protective fleece (coefficient of friction 1.5) or freely on the gravel (coefficient of friction 0.3).

Mount the system on the sealing or protective fleece

✓ Height gravel fill: 30 - 60 mm

i Since damage to the roof waterproofing can occur because of excessive point loading, do not install the system on the gravel if the gravel layer is up to 60 mm.

- ▣ Carefully move aside the gravel in the array field.
- ▣ Install the system components on the roof surface or on the protective fleece.

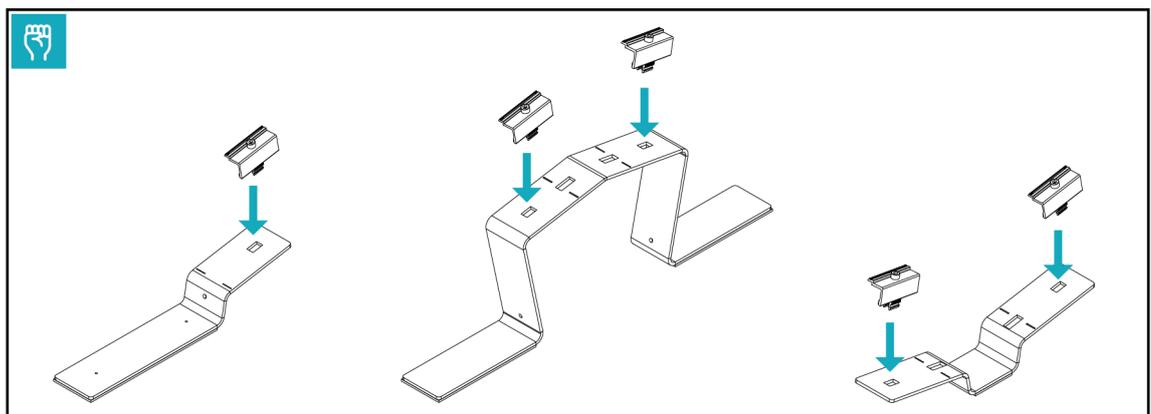
i Use the gravel for ballasting after assembly according to the AeroTOOL report.

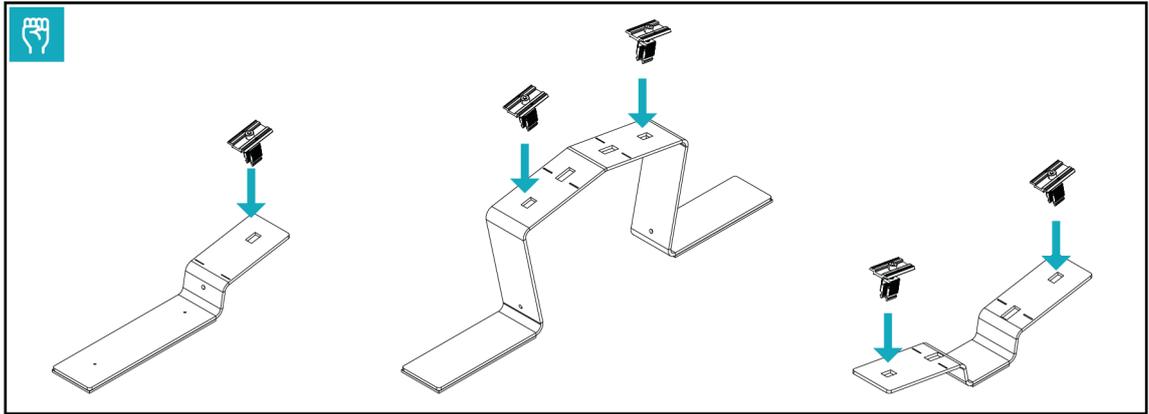
Mount the system on the gravel

- ✓ Gravel fill 60 - 100 mm and protective fleece (min. 300 g/m²) is present or
- ✓ Gravel fill is 100 mm or higher.

- ▣ Mount the system on the gravel.

Pre-install the clamps

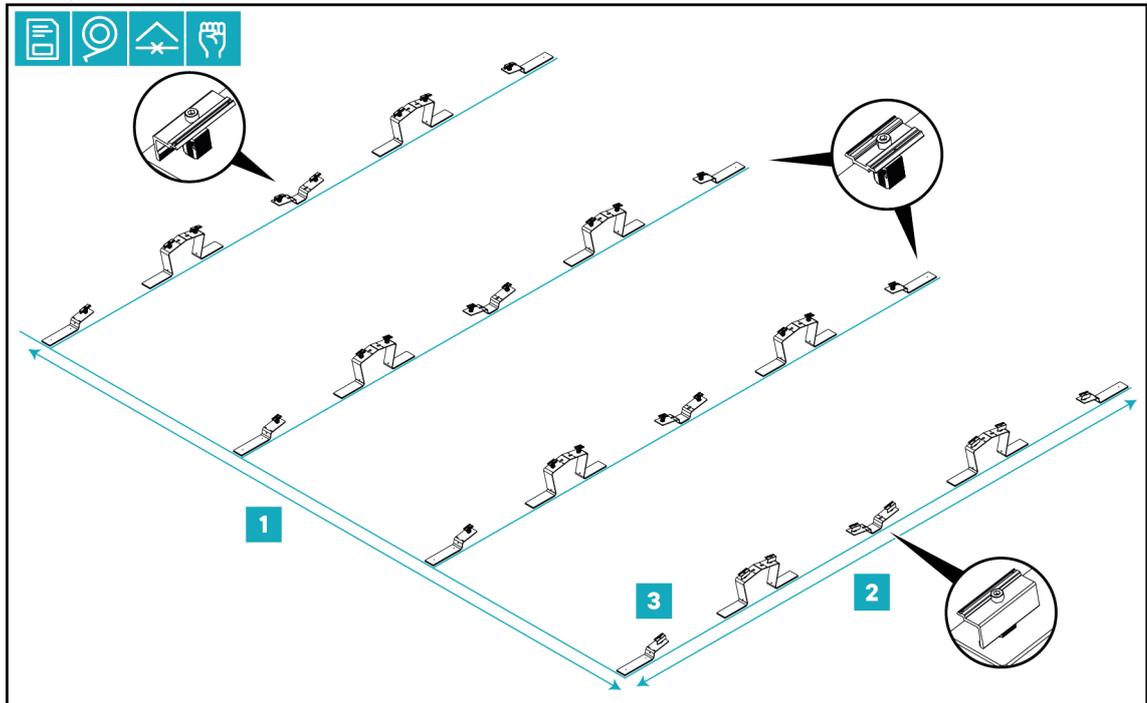




- ▶ Pre-install the end-clamps or mid-clamps to the front brackets, middle brackets and connector brackets as needed.

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Measure area, place components



- ▶ Take the dimensions of the array field from the planning documents.
- ▶ Measure the length of the array **1** and mark the line.
- ▶ Measure the width of the array **2** and mark the line.
- ▶ Place the front brackets, middle brackets and connector brackets in the array field **3**:
 Edge rows: place front brackets, middle brackets and connector brackets with end-clamps.
 Middle rows: place front brackets, middle brackets and connector brackets with mid-clamps.

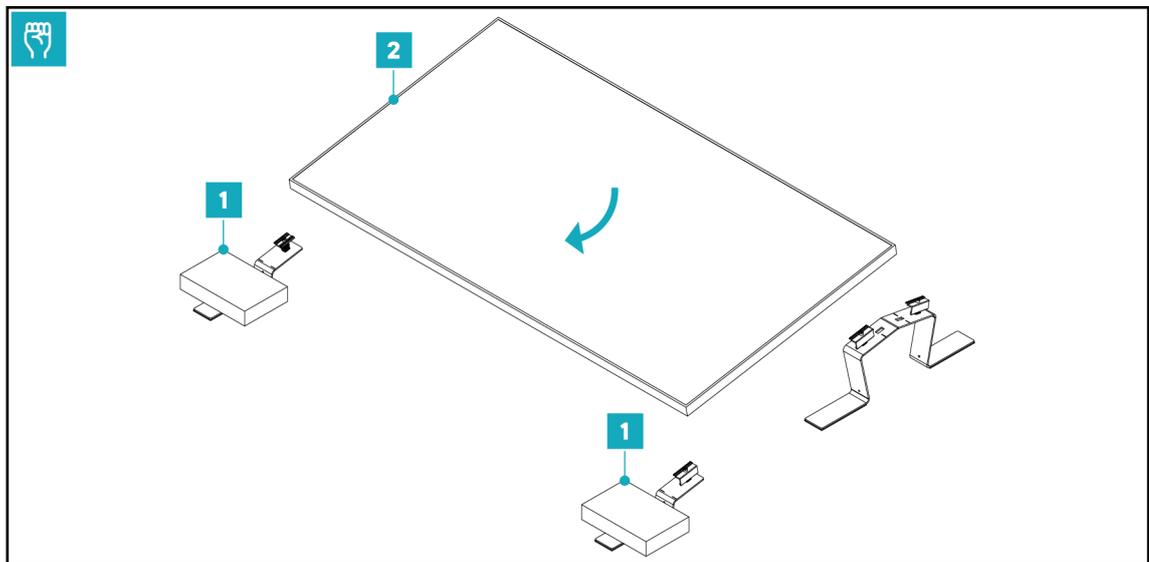
Installing modules

i Tip: When installing, wire the modules at the same time.

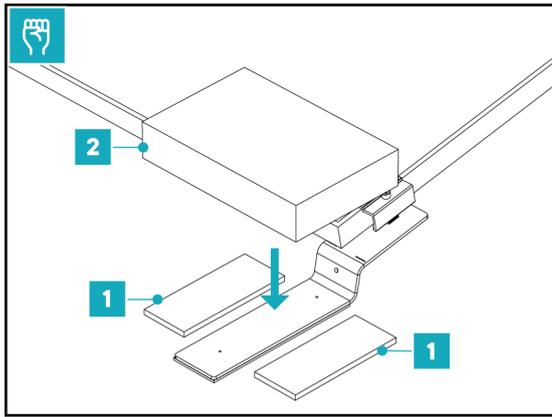
i The cables can be attached to the module with the cable tie clip (CLP-M).

i The distance between the clamps is determined by the brackets and connector brackets or by the module size.

Install the first module row



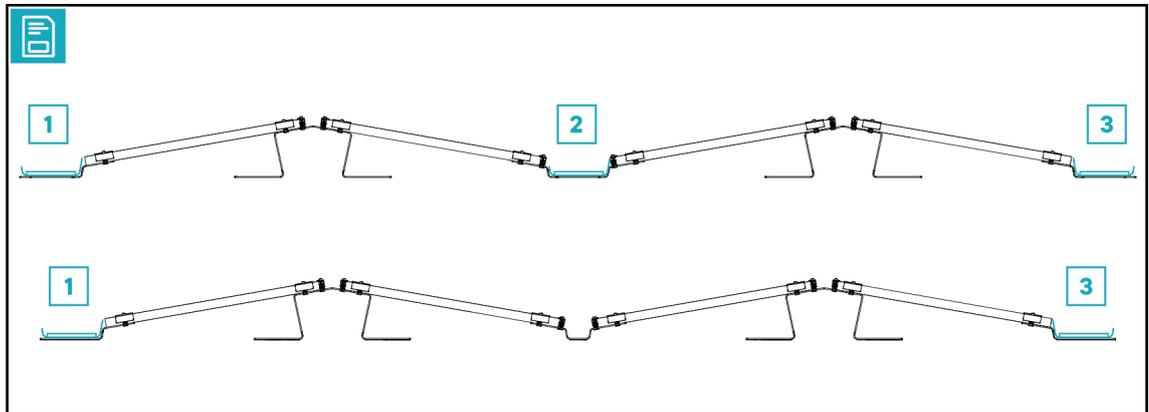
- Weigh down the front brackets with ballast blocks **1**
- Place the **2** module on the front brackets and middle brackets.



i Recommendation: Gluing the protection pads to the ballast blocks will prevent movement of the pads. Use weather-resistant construction adhesive.

- Position the protection pads **1** to the right and left of the front brackets, middle brackets or connector brackets.
- Place the ballast blocks **2**.

Version 2: Short ballast trays

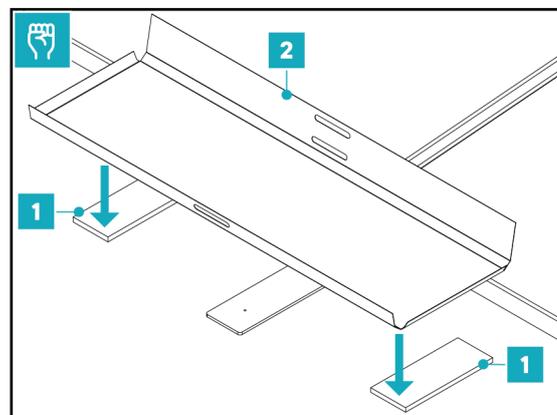


The short ballast tray can be installed in the following positions:

- 1** across the front bracket.
- 2** on the connector bracket.
- 3** at the end bracket - last row - mirror of front bracket.

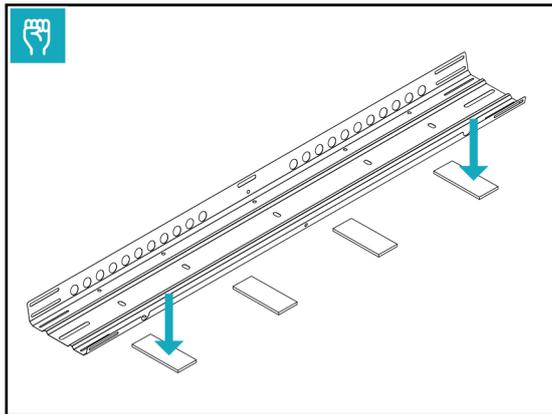
i Refer to the Aerotool planning documents for the exact number and position of the short ballast trays.

Installing the short ballast tray



- Position building protection mats **1** underneath and to the right and left edge of the ballast tray.
- Place the ballast tray **2** centrally on the bracket or connector bracket.

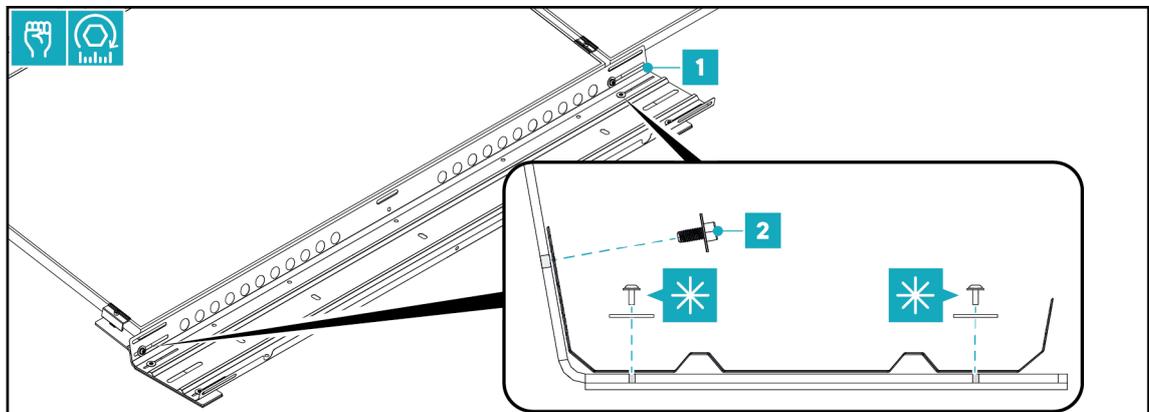
Snpols 1015



i When positioning the protection pads, make sure that the drain holes at the bottom of the ballast tray are not covered.

▷ Distribute roof protection pads evenly under the ballast trays.

Install the long ballast tray on the initial bracket or connector bracket.



▷ When several ballast trays are placed side by side:

Lay out ballast trays so that they overlap at the connector brackets or end brackets **1**.

▷ Die Ballastwanne an den Stützen mit Furchenschrauben festschrauben **2**.

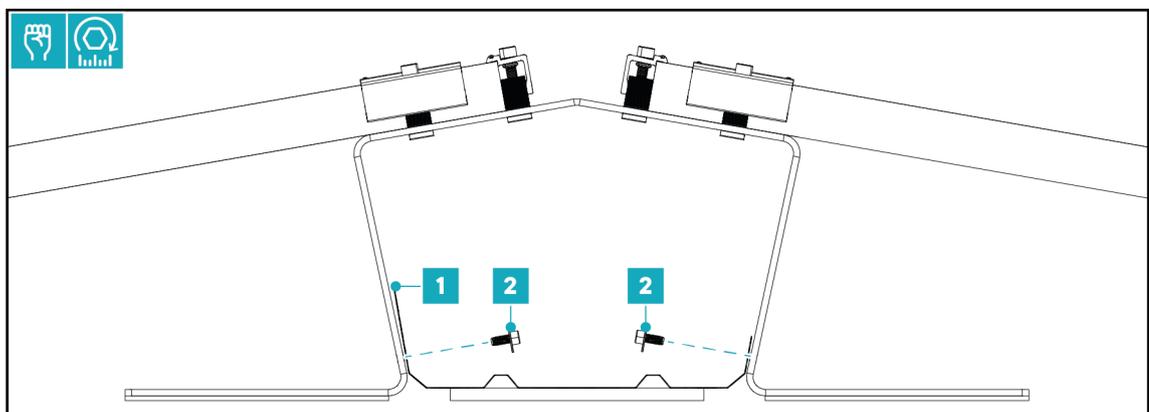
▷ Tighten the screws with 15 Nm or 11 ft lb.

▷ If specified in the planning documents (optional):

Screw the bottom of the ballast trays to the connector brackets or end brackets.

▷ Tighten the screws with 15 Nm or 11 ft lb.

Install long ballast tray on center support



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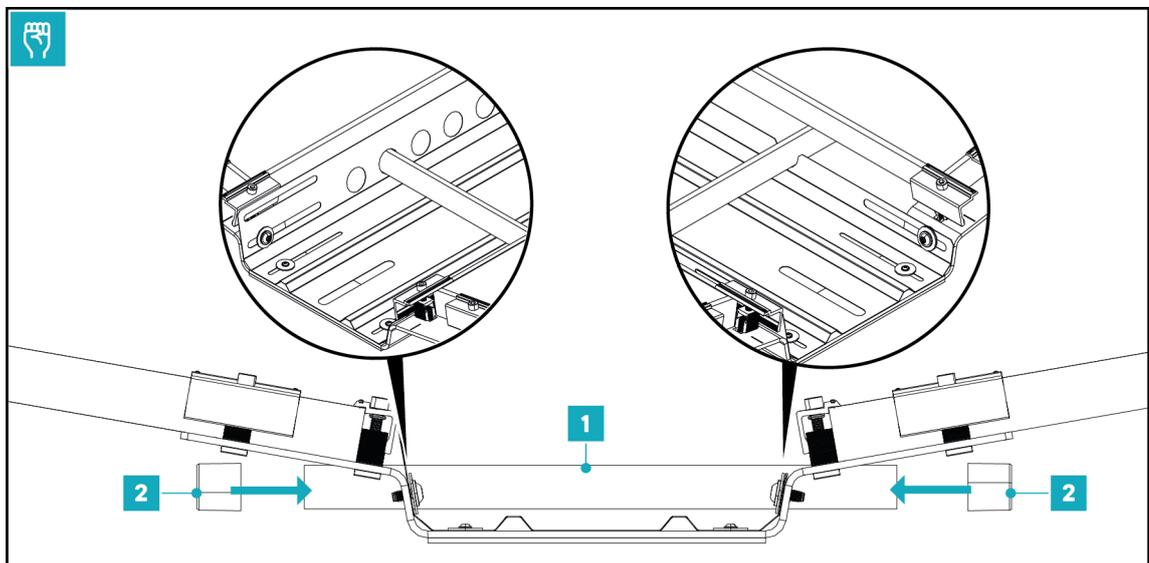
- ▶ Place the ballast tray **1** under the middle bracket.
- ▶ Die Ballastwanne an den Mittelstützen mit Furchenschrauben festschrauben **2**.

Installing cable pipe assembly (optional)

i The cable pipes can be installed at the edges or interior of the module field.

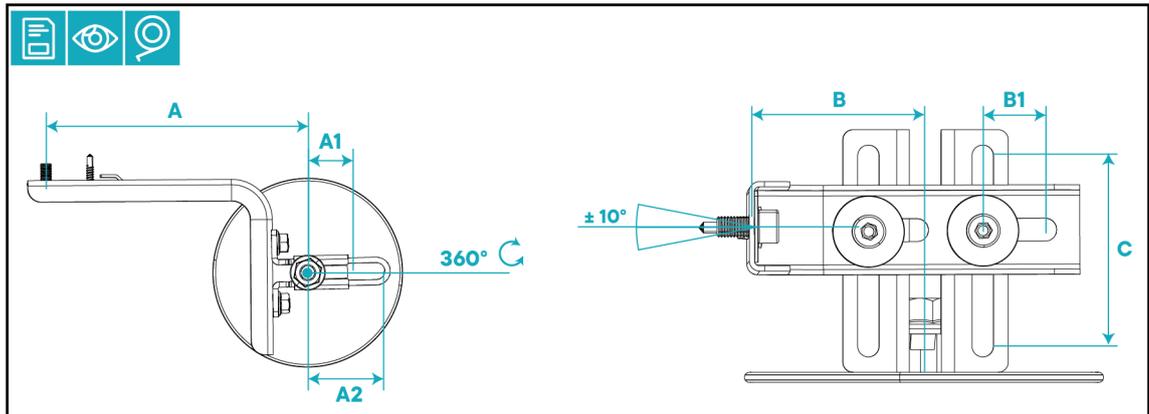
i Depending on the situation, the cable pipe is installed through the long ballast tray or with the brackets provided.

Slide the cable pipe through the appropriate hole on the ballast tray



- ▶ Attach the cable pipe **1** to the ballast tray.
- ▶ Attach the plastic caps to the cable pipe **2**.

Position the Mechanical Attachments

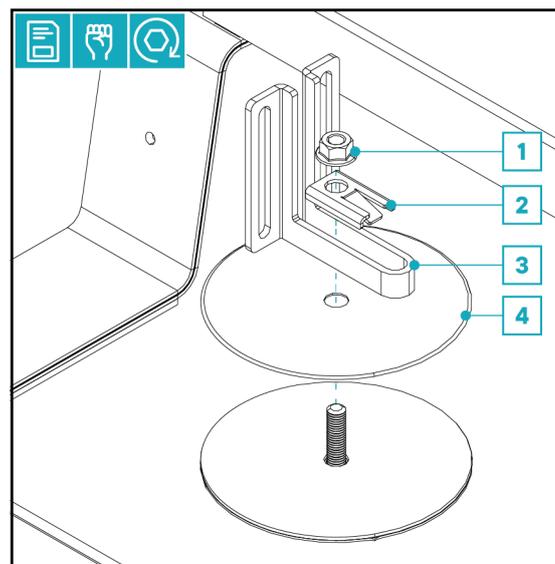


i AEROTOOL marks only the components on which the mechanical attachments are mounted.

- ▣** Determine the exact position of the mechanical attachment according to the following dimensions/tolerances:
 - A: 218 mm / 8.58 inch
 - A1: 0 - 30 mm / 0 - 1.18 inch
 - A2: 64 mm / 2.52 inch
 - B: 66 - 89 mm / 2.60 - 3.50 inch
 - B1: 28 mm / 1.10 inch
 - C: 74 mm / 2.91 inch

Connect system with mechanical attachments

i The connection to the mechanical attachments can be mounted together with the wind deflectors and/or ballast trays.

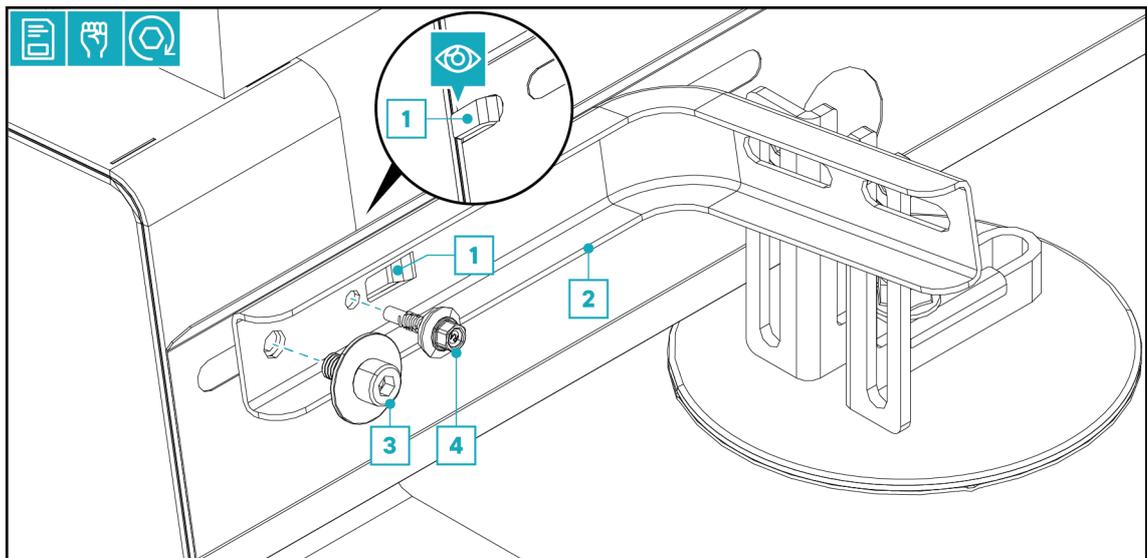


i The nut **1** is not included in the scope of delivery and must be provided by the customer.

- ▣** Place washer **4**, bracket **3** and spacer **2** onto mechanical attachment hardware.

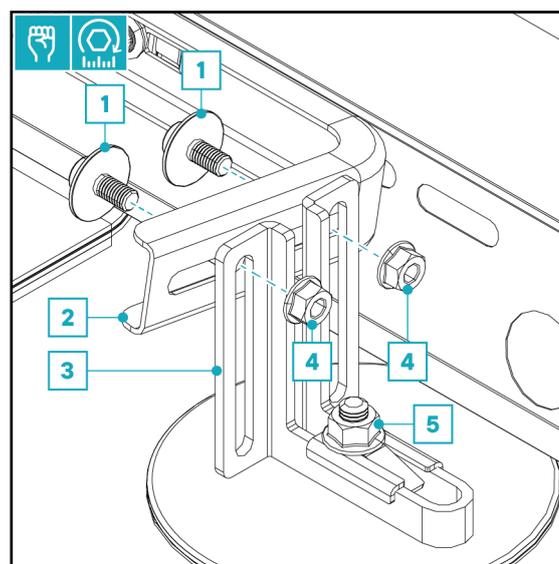
i Make sure that the tab of the spacer **2** is facing outwards.

- ▣** Hand-tighten the components with the nut **1**.



i For chip-free mounting of the anchor point attachment, use the bracket / connector bracket (S...-TF...) with additional holes and a thin sheet metal screw.

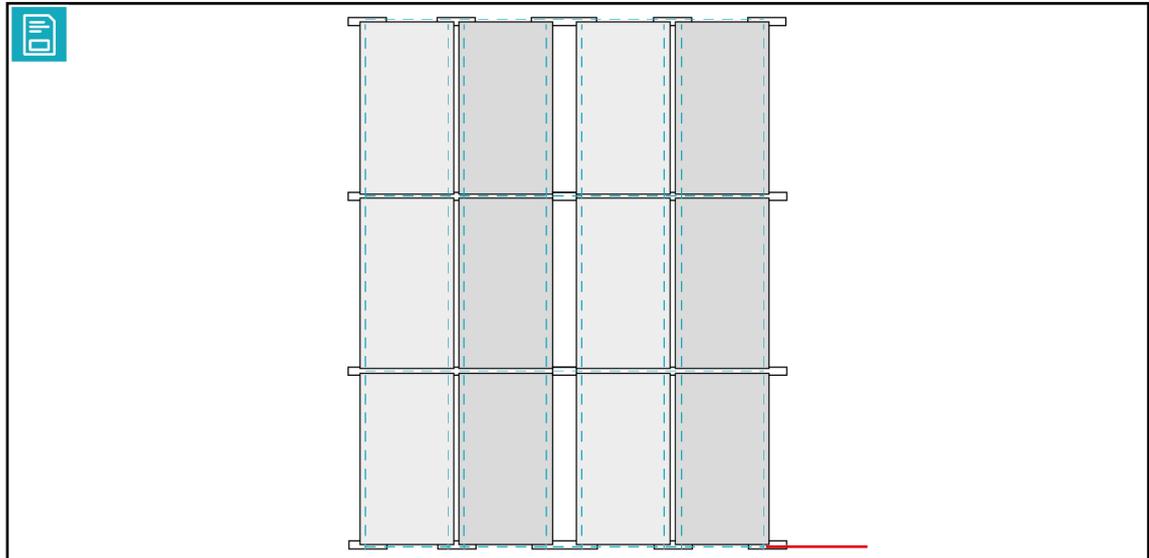
- ▶ Attach the angle connection **2** to the bracket / connector bracket.
- ▶ Make sure that the tab **1** is positioned on the side of the bracket / connector bracket.
- ▶ If necessary, move the wind deflector so that the tab **1** protrudes through the slotted hole of the wind deflector. The wind deflector and the angle connection **2** must be placed flush on the bracket/connector bracket.
- ▶ Fasten the angle connection **2** to the bracket / connector bracket using the furrow screw **3** and the self-tapping screw or thin-head screw **4**.
- ▶ Remove any possible metal shavings from the roof membrane.



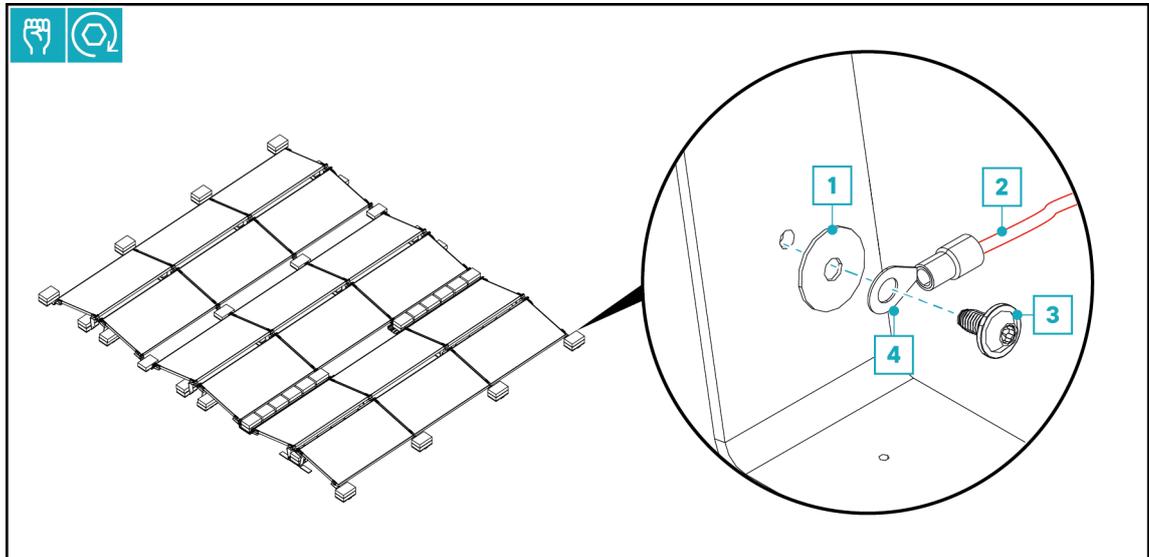
- ▶ Position the angle connection **2** and the bracket **3** flush against each other.
- ▶ Connect the angle connection **2** and the bracket **3** to each other at the slotted holes using the furrow screws **1** and nuts **4**.
- ▶ Tighten the nuts **4** and bolts **5** to 11 ft-lb (15 Nm) each.

Bonding and Grounding

i The modules of an array field are bonded to each other by the module clamps and brackets/ connector brackets.



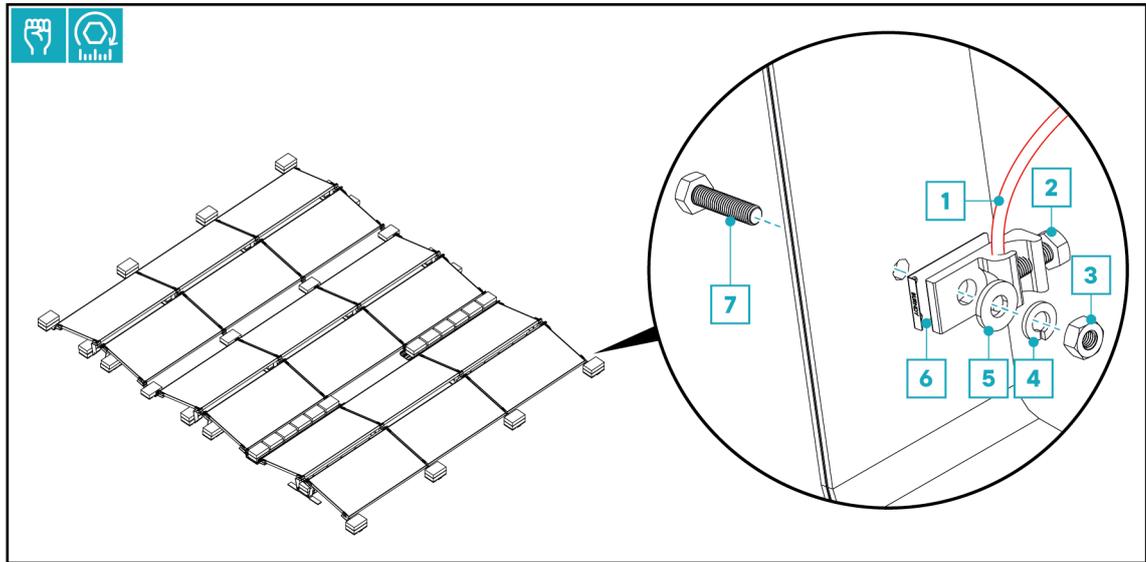
Install grounding/ bonding equipment (not USA-compliant)



i The grounding / potential equalization is mounted at the edge of a module field on a bracket.

- Loosen and remove screw **3**.
- Connect ground wire **2** firmly to cable lug **4**.
- Attach washer **1** and cable lug **4** in the order shown with the screw **3**.
- Tighten the screw **3**.

Mount grounding / bonding equipment (USA-compliant)



i The grounding / potential equalization is mounted at the edge of a module field on a bracket.

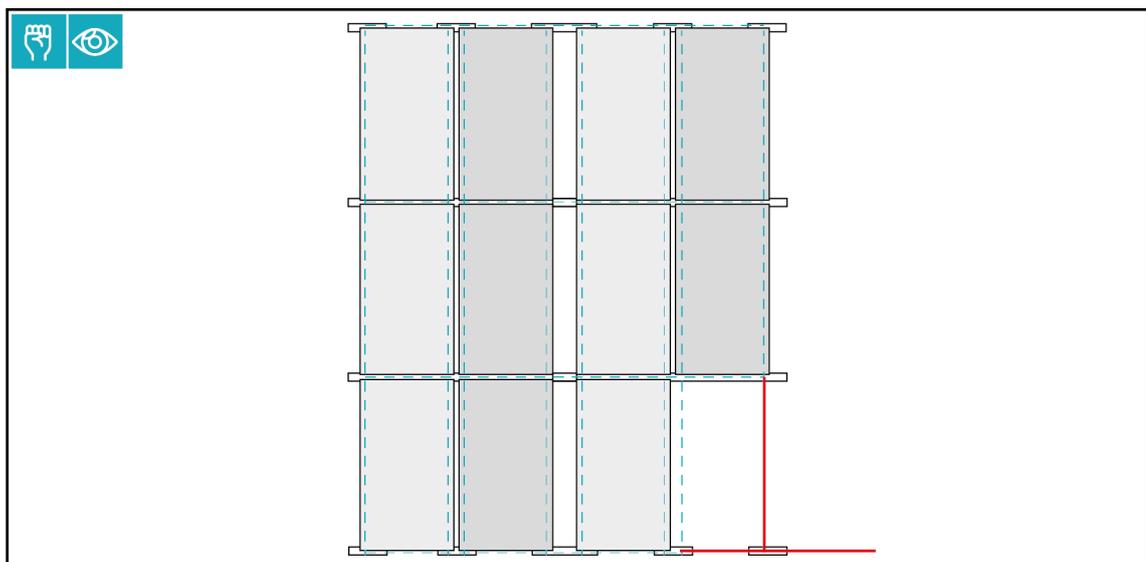
i The grounding / potential equalization can be mounted together with the ballast trays.

- Mount the grounding lug **6** at the bracket using the screw **7**, washer **5**, split ring **4** and nut **3**.
- Attach an appropriately sized copper grounding wire (provided by customer) **1** to the grounding lug with the screw **2**.

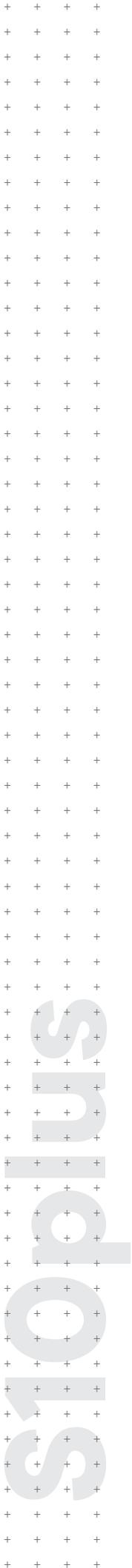
Potential equalization during maintenance

i Attention!

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.



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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.

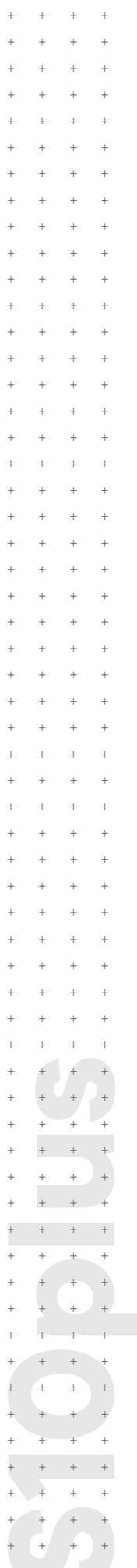
A test of the system is necessary after severe weather events (e.g. wind storm, snow, hail, etc.) as well as after extreme events such as a hurricane or earthquake.

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.

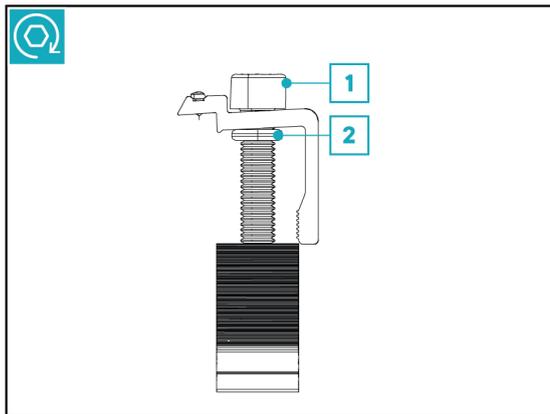


DISMANTLING

Disassemble components

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

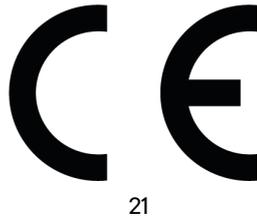
Dismantle clamps



- ▶ 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 S10plus



Manufacturer: **AEROCOMPACT®**
 Designation: **CompactFLAT S10plus East/West system for flat roofs**
 Identification code: **S10plus**
 Applied standard: **EN 1090**
 Certification body: **2397**



[To the declaration of performance](#)

UL Certification Notes

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

The CompactFLAT S 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. 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).

For compliance with a Fire Class A rating, the CompactFLAT S systems have to be installed with type 1 or type 2 PV modules over a fire-resistant roof covering rated for the application (UL 2703, 26.3B).

Load Ratings

The CompactFLAT S05, S10, and S15 system design load ratings for a 72 cell PV module are:

- Upward: 29.2 psf / 1.4 kPa
- Downward: 45.9 psf / 2.2 kPa
- Down-slope 8.0 psf / 0.4 kPa

Tested loads:

- Upward: 43.9 psf / 2.1 kPa
- Downward: 68.9 psf / 3.3 kPa
- Down-slope: 12.0 psf / 0.6 kPa



The CompactFLAT S10+ system design load ratings for a 72 cell PV module are:

- Upward: 29.2 psf / 1.4 kPa
- Downward: 45.9 psf / 2.2 kPa
- Down-slope 8.0 psf / 0.4 kPa

Tested loads:

- Upward: 43.9 psf / 2.1 kPa
- Downward: 68.9 psf / 3.3 kPa
- Down-slope: 12.0 psf / 0.6 kPa

The CompactFLAT S05 Alpine, S10 Alpine, and S15 Alpine system design load ratings for a 72 cell PV module are:

- Upward: 29.2 psf / 1.4 kPa
- Downward: 91.9 psf / 4.4 kPa
- Down-slope 8.0 psf / 0.4 kPa

Tested loads:

- Upward: 43.9 psf / 2.1 kPa
- Downward: 137.8 psf / 6.6 kPa
- Down-slope: 12.0 psf / 0.6 kPa

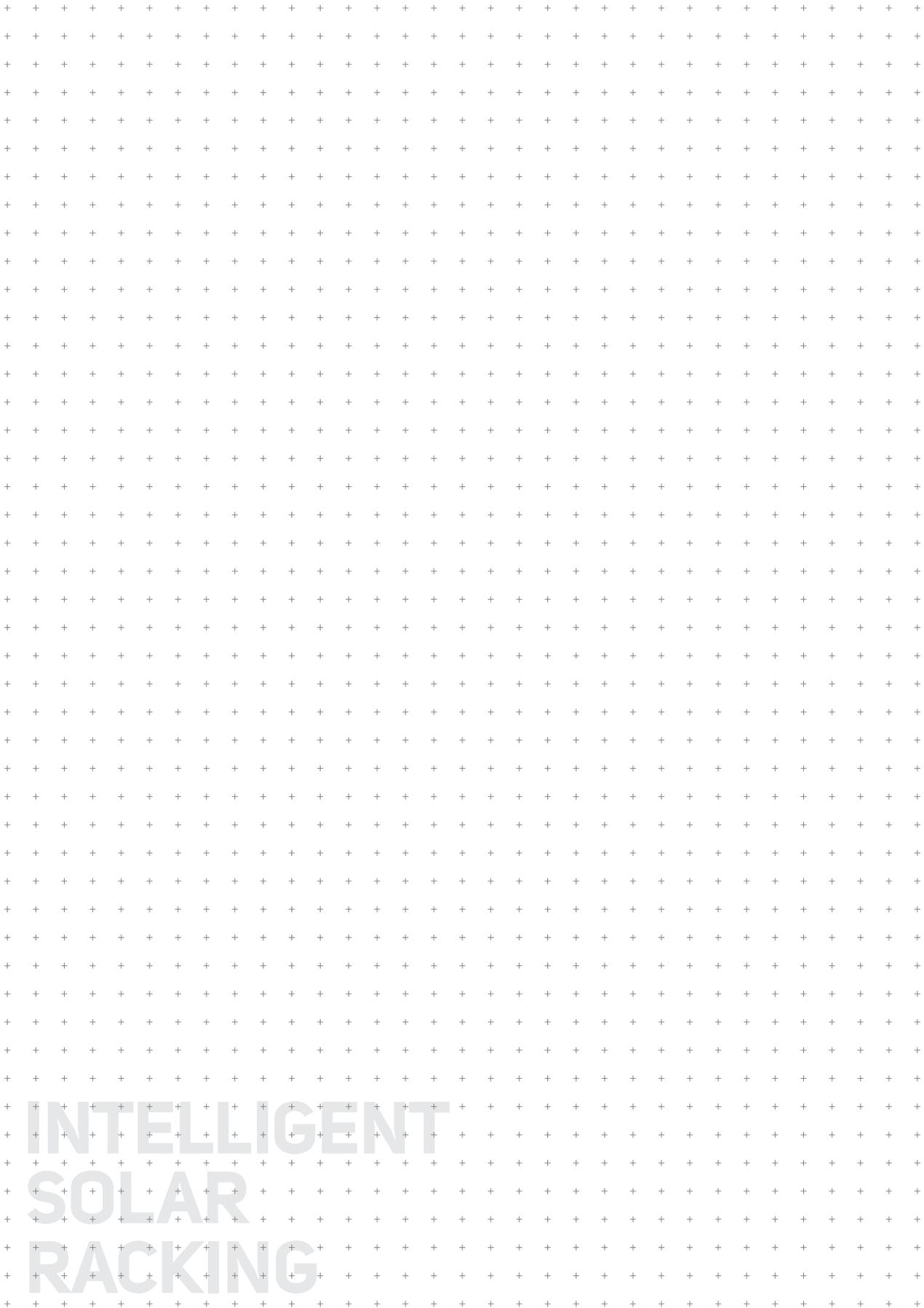
The CompactFLAT S10+ Alpine system design load ratings for a 72 cell PV module are:

- Upward: 29.2 psf / 1.4 kPa
- Downward: 91.9 psf / 4.4 kPa
- Down-slope 8.0 psf / 0.4 kPa

Tested loads:

- Upward: 43.9 psf / 2.1 kPa
- Downward: 137.8 psf / 6.6 kPa
- Down-slope: 12.0 psf / 0.6 kPa

Notes



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