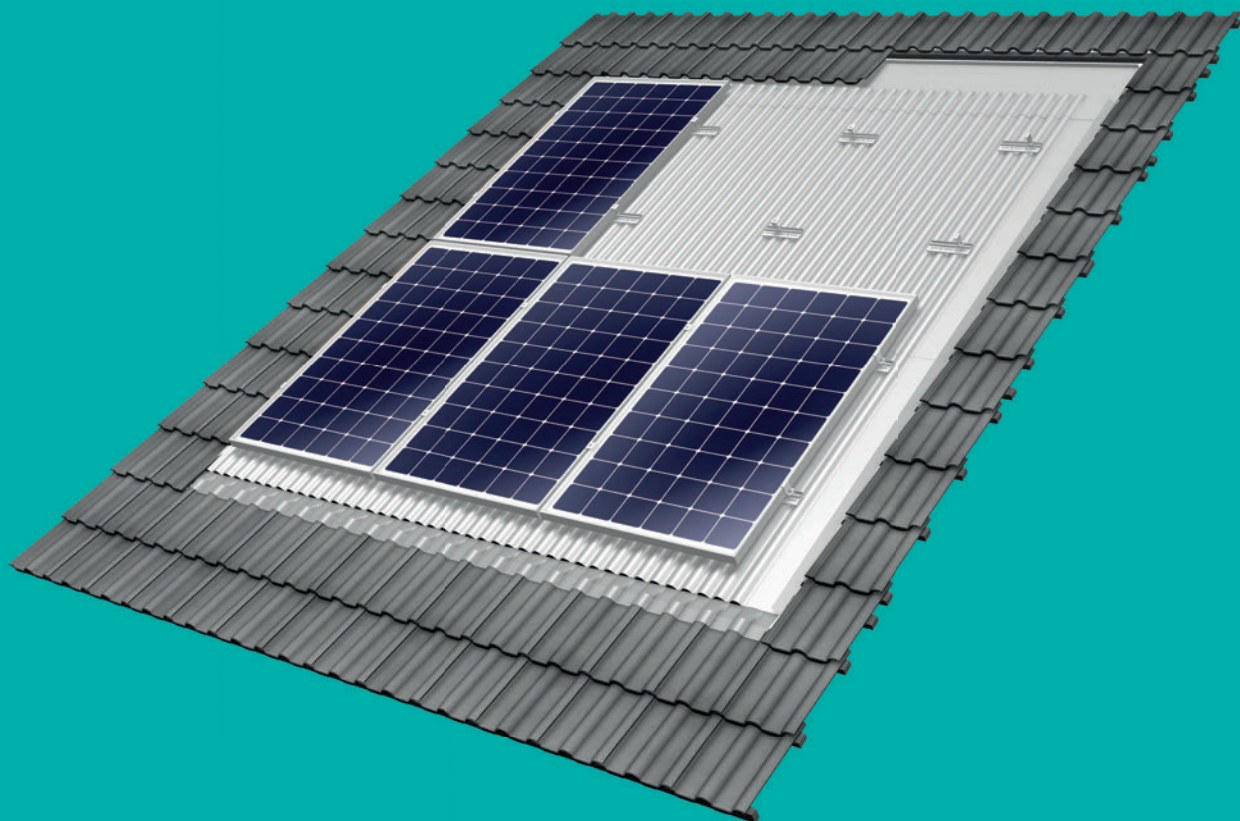




mounting
systems

Infix ProLine Installation manual



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1. Introduction

1.1. Short Description

Infix ProLine is an in-roof system for PV modules. It enables direct integration of PV modules (framed or unframed) into the roof cladding independently of the type of roof covering. All components are pre-assembled on the basis of your order and replace the previous roof covering. Infix ProLine is mounted on the existing or on new battens of the roof construction. The roof can thus be completely or partially covered with PV modules.

1.2. About These Instructions

Content

These instructions describe the mounting of the onroof system Infix ProLine and all system-specific information for planning, components and safety warnings. The first part of the Instructions (chapters 5) demonstrates the complete installation of framed modules.

Applicable Documents

In addition to this document, the document "Installation Instructions for PV Mounting Systems: General Part" is part of each product delivery. This document describes the general applicable information for Mounting Systems products on standardisation, safety, transport, maintenance, disassembly and disposal. Both the present Instructions and the "Installation Instructions for PV Mounting Systems: General Part" are an integral part of the system Pitched ProLine and must be adhered to for each installation.

It is crucial to carefully read these Instructions as well as all applicable documents prior to carrying out any installation, maintenance or disassembly work. You are provided with the information required for the safe and complete installation, maintenance and disassembly. Should you have any questions, please contact Mounting Systems GmbH.

User Group

Mounting Systems GmbH's installation instructions are intended for the following persons (user group):

- Skilled personnel
- Instructed personnel

Skilled personnel

Skilled personnel are individuals who, on the basis of their professional training, are able to execute installation, maintenance, and disassembly work appropriately.

Instructed personnel

Instructed personnel are individuals who have been instructed and taught appropriately regarding the assigned tasks and the possible risks in the event of improper conduct. An instructed individual must have received instructions regarding the required safety policies, precautions, relevant regulations, accident prevention regulations, as well as operating conditions and must have demonstrated his/her competence. The implemented work must be approved by skilled personnel.

Orientation Guide

The following visual aids will make installation easier.

Piktograms:



This symbol indicates important information and useful tips.



This symbol indicates tips and tricks to make processes easier.

1.3. Warnings

The warnings used in these Mounting Instructions indicate safety-related information. They include:

- Warning symbols (pictograms)
- Signal words for the identification of the hazard level
- Information about the type and source of the hazard
- Information about potential consequences in case of the hazard being disregarded
- Measures for the prevention of hazards and the prevention of injuries or damage to property.

The signal words of the warnings respectively indicate one of the following hazard levels:



DANGER

Indicates a great and extraordinary danger, which may result in death or serious injury if ignored.



WARNING

Indicates a potentially dangerous situation, which may result in serious or medium injury or damage to the property.



CAUTION

Indicates a potentially dangerous situation, which may result in minor injuries or damage to the property if ignored.



ATTENTION

Indicates potential danger, which can result in damage to the property.

1.4 Safety

All generally applicable safety regulations for products of Mounting System GmbH can be viewed in the document "Installation Instructions for PV mounting Systems: General Part". Please read this document carefully and adhere to the described points – only use the system for its intended purpose, comply with the obligations of the building proprietor and follow both the general and specific safety instructions.

In addition, please observe the specific safety instructions which precede the process steps in the present product-specific Mounting Instructions.

2. Technical Description

2.1 System Overview

In the following, the most important system parts are described.

The design of the individual system components can vary, or additional components may be required, depending on:

- Type of roof (substructure and roof cladding)
- Type of module
- Number of modules and configuration
- Local conditions

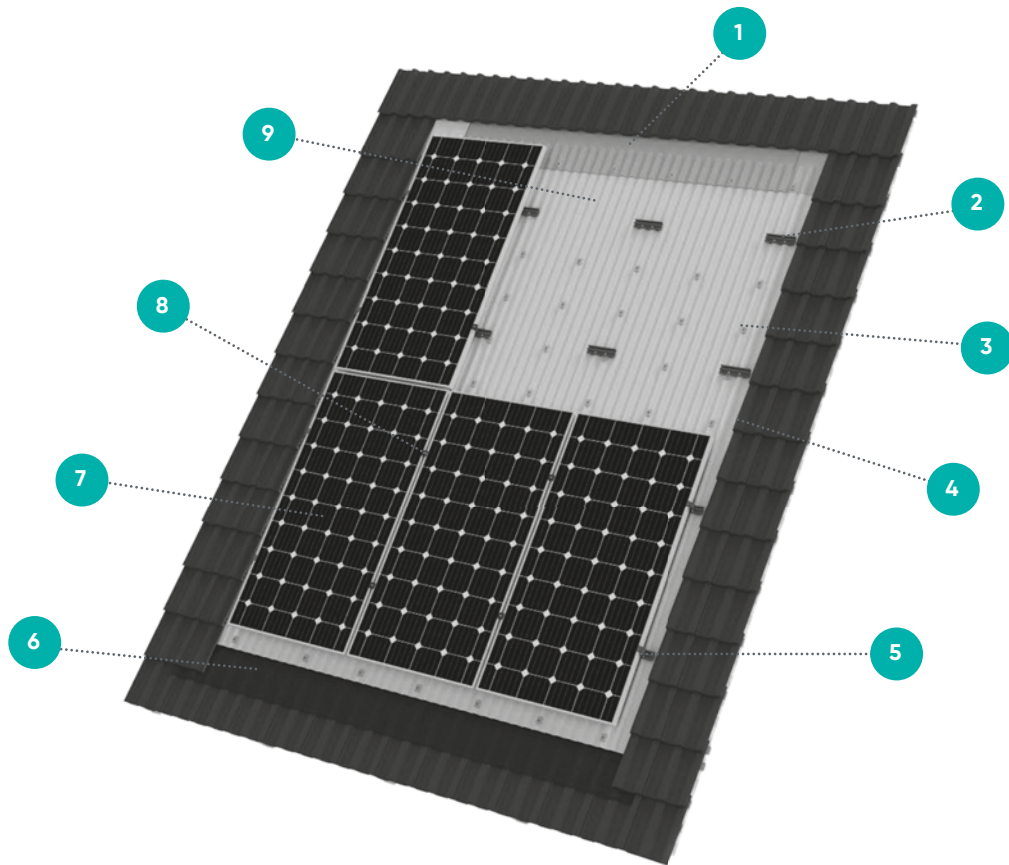


Image 2.1-1 Portrait Installation

Infix ProLine Components:

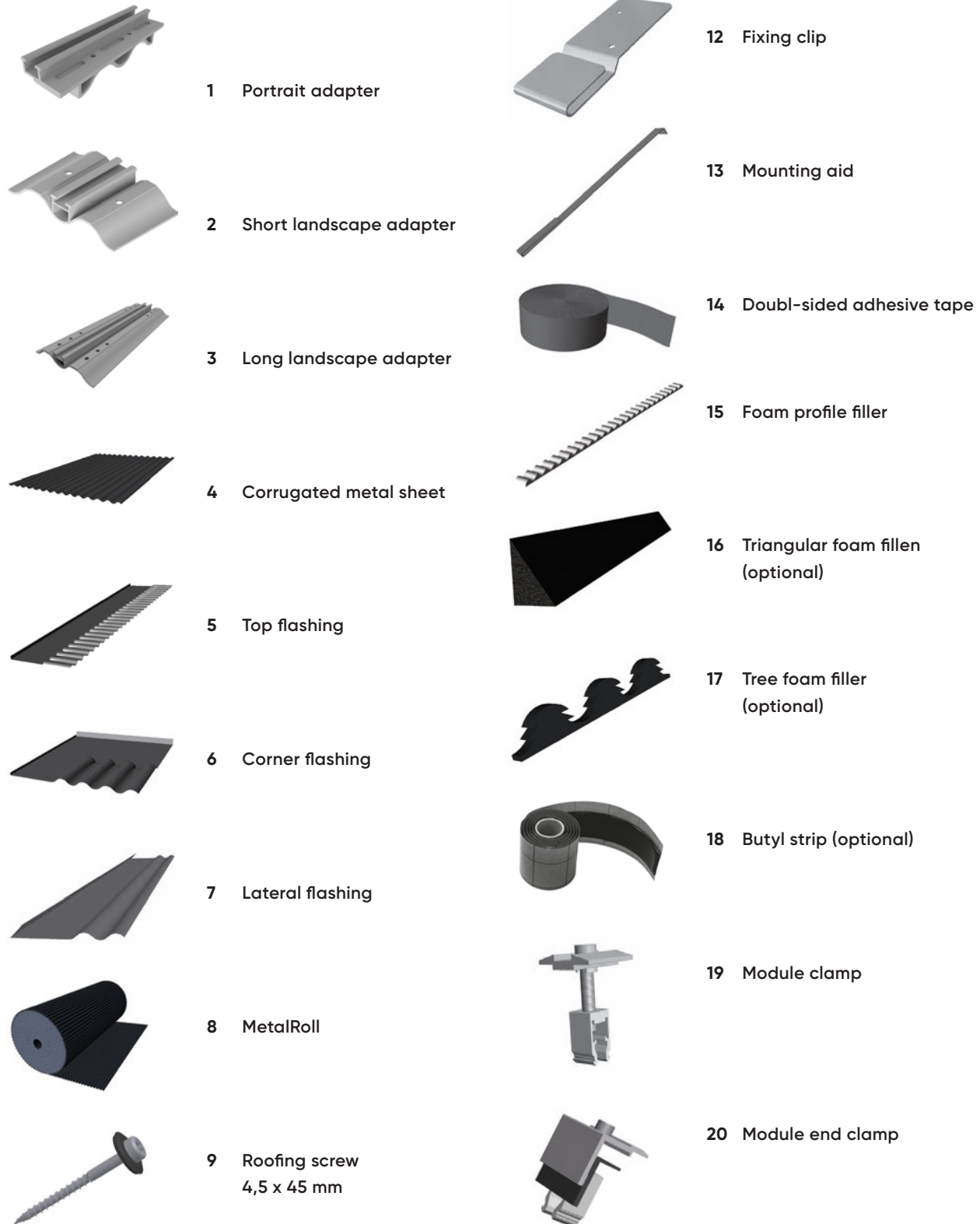
- 1 Top flashing
- 2 Portrait adapter
- 3 Calotte
- 4 Lateral flashing
- 5 Module end clamp
- 6 Stealing strip
- 7 PV module
- 8 Module clamp
- 9 Corrugated metal sheet

Note:

This illustration shows the portrait mounting position of the PV module. Other adapters must be used for landscape installation.

2.2 Components

Infix ProLine includes all system components and accessory components which are necessary for installation. The delivery content corresponds to the configuration of the PV unit. Additional roof battens and their respective fixing materials are not included in delivery.



2.3 Technical Data

Application	Pitched roof – roof integration
Roof cladding	Suitable for most types of roof cladding
Roof slope	10° to 45° (other slopes on request) ¹
PV modules	Framed, frameless
Total height of PV system	Portrait: 40 mm + module height Landscape: 30 mm + module height
Type of mounting	Flat
Module layout	Connected surfaces, as well as entire roof and Integration of windows possible (subject to previous checking)
Module orientation	Portrait, landscape
Size of module array	Any size possible
Position of the module array	No special requirements
Roof structure	Battens as for conventional tile covering ²
Standards	Eurocode 1 – Actions on structures Eurocode 9 – Design of aluminium
Certificate	MPA Dresden: Fire behaviour tests in accordance DIN EN 13501-5:2010-02
Supporting profiles	Extruded Aluminium (EN AW 6063 T66)
Small parts	Stainless steel (V2A)
Flashing (lateral and top)	Aluminium (EN AW 5005)
Corrugated metal	Aluminium (EN AW 3005)
Seals	EPDM
Colour	Profiles/sheeting: plate finish, black on demand
Warranty	10 years ³

¹ Complies with German roofing regulations. Any installation must also be in accordance with local roofing regulations.

² The standard screws are dimensioned for roof battens 30 x 50 mm in wood classification 10. (Other on request.)

³ Please find the exact terms in the Mounting Systems GmbH warranty document.

3. Important installation information

3.1 Preparation work

Mounting Systems recommends that you inform yourself about the local conditions prior to ordering Infix ProLine. In particular, be familiar with:

- the roof construction,
- the roof batten thickness,
- the roof batten quality and
- the roof batten spacing.

3.2 Installation aids and required tools

The following tools will be needed for the installation of Infix ProLine:

- Roof ladder
- Folding rule
- Chalk line to align the adapters
- Aluminium level (to check the flatness of the battens and the module field)
- Cut-off grinder with a stone disc (to fit the tiles)
- Metal cutters (for cutting the metal sheets, sealing strip, etc.)
- Roofing tinsmith tools, i.e. crimping or clinching pliers (for possible work on the flashings)
- Rubber hammer
- 6 mm Allen key
- Cordless drill with an 8 mm hex headbit (for adapter screws) and torx bit (for calottes and roofing screws)

3.3 Additionally required material

Depending on the system plan, the following additional materials may be necessary:

- Double-sided adhesive tape
- Roof battens
- Appropriate wood screws for fixing roof battens
- Appropriate material for sealing and additional fixing of the surrounding tiles, as needed.



DANGER

**Risk of fatal injury
from damage to roof**

Excessive loads can severely damage the roof.

- Before mounting and installation, please make sure that the building and especially the roof cladding meets the increased structural requirements for the PV system and the mounting operation.



DANGER

**Risk of fatal injury
from falling objects**

Parts falling from the roof can result in serious injuries or death.

- Before commencing with the installation, please ensure that the material used meets the structural requirements of the site.

4. Planning the module field

4.1 Operating conditions

Module field planning is based on:

- Module size (L x W x H),
- Module positioning (portrait, landscape),
- Number of modules and
- Roof batten spacing

Additional roof battens

If the existing roof battens do not correspond to the required points in the module field, additional roof battens will be necessary at the following points:

- Fixation of upper adapters
- Fixation of the sealing strip
- Fixation of the top flashing

Additional roof battens and their respective fixing materials are not included in delivery.



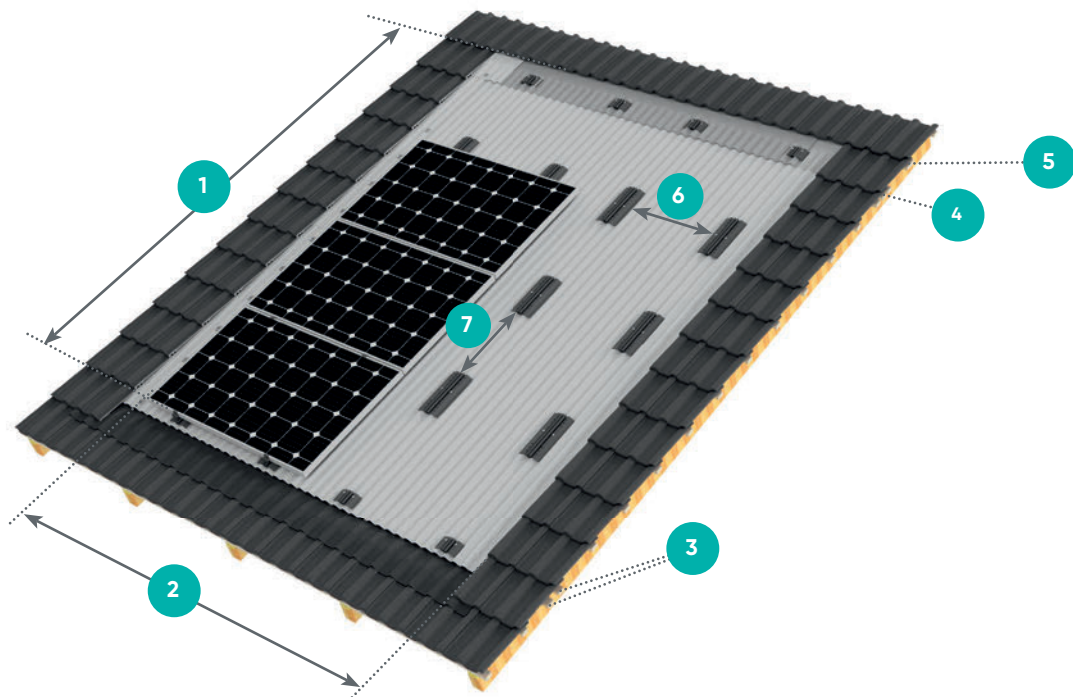
NOTE!

The following must be observed for planning the module field:

- The standard Infix ProLine components are designed for mounting the module field into a tiled roof. Mounting on other types of roof coverings must always be done by a professional roofing company.
- There must be a distance of at least three rows of tiles between the top edge of the module field and the roof ridge. If this is not the case, the top edge completion must be performed by a roofing company to guarantee the water tightness and durability of Theta.
- Should the ridge tiles not be fixed, then there must be a distance of at least one row of tiles between the top edge of the module field and the roof ridge.
- Direct connections of the module field to the roof ridge, roof verge or the eaves must be performed by a professional roofing company in all cases.

4.2 Choosing between short and long adapters for landscape installation

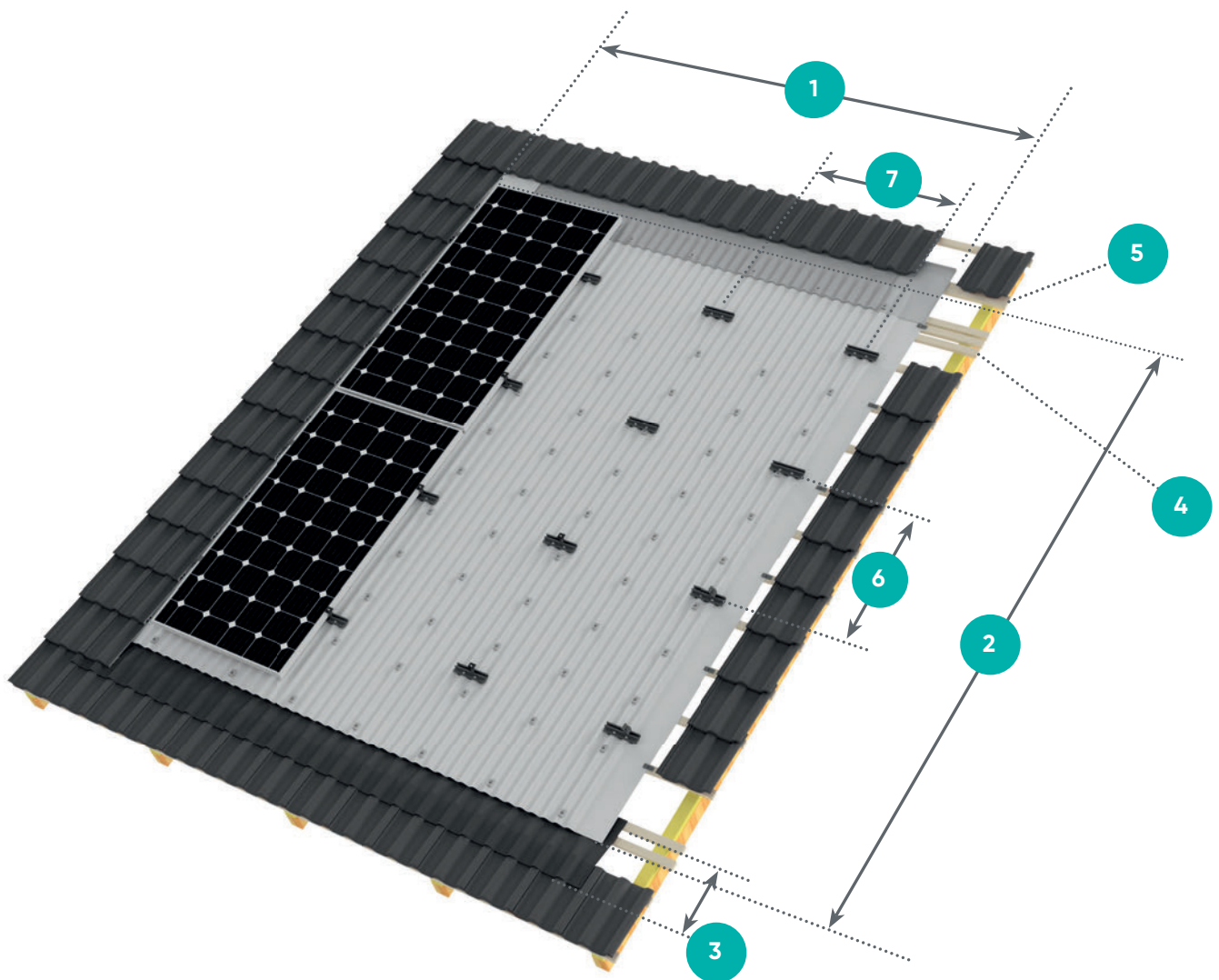
Should the existing battens be replaced or supplemented during the course of precise module arrangement planning, then the short adapters may be used in the inner surface area. The long adapters facilitate more flexibility in the vertical fixation of the PV modules, so that in some cases, when installing the mounting system, no further roof battens need to be added to the roof truss. For the lower edge of the PV field, short or intermediate adapters may be used. The intermediate adapters enable (in connection with a correspondingly wide sealing strip) a larger overlapping in the sealing strip area. This may be necessary, depending on the national standards.



The modules can be fixed along the entire length of the adapters.

1. Height of the module field: $\text{Module width} \times \text{number of modules vertically} + ((\text{number of modules vertically} - 1) \times 19 \text{ mm}) + 50 \text{ mm}$
2. Width of the module field: $\text{Module length} \times \text{number of modules horizontally} + ((\text{number of modules horizontally} - 1) \times 19 \text{ mm})$
3. Additional roof battens for attaching the sealing strip and the lower adapter: Distance between new batten (center) and edge of the below tiles: 120 mm (for the short adapter).
4. Additional roof battens for fixing the top adapter: Height of module field - 30 mm (center of batten).
5. Additional roof battens for fixing the top flashing: Height of module field + 280 mm (center of batten).
6. Horizontal distance between adapters: Approx. at quarter points of the module = $\frac{1}{2}$ module length (observe the information provided by the module manufacturer)
7. Vertical distance between adapters: Can be calculated from the module dimensions. Place the adapter correctly in the inner part of the module field so that its centre point is located in the 19 mm clearance space between the modules. A minimum distance of 25 mm between the adapter edge and module field edge must be kept for the outer top and bottom adapters.

4.3 Portrait installation



1. Width of the module field: $\text{Module width} \times \text{number of modules horizontally} + ((\text{number of modules horizontally} - 1) \times 19 \text{ mm}) + 50 \text{ mm}$
2. Height of the module field: $\text{Module length} \times \text{number of modules vertically} + ((\text{number of modules vertically} - 1) \times 19 \text{ mm})$
3. Additional roof battens for fixing the sealing strip: Distance between new batten (center) and edge of the below tiles: 120 mm
4. Additional roof battens for fixing the upper edge of the PV field: Height of the module field - 30 mm (center of batten).
5. Additional roof battens for fixing the top flashing: Height of the module field + 280 mm (center of batten).
6. Vertical distance between adapters: Approx. at quarter points of the module = $\frac{1}{2}$ module length (observe the information provided by the module manufacturer). Spacing is based on the roof batten raster. In the case of a particularly unfortunate batten raster, additional battens may have to be installed).
7. Horizontal distance between adapters: Can be calculated from the module dimensions. Position the adapter in the inner part of the module field so that its centre point is located in the 19 mm clearance space between the modules. A minimum distance of 25 mm must separate the adapter edge of the adapters on the right and left edge and the module field edge.

5. Installation

5.1 Roof preparation

Removing the roof covering

Mounting steps:

- Remove roof covering for the surface area of the modules. On the lateral and top edges remove an additional row of tiles beyond what is necessary for the actual module field.
- In the case of an uneven roof truss, it may be necessary to adjust the height of the roof battens.
- If necessary, lay a roofing membrane under the intended module field. Should the insulation be in direct contact with the roofing membrane, the vapour permeability of the roofing membrane must be ensured.

Installing additional roof battens

Mounting steps:

- Attach the additional roof battens at the appropriate places in a professional manner (see point 4).



CAUTION

Material damage from faulty installation

If the additional roof battens are not sufficiently fixed, they will not resist increased wind loads.

- Ensure that the roof battens are sufficiently attached to the rafters.

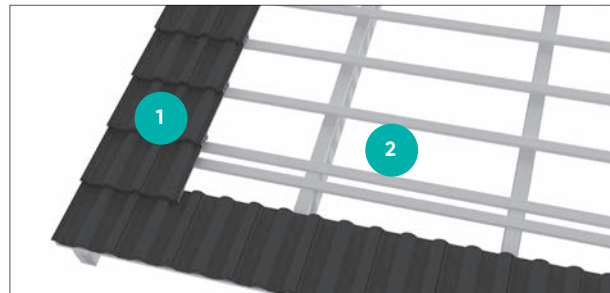


DANGER

Potentially mortal danger from falls and falling objects

When working on the roof components may fall down, or persons may fall off.

- Protect yourself against falling (use scaffolding or barriers if necessary).
- Mark the danger zone on the ground (concerning falling components) and bar access to unauthorised persons.
- Do not remain in the danger zone.
- Wear a hard hat.
- Take note of the possible effect of wind gusts when transporting modules and sheets.
- After the assembly is complete, ensure secure fixing of the mounting system, the PV modules and the tiles.



5.1-1 Roof construction

1. Roof covering (for example tiles)
2. Roof substructure (for example wooden battens)

5.2 Installing the substructure

Laying the sealing strip

Mounting steps:

- Unroll the sealing strip along the lower edge of the uncovered roof surface.
- Cut the sealing strip for the length of the surface area + one extra tile width on the left and right.
- Allow for adequate spacing (50 mm) between the upper edge of the roof tile and the lower edge of the corrugated metal sheet to avoid an edge that is too sharp. Also allow for adequate overlapping by the corrugated sheets.
- Fix the sealing strip on the additional roof battens with screws.
- After fixing the sealing strip, adapt the shape of the strip to the shape of the tiles, taking care to avoid the formation of sharp edges.

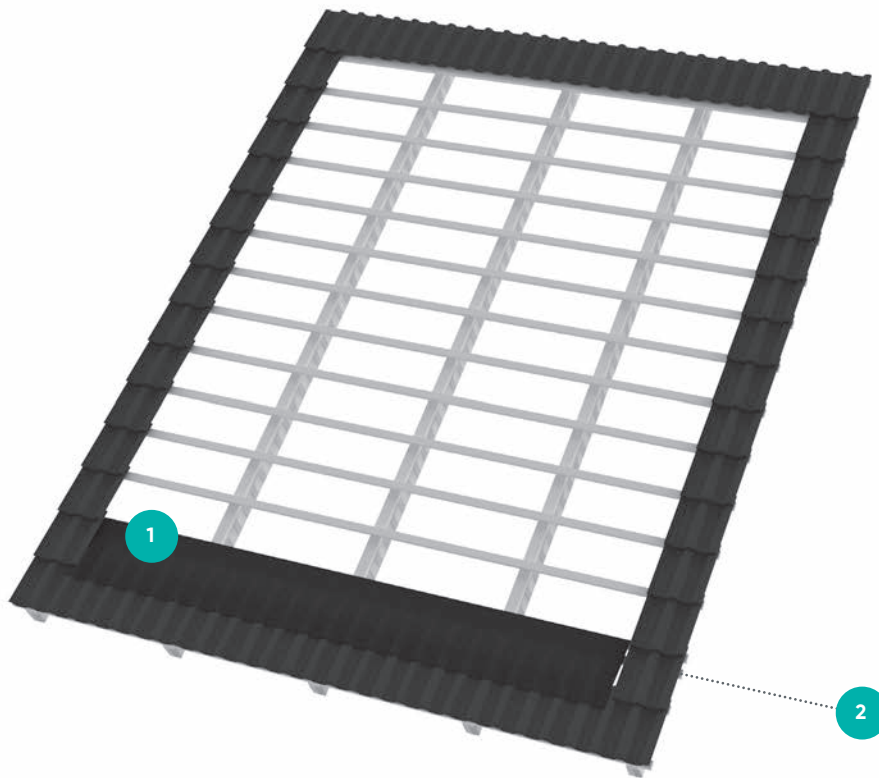


CAUTION

Leaky construction

If the sealing strip does not sufficiently overlap the roof tiles, the roof may become subject to leaks.

- The sealing strip must vertically overlap the tiles at least as much as the tiles overlap themselves. In case of very curved roof tiles, it may be advisable to flatten the upper edge of the tile underneath the sealing strip prior to laying. In that way, sharp edges and water accumulation can be avoided.



5.2-1 Sealing strip

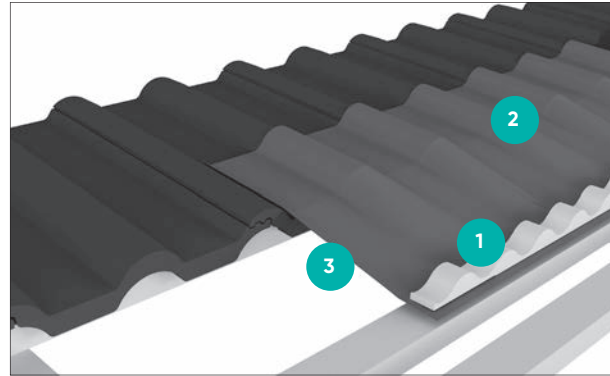
1. Sealing strip
2. Additionally installed battens for sealing strip fixation

Installing the lower profile filler

Foam profile filler with short lower adapter and narrow sealing strip (in this case: MetallRoll)

Mounting steps:

- Guide the foam profile filler up to the lateral flashings of the module field.
- Fix the profile filler on the sealing strip with doublesided adhesive tape in such a way that later (by means of adapters or calottes), it can be screwed onto the roof batten directly underneath it.
- Should MetalRoll be used as the sealing strip, the top 2 cm of the adhesive surface can be completely turned over, so that the adhesive surface is facing upwards, and the profile filler can be attached without additional adhesive tape.



5.2-2 Lower profile filler

1. Foam profile filler
2. Sealing strip
3. Lower edge of the corrugated metal sheet



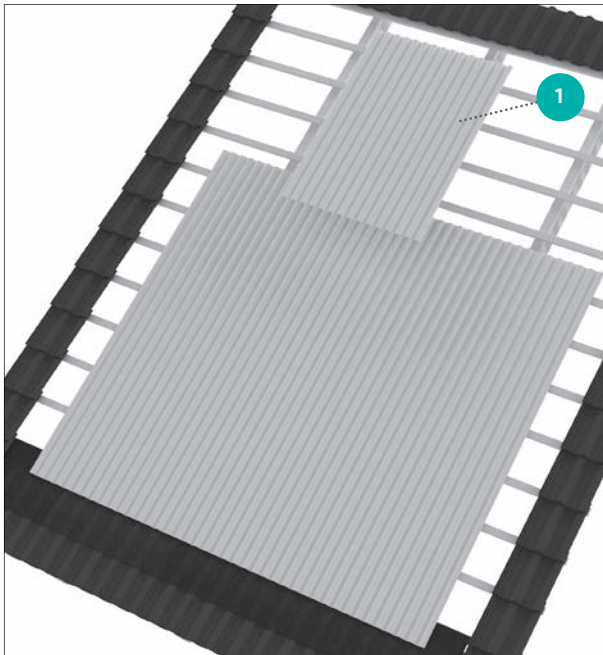
CAUTION

Leaky construction

If the sealing strip is not sufficiently overlapped by the corrugated metal sheets, the roof covering may become subject to leaks.

- The sealing strip must begin no less than 100 mm above the planned lower edge of the corrugated metal sheet. An allowance of a further 5 cm up to the roof tile edge has to be made.

Laying the corrugated metal sheets

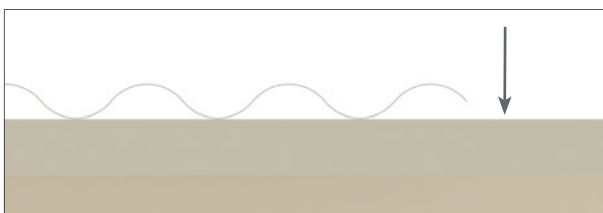


5.2-3 Corrugated metal sheets

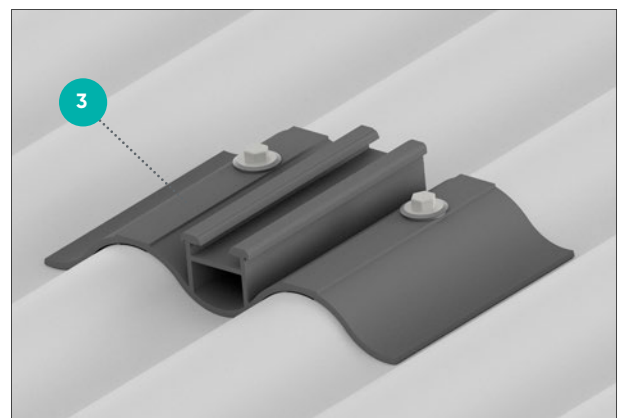
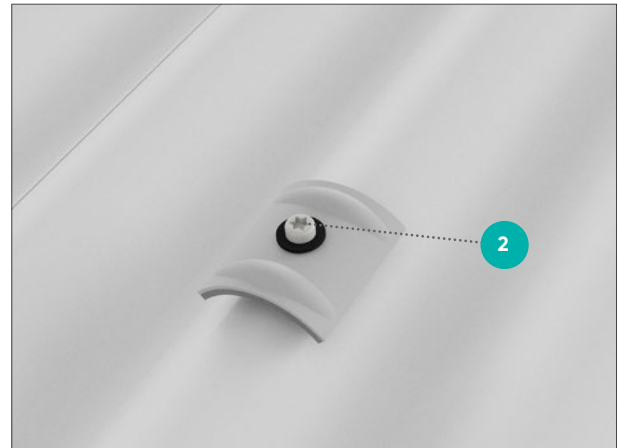
1. Corrugated metal sheets
2. Roofing screw 4.5 x 45 mm with calotte
3. Landscape adapter

Mounting steps:

- Place the lower edge of the corrugated sheet onto the sealing strip with adequate overlapping: 100 mm for the foam profile filler and 150 mm for the comb profile filler (see „Installing the lower profile filler“).
- Position the corrugated sheets so that the sides end with corrugation pointing downward to the roof truss.



5.2-4 Corrugated metal sheet end



CAUTION

Leaky construction

If the corrugated metal sheets do not sufficiently overlap, the roof may become subject to leaks.

- Sheets must overlap above each other by at least 200 mm vertically and by at least 80 mm = 2 high points of the corrugation horizontally.
- Lay the corrugated sheets in sequence starting from the bottom and working upwards, and plan the side overlap in accordance with the main wind direction.

Mounting steps::

- For normal rectangular roofs, lay the lower edge of the bottom row of corrugated metal sheets parallel to the eaves.
- Attach the corrugated metal sheets (see point 5.3/5.4 „Installing the adapters“) to the roof with 6.5 x 65 mm sheet metal screws together with the adapters, the profile filler and the lateral flashings. If necessary, use additional 4.5 x 45 mm roofing screws and calottes, so that at least 6 fixing points per m² are provided.
- Position the corrugated sheets so that they correspond to the entire module field. If necessary, use additional roofing screws and calottes to attach the overlapping points.
- After laying the lateral and top flashings, attach the outer edges of the corrugated sheet surface area every 50 cm with roofing screws and calottes.
- To expedite the installation process, the mounting aid can be used starting at the second row of sheets. The mounting aid cannot be used on the last / top row, as the height of the corrugated sheet must be adjusted to the intended module field height, and the mounting aid's prescribed overlap of 200 mm must therefore be exceeded there.

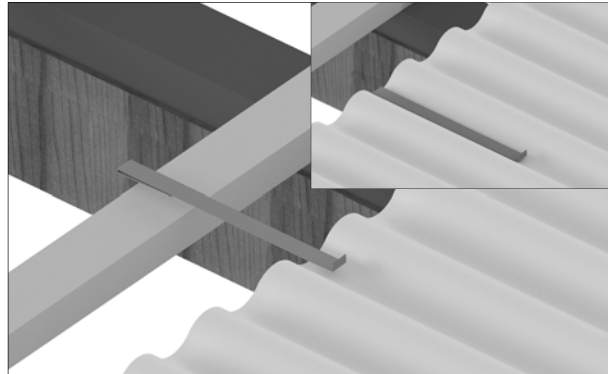


CAUTION

Material damage

Walking on the corrugated sheets can cause dents or tears.

- Do not walk or stand on the corrugated sheets.
- Use of a roofer's ladder is recommended.



5.2-5 Mounting aid

5.3 Installing the adapters (landscape installation)

Fix the adapters from the bottom, moving upwards.
While installing the adapters, repeatedly check that the surface is flat, for example with an aluminium level.

Installing of the short landscape adapters (on the lower edge of the module field)

Mounting steps:

- Lay out the first row of corrugated sheets above the sealing strip, and make the side points of overlap correspond to the final surface width.
- Position the short or intermediate landscape adapters on the lower corrugated sheet edge according to the plan (see chapter 4). The holes of the adapter should face upwards, the round tip in the adapter's Quickstone channel should be facing left (see detailed illustration).
- If one of the profile filler fixation points lines up exactly with one of the adapters, remove this screw from the profile filler.
- Position the corrugated metal sheets to the prescribed overlap onto the sealing strip and profile filler, and align the sheets.
- Screw the adapters with two 6.5 x 65 mm sheet metal screws each (see chapter 4, „Planning the module field“) onto the roof batten lying directly underneath at the designated points. At the same time, attach the corrugated sheet, sealing strip and profile filler.



CAUTION

Material damage

Walking on the corrugated sheets can cause dents or tears.

- Do not walk or stand on the corrugated sheets.
- Use of a roofer's ladder is recommended.

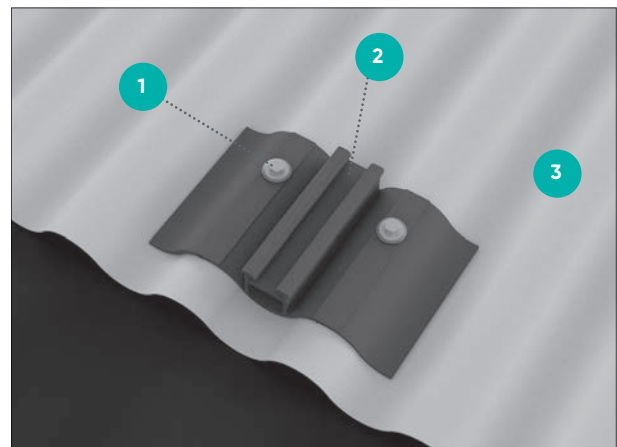


CAUTION

Material damage

Screws that are not attached in the centre of the roof batten may rip out.

- Position all screws in the centre of the battens.



5.3-1 Landscape adapter short

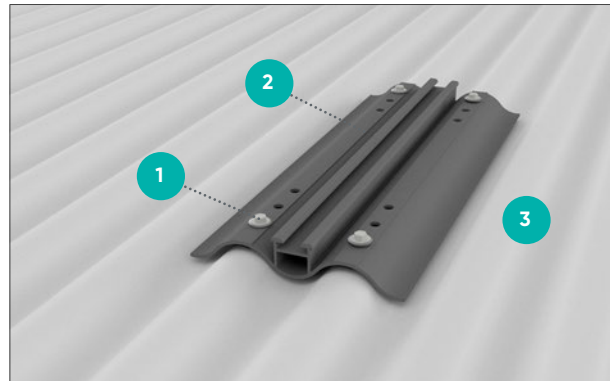
- 1 Sheet metal screws, 6.5 x 65 mm (self-drilling)
- 2 Short landscape adapter
- 3 Corrugated metal sheet

**Installing the short or long lateral adapters
(in the centre and upper range of the module field)**

The long landscape adapter is used when no new battens are to be installed in the inner surface area. Otherwise, short adapters can be used. The top adapter row must be fitted with short adapters.

Mounting steps:

- For orientation: Mark the position of the roof battens on the corrugated sheet by using a chalk line.
- In accordance with the plan, screw long or short adapters on the designated points (see chapter 4) with 6.5 x 65 mm sheet metal screws onto the roof batten lying directly underneath. Use the corresponding holes in the adapters – 2 each for the short, or 4 for the long adapters.



5.3-2 Landscape adapter long

1. Sheet metal screw, 6.5 x 65 mm (self-drilling)
2. Long landscape adapter
3. Corrugated metal sheet

Attention:

For landscape installation, the top flashing must be fixed before the installation of the top adapter row (see chapter 5.6).

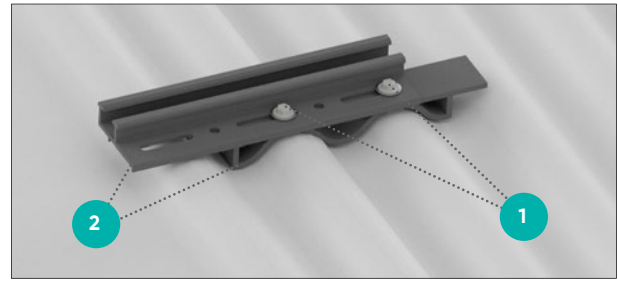
5.4 Installing the adapter (portrait installation)

Mounting steps:

- For orientation: Mark the position of the roof battens on the corrugated metal sheet by using a chalk line.
- Screw the portrait adapters at the points specified in the planning (see chapter 4, „Planning the module field“) with two 6.5 x 65 mm sheet metal screws each onto the roof batten lying directly underneath. Use the corresponding drill holes in the adapter.
- Install the two parts of the portrait adapters in the module field precisely aligned above each other.
- For mounting on the lateral edges, the perforated rail can be slid sideways up to 50 mm beyond the basis to ensure a clean transition between roof and module field.

Attention:

For portrait installation, the lateral flashings must be installed before fixing the outer adapters (see point 5.5 „Installing the lateral flashings“). Ensure professional potential equalisation of the metal surface without damaging the leak tightness.



5.4-1 Portrait adapter

1. Sheet metal screws, 6.5 x 65 mm (self-drilling)
2. Portrait adapter (two-part)



CAUTION

Material damage

Screws that are not attached in the centre of the roof batten may rip out.

- Position all screws in the centre of the battens.



CAUTION

Material damage

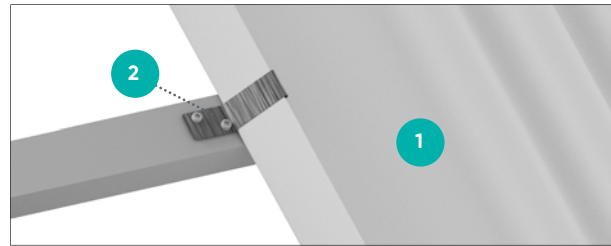
Walking on the corrugated sheets can cause dents or tears.

- Do not walk or stand on the corrugated sheets.
- We recommend the use of a roofer's ladder.

5.5 Installing the lateral flashings

Mounting steps:

- Position the lateral flashings so that 2 waves of the flashing overlap the corrugated metal sheet on the right and left side of the module field.
- Align the sheets on the lower edge of the corrugated metal sheet area.
- If using several lateral flashings, overlap them by at least 200 mm vertically – if necessary, shorten the topmost lateral flashing corresponding to the size of the corrugated metal sheet area.
- Fix the flashing on the inside by using roofing screws and calottes or adapters (only for portrait installation) at least every 500 mm.
- By using the fixation clips and roofing screws, fix the flashing on the outer edge at least every 50 cm.
- Ensure a professional overlapping of the sheets by using roofing tinsmith tools such as clinching pliers.



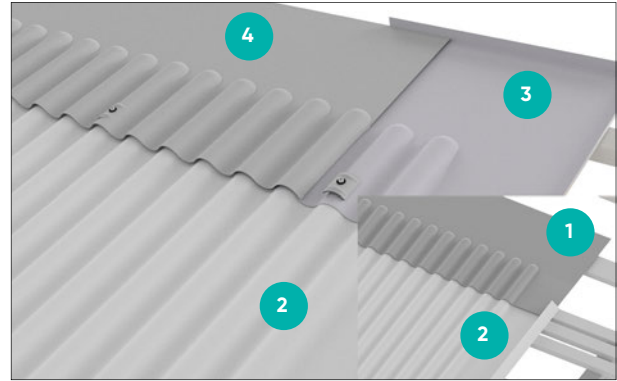
5.5-1 Lateral flashing

1. Lateral flashing
2. Fixation clip for 4.5 x 45 mm roofing screws

5.6 Installing the top flashing

Mounting steps:

- Install additional roof battens 30 mm below and 280 mm above the upper end of the corrugated metal sheet area (measured from the centre of the battens). The second roof batten should stick out above the top flashing to allow the fixing clip.
- Position the left-hand and right-hand corner flashing with the respective two outer corrugations and the flat part overlapping the lateral flashing, and push them downwards as far as they will go. (Alternatively, by use of a rubber hammer, about 150 mm of the top flashing respectively (see area marked in grey above). The flattened sheets can then be used in place of the corner flashings).
- Continue positioning the top flashings, taking care to align them properly and to have them overlap each other by at least 80 mm (= two high points of the corrugation). Fix each overlap with an adapter and 2 screws 6.5 x 65 mm (if in the right position) or with a calotte and screw 4.5 x 45 mm.
- Work the upstand of the flashings with tinsmith tools to ensure a clean overlap.
- Fix the upstand to the underlying batten at least every 500 mm, using fixing clips and screws 4.5 x 45 mm.
- Complete the fixation of the top flashings by fixing the corrugated part at least every 500 mm, using adapters and/or calottes and the according screws.



5.6-1 Corner area

1. Top flashing, a strip of 150 mm flattened on the edges (area marked in grey)
2. Lateral flashing
3. Corner flashing
4. Top flashing

5.7 Installing of Clickstones

Clickstones are used for the fastening of the modules. The Clickstone is a special clip with which the module clamps are fastened in the base rail. You only need an allen key (5 mm) for the installation. You can insert the Clickstone from above into the top channel of the base rail.

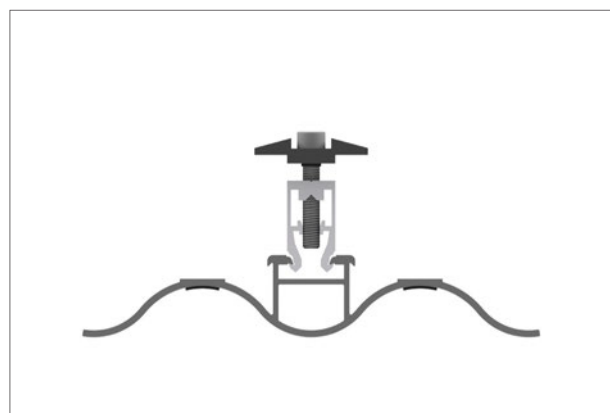
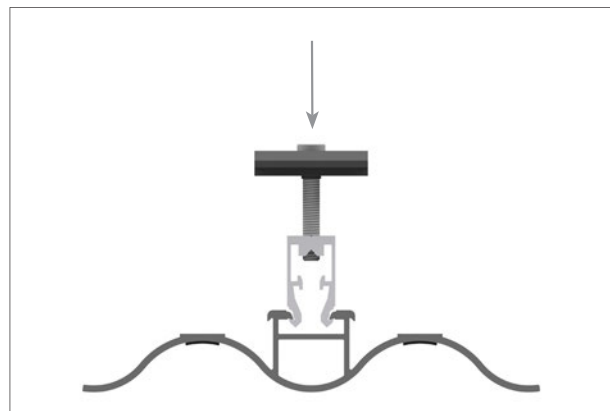
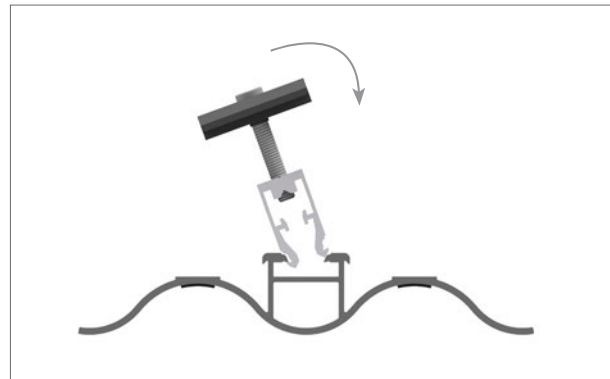
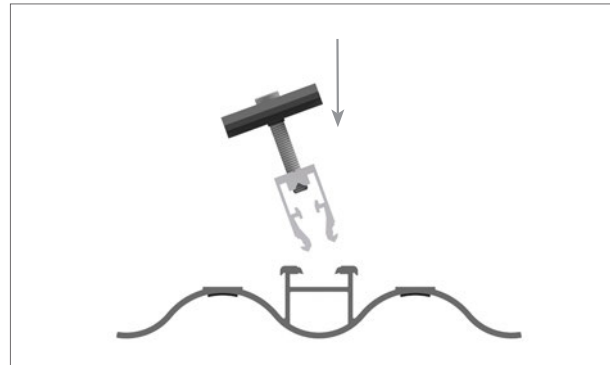
Mounting steps:

- Insert the Clickstone at a slight angle into the rail channel.
- Push the Clickstone down. Make sure you hear the Clickstone clicking into the base rail.
- Tighten the bolt with a torque of 8 Nm.



NOTE!

The shape of the Clickstone corresponds exactly to the profile of the rail channel. It has been consciously constructed not to run easily in order to prevent unintentional slipping in vertical rail tracks. To move the Clickstone, press lightly on the bolt, from above, and move the stone with a little pressure along the rail channel.

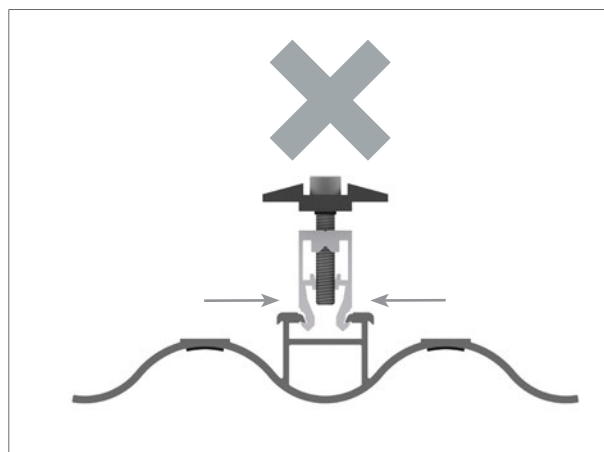


5.7-1 Mounting steps



NOTE!

The lugs on the inside of the Clickstones are designed in such a way that once the bolt has been tightened, they prevent a “click out” mechanically. Accordingly, the bolt must first be unscrewed to above the lugs before the Clickstone can be removed from the base rail by pressing the sides of the stone together and lifting.

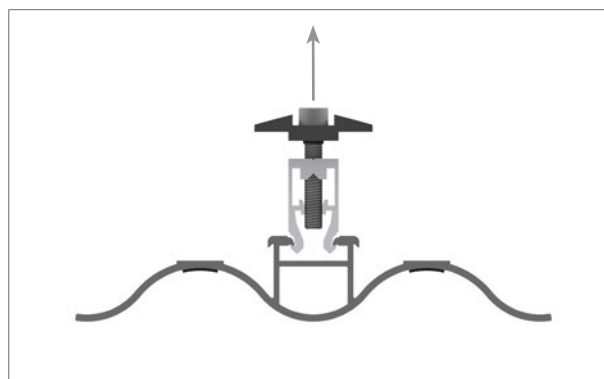


CAUTION

Material damage due to incorrect installation

Incorrectly mounted Clickstones can slip out. PV modules can fall and be damaged.

- Mount all Clickstone connections in accordance with the instructions.

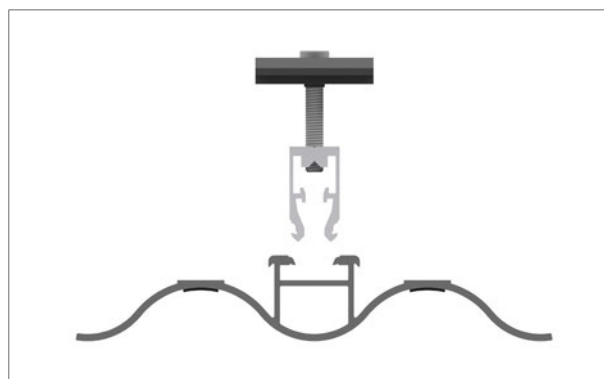
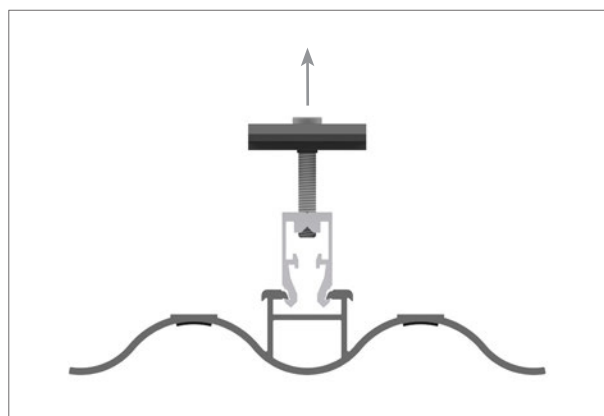


CAUTION

Material damage caused by deformed Clickstones

If clearly deformed Clickstones are used, the safety of the module fastening is not guaranteed. PV modules can fall and be damaged.

- Only use Clickstones where the lugs are parallel to each other and you can clearly hear them clicking into the rail channel.
- Replace deformed Clickstones prior to installation.



5.7-2 Demounting steps

5.8 Installing the PV modules

The modules are installed on the base rails one by one. Mounting Systems GmbH recommends mounting the modules starting from one side. Module clamps and module end clamps are used for the fastening of the modules. The module end clamps can hold one module each. The module clamps are positioned between two modules.

Fastening the Modules on the Outer Side

The margin modules of the PV system are on the left and right side at a portrait installation and on the up and down side at a landscape installation. These modules are fastened on the outer side with two module end clamps each.

Mounting steps - Portrait Installation

- Place and align an outside module. The base rail must protrude the module frame by 30 mm.
- Insert the Clickstone of the module end clamp into the channel of the base rail.
- Push the module end clamp right to the module frame (max. permissible gap 1 mm).
- Tighten the bolt (torque 8 Nm) and thus clamp the module.

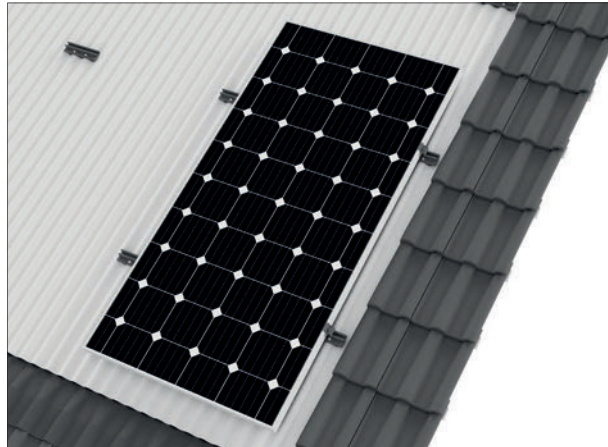
Mounting steps – Landscape Installation

- Insert the Clickstone of the module end clamp into the channel of the base rail.
- Place and align the module.
- Push the module end clamp right to the module frame (max. permissible gap 1 mm).
- Tighten the bolt (torque 8 Nm) and thus clamp the module.

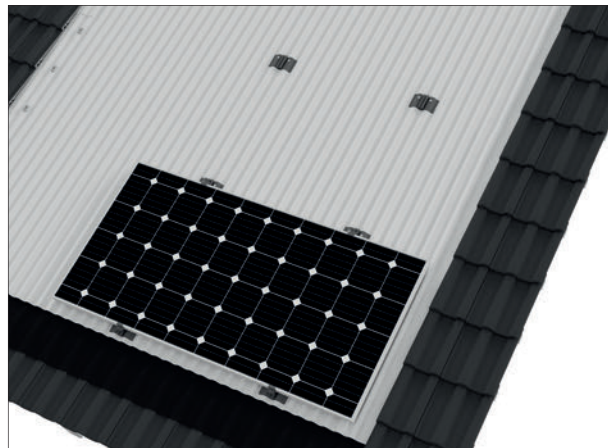


NOTE!

Please adhere to the module-clamp standards of the module manufacturer. Basically, the modules are clamped at the quarter points.



5.8-1 Portrait installation



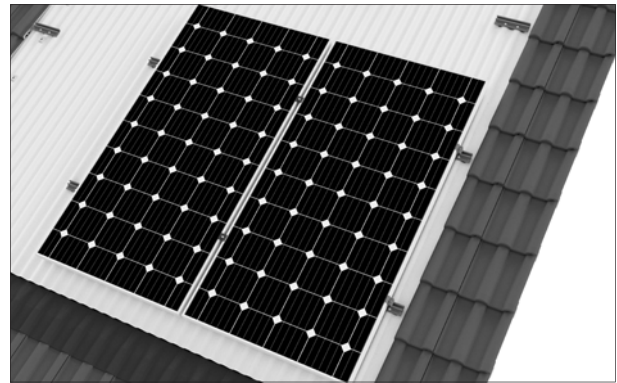
5.8-2 Landscape installation

Fastening the Modules on the Inner Side

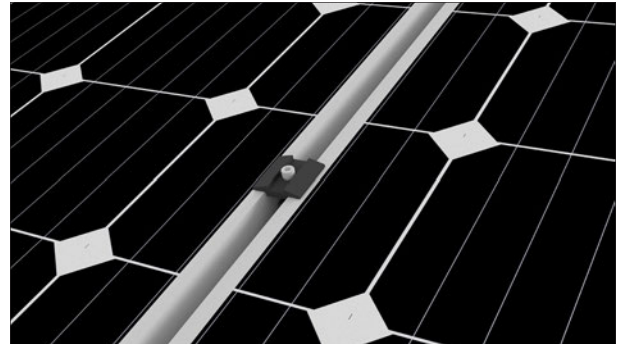
Two module clamps are fastened between two modules.

Mounting steps:

- Insert the Clickstone of the module clamp into the channel of the base rail.
- Push the module clamp all the way to the frame of the already mounted module.
- Push the second module to the module clamp (max. permissible gap between two modules: 19mm) and align.
- Tighten the bolt (torque 8 Nm) and thus clamp the modules.



5.8-3 Module clamp



5.8-4 Module clamp



CAUTION

Material damage due to incorrect mounting

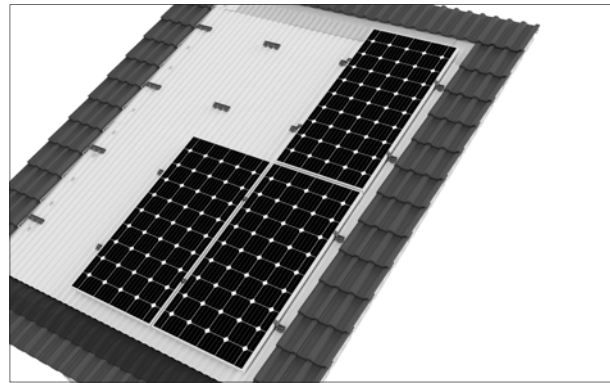
Incorrectly fastened modules can fall and become damaged.

- Make sure the Clickstones click in correctly.
- Push the modules all the way to the module clamp.
- Adhere to the stipulated torque of 8 Nm when tightening the bolt.
- Check both modules fit tightly after mounting.

Fastening Additional Module Rows

Mounting steps: - Portrait Installation

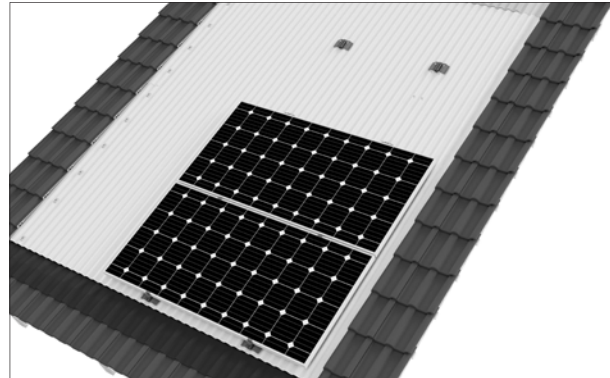
- Push the modules in the upper rows from above down to the modules in the lower rows. For optical reasons you can also keep a distance to the lower module.
- Fasten the modules analogously to the 1st row with module end clamps and module clamps (cf. chapters 8.1 and 8.2).



5.8-5 Portrait installation

Mounting steps: - Landscape Installation

- Push the modules on the side to the mounted modules. For optical reasons you can also keep a distance to the lower module.
- Fasten the modules analogously to the 1st row with module end clamps and module clamps (cf. chapters 8.1 and 8.2).



5.8-6 Landscape installation



NOTE!

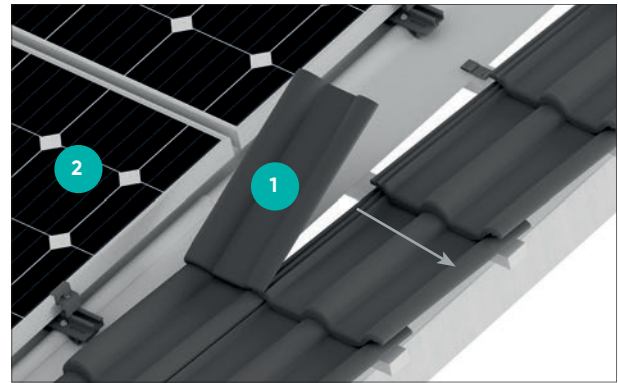
Use e.g. a module clamp as a spacer gauge. This way you will achieve identical horizontal and vertical distances between modules.

5.9 Retiling the roof

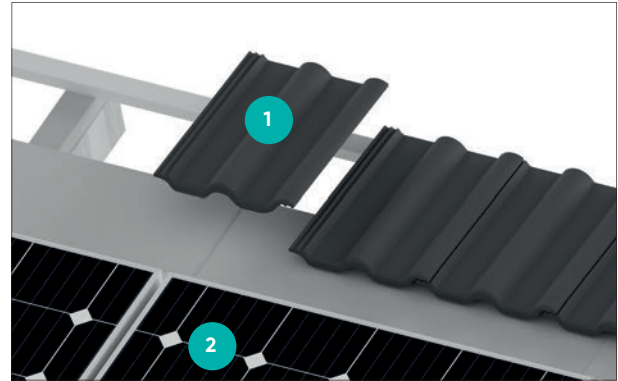
Mounting steps:

Replace the roof tiles around the module field.

- Depending on the module field and the type of tiles, it may be necessary to cut the adjoining roof tiles down to size.
- Should it be necessary to shorten the mounting on the underside of the roof tiles, additional professional fixation must be ensured.
- Depending on the type of roof covering, it may be impossible to avoid a gap between the tile and the flashing (top or lateral). Should this be the case, the gap must be sealed against snow accumulation and insects.



5.9-1 Roof tile side



5.9-2 Roof tile on top

1. Roof tile
2. Module field



CAUTION

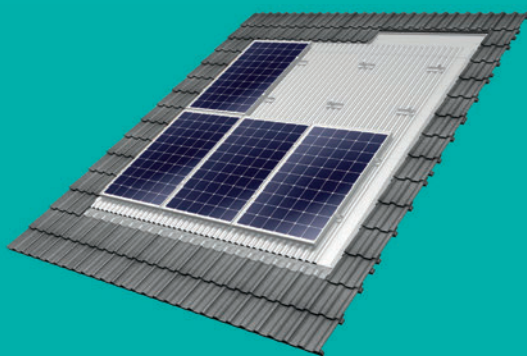
Leaky construction

If the roof tiles do not sufficiently overlap the flashings, the roof may become subject to leaks.

- Lay the roof tiles over the flashings up to the edge of the module field.



**mounting
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