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Assembly Instruction

## COMPACTMETAL TL/TLE

Version : 3.4

Language : English

Important! Read carefully before installation!

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## **Legal Notice**

Subject to change due to technical modifications! 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. Therefore, in case of doubt or contradiction, the authentic German version shall prevail. The installation instructions are protected by copyright. The installation instructions may not be copied, reproduced, microfilmed, translated or converted for storage and processing in computer systems, either in part or in full, without the written permission of AEROCOMPACT Europe GmbH

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## **Creation date**

11/2024

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# GENERAL

These assembly instructions describe the assembly procedure and must be strictly adhered to. Read these installation instructions carefully before starting installation. The basic prerequisite for safe working is compliance with all the safety and handling instructions in these installation instructions. In addition, the local accident prevention regulations and general safety regulations for the area of application of the product apply. Illustrations in these instructions are for basic understanding and may differ from the actual design.

## APPLICABLE DOCUMENTS

In addition to this manual, you have received an AEROTOOL project report, planning documents and drawings. Always comply with the instructions and notes contained therein.

## LIMITATION OF LIABILITY

All information and instructions in these assembly instructions have been compiled taking into account the applicable standards and regulations, the state of the art and our many years of knowledge and experience. Liability provisions are stated in our **terms** and can be accessed at [www.aerocompact.com/downloads](http://www.aerocompact.com/downloads).

## EXPLANATION OF SYMBOLS

### SYMBOLS FOR INSTRUCTIONS



Prerequisites for action instruction



Results of action steps



Step by step action instruction



This note provides useful information for smooth installation

### SYMBOLS IN ILLUSTRATIONS - ACTIVITIES



Optional component, optional mounting variation



Activity by hand



Check AEROTOOL project report or planning documents



Visual inspection



Observe right angle

### SYMBOLS IN ILLUSTRATIONS - TOOLS



Measuring tape, measure



Pencil, mark



Chalk line



Scissors, tin snips, cut to size



Cordless screwdriver, screwdriver



Use a torque wrench, Observe torque



Use Allen key

# SAFETY

The following list serves as an indication of the most common safety risks that can occur when installing these products. There is no liability for the completeness of the risks presented. A specific check of the necessary safety measures must be carried out by an authorized specialist company before installation.

## APPROPRIATE USE

The TL/TLE system is designed exclusively for mounting PV modules on metal roofs. Approval from the module manufacturer is required for the use of PV modules with the TL/TLE system. AEROCOMPACT Europe GmbH accepts no liability for loss of performance or damage of any kind to the PV modules. Any other use of the TL/TLE system is considered improper use.

### NOTE ON THE PROCESSING OF THIN SHEET METAL SCREWS

**i** The installation of thin sheet metal screws with impulse or impact wrenches is not permitted. The high speeds can cause damage to the screw bodies, the flashing and the sealing. Thin sheet metal screws may **only** be used **once**, as their performance is not guaranteed if they are reused.

- Apply pressure to the thin sheet metal screw and screw in at low speed (< 500 rpm).
- Then reduce the pressure and screw in the thin sheet screw at a higher speed.

## PERSONNEL REQUIREMENTS

Installation may only be carried out by a specialist company and must be carried out strictly in accordance with the installation instructions, the project report and the planning documents. A specialist company is a company that is familiar with the installation and maintenance of photovoltaic systems as part of its normal business operations. National and local building regulations, standards and environmental protection must be complied with. Under no circumstances may the assembly personnel be under the influence of medication, alcohol, drugs or in any other condition that impairs consciousness (e.g. overtiredness). Trainee personnel may only carry out work under the instruction and supervision of specialist personnel who are authorized to train personnel.

## WORKING SAFELY

The contractual partner must ensure that the necessary safety measures and the relevant labor law and occupational safety regulations are observed when installing products from AEROCOMPACT Europe GmbH. Information from AEROCOMPACT Europe GmbH on the need to comply with security measures is provided without guarantee and without any claim to completeness and serves only to support the contractual partner. The contractual partner is obliged to inform himself about all relevant regulations concerning working safety and to comply with them. AEROCOMPACT Europe GmbH expressly assumes no responsibility and consequently no liability. Areas below the roof on which work is being carried out must be protected from falling objects. Where this is not possible, the affected areas must be closed to the public and unauthorized personnel. If the weather is unsuitable, work on the roof must not be continued for longer than necessary or must not be started at all. Never carry out installation work in strong winds. Strong winds exert particular enormous forces on the large-area PV modules. There is a risk of a module being torn off the roof and people being injured. Never work in wet conditions or at temperatures below freezing. Depending on the roof pitch, there is a risk of slipping. Only use suitable, intact and tested ladders. Set up and secure ladders according to specifications. Separate rules apply to mechanical climbing aids (elevators, cherry pickers, etc.). Never use the PV mounting system as a climbing support. Keep sufficient distance from overhead power lines. Equipotential bonding between the individual system components must be carried out in accordance with the respective country-specific regulations. When cutting materials to size, make sure there are no burrs, especially on edges and corners where there is a risk of injury.

# BREAKTHROUGH PROTECTION

Roof windows, skylights, large ventilation flaps, etc. generally cannot withstand the weight or impact of a person. Such objects must be secured in a similar way to the roof edge. Corrugated fiber-cement roofs can be at risk of breakthrough over the entire surface. Define routes and secure them with load distribution measures. Always use load distribution aids on roof coverings or roof structures (e.g. thin sheet metal, corrugated fiber cement) with insufficient load-bearing capacity.

# PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment is used to protect people from health and safety hazards at work. Personnel must wear personal protective equipment during installation. Personal protective equipment is explained below:



**Wear safety goggles when drilling and sawing**



**Wear cut-resistant work gloves during assembly**



**Wear safety shoes**



**Use fall protection**



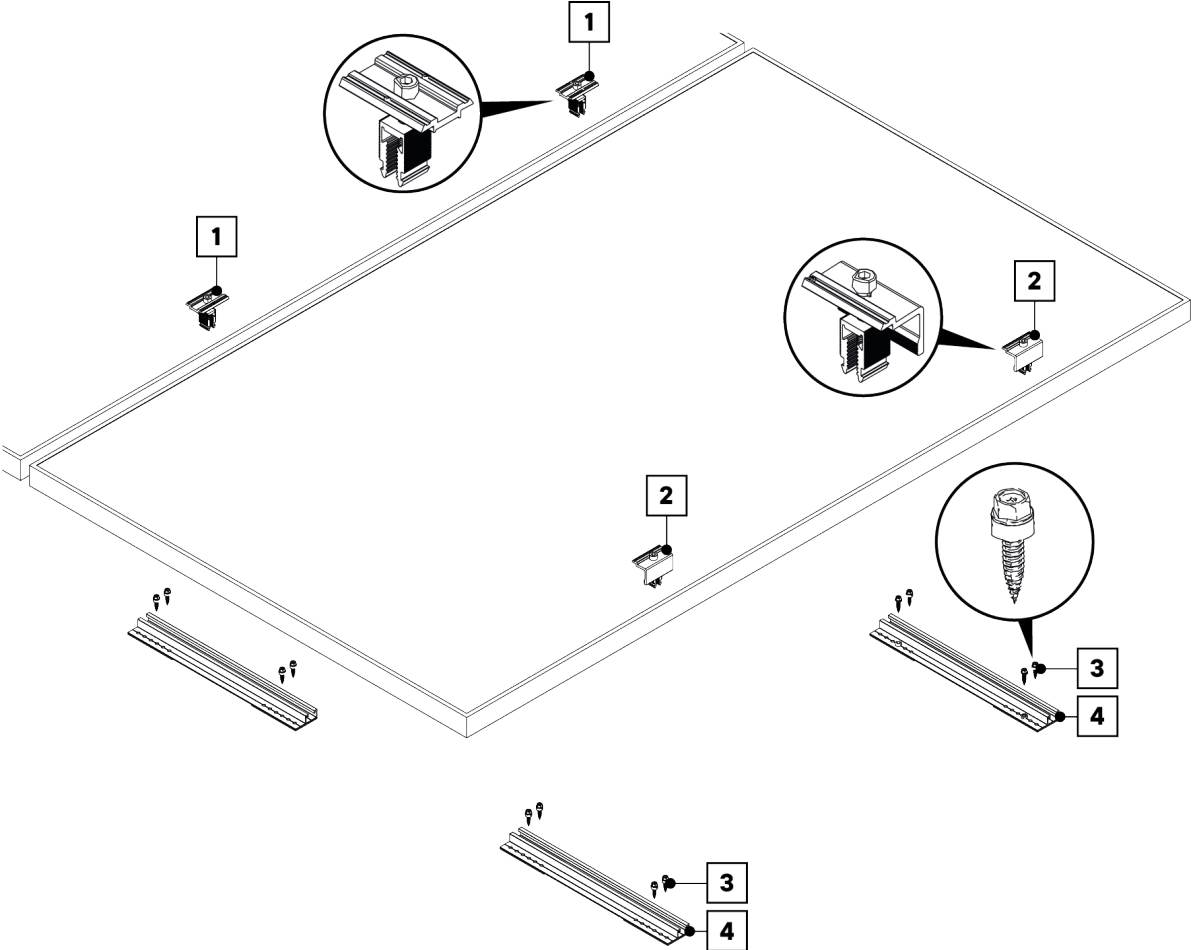
**Helmets must be worn by all persons working on the construction site**



**Wear hearing protection**

# SYSTEM OVERVIEW

## BASIC COMPONENTS TL25/TL38



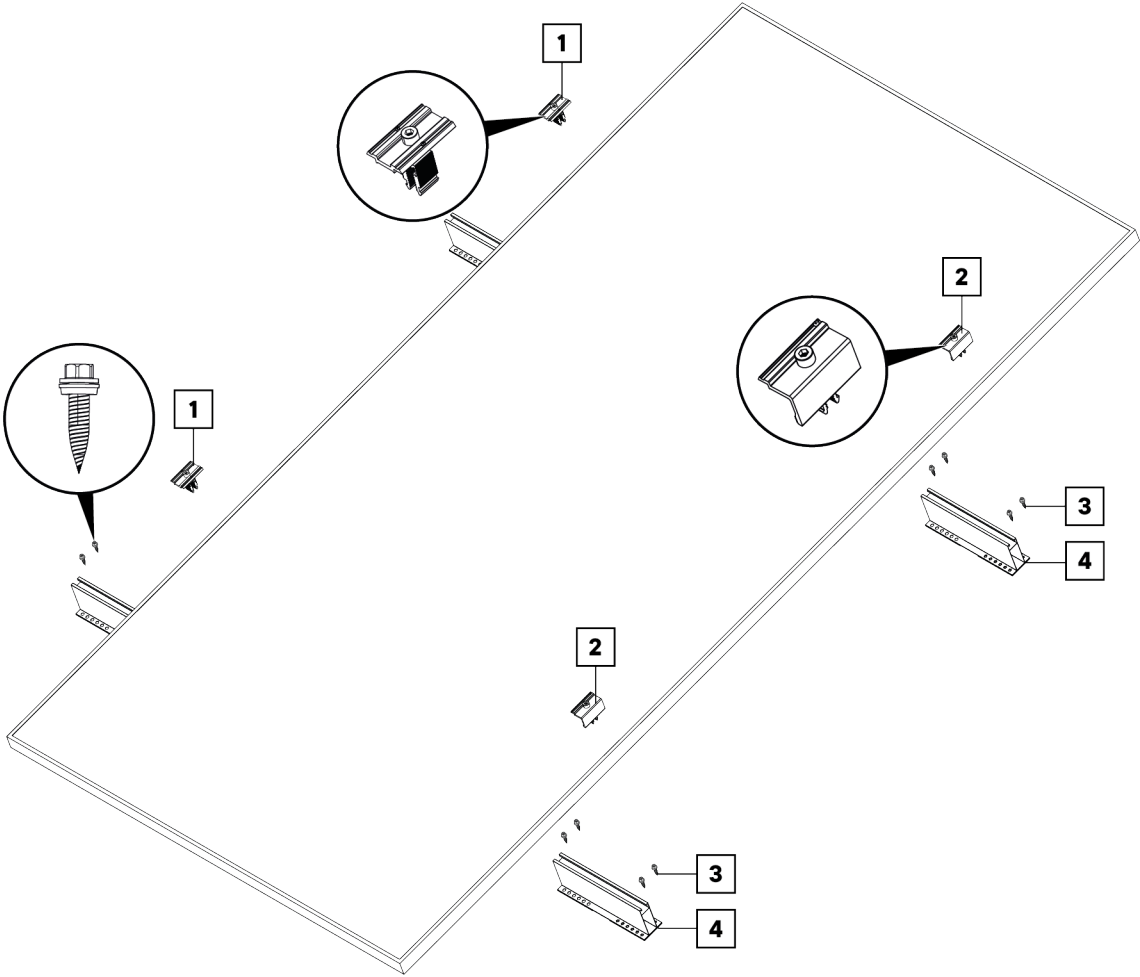
- 1 CLM10**  
Middle clamp Click 30 - 46 mm
- 3 MSS 6x25\***  
Metal sheet screw 6x25

- 2 CLE10**  
End clamp Click 30-46
- 4 TL25 | TL38**  
Trapezoidal sheet bridge | 250, 380 (mm)

\* This component is intended for single use only.



# BASIC COMPONENTS TLE25/38



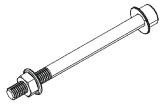
- 1 CLM10**  
Middle clamp Click 30 - 46 mm

**3 MSS 6x25\***  
Metal sheet screw 6x25
- 2 CLE10**  
End clamp Click 30-46

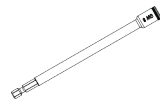
**4 TLE25 | TLE38**  
Trapezoidal-sheet bridge elevated 250 mm | 380 mm

\* This component is intended for single use only.

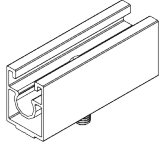
## SYSTEM ACCESSORIES



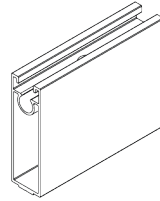
**LSP**  
Safety bolt kit



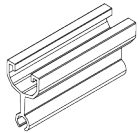
**BIT8SL**  
Socket bit SW8 x 150mm



**EL05**  
Height adapter 33 mm



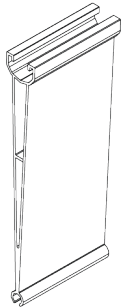
**EL10**  
Height adapter 83 mm



**PS**  
Front tilt adapter 20 mm



**PM**  
Tilt adapter rear 100 mm

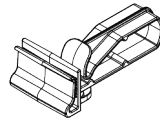


**PL**  
Tilt adapter rear 180 mm

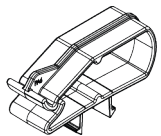
## MODULE ACCESSORIES



**CLP-M**  
Cable tie clip for module frames with a thickness of 1 - 3 mm

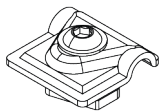


**CLP-U**  
Cable clip universal



**CLP-R**  
Cable clip rail

## POTENTIAL EQUALIZATION

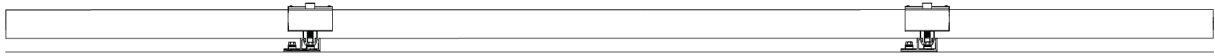


**WCL8-10**  
Wire clamp 8 - 10 mm

## INSTALLATION OPTIONS

**i** The following illustrations show the different mounting variants of the modules with the system.

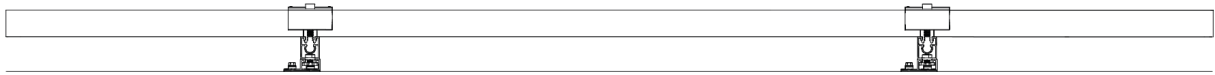
### TL25/TL38



### TLE25/TLE38

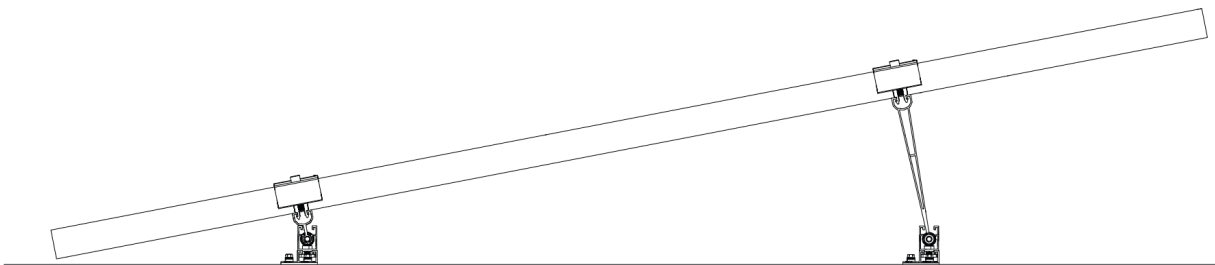


### TL25/TL38 + EL05/EL10



### TL25/TL38 + EL05 + PS/PM/PL

**i** The use of the **EL10** height adapter in combination with the **PS/PM/PL** tilt adapters is not permitted.



Front tilt adapter 20 mm

PS Pitch

Tilt adapter rear 100 mm

PM Pitch

Tilt adapter rear 180 mm

PL Pitch

# ASSEMBLY

## ASSEMBLY PREPARATION

### Required tools for assembly

**i** Before starting the assembly, make sure that the assembly personnel are familiar with the proper use of the listed tools.



**Bit hexagon socket 6 mm**



**Socket bit 6 mm**



**Torque wrench 10 - 30 Nm with hexagon socket bit 6mm**

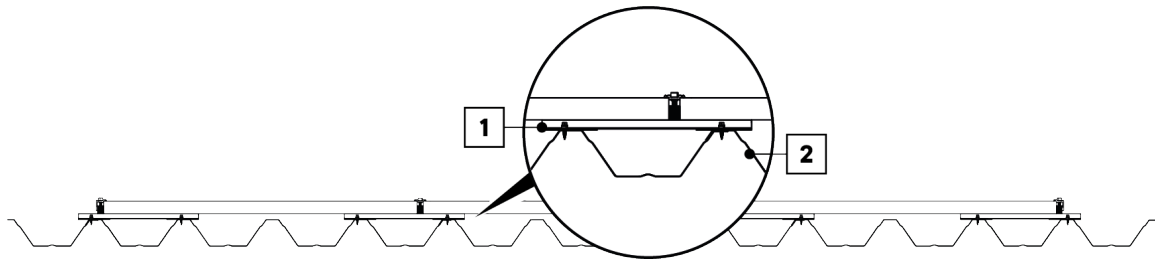


**Cordless screwdriver**

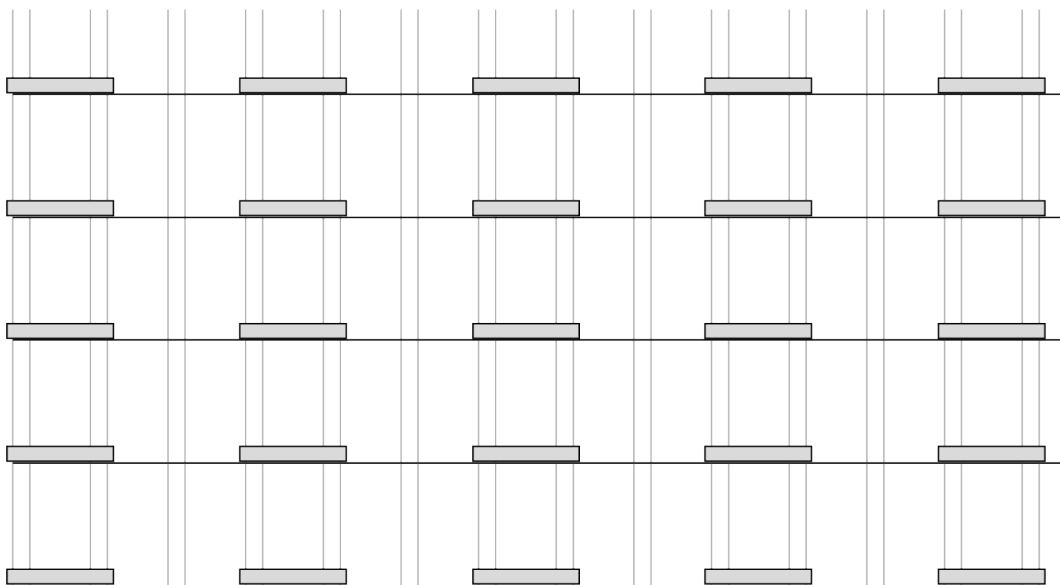


**Measuring tape**

## MEASURE AREA



**i** The trapezoidal sheet metal bridge (1) is bolted to two high ribs (2). The distance between the rails depends on the width/length of the modules and the distance between the high ribs.

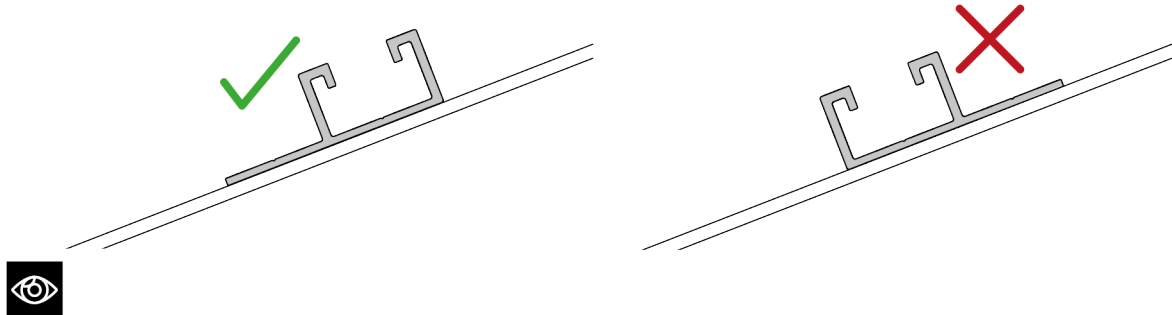


- Take over the dimensions of the module field from the Aerotool planning documents.
- Determine module dimensions.
- Determine the distances between the ribs.
- Determine and mark the positions of the rails.

## MOUNT TL

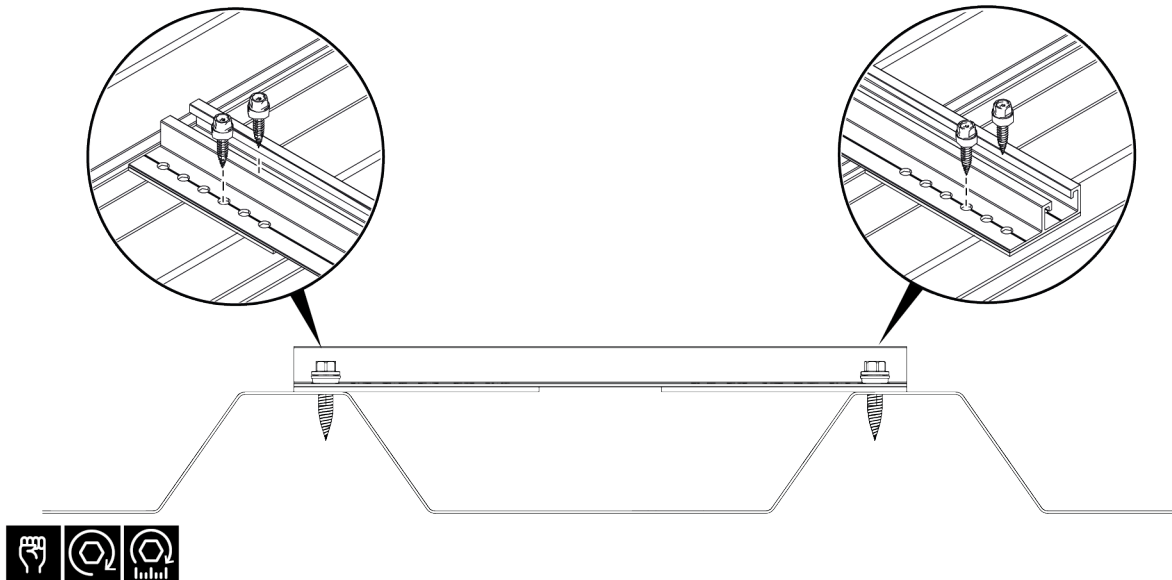
**i** The TL is available in lengths of **250 mm** and **380 mm**; the appropriate TL is selected in the planning software depending on the spacing.

### ALIGNMENT



➤ Mount the protruding side of the trapezoidal sheet metal bridge in the direction of the eaves.

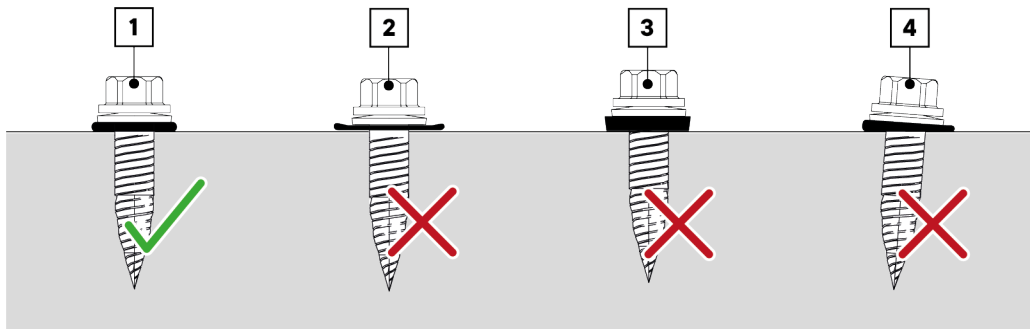
### FASTENING



- Position the trapezoidal sheet metal bridges in accordance with the planning documents.
- Use suitable holes depending on the distance between the high ribs.
- Fasten each trapezoidal sheet metal bridge with 4 sheet metal screws, using 2 screws on each side.
- Screw in the screws until the sealing washer is visibly in place. The sealing washer must be compressed by approx. 30%.

## TIGHTEN METAL SCREWS WITH ATTACHED EPDM WASHER

**i** The sealing washer must be compressed by approx. 30 %.



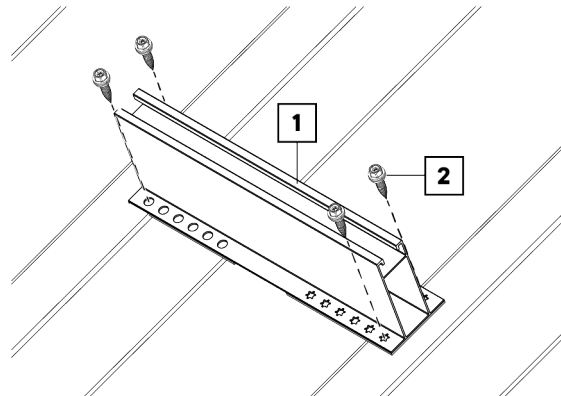
(1) Correct | (2) Tightened too tight | (3) Tightened too weak | (4) Tightened too diagonally

## MOUNT TLE

**i** The TLE is available in lengths of **250 mm** and **380 mm**; the appropriate TLE is selected in the planning software depending on the bead spacing.



- Place the TLE (1) between the two ribs so that a screw connection is possible on both ribs.
- Screw in the thin sheet metal screws (2) as shown in the illustration.



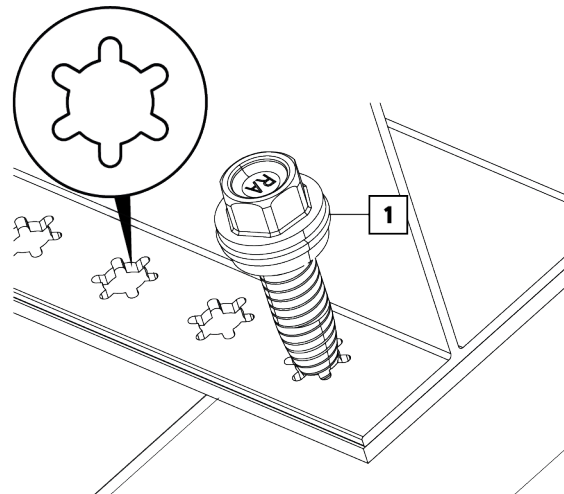
## STARHOLE TLE



**i Important:**

The starhole ensures conductivity between the TLE and the trapezoidal sheet by using the screw (1). Additional bonding through grounding lugs and bonding jumpers is required.

**i** Further information on equipotential bonding can be found in the chapter "Potential equalization" on page 26

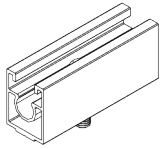




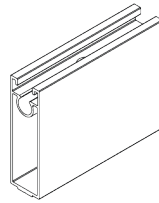
## MOUNT HEIGHT ADAPTER (OPTIONAL ONLY WITH TL)

**i** The **EL05** height adapter is used to tilt the modules. The **EL10** height adapter is used to maximize the distance between the roof surface and the modules.

### HEIGHT ADAPTER VARIANTS



**EL05**  
Height adapter 33 mm

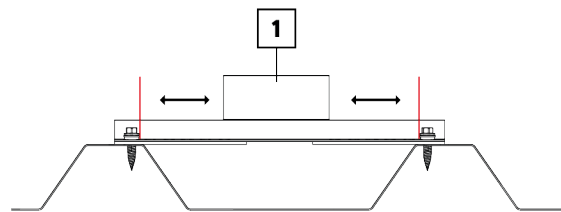


**EL10**  
Height adapter 83 mm

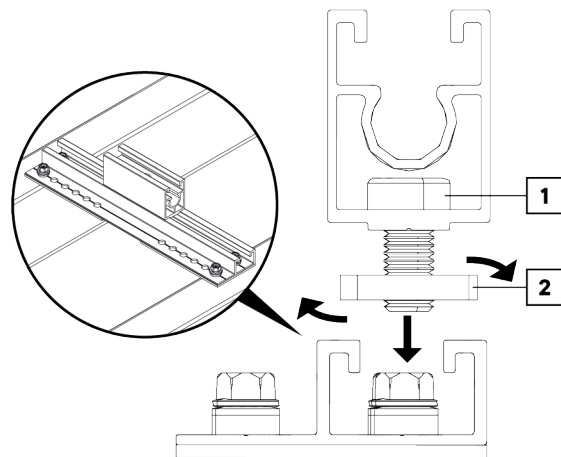
### ASSEMBLY



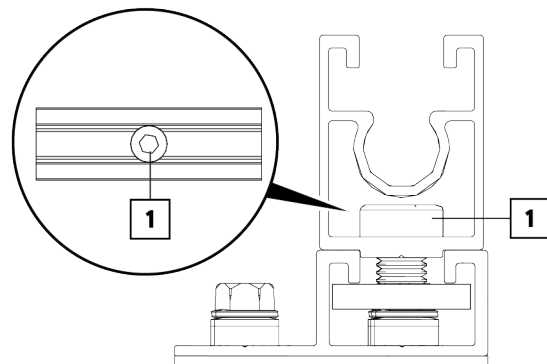
**i** The position of the height adapters (1) on the trapezoidal sheet metal bridge must be determined according to the module size. Make sure that the height adapters are mounted between the fixing screws as shown in the illustration.



**▷** Mount the height adapter (1) to the trapezoidal sheet metal bridge: Insert the hammer head (2) into the mounting channel.



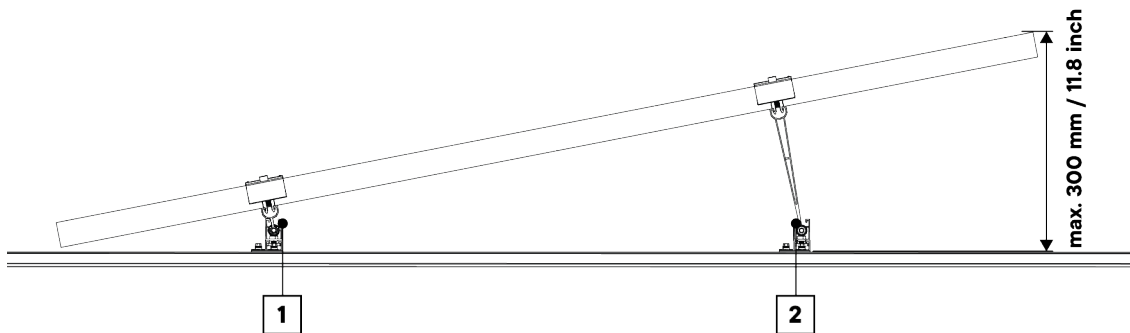
**▷** Tighten the screw (1) with a torque of 15 Nm or 11 lb-ft.



## MOUNT TILT ADAPTER (OPTIONAL ONLY WITH TL)

### MOUNTING VARIANTS

The tilt adapters can be used to tilt the modules from 5 ° to 15 °.



- (1) Front: Height adapter **EL05** with tilt adapter **PS**
- (2) Rear: Height adapter **EL05** with tilt adapter **PM | PL**

**i** The height of the elevation must not exceed 300 mm or 11.8 in.

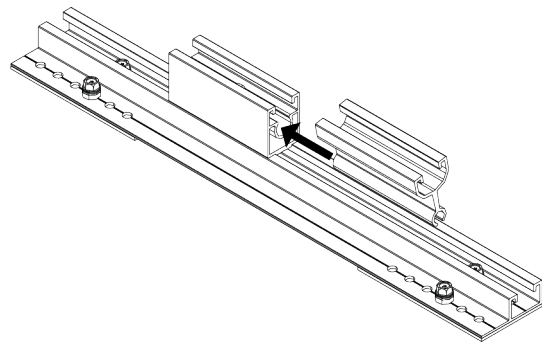
### Assembly

**i** **IMPORTANT!** The tilt adapters are only fitted in combination with the **EL05** height adapter.

#### VARIANT PS



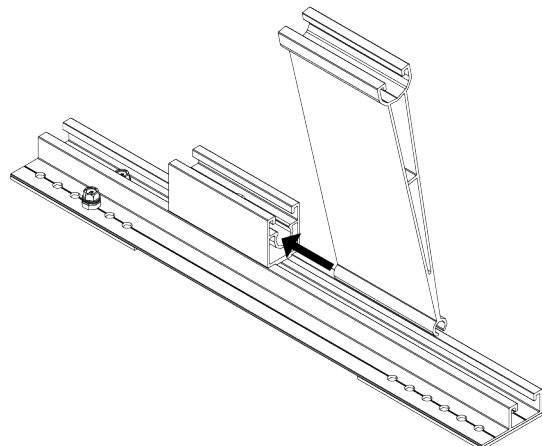
- Attach the tilt adapter to the height adapter EL05 as required.



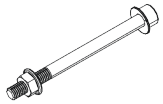
#### VARIANT PM | PL



- Attach tilt adapter to EL05 height adapter as required.



## LSP locking set



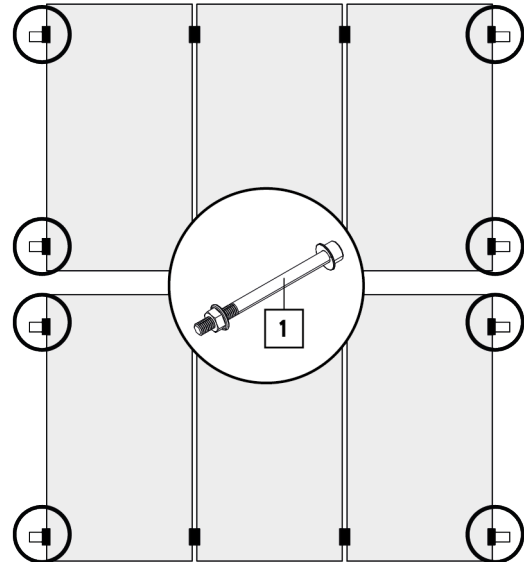
**LSP**  
Safety bolt kit

### POSITION LSP LOCKING SET

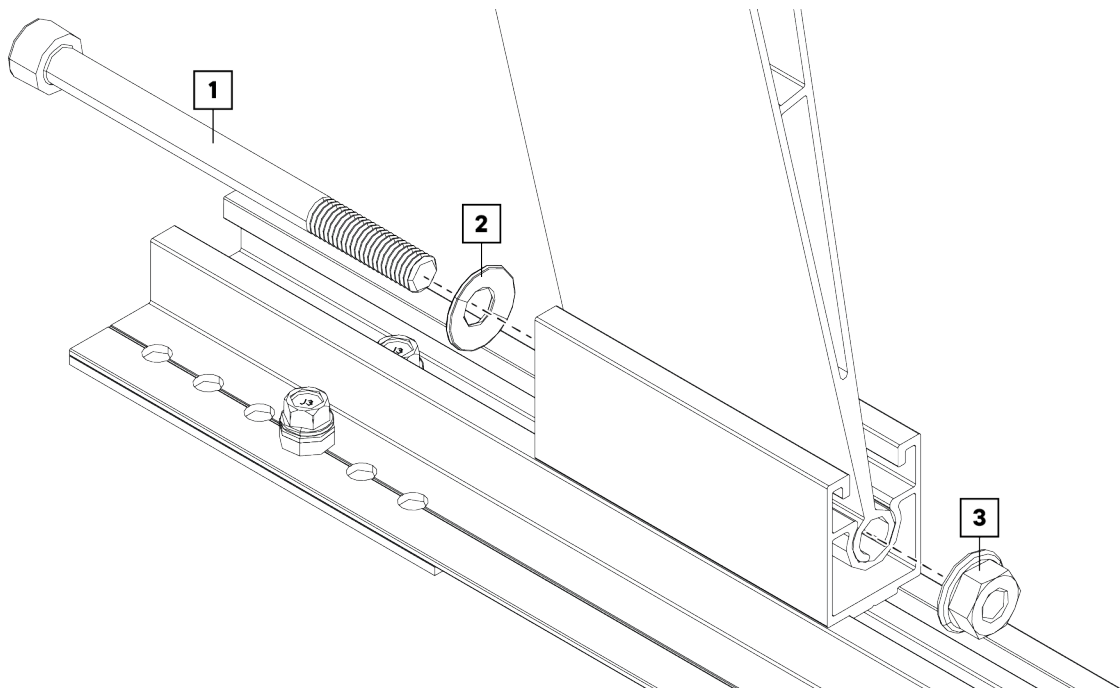


1 The LSP locking SET (1) is used to secure the **PS**, **PM** and **PL** tilt adapters.

2 The LSP locking SET (1) must be mounted on all tilt adapters to which an end clamp is attached.



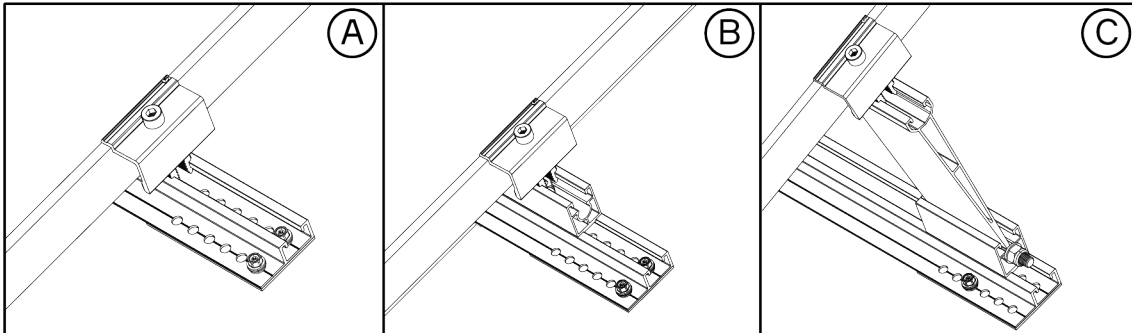
### ASSEMBLY LSP



- 2 Insert the screw (1), washer (2) and nut (3) as shown in the illustration.
- 2 Then tighten the nut (3) to a torque of 10 Nm or 7.38 lb-ft.

# MOUNT MODULES

## MODULE MOUNTING VARIANTS



**A** - Mounting the modules on the trapezoidal sheet metal bridges or elevated trapezoidal sheet metal bridges

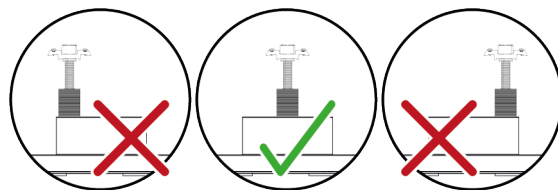
**B** - Mounting the modules on the height adapters

**C** - Mounting the modules on the height adapters and tilt adapters

## INSTALLATION OF END AND MIDDLE CLAMPS FOR HEIGHT ADAPTERS

**i Important:**

When installing the modules, the middle and end clamps must be positioned as centrally as possible on the height adapters.



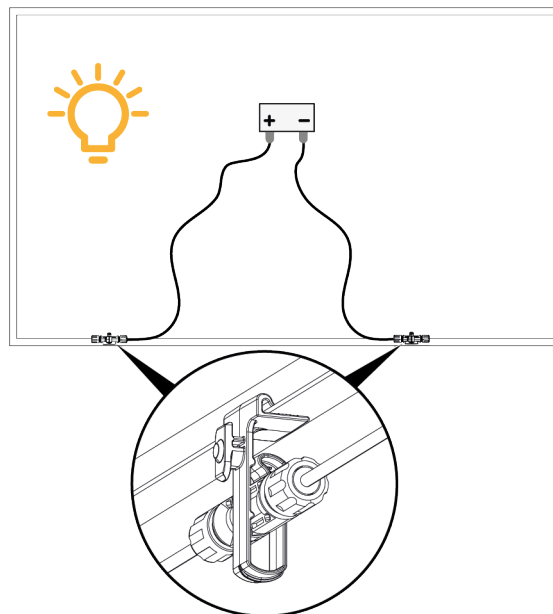
## RECOMMENDATION FOR WIRING THE MODULES



**i Installation tip:**

Before starting the module installation, install two CLP-U per module as shown in the illustration to ensure better accessibility for the subsequent cabling.

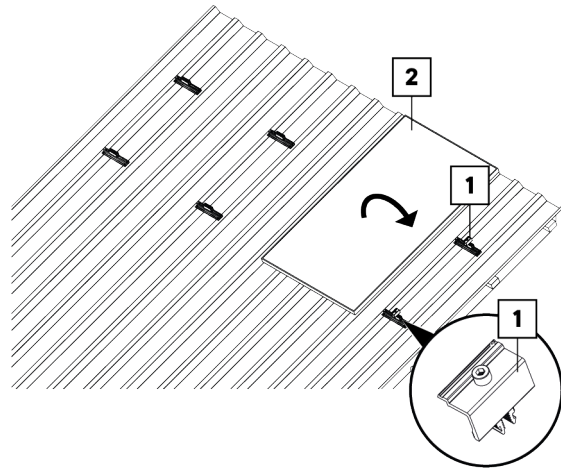
**➤** If necessary, slide the CLP-U cable clips out of the clamping area.



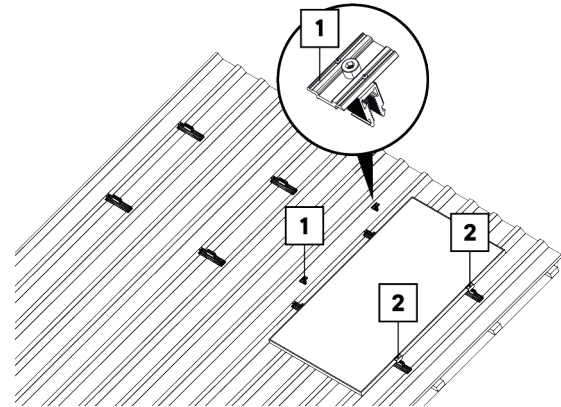
## MOUNT THE FIRST MODULE ROW



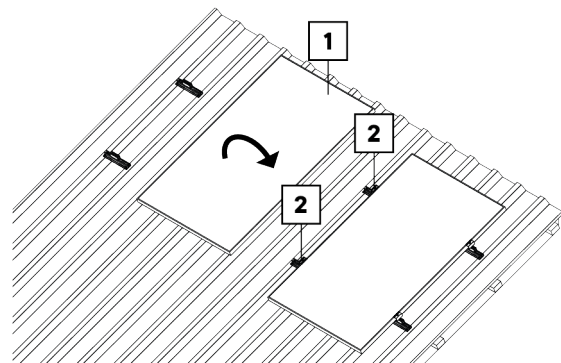
- ▶ Click in the end clamps at the edge of the module field - **2 to 3 threads, do not screw tight.**
- ▶ Place the first module (1).



- ▶ Click in the middle clamps (1) flush with the module - **2 to 3 threads, do not screw tight.**
- ▶ Tighten the end clamps (2) with a torque of 15 Nm or 11 lb-ft.

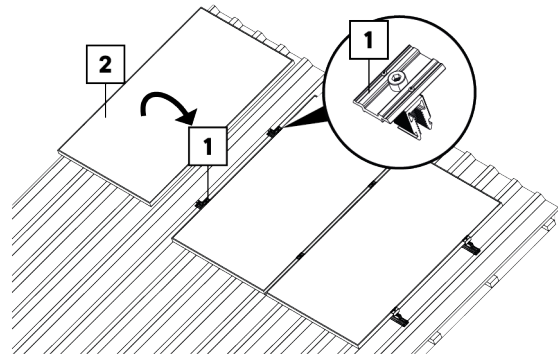


- ▶ Place the second module (1).
- ▶ Tighten the middle clamps with a torque of 15 Nm or 11 lb-ft.



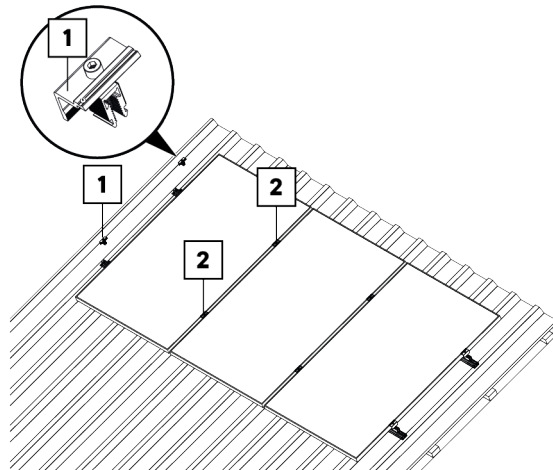


- ▶ Click in the middle clamps (1) flush with the module - **2 to 3 threads, do not screw tight.**
- ▶ Position the third module (2) so that the middle clamps (1) are flush with the module.



- ▶ Click in the end clamps (1) flush with the module.
- ▶ Tighten the end clamps (1) and middle clamps (2) to a torque of 15 Nm or 11 lb-ft.

**i** Install the other module rows in the **same sequence**.



## CABLE MANAGEMENT

### CABLE CLIP CLP-M FOR MODULES

**i** The **CLP-M cable clip** is suitable for module frames with a sheet thickness of **1 - 3 mm**.



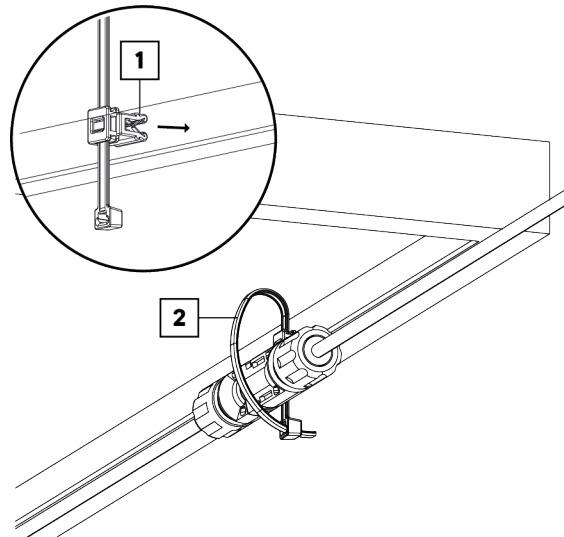
#### CLP-M

Cable tie clip for module frames with a thickness of 1 - 3 mm

#### ASSEMBLY

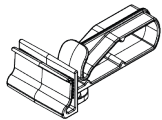


- ▶ Insert the CLP-M (1) into the module frame.
- ▶ The CLP-U is suitable for:
  - Solar plug (e.g. MC4)
  - Solar cable
- ▶ Then tighten the cable tie (2).



### CABLE CLIP CLP-U FOR MODULES

**i** The **CLP-U cable clip** is suitable for module frames with a sheet thickness of **1.5 - 3 mm**.



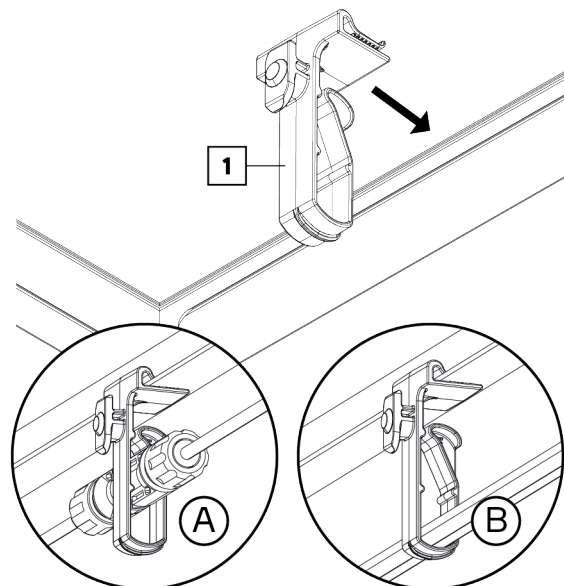
#### CLP-U

Cable clip universal

#### ASSEMBLY



- ▶ Insert the CLP-U (1) into the module frame.
- ▶ The CLP-U is suitable for:
  - A** - Solar connectors (e.g. MC4)
  - B** - Solar wire



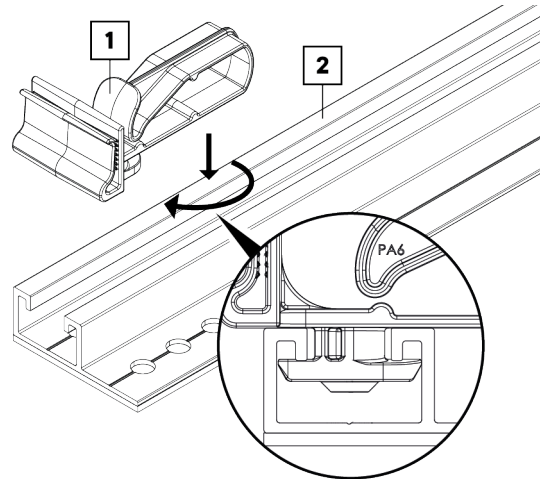
## MOUNT THE CLP-U CABLE CLIP TO THE TRAPEZOIDAL SHEET METAL BRIDGE



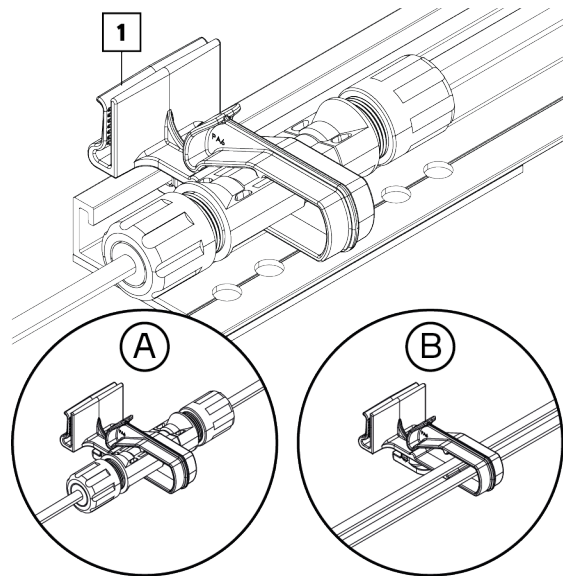
- Guide the cable clip (1) onto the trapezoidal sheet metal bridge from above.
- Rotate the cable clip by 90°.

### **i Attention:**

Make sure that the cable clip is fully engaged in the rail channel.

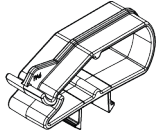


- The CLP-U (1) is suitable for:
  - A** - Solar connectors (e.g. MC4)
  - B** - Solar wire





## MOUNT THE CLP-R CABLE CLIP TO THE TRAPEZOIDAL SHEET METAL BRIDGE



**CLP-R**  
Cable clip rail

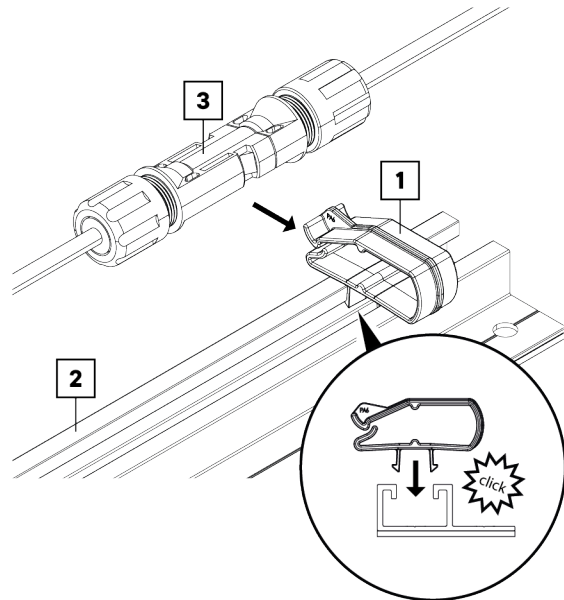
### MOUNT THE CLP-R



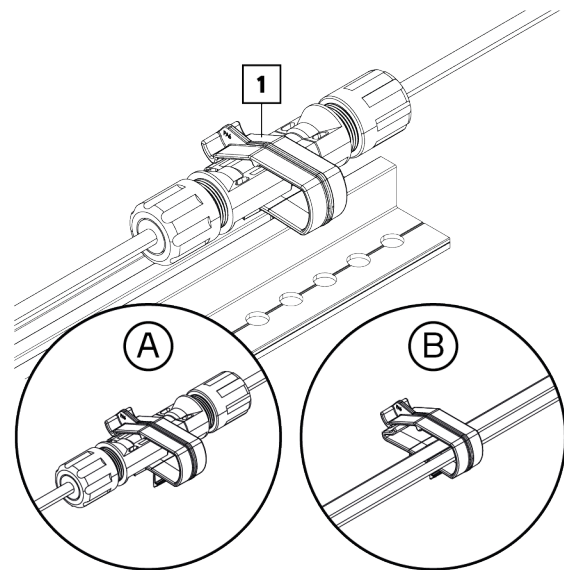
- Click the cable clip (1) into the trapezoidal sheet metal bridge (2) from above.
- Insert the solar plug (3) from the side.

#### **i Attention:**

Make sure that the cable clip is fully engaged in the rail channel.



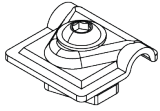
- The CLP-R (1) is suitable for:
  - A - Solar connectors (e.g. MC4)
  - B - Solar wire



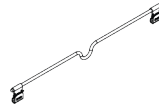
# POTENTIAL EQUALIZATION

**i** The work steps shown here refer to a **TLE25**. The work steps for **TL25**, **TL38** or **TLE38** are identical.

## REQUIRED COMPONENTS



**WCL8-10**  
Wire clamp 8 - 10 mm



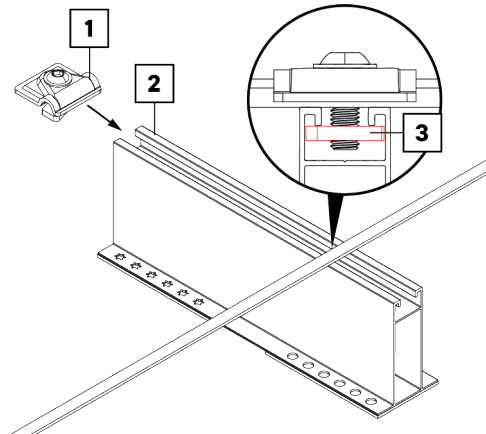
**BJ8**  
8" Bonding Jumper (approved for outdoor use and UL 467 and UL 2703 compliant)

## MOUNTING WIRE CLAMP



**i Attention:**  
The wire clamp is only intended for use with a round wire with a diameter of **8-10 mm**.

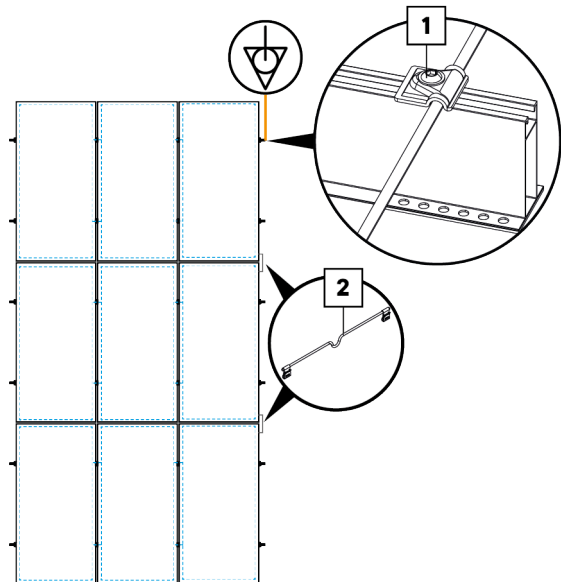
- Insert the wire clamp (1) into the TLE25 (2).
- Ensure that the threaded plate (3) is positioned as shown in the illustration.
- Clamp the round wire.
- Then tighten the wire clamp (1) with a torque of 10 Nm or 7.38 ft-lb.



## MOUNTING EQUIPOTENTIAL BONDING



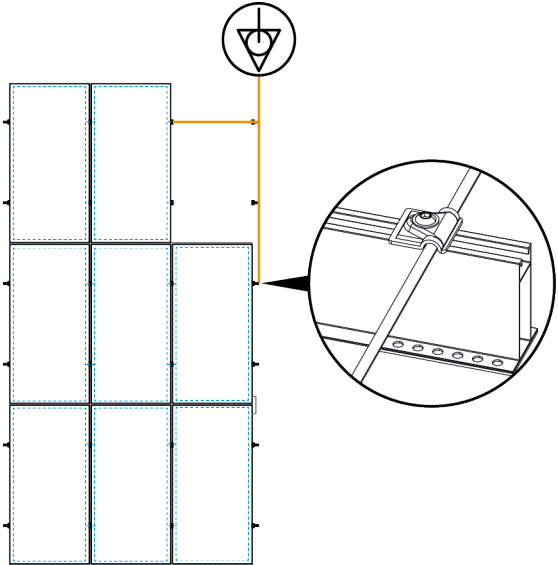
- Install the wire clamp (1) with the on-site bonding.
- Attach a bonding jumper (2) to each module column in the first row.



POTENTIAL EQUALIZATION DURING MAINTENANCE WORK



**Caution!**  
Module removal may disrupt the bonding path and could introduce the risk of electric shock. Additional steps may be required to maintain the bonding path. Modules should only be removed by qualified persons in compliance with the instructions in this manual.



# MAINTENANCE, DISASSEMBLY AND DISPOSAL

## MAINTENANCE

To prevent personal injury and damage to property, the system must be checked regularly by qualified personnel and annual maintenance is required.

- Check all system components for damage. In the event of damage, replace the affected component immediately.
- Check all screw connections. Tighten loose screw connections, observing the tightening torque specified in the installation instructions.
- Checking all components for damage caused by the weather, animals, dirt, deposits, build-up, vegetation, roof penetrations, seals, stability and corrosion. In the event of damage, clean, repair or replace the affected component.

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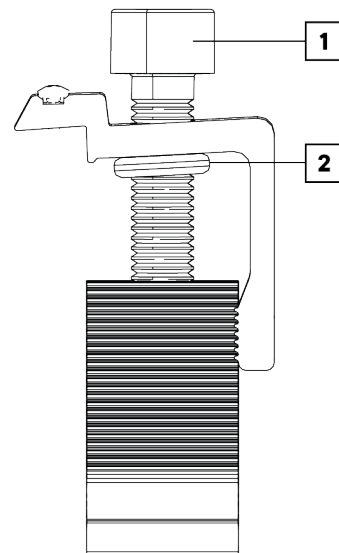
## DISASSEMBLY

### DISMANTLING THE CLAMPS (EXAMPLE)



**i** To disassemble the system, carry out the assembly steps in reverse order.

- Unscrew the screw (1) on the clamp.
- When reusing the clamp, ensure that the O-ring (2) is not lost.
- i** If the components are reused, it must be noted that these are wearing parts. Therefore, the AEROCOMPACT Europe GmbH cannot assume any responsibility for checking the degree of wear. For this reason, any liability or warranty of AEROCOMPACT Europe GmbH in case of reuse is excluded and reuse is at the installer's own responsibility.



## DISPOSAL

Unless a take-back or disposal agreement has been made, disassembled components should be recycled:

- Give metals and plastic elements for recycling.
- Dispose of remaining components sorted according to material composition.

**i** Incorrect disposal may result in hazards to the environment. In case of doubt, obtain information on environmentally sound disposal from the local municipal authority or from specialized disposal companies.

# APPENDIX

## DECLARATION OF PERFORMANCE



Manufacturer: **AEROCOMPACT Europe GmbH**  
Designation: **Metal roof system  
CompactMETAL trapezoidal metal sheet  
bridge**  
Identification code: **TL/TLE**  
Applied standard: **EN 1090**  
Certification body: **2397**



[For the declaration of performance](#)

## REVISION HISTORY

Version	Chapter	Modification
v3.3	"Mount TLE" on page 16	New chapter added
v3.4	"Cable management" on page 23	New chapter added

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