

Assembly Systems for photovoltaics plants

Assembly Instructions – Flat Roof

Assembly Systems for photovoltaics plants



ASSEMBLY INSTRUCTIONS FLAT ROOF

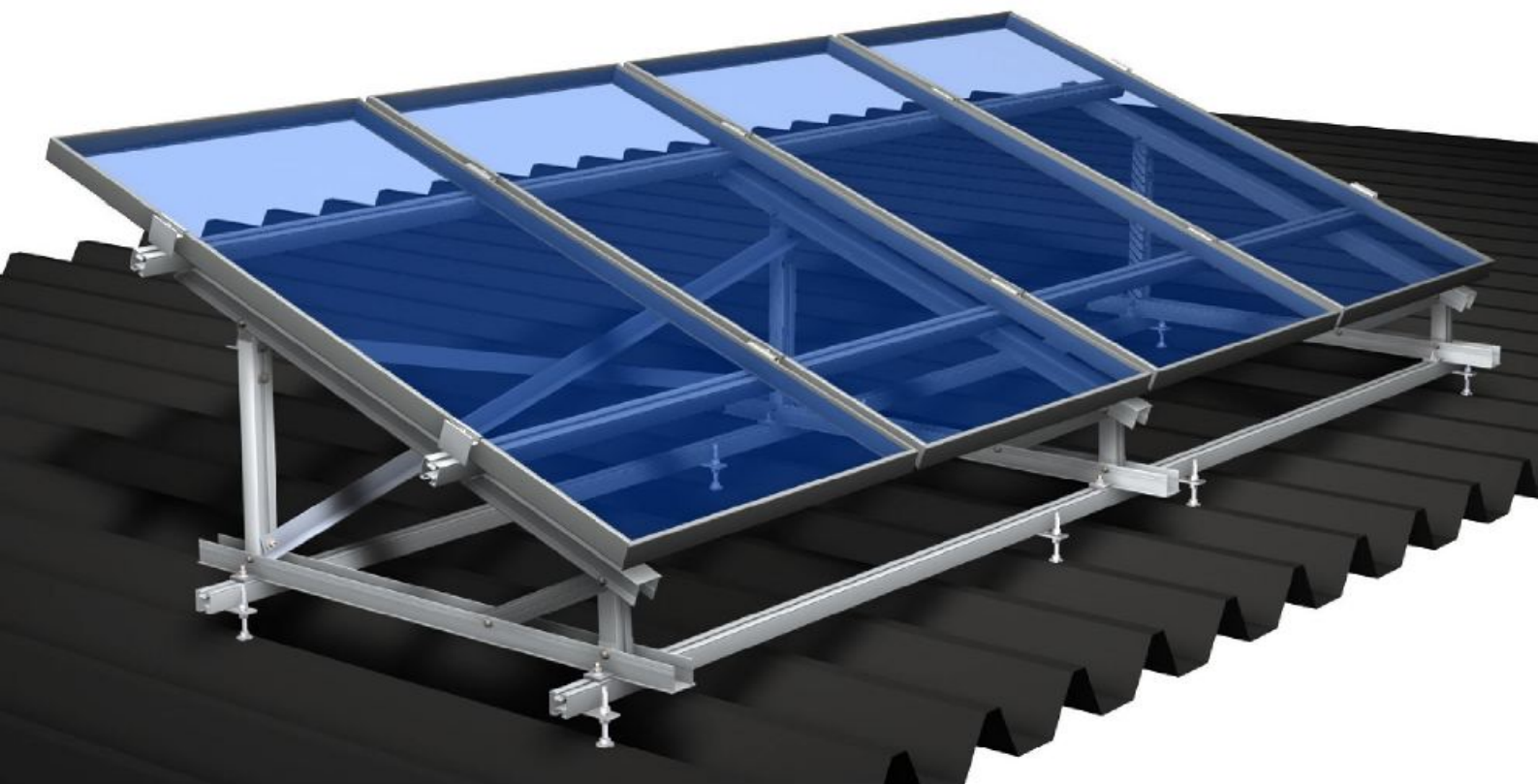
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ASSEMBLY INSTRUCTIONS FLAT ROOF GENERAL

Two things were decisive for us when constructing and developing PROFINESS assembly systems: the most simple installation and long-life which guarantees for safety. This is what the PROFINESS Solar programme is based on.

We would like to point out that these assembly recommendations reveal the standard of the technology and the experience gained over many years, showing how our systems can be installed locally.



As there are individual particularities to be considered for every roof, we request you, prior to tackling the installation, to seek professional clarification. Particularly the requirements of statics must be considered. When assembling the plant care shall be taken that the corresponding standards and accident prevention regulations are abided by.

Important standards and regulations
BGV A2 Electrical plants and equipment

BGV C22 Construction work

BGV D35 Ladders and stairs

BGV A1 Accident prevention regulation

DIN 1052-2 Wooden construction: mechanical connections

DIN 1055 Designed load for buildings

DIN 18299 General regulations for construction work of all kinds

DIN 18451 Scaffolding

ASSEMBLY INSTRUCTIONS FLAT ROOF POSSIBILITIES OF APPLICATION TO THE ROOF – PLANNING INSTRUCTIONS

1

FIG. 1 9785-PROFINESS 2040
Unfolding, variable adjustable from 20° to 40°. Is supplied completely assembled, ex warehouse. You only have to fold it apart and screw it on. Per mounting system you need 8 mounting disks 9785-PROFINESS 26. The aluminium angle 40*40*3 etc. can be used as cross stay.



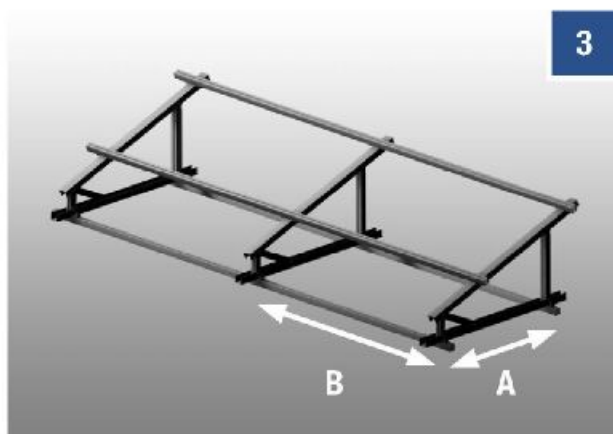
2

FIG. 2: 9785- ...
This mounting system is customized according to a drawing. The customer may determine the dimensions according to a drawing and determine the angle for the supplies. This mounting system is then completely pre-installed and need only be mounted to the stair bolts. This mounting system is made of aluminium L profiles (40*40*3,4 or 5)



3

FIG. 3: Spacing
A: spacing between the mounting points on the substructure of the mounting system
9785-PROFINESS 2040: 900 mm is the best.
B. Spacing between the mounting system is determined by the statics calculations.



ASSEMBLY INSTRUCTIONS FLAT ROOF POSSIBILITIES OF APPLICATION TO THE ROOF – PLANNING INSTRUCTIONS



FIG. 1 Stair bolts
When roofing is of corrugated sheeting or trapezoidal metal plating, stair bolts can be used. This is possible in the case of inclined roofs up to a max. 20° roof incline



FIG. 2: Should the mounting points on the rafters, taking account of the statics calculation of the triangle casing lie at the very best, the mounting system can be installed directly to the stair bolts without using the appertaining angle.

For the use of the stair bolts without an angle, adapter respectively, the mounting bores in the triangle must be adapted to the stair bolt dimension found at construction site.



If the mounting points are not optimally spaced from each other, the mounting systems have to be mounted onto system supports (substructure/rail system. This assembly sequence is described on the following pages

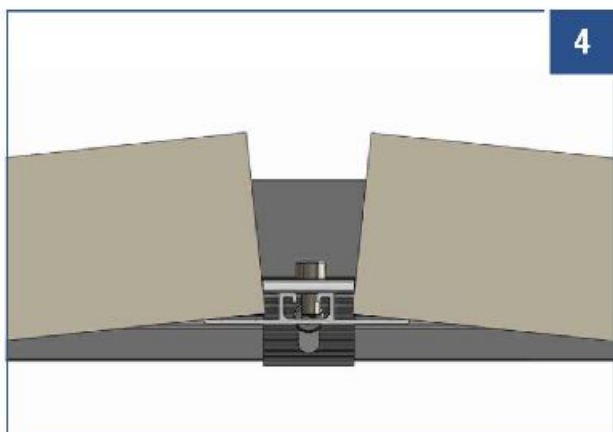


FIG. 3,4: Without roof penetration
Should roof penetration not be possible, the mounting systems can be fastened to the roof, with weighting. The bearing loads of the roof construction and, not least, the weighting values required by the structure have to be checked in advance.

ASSEMBLY INSTRUCTIONS FLAT ROOF

ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR TRAPEZOIDAL METAL COVER

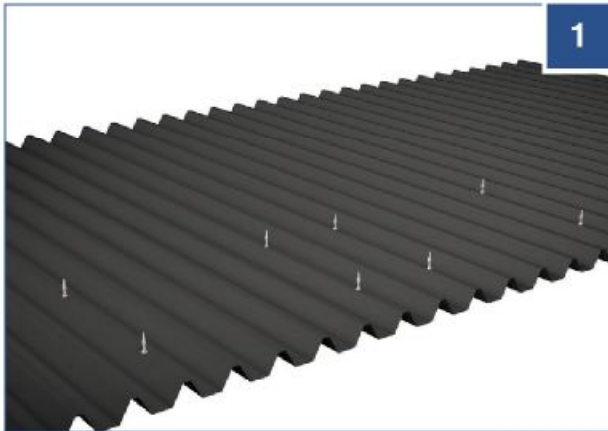


FIG. 1;2: The stair bolts are first screwed to the roof construction. Please find the spacing in the project-related assembly drawings, The choice of the corresponding stair bolts is defined by the respective substructure (e.g. wood or steel).



We offer the following possibilities:

For wooden substructures:

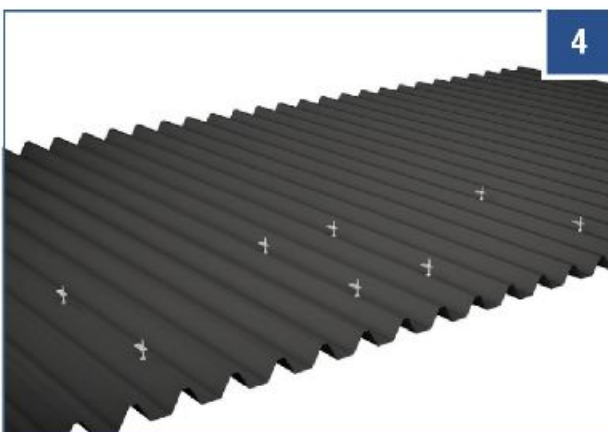
See product range 9215 + 9216 + 9217 + 9219 + 9221

For steel substructures:

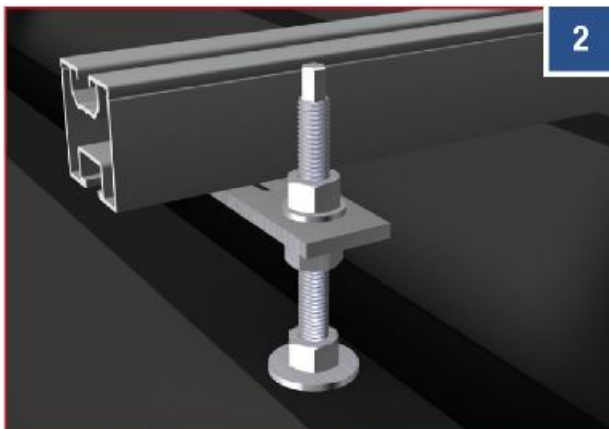
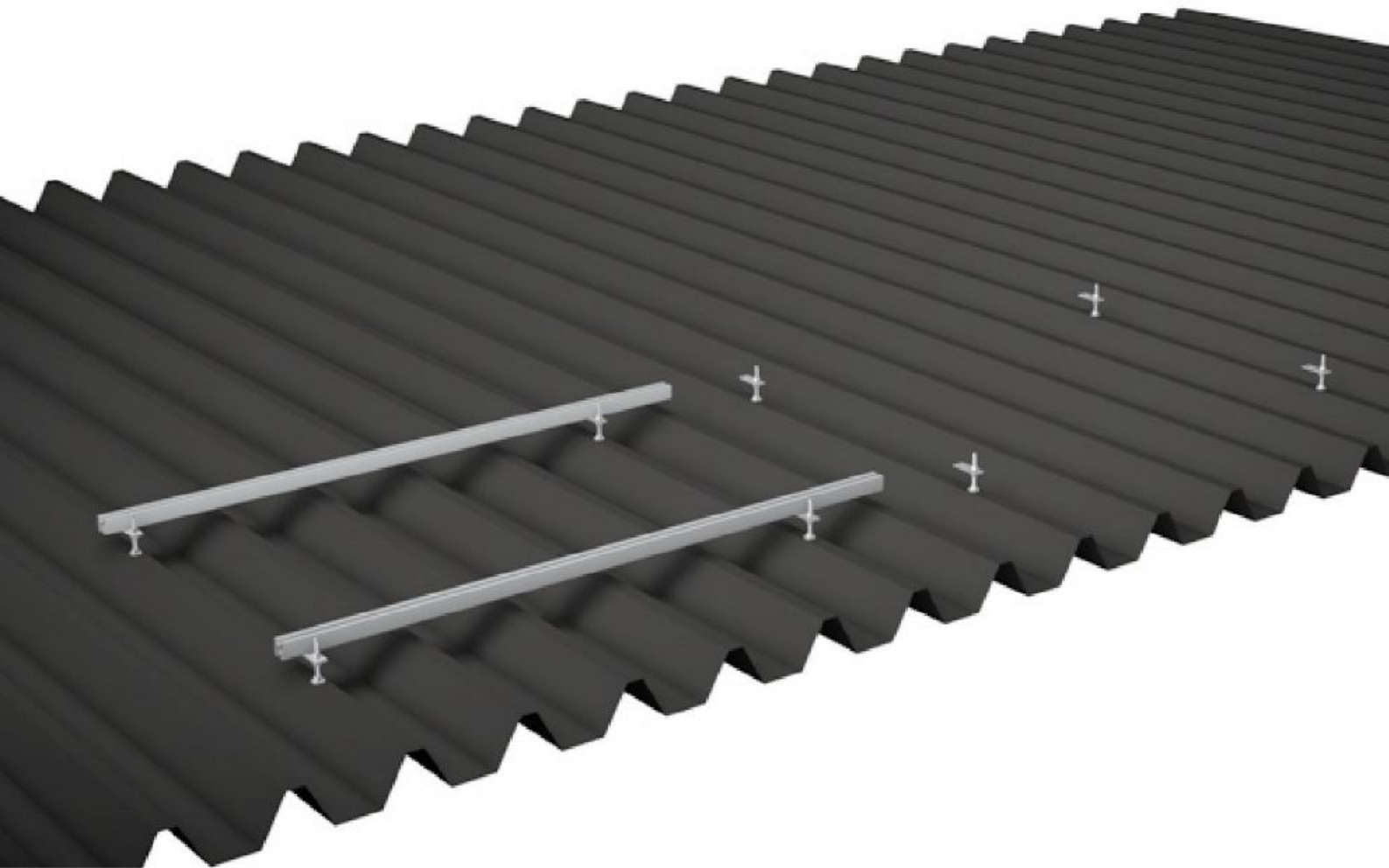
- see product range 9222
approved solar mounting!



FIG. 3,4: Then the metal adapter plates are mounted to the stair bolts (torque: M10 > 30-40 Nm, for M12 > 50-60 Nm)



ASSEMBLY INSTRUCTIONS FLAT ROOF ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR TRAPEZOIDAL METAL COVER



When all the metal adapter plates have been mounted, the system supports are mounted to the adapter plates. For this purpose the hexagonal screws DIN 933 A2/A4 M10*25 mm are inserted into the respective rail and fastened with the lock nut 9345 A2/A4 M10 on the adapter metal plate (torque 9-10 Nm).

If you would like to use a hammer head screw 9664 A2 M10*30mm, then take care of the alignment of the hammer head screws in the duct of the system support

ASSEMBLY INSTRUCTIONS FLAT ROOF ASSEMBLY OF THE RAIL CONNECTORS

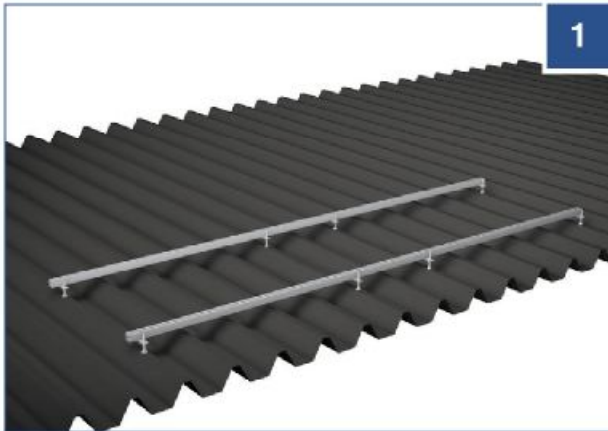


FIG. 1: To string several system supports together, various connectors can be used:

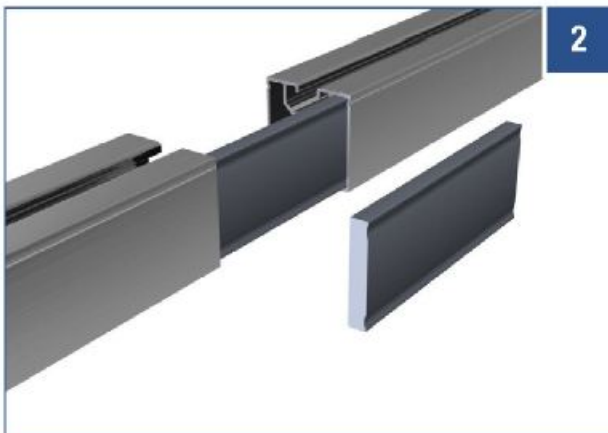


FIG. 2: The connector (PROFINESS 18) is pushed 50% into the mounting rail. Then the other mounting rail is pushed onto the connector. Finally exert pressure to the mounting rails to connect them flush to each other.

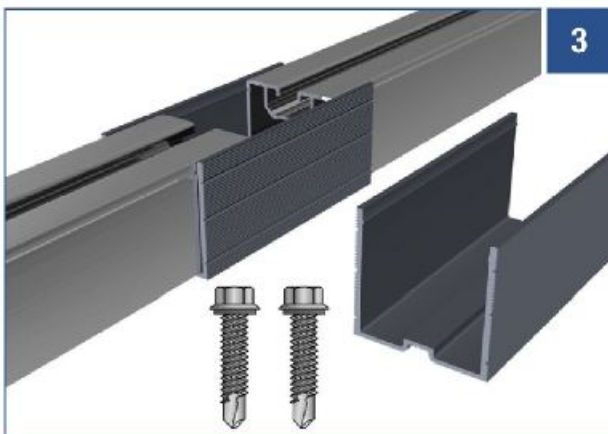


FIG. 3: Push the connector (PROFINESS 12) over the first mounting rail and click into the exiting groove. Then click in the second mounting rail and press both together. Finally this connection is screwed tight crosswise.(torque 8-10 Nm)

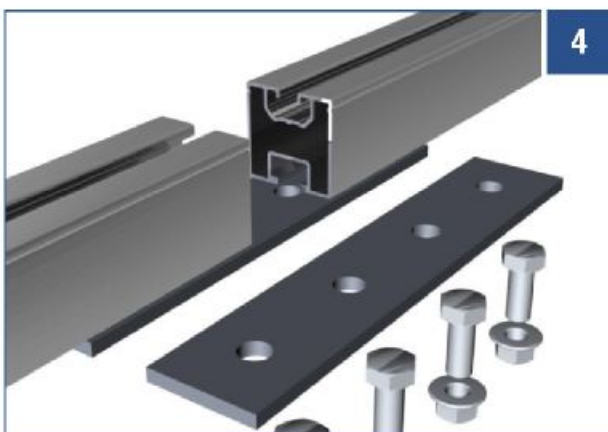


FIG. 4: Fit the connector (4-hole) with four hexagonal screws and slide the first two screw heads into the lower duct of the first assembly rail. Then slide the last two screws into the other rail. Then fasten all the screws with 4 nuts each.(torque 10-12 Nm)

ASSEMBLY INSTRUCTIONS FLAT ROOF ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR TRAPEZOIDAL METAL COVER

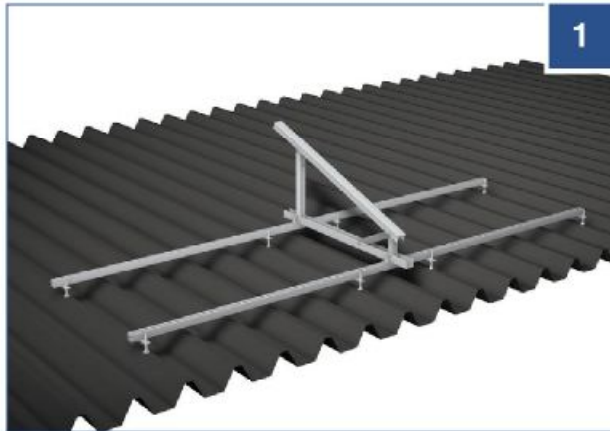


FIG. 1-4: Mounting BELOW
Now the mounting systems are fastened to the system support. A coach bolt DIN 603 A2/A4 M8*25mm is pushed into the upper profile of the system support, the thread must penetrate to the outside.



Then lay the mounting disk 9785 loosely to the threaded neck and tighten using a stop nut 985 A2/A4 M8 or a lock nut 9345 A2/A4 M8. (torque 14-16 Nm)



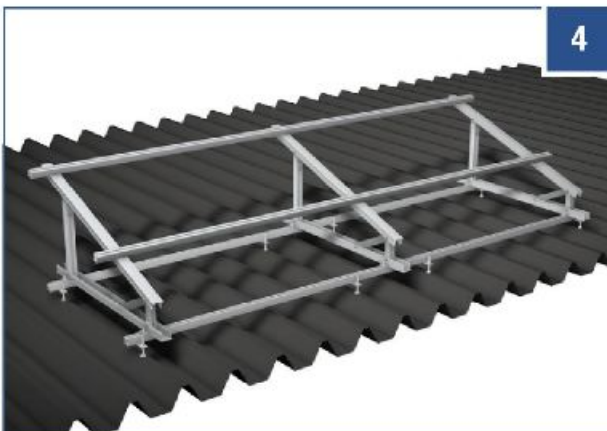
FIG. 5: Alternative
Slide the slot nut into the upper rail and click tight. Then fasten the mounting disc 9785-PROFINESS 26 to the mounting system and the rail using a cylinder screw DIN 912-2-8x16.

ASSEMBLY INSTRUCTIONS FLAT ROOF

ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR TRAPEZOIDAL METAL COVER



FIG. 1-4: Mounting TOP
Now the system support for the modules is fastened to the triangle.
For this purpose slide a hexagonal screw DIN 933 A2/A4 M10*25mm into the lower profile of the system support making sure the thread appears on the outside.
Then loosely lay the mounting discs 97895-PROFINESS 265 onto the screw threads and fasten with a lock nut A2/A4 M12.
Clamping torque 14-16 Nm



The spacing between the module rails for framed rails mounted upright is approx. $\frac{1}{2}$ of the module height.
Please always abide by the instructions of the module manufacturer.

ASSEMBLY INSTRUCTIONS FLAT ROOF

ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR TRAPEZOIDAL METAL ROOFING

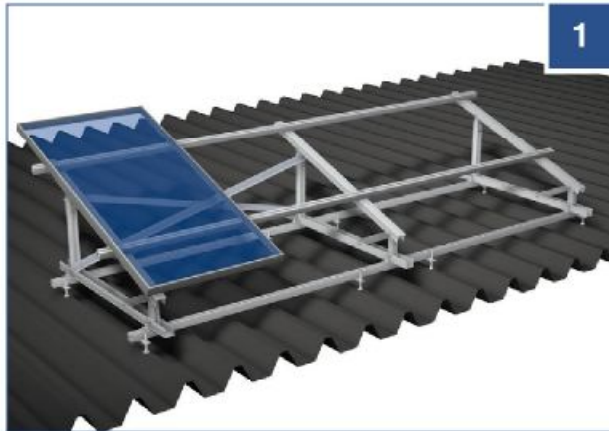


FIG. 1,2: When all the module supports have been mounted to the angles, the cross-bracing is applied. For this purpose you can use customary L-profiles (40*40*3). These have to be mounted at least every 12m in every row. You can screw these profiles directly to the rear angle with self-drilling screws; or use standard screws.

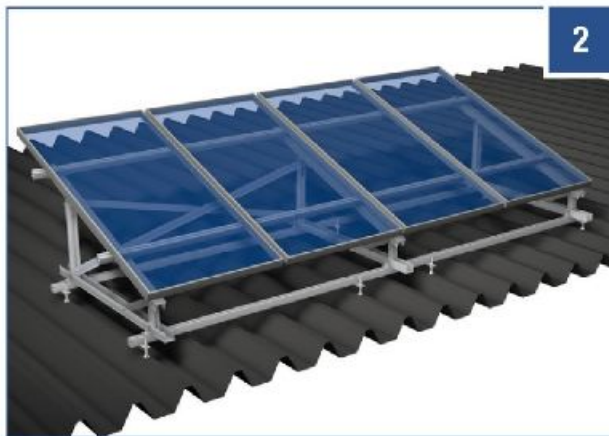


FIG. 3: To mount the module clamps the slot nut is swivelled into the upper rail and clicked in. Screw the terminal clamps with appertaining screw (each depending on module height) into the slot nut. Alternatively click the click element into the upper duct of the rail and tighten (torque up to a max. 18 Nm depending on module manufacturer.) A cover may be used to close off the form.



FIG. 4: Swivel the slot nut into the upper rail and click together. Then turn the centre clamp with the appertaining screw (depending on module height) into the slot nut. Alternatively click the click element into the upper duct of the rail and tighten (torque up to a max. 18 Nm depending on module manufacturer.)

ASSEMBLY INSTRUCTIONS FLAT ROOF

ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR FRAMELESS PV MODULES

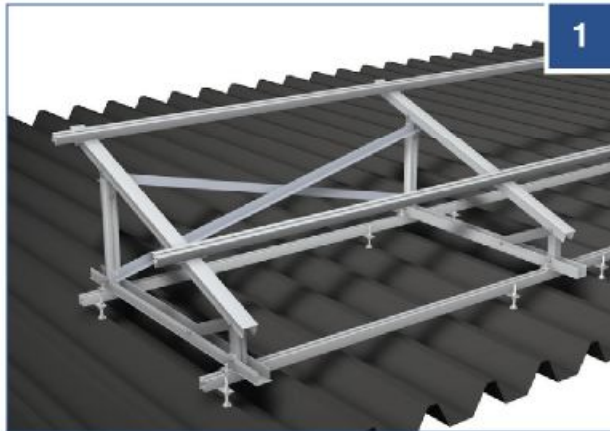


FIG. 1.: When all the module supports have been mounted to the angles, the cross-bracing is applied. For this purpose you can use customary L-profiles (40*40*3). These have to be mounted at least every 12m in every row. You can screw these profiles directly to the rear angle with self-drilling screws; or use standard screws.

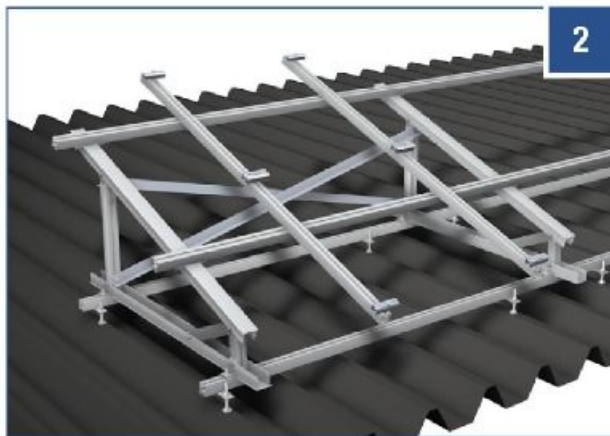


FIG. 2.: When laying frameless PV modules, assembly in cross bracing is possibly laid down. Please refer to and comply with the assembly specifications of the module manufacturer

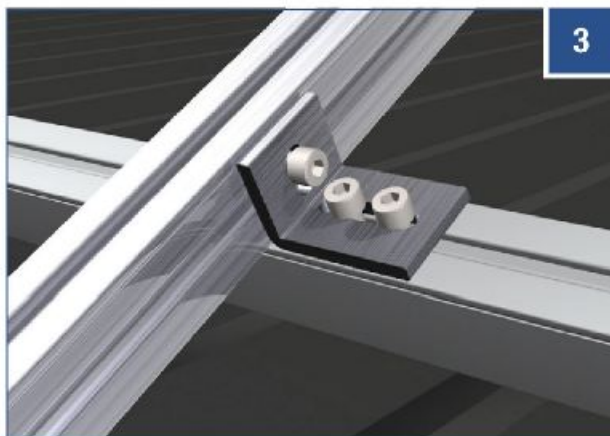


FIG. 3: Connection of the two rails by cross bracing angle
- 912 A2/A4 8*16 (3x) cylinder screws
- 9431 120901 (3x) slot nut
- 9701 PROFINESS 14 angle cross bracing

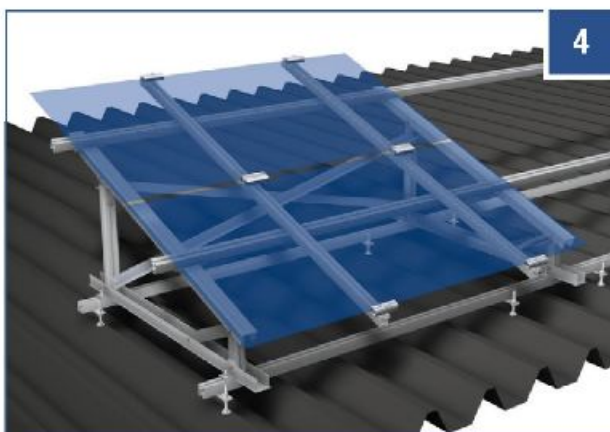


FIG. 4: Turn the slot nut into the upper rail and click in. Screw the clamp using a screw DIN 912 A2/A4 M8*35mm into the slot nut and tighten (torque up to a max. 15 Nm.)

ASSEMBLY INSTRUCTIONS FLAT ROOF

ASSEMBLY SEQUENCE OF THE FLAT ROOF FRAME FOR FRAMELESS PV MODULES

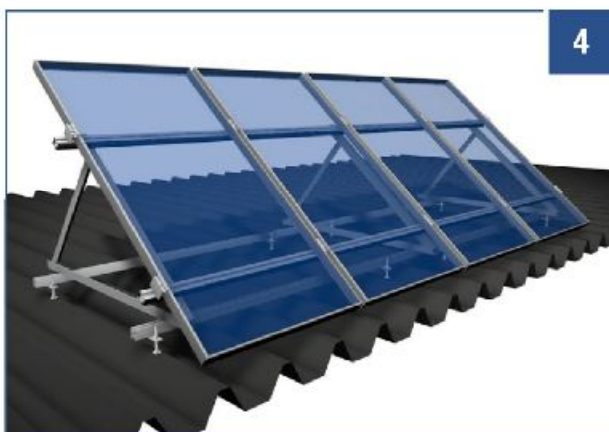
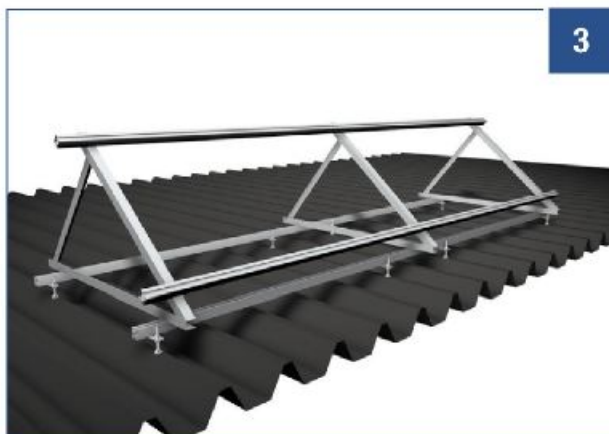
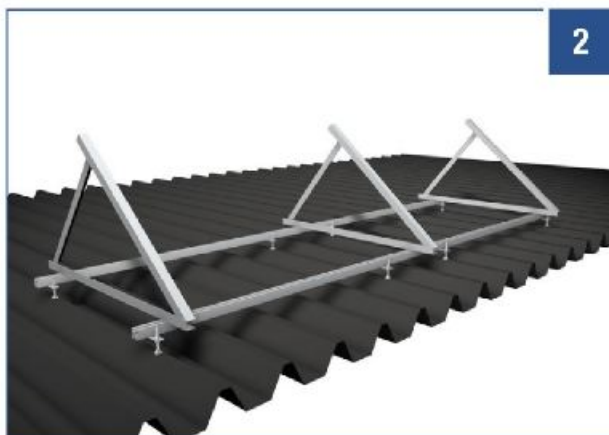
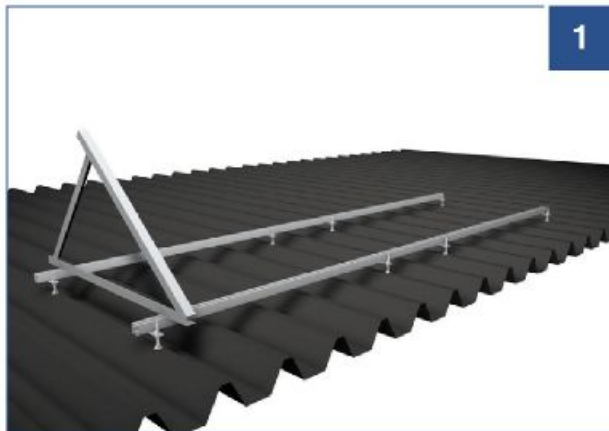


FIG. 1.: Mounting bottom: The inflexible mounting systems are fastened to the substructure, similar to the adjustable type, however, without mounting discs. Here again two alternative procedures are possible:

Alternative 1: if the mounting profile PROFINESS 1 runs under the mounting system with an upper duct for our slot nut M8, the head of a flat round screw DIN 603 M8x25 can be inserted in the upper rail duct, the thread must penetrate to the outside. The thread is inserted through a bore in the lower bracket of the mounting system and be tightened and secured with a self locking nut 9345-2-8 or a lock nut 985-2-8.

Alternative 2: A slot nut is clicked into the upper rail duct of PROFINESS 1 and is fastened with an Allen screw DIN 912 M8 (length depending on thickness of mounting system) which is screwed into the slot nut.

FIG. 3.: Mounting top: The mounting of the system support is also effected similar to the mounting to the adjustable mounting systems, however, in turn without mounting discs. A hexagonal screw DIN 933 A2/A4 10x25 is pushed into the lower duct of the system support, thus the thread penetrates to the outside at the bottom. The thread is inserted through a bore on the diagonal bracket of the mounting system and is tightened and secured with a self locking nut 9345-2-10 or a stop nut 985-2-10.

FIG. 4: The mounting of the modules is effected analogue to the depiction on page 11.

ASSEMBLY INSTRUCTIONS FLAT ROOF

ARTICLE LIST ACCESSORIES

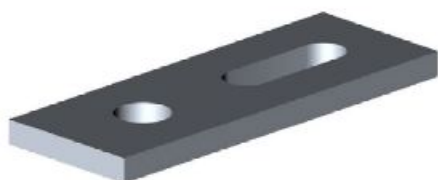
Stair Bolt



Trapezoidal metal cover



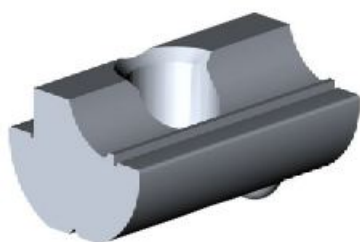
Adapter metal plate



Mounting angle



Slot nut



Profile connector 9557



Profile connector PROFINESS 18

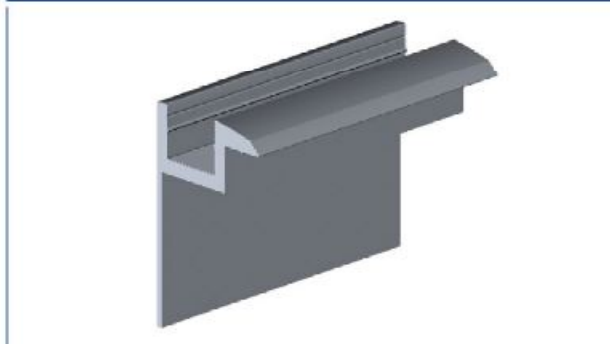


Profile connector PROFINESS 12

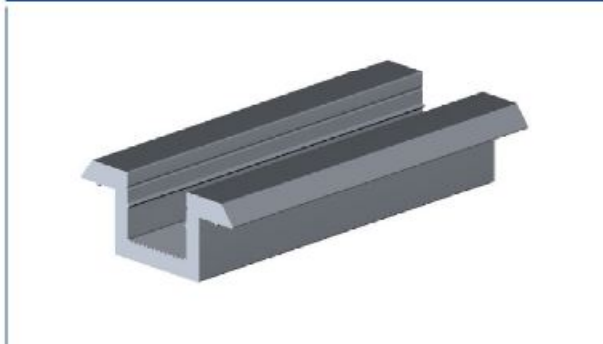


ASSEMBLY INSTRUCTIONS FLAT ROOF ARTICLE LIST ACCESSORIES

Terminal clamp



Centre clamp



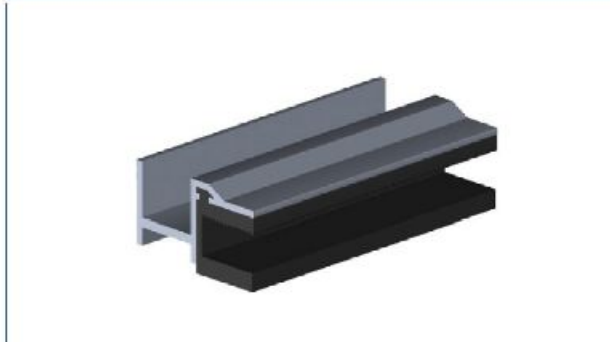
Terminal clamp for glass modules LAMINATE L



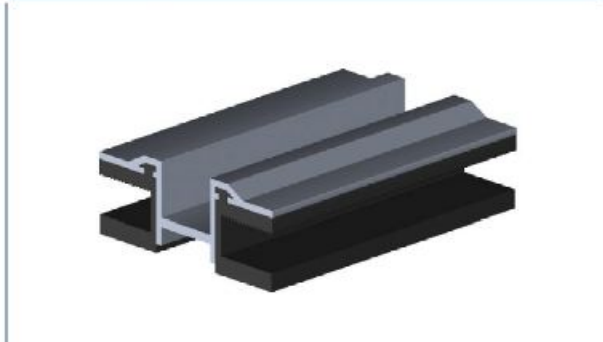
Centre clamp for glass modules LAMINATE L



Limit clamp for glass modules LAMINATE JT



Centre clamp for glass modules LAMINATE JT



Adjustable stand



Inflexible stand





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