

# Mounting instructions

facade



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# 1 Notes

The following instructions are generally valid for our mounting system novotegra and are to be applied or interpreted accordingly regardless of the respective roof and mounting system type.

## Safety information

Mounting tasks may only be carried out by qualified and competent persons. During the work protective clothing in accordance with the relevant national regulations and guidelines must be worn.

Mounting must be carried out by at least two persons to ensure help in case of an accident.

All relevant national and locally applicable health and safety regulations, accident prevention regulations, standards, construction standards and environmental protection regulations as well as all regulations of the employers' liability insurance associations must be complied with.

The national regulations for working at height / on the roof must be complied with.

Electrical work must be carried out in compliance with the national and locally applicable standards and guidelines and the safety rules for electrical work.

Earthing / equipotential bonding of the mounting system must be carried out in accordance with the national and locally applicable standards and guidelines.

## Categorisation into hazard classes

To alert the user of potential danger situations the hazard classes analogous to ANSI Z 535 are used. The hazard class describes the risk if the safety information is not observed.

Warning symbol with signal word

Hazard class analogous to ANSI Z 535



**DANGER!** describes an immediate danger. If it is not avoided, death or serious injury will result.



**WARNING!** describes a potential danger. If it is not avoided, death or serious injury might result.



**CAUTION!** describes a potential danger. If it is not avoided, light or minor injury might result.



**NOTE!** describes a potentially harmful situation. If it is not avoided, the plant or objects in its vicinity might be damaged.

## General information

After receipt the goods must be inspected for completeness using the accompanying delivery note.

novotegra GmbH does not accept the costs, nor can we guarantee subsequent express deliveries if missing material is only noticed during mounting.

Since our mounting systems are subject to continuous development, mounting processes or components may change. Therefore, please check the current status of the mounting instructions on our website prior to mounting. We are also happy to send you current versions upon request.

The mounting system is suitable for the attachment of PV modules with standard market dimensions. Please find more detailed information about this in chapter 3.

The usability of the mounting system for the respective project must be checked for each individual case on the basis of the roof cover / roof construction / facade present.

The roof cover / roof construction / facade must meet the requirements of the mounting system with regard to load bearing capacity, support structure and condition.

Requirements for the material of the roof construction / roof cover / facade:

Wooden components (rafters/purlins): min. strength class C24, no fungus infection or rot

Tensile strength  $R_m$ , min for trapezoidal metal: steel 360 N/mm<sup>2</sup>; aluminium 195 N/mm<sup>2</sup>

Wall construction material: concrete, brick or sand-lime brick in solid or hollow block design.

The load bearing capacity of the roof / roof construction (rafters, purlins, trapezoidal metal, concrete floors, number of adhesive points, folded seams, etc.) or the facade (wall construction materials) must be checked by the user or a check be commissioned.

Physical building aspects concerning insulation penetrations (e.g. condensation) must be taken into account by the user.

## Notes on mounting

The components of the novotegra mounting system are intended exclusively for the attachment of PV modules. Dependent on the roof type of the building the designated mounting system components must be used.

A condition for the intended use of the novotegra mounting system is the mandatory compliance with the specifications in these instructions regarding safety information and mounting.

In case of unintended use and non-compliance with the safety information and mounting instructions and non-utilisation of the corresponding mounting components or use of third party components not belonging to the mounting system any warranty and liability claims against the manufacturer are voided. The user is liable for damage and resulting consequential damage to other components, such as PV modules, or the building as well as personal injury.

The user must read the mounting instructions prior to mounting. Unresolved issues must be clarified with the manufacturer prior to mounting. The mounting sequence in these instructions must be adhered to.

It must be ensured that a copy of the mounting instructions is accessible in the immediate vicinity of the work on site.

The mounting specifications (module load, attachment, clamping areas etc.) of the module manufacturer must be observed and complied with.

Prior to mounting the mounting system must be statically calculated with the loads to be assumed for the building project in accordance with the national standards. Information relevant to mounting (e.g. roof hook distance, lengths of bolts, overhang and protrusions or distance of base trough and required ballast) must be determined by the static calculation using the design software [www.solar-planit](http://www.solar-planit).

The permissible roof inclination for using the mounting system according to these installation instructions is 0 to 60 degrees for roof-parallel installation on a pitched roof and 0 to 5 degrees for elevated installation on a flat roof. Facade systems must be mounted parallel to the facade.

For roof-parallel installation with the clamping system, two module support rails per module must be mounted symmetrically under the modules for equal load transfer into the substructure. Alternatively, the roof-parallel installation can also be installed with insertion rails.

The specified tightening torques must be adhered to and checked randomly on site.

### Notes on static calculations

The mounting system must generally be statically calculated for each individual project using the design software Solar-Planit. Excluding façade systems, the calculation for this will be carried out by the company novotegra GmbH.

The static calculation only determines the load bearing capacity of the novotegra mounting system and also takes account of the attachment to the building (rafters, purlins, trapezoidal metal, facade etc.). The load transfer within the building is not considered (customer static calculations).

The load bearing capacity of the mounting system components is determined on basis of the planned module layout and the underlying building information (project data recording). Deviations from the planning on site may lead to different results.

The load assumptions (load and roof division) are country-specific in accordance with the specifications of the Eurocode load standards. The determination of the loads to be assumed for Switzerland is in accordance with SIA 261.

At pitched roof, the modules may not be fitted above the gable end, ridge and eaves or the facade (increased wind load). At the ridge the modules may be fitted up to max. a theoretical horizontal line with the ridge tile and perfectly flush with the gable end. In the eaves area the modules may reach to max. the end of the roof cover due to loads.

In case of an exposed building position (with wind load e.g. at the edge of a slope) or snow accumulation (e.g. dormer or catchment grill or roof structures like domelights etc) the specifications of the Eurocode load standards or SIA 261 (Switzerland) must be taken into account by the user within his own responsibility. The design software does not consider these cases.

The static calculation of the mounting system is based on the symmetrical placement of the modules on the mounting rails at the longitudinal side of the modules (roof-parallel clamping systems) or on the support components (elevation) for equal load transfer into the substructure. For the insertion system a cross rail arrangement is expected for equal load transfer.

The results calculated with the design software, such as distances of the fasteners (e.g. roof hooks, stock screws, saddle clamps etc.), rail lengths and number of fasteners (e.g. direct attachment on the trapezoidal metal), overhang (e.g. rail and roof hook protrusions) or distances between the base troughs and number of fixing materials (e.g. rail joint) and the other calculation notes must be considered and complied with.

novotegra has been tested and certified by TÜV Rheinland:



## 2 Maintenance of the mounting system

The mounting system must be checked for stability and operation at regular intervals during the system maintenance.

In addition to the visual inspection of the components, we recommend a random check of the connections and the safe and correct position of the ballast on the base rails and ballast troughs.

Removal is possible in reverse order in the work steps mentioned below.

The maintenance work must be carried out by a specialist company with proven experience in electrical systems and work on mounting systems.

## 3 novotegra for facade

The contents of these installation instructions describe the construction of the mounting system on uninsulated facades in solid concrete or masonry construction. The maximum permissible module width is 1.34 m for the respective mounting system to be used.

The use of the mounting system on insulated or clad facades or integrated system facades is not possible due to the mounting anchor used. The specifications of the anchor approval ETA 11/0008 must be observed during planning and during installation on site. Furthermore, reference is made to the current DIBt paper "Instructions for the installation of anchor anchors".


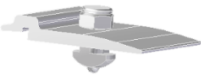


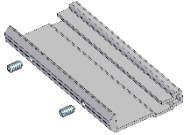

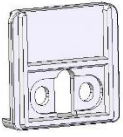




Due to the mounting system design (insertion rail on socket), the distance between the facade and the module frame is 75 mm. In order to keep the facade accessible for extinguishing water in case of fire, this gap must not be filled or closed. Only a facing with sufficiently permeable perforated sheets is permissible.

The required distance to the facade taking into account the local fire protection regulations (fire protection regulations of the responsible building authority, state building regulations, model building regulations, general DIN and VDE regulations) must be determined by the planner / installer on site.







The planner / installer must ensure on site that the intended modules are suitable and approved for this type of application on the facade.

## 4 System components, tools and equipment

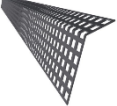






### 4.1 What is required for mounting

Figure	Tool	Component*	Product group
		Socket set 250 mm 11,5 Material: Aluminium and stainless steel Tool: Hexagon nut AF 13	Sockets insertion rail
		Cross rail connector set N IR M8 Material: Aluminium and stainless steel Tool: Hexagon nut AF 13	Cross rail connector
		Insertion rail Material: Aluminium	Profile rails
		Rail connector set IR Material: Aluminium and stainless steel Tool: Hexagon socket AF 3	Rail connectors and expansion joints
		Edge stop set IR Material: Aluminium and stainless steel Tool: TORX bit TX30	Module protection and rail top cover
		EPDM-T protection IR Material: EDPM	Module protection and rail top cover
		Adapter plate set 80 x 20 x 8 mm Material: Aluminium and stainless steel Tool: TORX bit TX25	Adapter plates module protection and perforated sheet fixing

\* The components vary dependent on the roof requirements, the static calculation or the component selection and may differ from the figures above.

Figure	Equipment	Use of tools	Application
	Cordless screwdriver	Torx bit and socket AF 8	Component attachments, clamp mounting
	Masonry drill $\varnothing = 10$ mm	Drilling machine	Component attachments, clamp mounting
	Torque wrench 1/2" 20-50 Nm	Hexagon nut AF 13	Rail assembly
	Assembling jig	---	Rail assembly
	Long nut socket AF 13	Torque wrench	Component attachments, clamp mounting
	Mitre saw	---	Rail section

## 4.2 Montagesystembauteile – optional

Figure	Tool	Component**	Product group
		Perforated sheet Material: Aluminium	Perforated sheets
		Adapter plate set Material: Aluminium and stainless steel Tool: TORX bit TX25	Adapter plates edge stop and perforated sheets
		Connector set perforated sheet Material: Aluminium and stainless steel Tool: TORX bit TX25	Connector perforated sheet
		Cable-tie clip for profile flange	Cable fixing
		Cabel-clip d = 10 mm	Cable fixing

\*\* Optionally available mounting system components e.g. for the visual enhancement of the system, cable laying or the earthing of the mounting system.



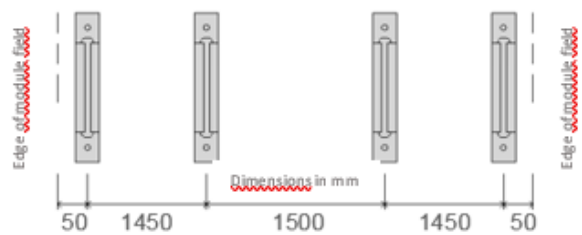
## 5 Installing the mounting system

Prior to mounting, the module field must be measured on the facade and the position of the fastening means (base set, dowels) defined taking into account the static calculation.

The individual mounting steps for upright module installation are explained below. The mounting variant (MV) with perforated sheet metal as a sideways closure is explained in the following.

### 5.1 Installing the sockets

#### Measure the sockets



Horizontal dimensions:

- Distance between the modules 3 mm
- Grid dimension base maximum 1500 mm
- Base projection Module field edge 50 mm
- Grid dimension 1. on 2. base maximum 1450 mm

The distances between the bases can be communicated in compliance with the above specifications.

Vertical dimensions:

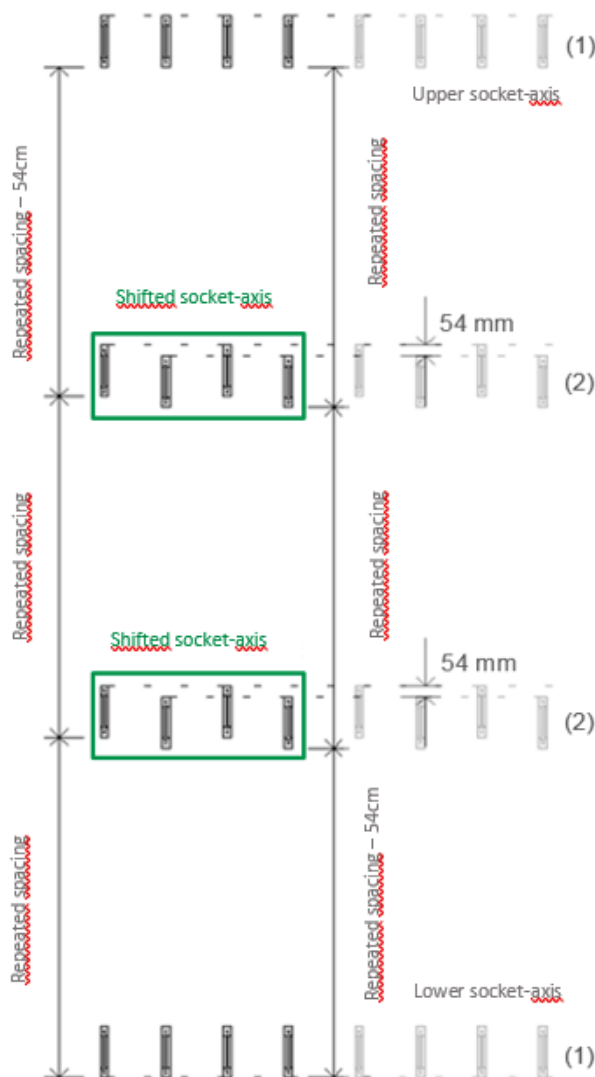
- Step size = module length + 12 mm
- Offset dimension middle plinth 54 mm

The sockets of the bottom and top rows (1) run in one axis. The arrangement of the crossbar connector set N ES M8 for fastening the insertion rail is made within the module field.

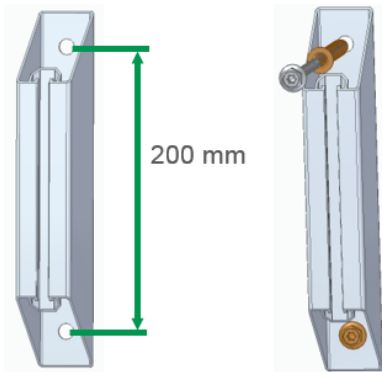
The sockets of the middle rows (2) must be arranged offset in height to each other so that the cross rail connector set N ES M8 for fastening the insertion rails can be mounted alternately above and below the insertion rails (see chapter 5.2).

#### ⚠ WARNING

To carry out the work, a scaffold must be erected according to the relevant specifications. Observe accident prevention regulations, avoid damage to property and remove drilling residues.



## Fixing the sockets



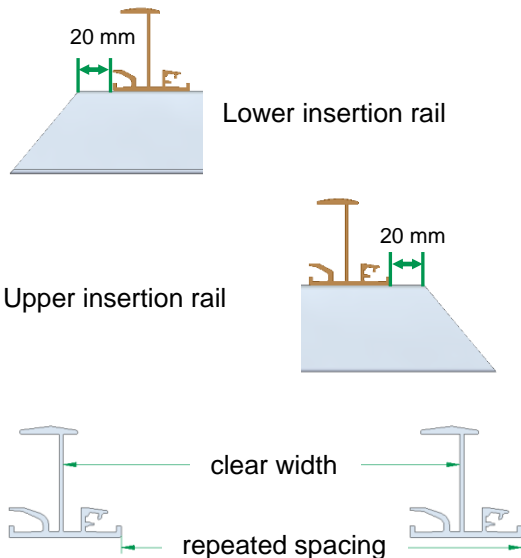
Drill wall holes with a suitable drill in accordance with the building inspectorate approval for the frame anchor. For each socket 2 holes, 80 mm deep 10 mm, must be drilled. Then anchor the dowels through the socket up to the collar in the holes and screw in the screws.

### NOTICE

Tightening torque 10 Nm, do not overtighten!

## 5.2 Installing the insertion rails

### Position the insertion rails on the sockets



The distance between the lower and upper insertion rail to the edge of the support surface to the end of the module field at the bottom and top is 20 mm.

Between them, the insertion rails must be laid with a repeated spacing.

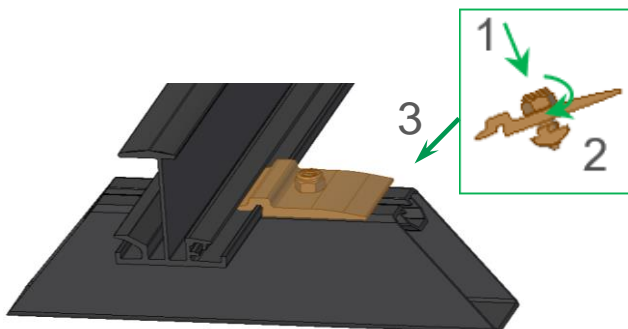
Repeated spacing = Module length  $L$  + 12 mm  
Clear width of rails = Module length  $L$  + 10 mm

### NOTICE

The distances must be observed for the installation of the slip guard.

For module installation in landscape, the module width must be used instead of the module length.

### Installation of the cross rail connector set N IR

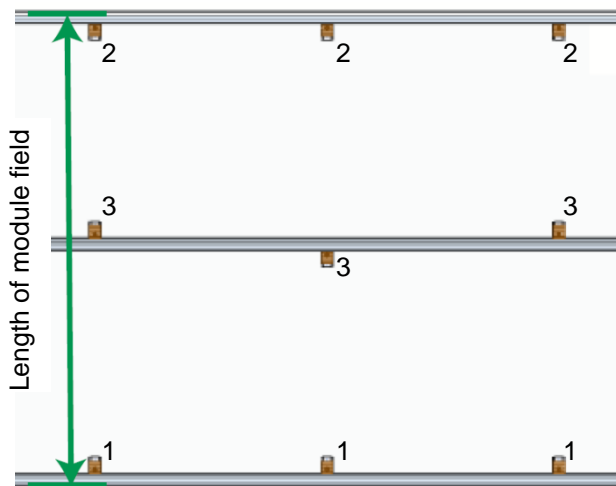


Insert cross rail connector set N IR M8 from above into the rail groove (1), turn nut by 90° (2) and push component against the insertion rail (3) so that the cross rail connector set engages with the mounting flange.

### NOTICE

Tightening torque cross rail connector set N IS = 25 Nm.

### Position cross rail connector IR



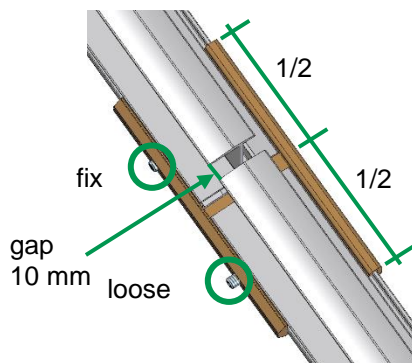
For the top and bottom insertion rail of the module array, the cross rail connector set N IR is mounted on the inside of each (1, 2).

The cross rail connectors are to be attached alternately at the top and bottom of the retaining flange on the middle insertion rails (3).

#### NOTICE

Length of module field =  
Repeated spacing x number of module fields  
+ width of insert rail

### Installation of the rail connector set IR

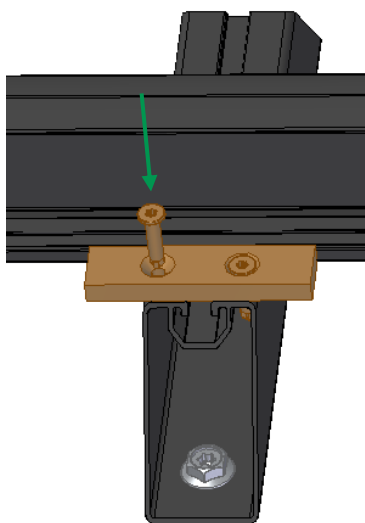


Push the rail connector over the mounted rail in the middle and tighten the first grub screw. Push the rail to be connected into the connector, gap between the rails 10 mm, tighten second grub screw without play.

#### NOTICE

Do not mount the connector on the cantilever arm or above the socket.  
Loose grub screw is used for longitudinal expansion.

### Installation of the slip guard



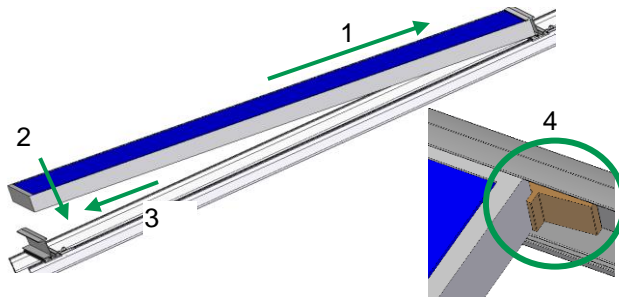
Mount the slip guard device under the lowest insertion rail on each socket with two drilling screws, starting with the right-hand screw, centrally and without gaps.

#### NOTICE

The set includes two additional screws with countersunk washers for the optional fixing of perforated plates as a closure. Mounting Perforated plate according to mounting variant in chapter 5.4.

## 5.3 Installing the modules

### Module installation insertion system

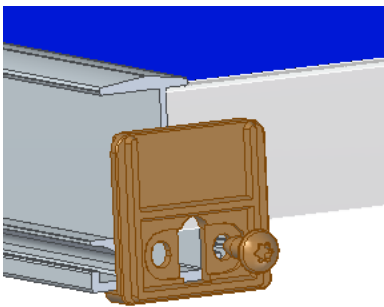


Place the module onto the top insertion rail and push it up (1). Then lower the module onto the bottom insertion rail (2) and push it down against the insertion rail (3). Mount the next modules following the same principle, the gap between the modules must be min. 3 mm.

#### NOTICE

Install the EPDM-T protection IR between the modules (4) with a module inclination  $< 10^\circ$  or as theft protection.

### Installation of the slip guard



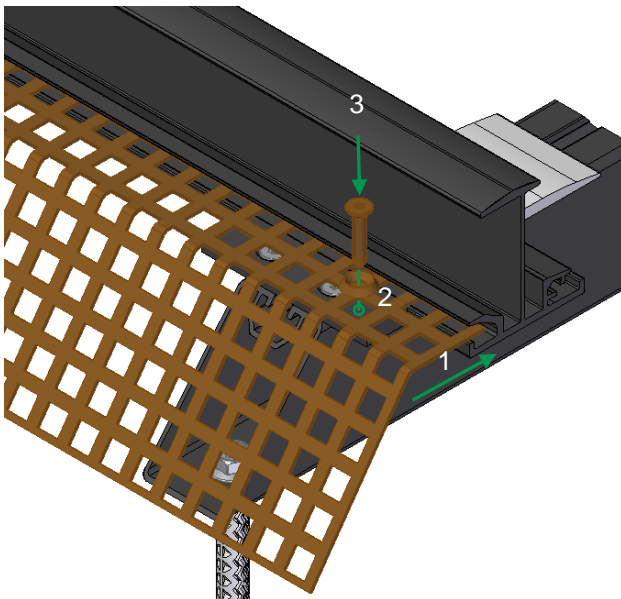
Fit an edge stop at the end of a module row at each insertion rail with a metal screw in the screw channel.

#### NOTICE

The opening of the edge stop must expose the drainage channel of the insertion rail.

## 5.4 Mounting versions

### Perforated plate mounting top and bottom



For the attachment of the upper perforated plates, slip guards must also be mounted on the uppermost base as described above.

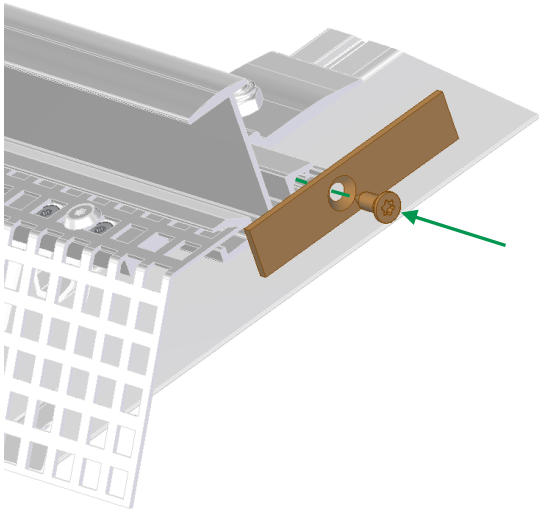
The mounting of the perforated plates should be carried out in the same step as the mounting of the slip guard protections.

Place the short side of the perforated plates on the slip guard protections and push them evenly under the module support side of the insertion rail and finish flush with the end of the rail (1). Pre-drill 4 mm holes in the adapter plate next to the socket in the area of a perforated plate opening (2). Fasten the perforated plate with countersunk washer and drill screw (3).

#### NOTICE

Joint formation of the perforated plates on slip guards can be carried out without overlap. One screw with countersunk disc must then be used per perforated plate.

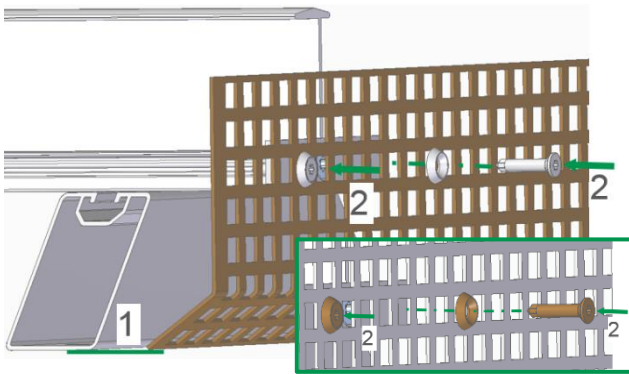
## Perforated plate mounting sideways



Place the adapter plate with the longer side of the leg pointing upwards on the end of the insertion rail and screw it into the screw channel of the insertion rail with the countersunk screw included in the set. Align the adapter plate parallel to the bottom of the rail and fix it flush with the upper and lower perforated plate.

### NOTICE

The adapter plate replaces the edge stop, which cannot be mounted with perforated plates on the side.

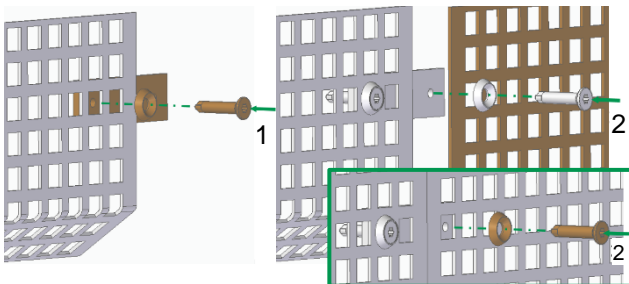


Mount the perforated plate with the angled leg pointing under the module field, flush with the lower or upper perforated plate and resting on the wall (1). Place the long leg on the adapter plate and fasten it with the two self-drilling screws with countersunk washer to the left and right edge of the adapter plate through the openings of the perforated plate (2).

### NOTICE

Screw slowly and stop-oriented so that the adapter plate does not twist.

## Connect perforated plates

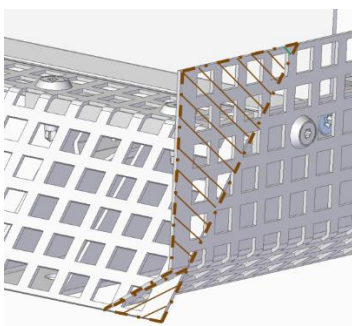


Push the connector for the perforated sheet approximately centrally under the already mounted perforated sheet and fasten it with the drilling screw and countersunk washer through an opening (1). Place the subsequent perforated plate flush and fasten it using the same principle (2). If necessary, the perforated plates must be cut to the required length with a sheet metal scissors.

### NOTICE

Screw slowly and stop-oriented so that the connector plate does not twist.

## Cutting perforated plates



Cut and bend the perforated sheets in the overlap area of the corners with the plate shears and suitable pliers for a visually attractive finish.

### NOTICE

Scratches and damage to the components during processing must be avoided.

### ⚠ Caution

Gloves must be worn to protect against injuries on sharp sheet edges.

## 6 Warranty / product liability (exclusion)

In addition to the above-mentioned regulations and safety notices the applicable regulations and rules of technology must be observed by the installing specialist company.

The installer is responsible for the dimensioning of the mounting system.

The installer is responsible for the connection of the interfaces between the mounting system and the building. This also includes the tightness of the building envelope.

For flat roofs the roof insulation must be evaluated by the installer on site within his own responsibility regarding the material of the sealing layer, resistance, ageing, compatibility with other materials, overall condition of the roof insulation, need for a separating layer between the roof insulation and the mounting system. The required and necessary measures or precautions for the protection of the roof insulation for the mounting of the substructure of a PV system must be initiated by the installer with the aid of a specialist tradesman where necessary. novotegra GmbH does not accept liability for faulty or inadequate measures and precautions for the protection of the roof insulation!

The installer must review the friction coefficient used in the calculation for the verification of the slip safety of PV systems on flat roofs on site. Friction coefficients determined on site can be taken into account by entering them in the Solar-Planit planning tool. novotegra GmbH does not guarantee the correctness of the assumed values and is not liable for damage due to the use of incorrect values.

The specifications of the module, cable and inverter manufacturers must be observed. If these contradict the mounting instructions, always consult the novotegra GmbH sales team before mounting the novotegra mounting system or – in the case of components not supplied by novotegra GmbH – the manufacturer concerned.

During the preparation of the offers for novotegra by our sales staff the local conditions are not always sufficiently known, which is why changes to the offered quantities may result during installation. These changes relate mainly to the number of fasteners for the building envelope (for example roof hooks). In this case the additionally required components must always be installed in accordance with the dimensioning.

novotegra GmbH is not liable for incorrect or incomplete data collection sheets. Error-free and fully completed data collection sheets are essential for correct dimensioning.

The information in the mounting instructions, the warranty terms and the information about the liability exclusion must be noted.



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