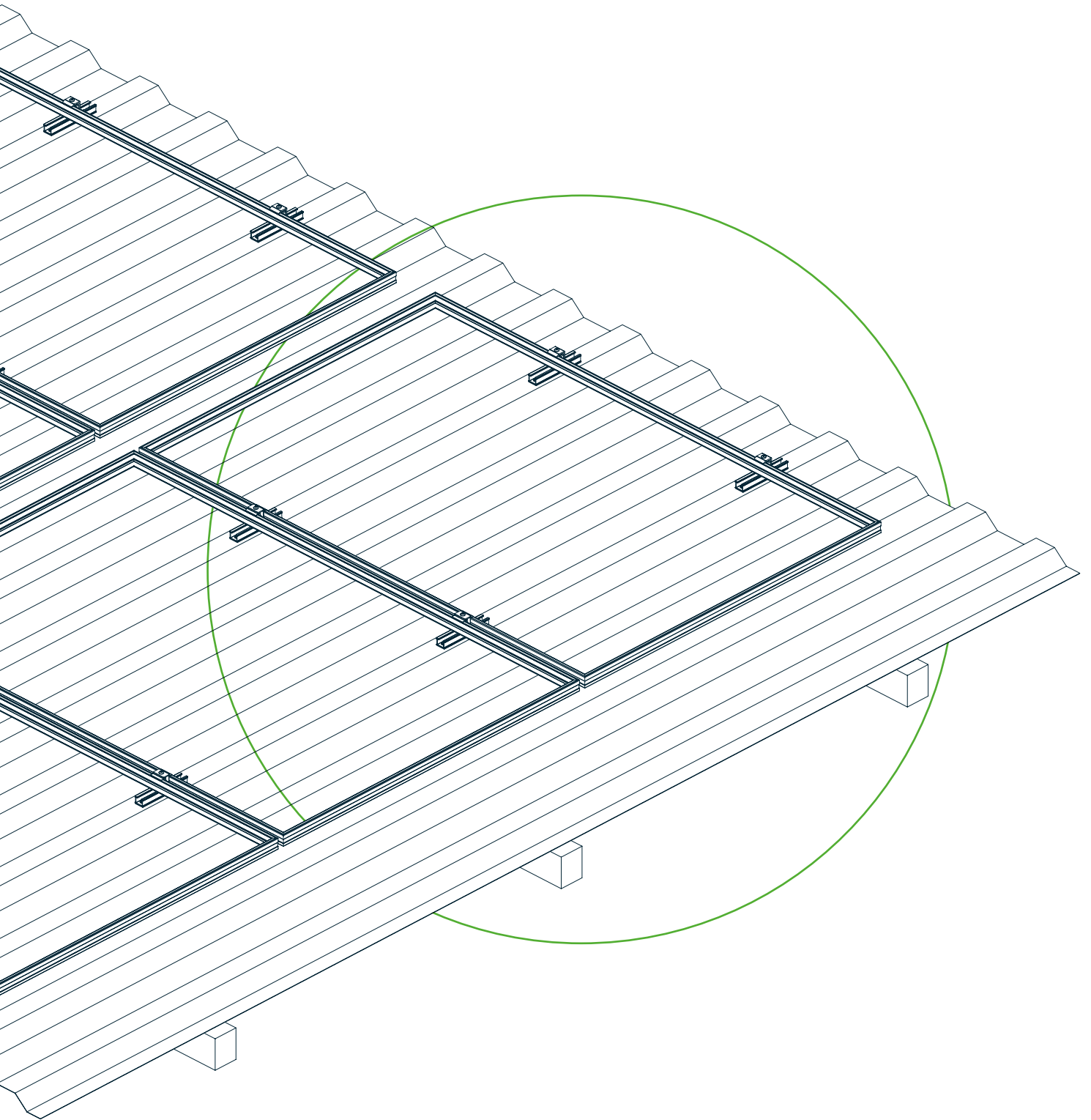


PMT SHORT RAIL

TBQ | TRAPEZOIDAL SHEET METAL RAIL CROSSWISE

ASSEMBLY INSTRUCTIONS



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PMT SHORT RAIL TBQ

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INTERACTIVE
ASSEMBLY
INSTRUCTIONS

Click to select page

1 Introduction

Please read these assembly instructions carefully before installing the PMT installation system and keep them for future reference!

These assembly instructions are only complete when accompanied by the project-specific implementation plan (project report)!

These Assembly Instructions describe the installation of the PMT PV mounting system on roofs covered with trapezoidal or corrugated sheet metal. They are intended for appropriately qualified personnel who have been instructed by the operator of the PV system. The installation of the PMT PV mounting system on trapezoidal and corrugated sheet-metal roofs requires extensive specialist knowledge. We therefore recommend engaging a qualified roofing contractor to carry out the installation.

The PMT mounting system allows the modules to be installed in portrait orientation.

The PMT PV mounting system for trapezoidal sheet-metal roofs features a very high degree of pre-assembly. Its innovative, patented click technology significantly reduces installation times.

All components are generally made of aluminium and stainless steel. Their high corrosion resistance ensures a long service life and allows the components to be fully recycled.

1.1 Intended Use

The PMT PV mounting system for trapezoidal sheet metal roofs is a racking system for the installation of PV modules.

It is designed exclusively for the mounting of PV modules. Any use other than this must be regarded as not in accordance with the intended purpose. In particular, compliance with the instructions in these installation guidelines forms part of the intended use. PMT accepts no liability for damage resulting from failure to comply with the installation guidelines or from the misuse or improper use of the product.

1.2 About This Document

This document is an internal translation prepared by PMT. In the event of any discrepancies, ambiguities or differences in interpretation, the original German version shall prevail.

The PMT PV mounting system for trapezoidal sheet metal enables the installation of roof-parallel PV systems.

These assembly instructions describe installation using trapezoidal sheet metal rails. This is possible with:

- trapezoidal and corrugated sheet metal
- sandwich panels, where applicable (provided the manufacturer has approved fixing to the outer skin)

It must be ensured that only up-to-date and complete installation guidelines are used for the installation.

These Assembly Instructions illustrate the installation using the TBQ 24x125 as an example.

1.3 Warnings

The warnings used in these assembly instructions highlight safety-related information.

They consist of:



Failure to comply poses a high risk of injury and may be life-threatening.



Failure to comply may result in property damage.

1.4 General Information - Standards and Guidelines

Every photovoltaic system must be installed in accordance with the specifications set out in these Assembly Instructions and the project report.

These Assembly Instructions are based on the current state of the art and our many years of experience in the on-site installation of our systems. It must be ensured that only the latest and complete version of the Assembly Instructions is used for the installation and that a printed copy of the Assembly Instructions is kept in the immediate vicinity of the system. Subject to technical changes.

1 Introduction

The project report forms part of these Assembly Instructions and is drawn up on a project-specific basis. All information contained in the project report must be strictly adhered to. The structural calculations in the project report are carried out on a site-specific basis. The design and planning of PMT installation systems must be carried out using the PMT software.

As each roof has its own project-specific characteristics that must be taken into account, expert advice must always be sought prior to installation. The installer of the PV system must ensure, prior to installation, that the existing roof covering and roof substructure are designed to withstand the additional loads that will be imposed. The installer must check the condition of the roof substructure, the quality of the roof covering and the maximum load-bearing capacity of the roof structure. To do this, contact a structural engineer directly on site. When installing PV systems, care must always be taken to comply with the module manufacturer's installation instructions. In particular, it must be checked whether the module manufacturer's specifications regarding clamping requirements (clamping surface and clamping area on the module) are being met. If this is not the case, the module manufacturer's written consent must be obtained on site prior to installation, or the mounting frame must be adapted to the module manufacturer's specifications.

The lightning and surge protection requirements for PV mounting systems must be implemented in accordance with the applicable DIN and VDE regulations. The requirements of the responsible energy supply company must be observed.

Care must be taken to ensure that the PV system to be installed does not impair the effectiveness of the existing lightning protection system. Care must also be taken to ensure that the PV system is designed in such a way that it can be incorporated into the protection zone of the building's lightning protection system. Separation distances between the PV system and the lightning protection system must be taken from the relevant regulations and adhered to. Fire safety regulations must be observed during installation; for example, fire walls must not be built over and the appropriate distances must be maintained.

When making changes to the roof covering, the manufacturer's instructions must be followed. During and after installation, the frame components must not be walked on or used as a means of access. There is a risk of falling, and the roof covering beneath could be damaged. Before installation, the installer of the photovoltaic system must ensure that the installation is carried out strictly in accordance with national and site-specific building regulations, health and safety and accident prevention regulations, standards and environmental protection regulations. Any person installing PMT PV mounting systems is obliged to independently familiarise themselves with all rules and regulations governing technically correct planning and installation, and to comply with these during installation. This also includes obtaining the latest version of the relevant rules and regulations. The installation of the PV system must only be carried out by suitably trained specialists.



All system components must be checked for damage before installation. Damaged components must not be used.



The PMT substructure and the PV system may only be installed by appropriately trained and qualified personnel. System components must not be used as stepladders, and the modules must not be walked on. Roof work involves a risk of falling from a height or falling through the roof. Falls may result in serious injury or death. Suitable access and fall-protection equipment, such as scaffolding, must be provided. Measures must also be taken to protect against falling objects.



Before installation, check the structural stability of the building as well as the structure and condition of the roof substructure. The requirements specified in the Assembly Instructions and the project report must be strictly observed during installation. Failure to comply with these requirements may result in damage to the PV system and the building.

1 Introduction

1.5 System Description

The PMT TBQ offers suitable solutions for different requirements:

TBQ System Characteristics

Application:	Trapezoidal sheet metal, sandwich panels where applicable
Module type:	framed modules
Module orientation:	Landscape
Roof pitch:	max. 75°
Module array length:	Max. 7.00 m continuous module array (larger module arrays are also possible depending on the project. Prerequisite: suitable conditions and corresponding project planning)
Max. load:	5.4 kN/m²
Connection:	Thin-sheet screws
Material:	Aluminium EN AW-6063 / T6, stainless steel
Colour:	Natural, mill finish

Requirements for the Roof Covering

Minimum sheet thickness:	Steel sheet 0.5 mm; aluminium sheet 0.5 mm*
Minimum tensile strength Rm:	Steel sheet 235 N/mm²; aluminium sheet 165 N/mm²*
Minimum crown width:	25 mm, including a flat bearing surface of at least 20 mm around the drilled hole.

* PMT calculation basis. Nationally or regionally applicable standards may specify different values (DIN EN 1090-04:2020-06) and must be observed accordingly.

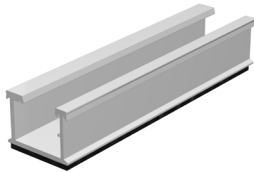


The module manufacturer's installation instructions must always be observed. All specifications of the roof manufacturer regarding installation on the roof covering must be complied with.

2 Installation

2.1 System Components

A TBQ | Trapezoidal Sheet Metal Rail Crosswise



C Locking Clip



B Module Clamps



D Thin-Sheet Screws



2.2 Direct Roof Attachment Using Thin-Sheet Screws

When installing the thin-sheet screws, the specifications set out in the building regulations approvals for these screws must be observed (e.g. scope of application, pre-drill diameter, minimum thicknesses of the materials to be joined, hole diameter for existing perforations).

The relevant thin-sheet screws are included in our supply. The choice of fasteners depends on the roof covering and the forces involved. Thin-sheet screws must be positioned exclusively in the area of the high-rib.

Thin-Sheet Screw:

4,5 x 25 A2 / Bimetal

4,8 x 20 A2 / Bimetal

6,0 x 25 A2 / Bimetal

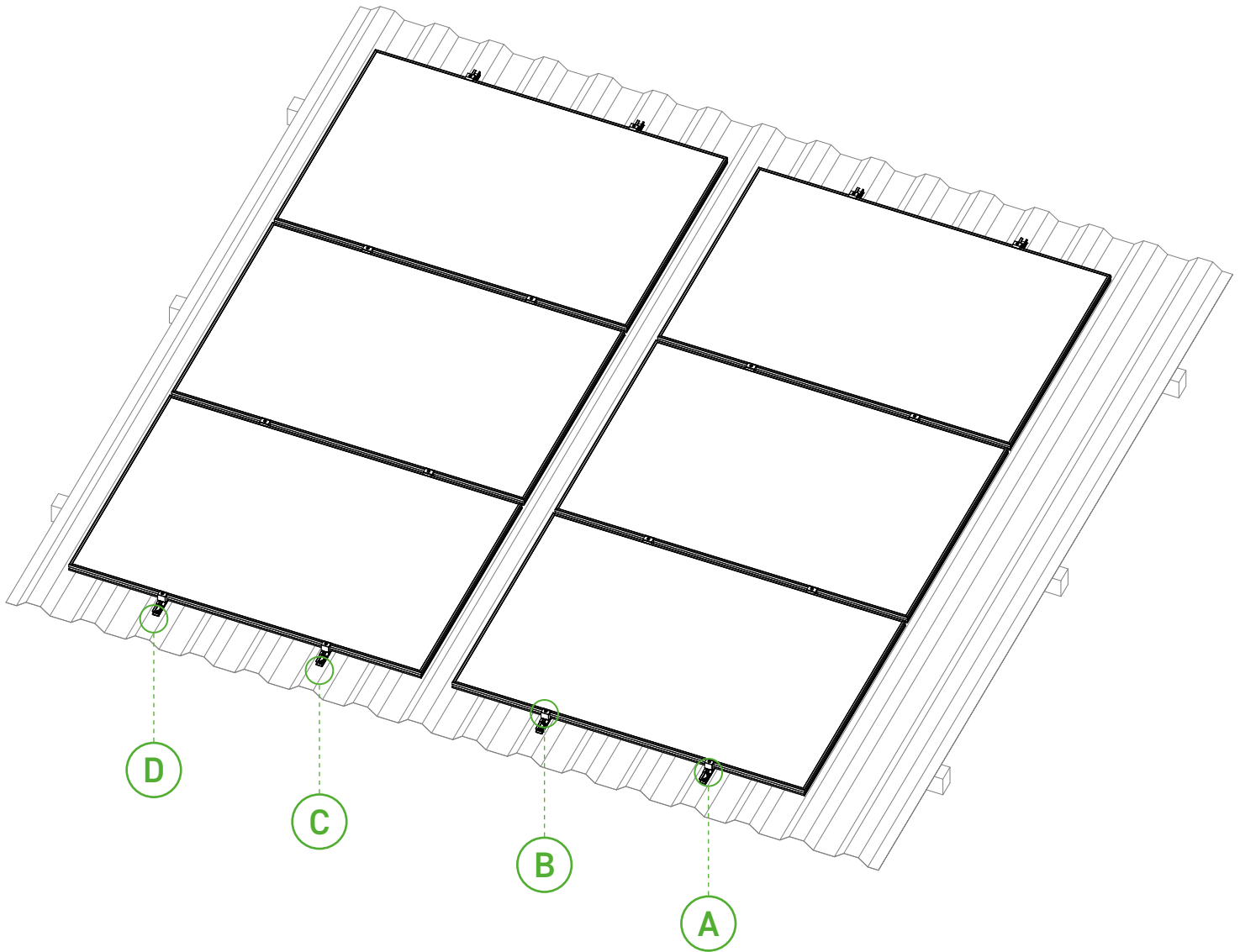


Installation:

- Wrench size 8 mm
- Maximum tool outer dimension (socket wrench): ≤ 15 mm

INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

2.3 Installation of the Single-Layer Substructure



A TBQ | Trapezoidal Sheet Metal Rail – Crosswise

B Module Clamps

C Locking Clip

D Thin-Sheet Screws

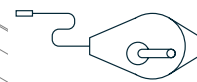
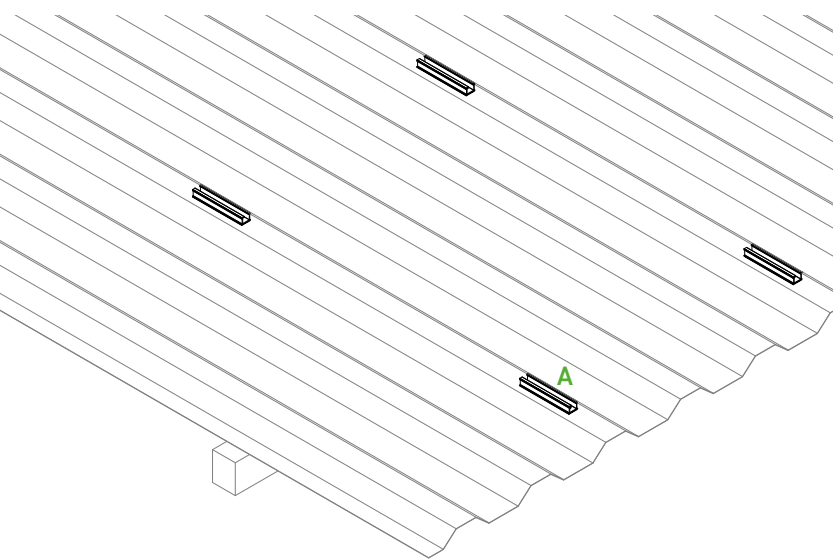
1

INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

Positioning of the TBQ | TRAPEZOIDAL SHEET METAL RAIL – CROSSWISE

The position of TBQ **A** must be determined in accordance with the structural requirements of the location and the installation situation. It must be checked again whether the dimensions used as the basis for planning correspond to the dimensions found on the roof (adjustments may be necessary). For single-layer substructures, the position of TBQ **A** must be checked against the specified module clamping distances.

TBQ **A** must be positioned so that the module end clamp and module middle clamp **B** can later be fastened exactly in the centre between the two fastening points (thin-sheet screws **D**). This ensures that both fastening points are loaded evenly.



Check the planning basis



Position in accordance with the structural requirements and the installation situation



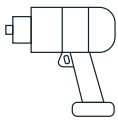
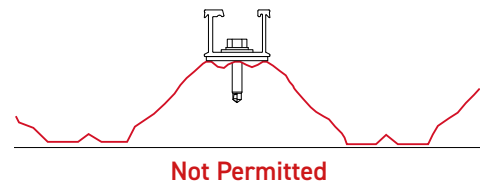
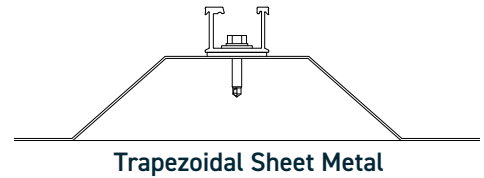
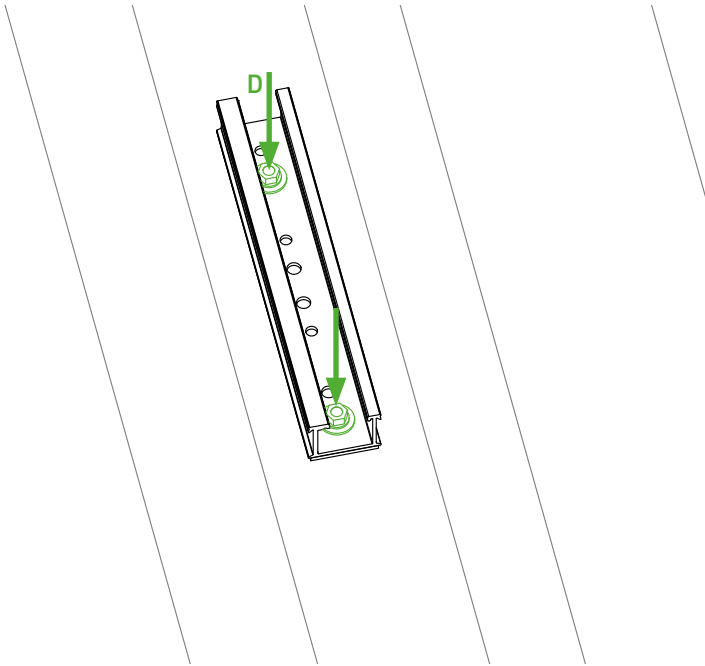
Align the TBQs using a string line

Install TBQ **A** using the thin-sheet screws. Use two thin-sheet screws **D** per TBQ **A**. To prevent water from penetrating between TBQ **A** and the roof covering, TBQ **A** must always be installed on the crown. The underside of TBQ **A** is fully covered with EPDM sealing strips.



When installing on trapezoidal sheet-metal roofing, the thin-sheet screws **D** may only be screwed into the crown. Fastening in the side area of the trapezoidal profile jeopardises the structural integrity of the system and the watertightness of the roof.

INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE



Wrench size 8 mm, maximum tool outer dimension $\leq 15\text{mm}$

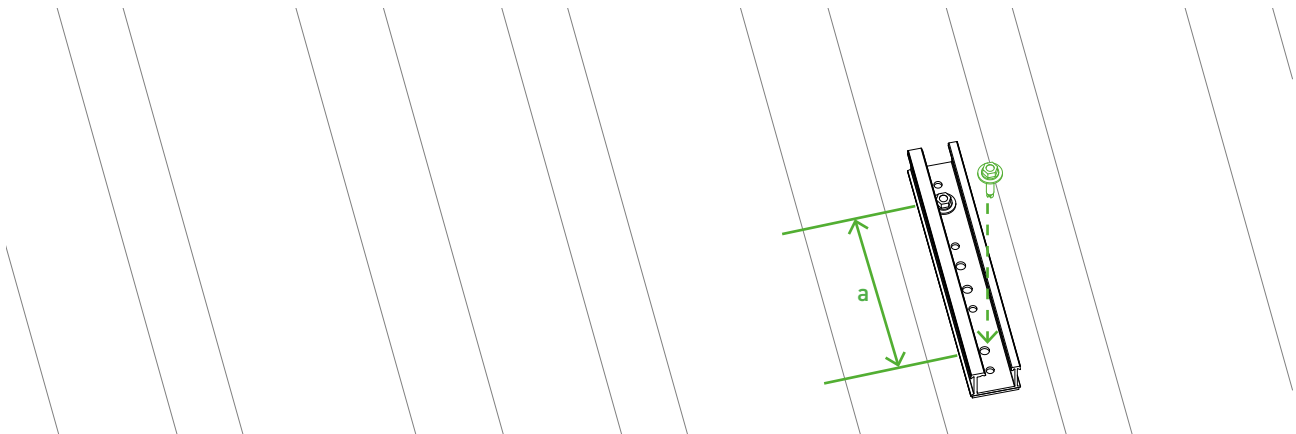


2 thin-sheet screws per TBQ

If TBQ A is ordered without EPDM, an EPDM sealing strip must be applied to the crowns or underneath TBQ A before installation in order to protect the roof against penetrating water. To do this, cut the strips to the appropriate length and adhere them vertically to the crown in the installation area of TBQ A. The crown must be clean and dry for bonding. The application temperature should not be below 5°C.



Caution when using trapezoidal sheets with profiled crowns: Taking into account the edge distances of the crown of the trapezoidal sheet, ensure that TBQ A always rests fully on the crown. The EPDM of TBQ A must always rest fully on a flat surface in order to prevent water from penetrating.



The distance between the fasteners must be structurally verified before installation. In this case, TBQ A must be cut to size and drilled on site.

INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE



If the module field is longer than 7.00 m perpendicular to the eaves, it must be separated by placing an additional TBQ A with module end clamps B.

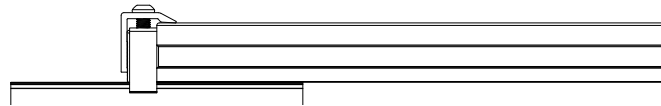
If the TBQ A is not installed in prefabricated rail sections $l=125\text{mm}$ or $l=172\text{mm}$, but as a continuous rail, the module field must be separated by placing two Module end clamps B. In the area between the Module end clamps B, the TBQ A the high beading rail must be separated (expansion joint). The arrangement of the expansion joints must be adapted to the conditions of the roof and the different expansion properties of the materials.



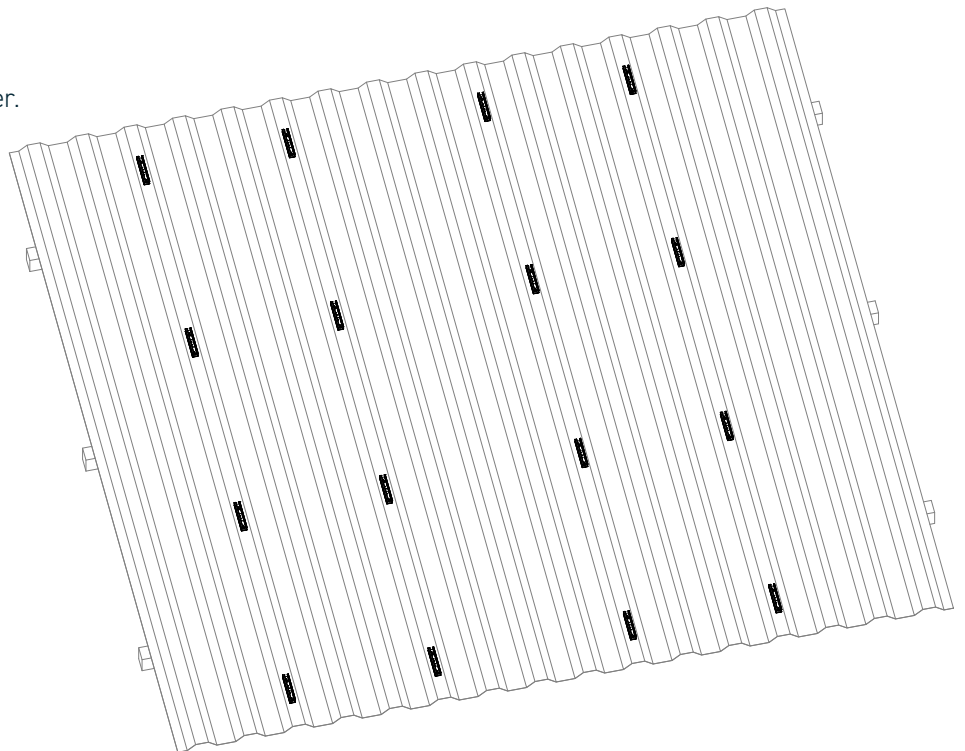
Modules must not be built over expansion joints.

There is no connection to earth.

This must be established without restricting the effect of the expansion joint.



Completed installation of the rail layer.



The following section describes the column-by-column installation of the modules from top to bottom.

If required by the location and permitted by the installation situation, installation can also be carried out from bottom to top. When installing from bottom to top, one locking clip C must be fitted and secured as anti-slip protection on each TBQ A in the lowest row before installing the modules (tightening torque: 10 Nm). Ensure that all XL locking clips C are fastened in a horizontal line. The module end clamps B are then clicked onto TBQ A and pushed against the XL locking clips C.

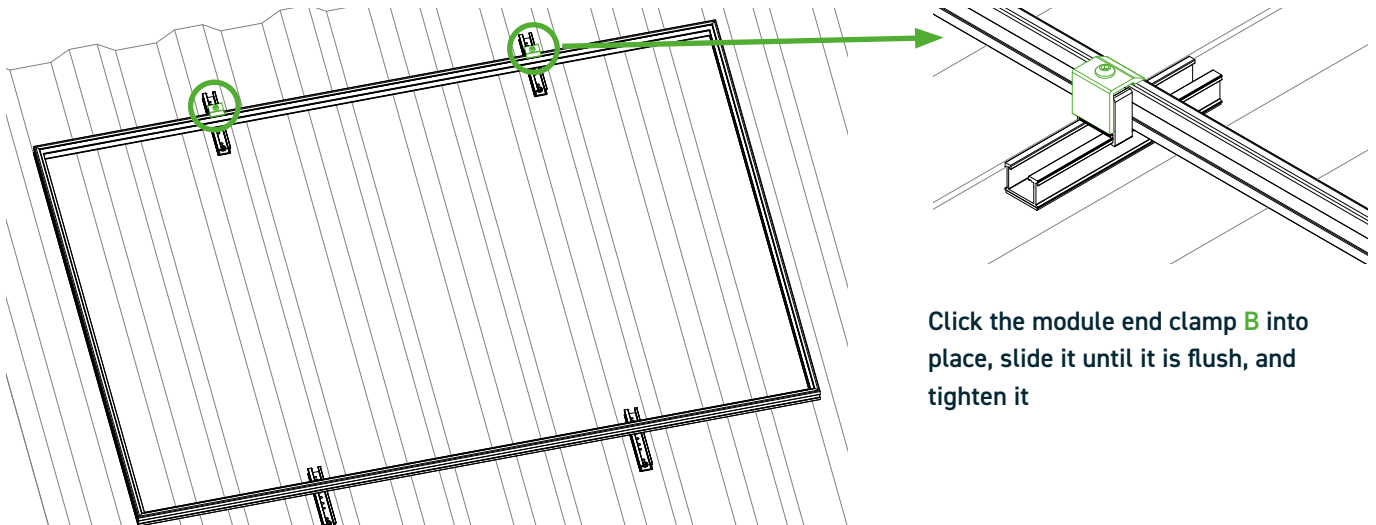
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INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

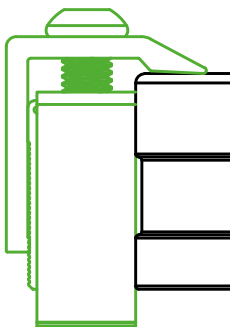
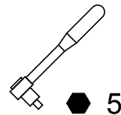
Module installation, Module end clamp

Place the module on TBQ **A**. Install the module end clamps **B**. To do this, click the module end clamp **B** onto TBQ **A** and push it flush against the module. Ensure that the module end clamp **B** is clicked into TBQ **A**. Then adjust the module end clamp **B** to the module height and tighten the screw (tightening torque: 10 Nm). Ensure that the module end clamp **B** clamps the module frame within the clamping area specified by the module manufacturer.

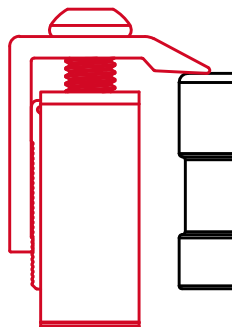
The module end clamps **B** must be installed exactly in the centre of TBQ **A** to ensure that the thin-sheet screws **D** are loaded evenly.



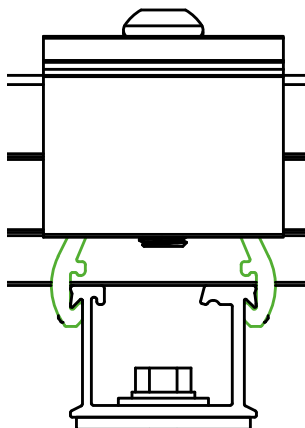
Install the module end clamp



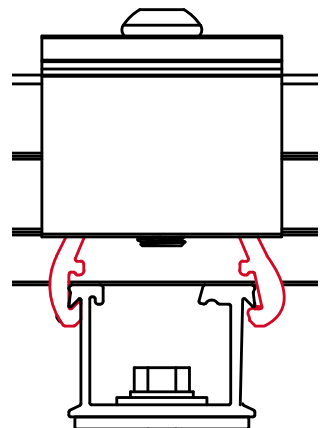
Defined clamping area



Incorrect



Both sides clicked in



Incorrect



Module end clamps **B** are approved for one-time installation. Check the end clamp has been clicked in.



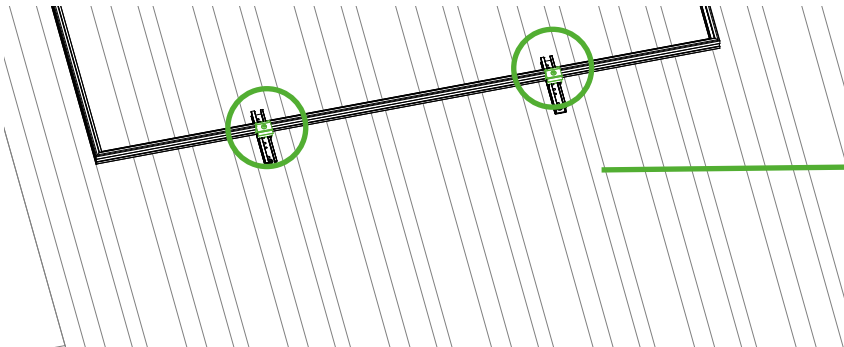
Observe the module manufacturer's instructions: Check the defined clamping area

3

INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

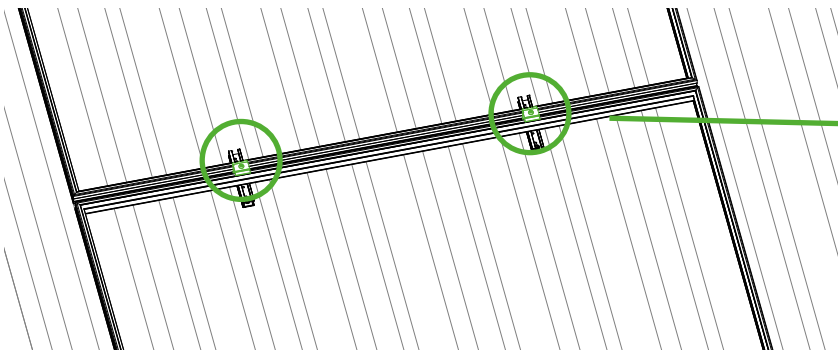
Module installation, Module middle clamp

Now install the module middle clamps **B**. To do this, click the module middle clamp **B** onto TBQ **A** and push it flush against the module. Ensure that the module middle clamp **B** is clicked into TBQ **A**. The module middle clamps **B** must be installed exactly in the centre of TBQ **A** to ensure that the thin-sheet screws **D** are loaded evenly.



Click the module middle clamp **B** into place and push it flush against the module.

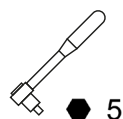
Now slide the next module underneath the module middle clamp **B**, adjust the module middle clamp **B** to the module frame heights and tighten the screw (tightening torque: 10 Nm).



Slide the module underneath and tighten the module middle clamp **B**.

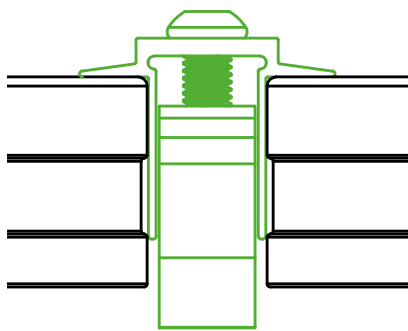
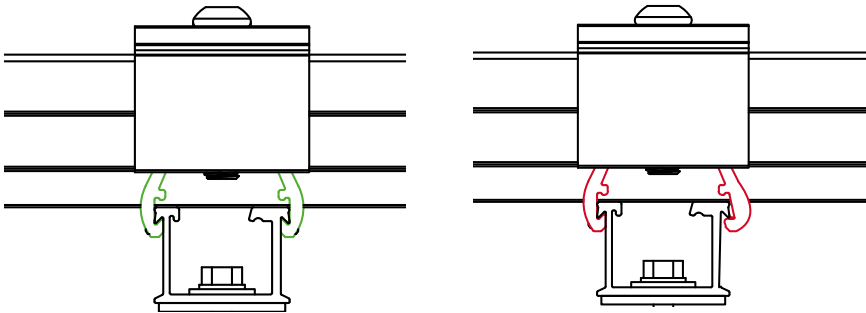


Install the module middle clamp.

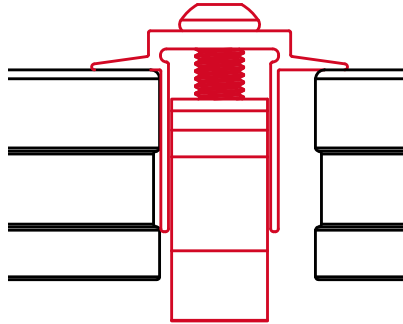


INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

Ensure that the module middle clamp **B** clamps both module frames within the defined clamping area specified by the module manufacturer.



Defined clamping area



INCORRECT



Module middle clamps **B** are approved for one-time installation only. Check that the module middle clamps **B** have clicked into place correctly.



Observe the module manufacturer's specifications: Check the defined clamping area.

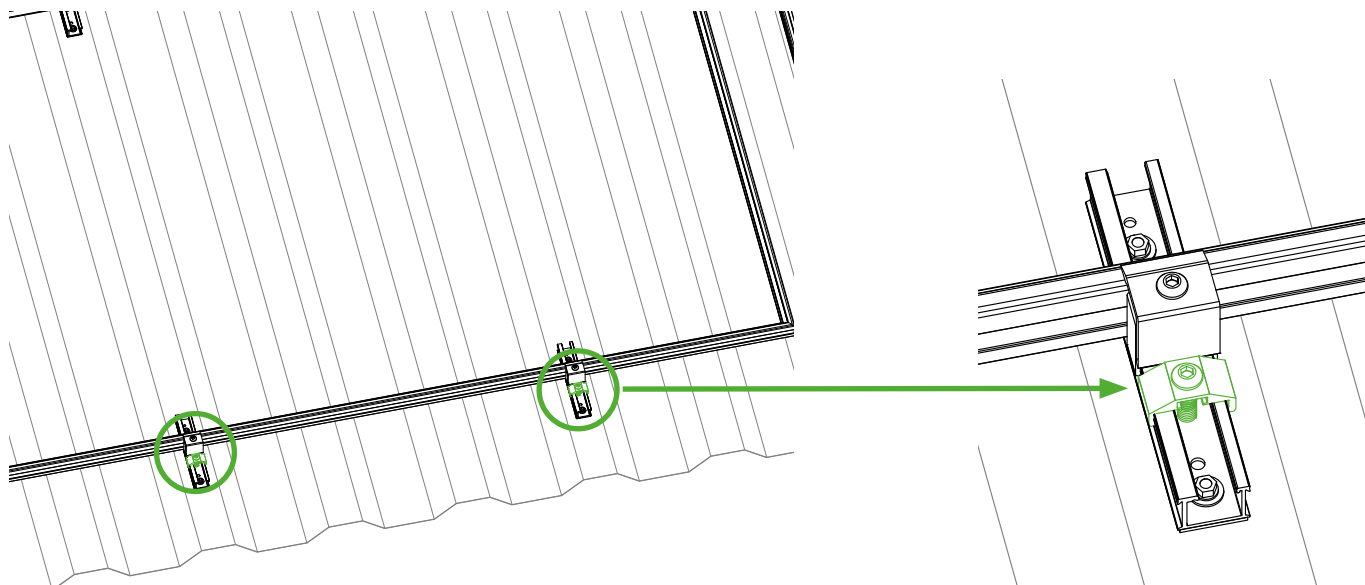
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INSTALLATION OF THE SINGLE-LAYER SUBSTRUCTURE

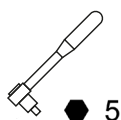
Module Installation, Module End Clamp at the End of the Row

At the last module in the row (or at expansion joints, if applicable), module end clamps **B** and locking clips **C** must be installed again.

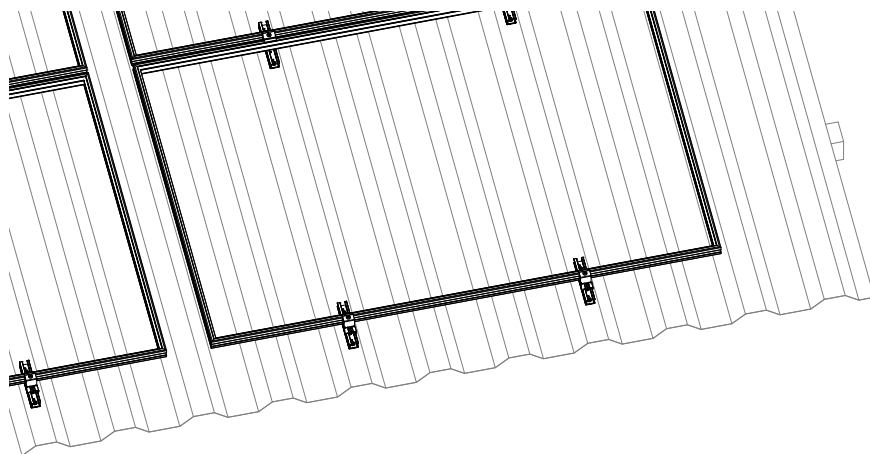
Click the module end clamp **B** onto TBQ **A** and push it flush against the module. Ensure that the module end clamp **B** is clicked into both sides of TBQ **A**. Then adjust the module end clamp **B** to the module height and tighten the screw (tightening torque: 10 Nm). Ensure that the module end clamp **B** clamps the module frame within the defined clamping area specified by the module manufacturer (see Installation 2).



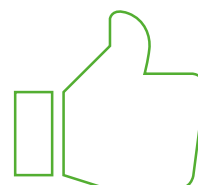
Install the module end clamp **B** at the last module. For roof pitches greater than 5°, additionally install XL locking clips **C**.



Proceed with the following rows as described.



**BASE SYSTEM
COMPLETE!**



3 Disassembly and Disposal

3.1 Disassembly

The PMT mounting system may only be disassembled by appropriately trained and qualified personnel. The same safety instructions, standards and guidelines as for installation must be observed. Disassembly must generally be carried out in the reverse order of the installation described.



Before disassembly, disconnect the PV modules from the grid. Disconnect all electrical cables of the PV modules, including string cables and plug connections, and detach them from the mounting system.



Then remove the modules and store them safely. Improper disassembly may damage the modules.



Disassemble the mounting system and store all components safely. Any openings in the roof covering must be properly sealed by qualified personnel.

3.2 Disposal

The PMT mounting system consists of aluminium, stainless-steel and steel components. After disassembly, these components can be sent for recycling. Dispose of the mounting system only through a certified waste management company (EFB). Observe the applicable national standards and guidelines.

Service-Hotline

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