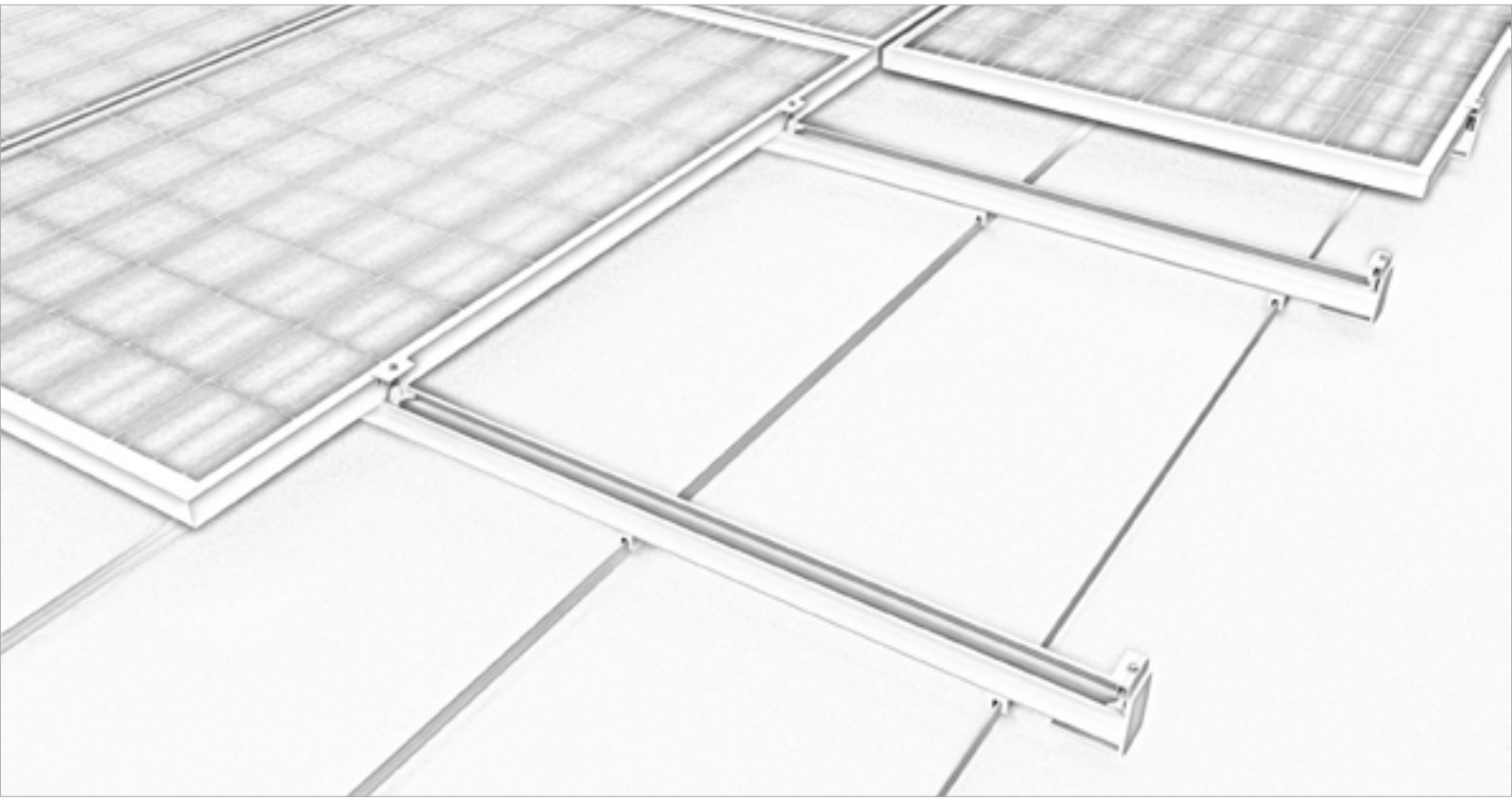
Seamed metal roof

Single-rail system with modules mounted vertically or horizontally



Mounting instructions

Safety instructions

The following instructions are to be understood as generally valid for our novotegra installation system and are to be applied accordingly, regardless of the particular roof type and installation system.

Systems may only be installed and commissioned by persons who are able to ensure that they are carried out in accordance with the regulations on the basis of their professional qualifications (e.g. training or activity) or experience.

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

- During the work, safety clothing must be worn in accordance with the relevant national regulations and guidelines.
- The assembly must be carried out by at least two persons in order to be able to guarantee help in case of an accident.
- The national regulations for work at heights and on roofs must be observed.
- The electrical work must be carried out in compliance with the national and locally applicable standards and guidelines in compliance with the safety regulations for electrical work.

The installer is responsible for dimensioning the novotegra mounting system.
Before installation, it must be checked whether the mounting system meets the static requirements on site For roof systems, the on-site load-bearing capacity of the roof must also be checked. Please note our instructions on static calculations, which can be viewed at novotegra.com/downloads.

The installer is responsible for connecting the interfaces between the mounting system and the building. This also includes the tightness of the building envelope. The mounting system must always be statically calculated individually for each project using the SolarPlanit design software. Except for facade systems, the calculation for this is carried out by novotegra GmbH.

The mounting system is suitable for mounting PV modules with standard market dimensions.
The installation instructions of the module manufacturers must be observed and complied with. There is no inspection by novotegra GmbH regarding constructability or mounting guidelines.

The specifications of the cable and inverter manufacturers must be observed. If there are any contradictions to these installation instructions, please be sure to consult your novotegra GmbH sales team or - in the case of components not supplied by novotegra GmbH - the manufacturer concerned before installing the novotegra mounting system.

It must be ensured that a copy of the assembly instructions is within reach in the immediate vicinity of the work on the construction site.

Since our assembly systems are constantly being further developed, assembly procedures or components may change. Therefore, please check the current status of the installation instructions on our website novotgera.com/downloads before installation. The assembly sequence of these instructions must be observed. We will also be happy to send you current versions on request.

In the event of improper use and non-compliance with our safety instructions and installation specifications, as well as non-use of associated installation components or use of third-party components that are not part of the installation system, all claims under guarantee, warranty and liability vis-à-vis novotegra GmbH shall lapse. The user is liable for damage and resulting consequential damage to other components such as PV modules or to the building itself, as well as for personal injury.

The permissible roof pitch for the use of the mounting system in accordance with these installation instructions is 0 to 60 degrees for installation parallel to the roof on a pitched roof and 0 to 5 degrees for elevated installation on a flat roof. Facade systems are to be mounted parallel to the facade.

The grounding / potential equalization of the mounting system must be carried out in accordance with the national and locally applicable standards and guidelines.

If all safety instructions are observed and the system is installed properly, there is a product warranty claim of 12 years. Please note our warranty conditions, which can be viewed at novotegra.com/downloads.

The system can be dismantled in reverse order to the steps described below.

General conditions

Location:	Seamed metal roof (Standing-, Round-, Snap- and Angle fold seam)
Roof inclination:	0° – 60°
Roof cover:	Sheet steel and copper, aluminium and stainless steel
Module mounting:	Clamping system: portrait Insertion system: portrait and landscape
Module width:	1,34 m
Sheet thickness:	0,80 mm

General installation instructions for pitched roofs

The suitability of the mounting system for the respective project must be checked on a case-by-case basis using the existing roof covering and roof structure. The roof covering, roof structure or façade must fulfil the requirements of the mounting system in terms of load-bearing capacity, load-bearing structure and state of preservation.

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.

Requirements for the material of the roof construction / roof cover:
At least strength class C24: no fungal decay or rottenness. OSB with material grade OSB 3.
Steel purlins for stock screw installation exclusively material grade S235.

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.

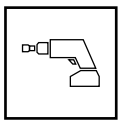
Physical building aspects concerning insulation penetrations (e.g. condensation) must be taken into account by the user.

The contents of these installation instructions describe the installation of the substructure on roofs with standing seam roofing (standing seam and round seam roofs) or profiled sheet metal roofing.

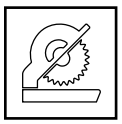
The seam and profiled sheet metal clamps are suitable for roof coverings made of sheet steel and copper, aluminium and stainless steel. Depending on the sheet thickness or roofing material, a stainless steel saddle must be installed under the clamp.

The individual installation steps for module upstand installation are explained below. Reference is made to installation variants for the various design options. The associated work steps follow.

Tool and equipment

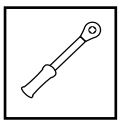


Cordless srew-driver



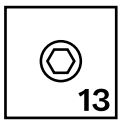
Mitre saw

Assembling jig

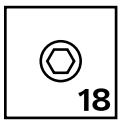


Torque spanner 20-50 Nm

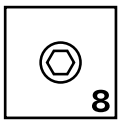
Hexagon socket AF 5



special nut socket 13 mm



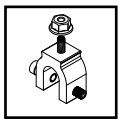
special nut socket 18 mm



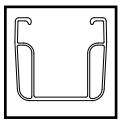
special nut socket 8 mm

Torx TX bit 30 drive

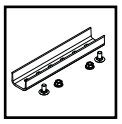
Mounting system components*



Rounded seam clamp-set M8

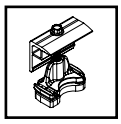


C-rail

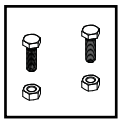


Rail connector-set C

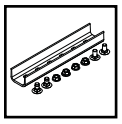
Middle clamp Set C



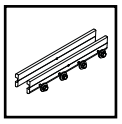
End clamp Set C



Module slip guard set M8/M6



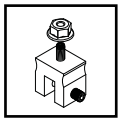
Expansion joint C47



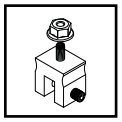
Rail connector set C47 S

*The components vary depending on the requirements of the roof, the structural analysis and the choice of components and may deviate from the images above

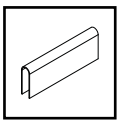
Mounting system components – variations**



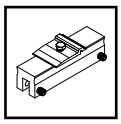
Standing seam clamp set M8



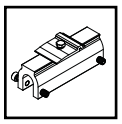
Snap and angle fold seam clamp set M8



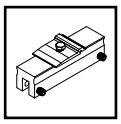
A2SS-saddle for standing seam clamp



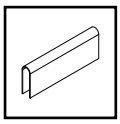
Standing seam clamp set 150 M8 IR



Rounded seam clamp 150 IR M8

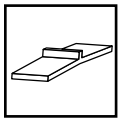


Snap and angle fold seam clamp 150 M8 IR



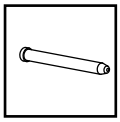
A2SS-saddle for standing seam clamp 150

Edge stop set IR



EPDM-T protec-tion IR

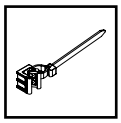
Insertion rail 30-50 mm



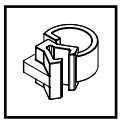
Rail Connector IR 5 x 100 stain-less steel

**The components vary depending on the requirements of the roof, the structural analysis and the choice of components and may deviate from the images above

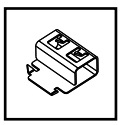
Mounting system components – optional***



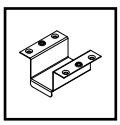
Cable-tie clip for profile flange



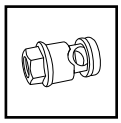
Cabel-Clip d = 10 mm



Contact latch IR



Contact latch middle clamp

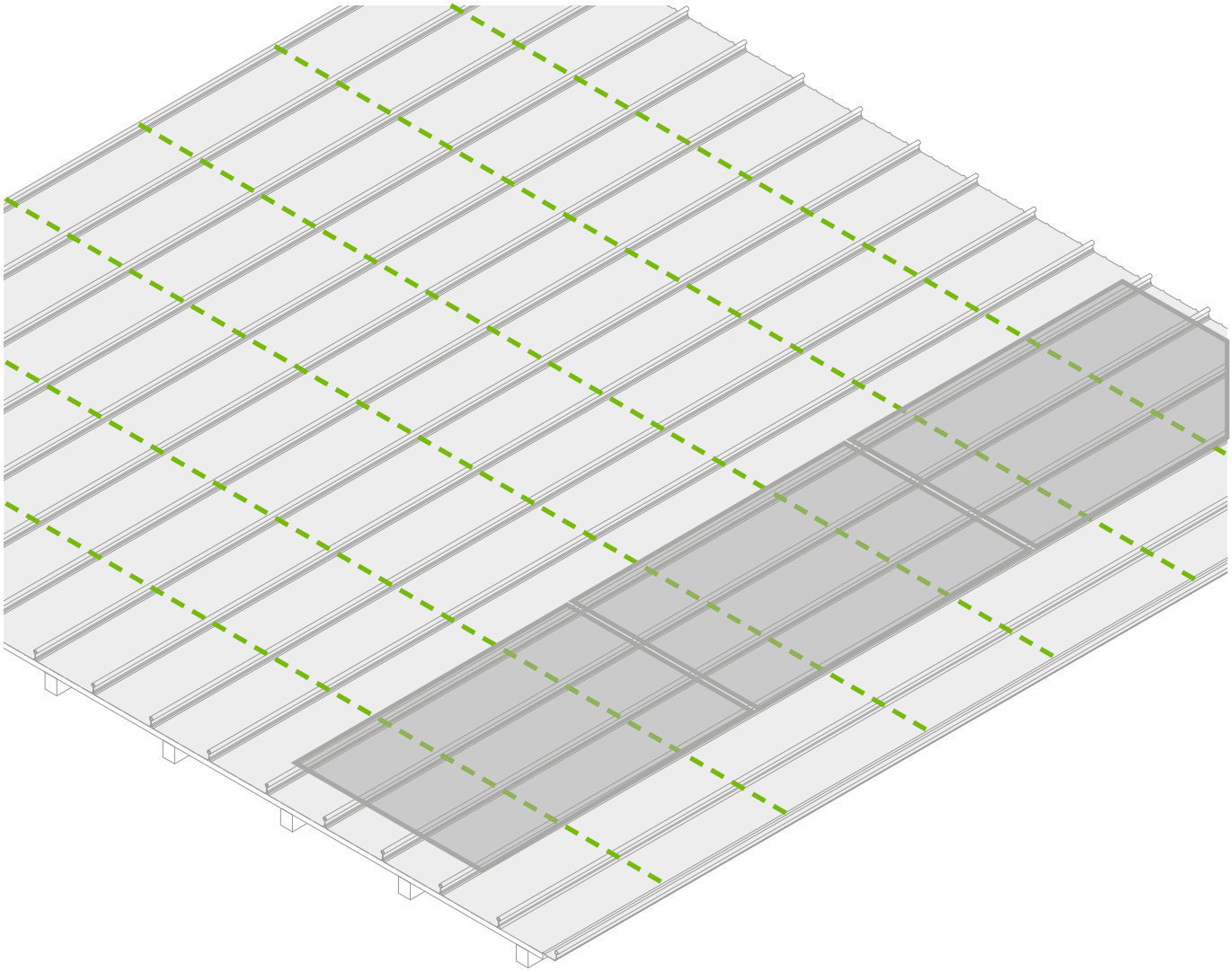


Grounding con-nector C-rail

***Optionally available installation system components, e.g. for improving the aesthetics of the system, cable management or grounding of the installation system.

Mounting the substructure

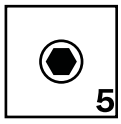
1 Seam clamps mounting

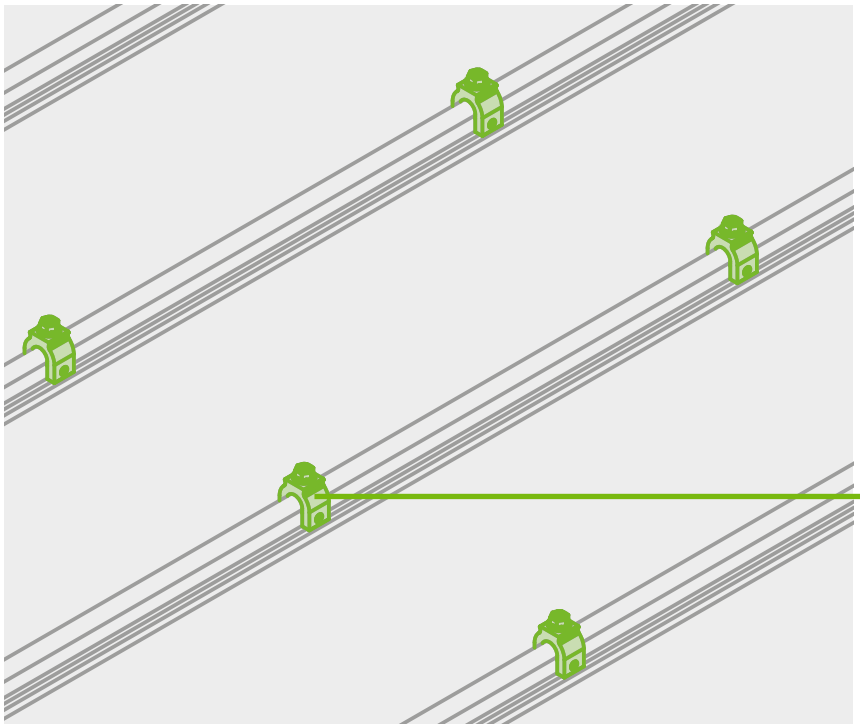


A Measure the module field on the roof.

The position of the seam clamps must be determined taking the static calculation into account.

Two rail under each module row must be installed.

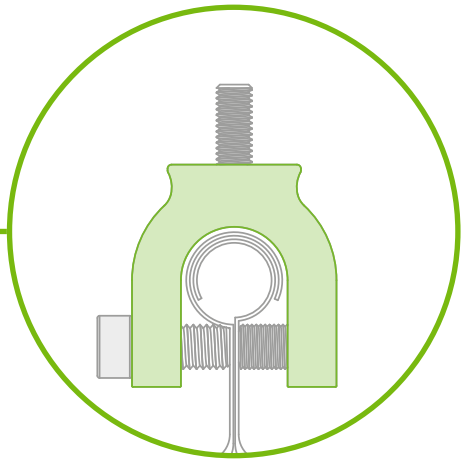




B Attaching seam clamps.

The seam clamps must be placed on the seam and fastened with the setscrew. The seam clamps must be mounted in the centre under the C-rail.

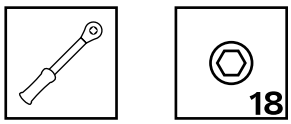
Tightening torque 18 Nm.

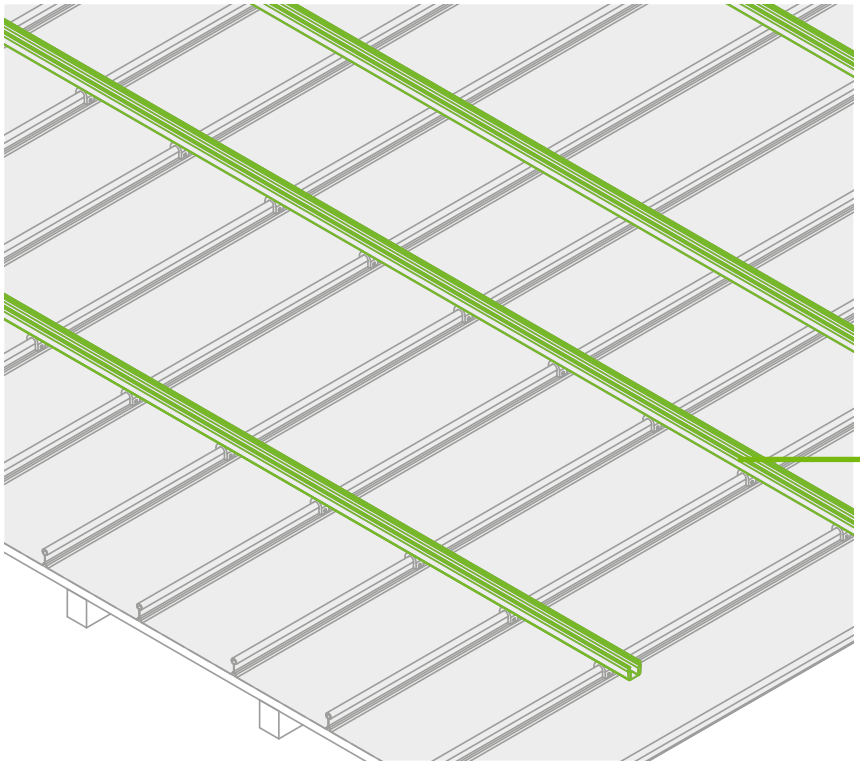


Warning:
The clamps must not be installed on or near the metal retainers.

novo-tip:
The illustration shows the clamp for round seam roofs; depending on the roof covering, all available clamps onto page 13.

2 Rail mounting

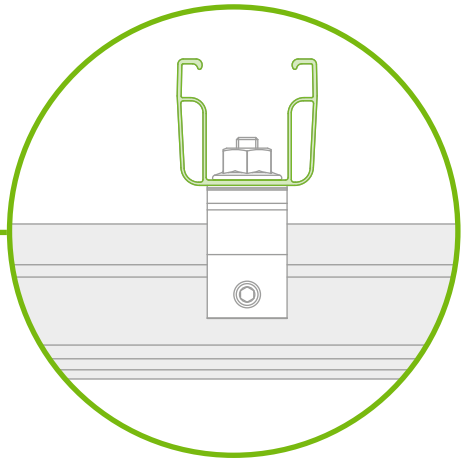


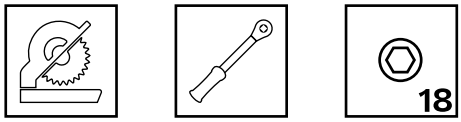


A Installing the C-rail.

The C-rail must be placed on the seam clamps and tightened with the locking nut.

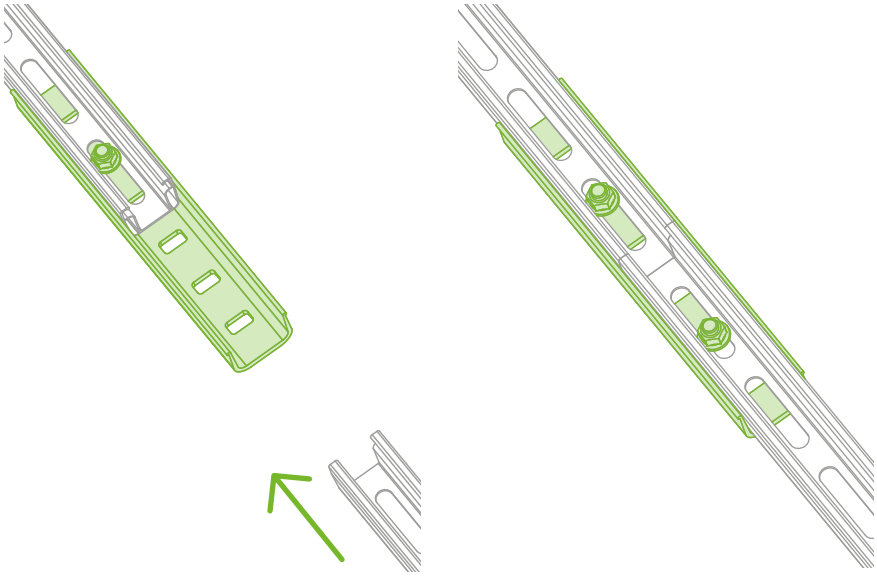
Tightening torque 50Nm.





Warning:
Risk of injury when sawing the rail to size
There is a risk of cutting yourself on the sharp edges of the rail and the saw blade.

- Comply with UVV
- Wear protective gloves
- Wear safety goggles



B Connecting the rails.

Push the ends of the rails tightly together, place the rail connectors centrally and screw together. Using the bolts contained in the set.

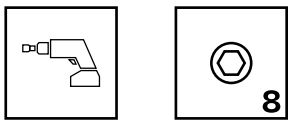
Mounting Rail connector set C47 S see page 14.

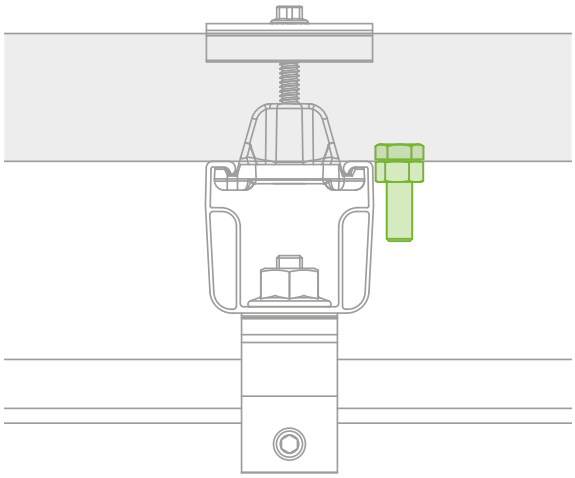
Tightening torque 50 Nm.
Maximum uninterrupted rail length 5,90 m.

Warning:
The installer must check on site whether the sheet metal used has manufacturer-specific require-ments for the rail length.

Warning:
The rail connector set cannot be installed in the area of a seam clamp. If this is the case, the rail cut or arrangement must be changed.

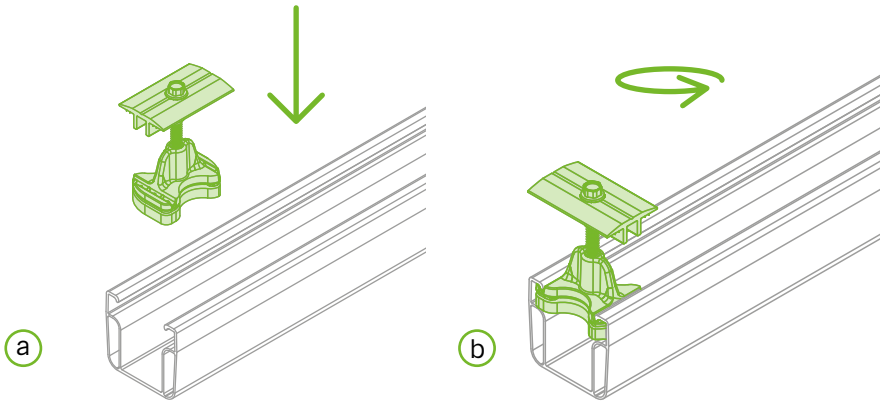
3 Module mounting clamping system





A Securing the module.

From a roof inclination > 10°, the module slip guard must be fitted to the frame holes of each module in the lower row of rails.



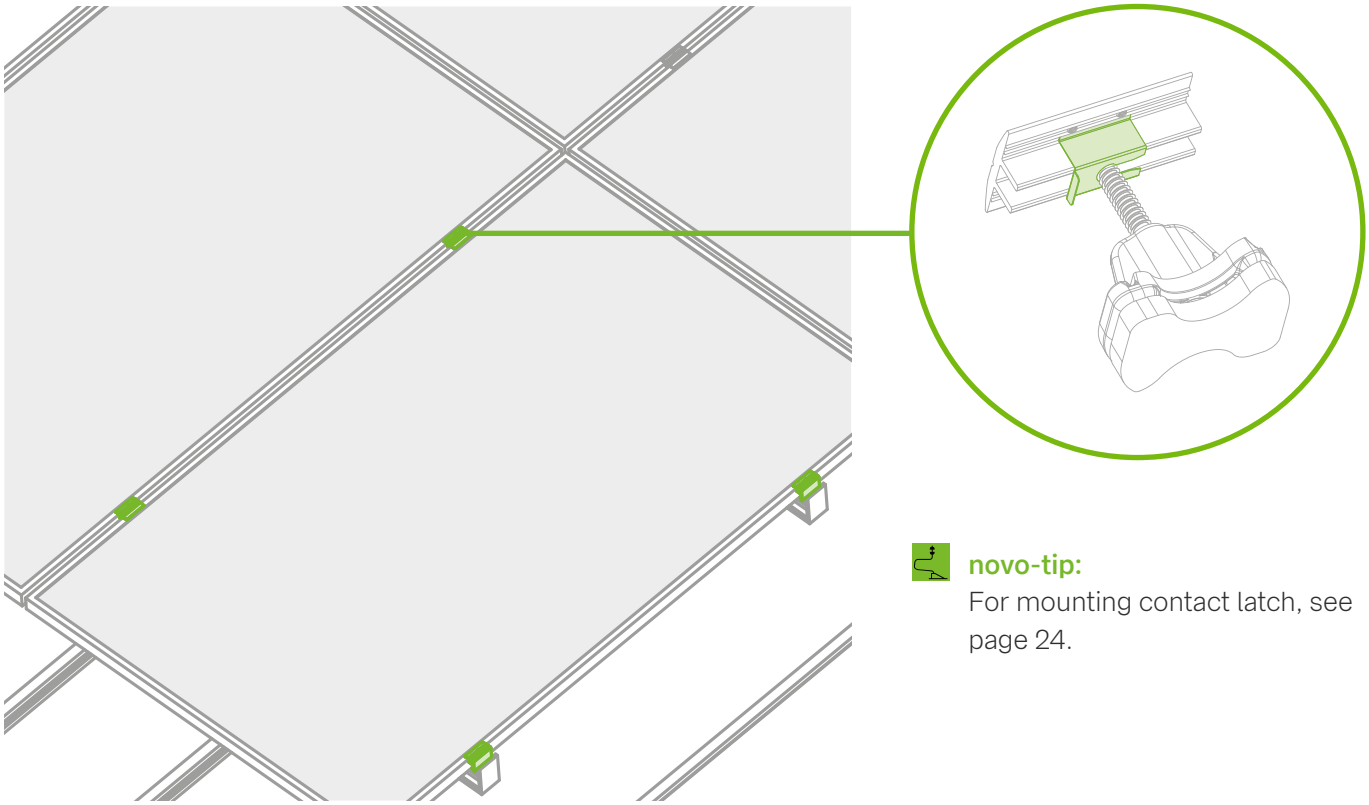
B Inserting module clamps.

(a) Insert into the rail from above.

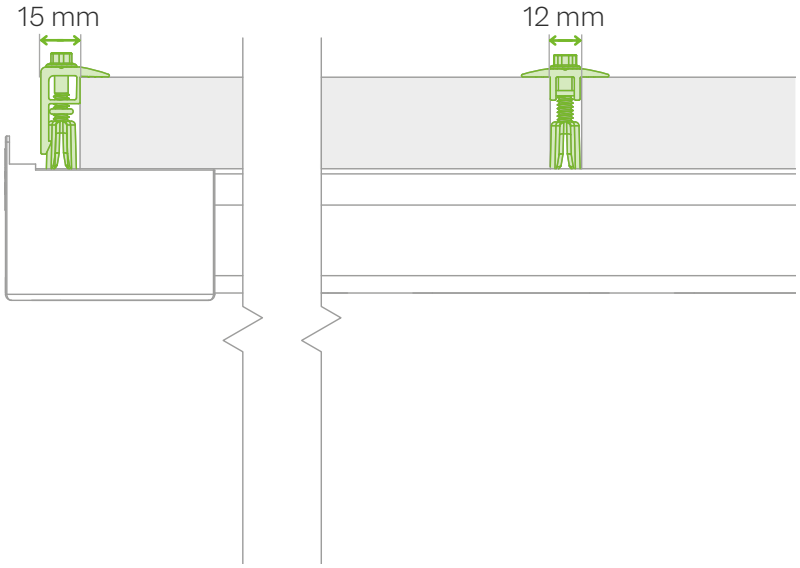
(b) Rotate by 90°

C Tightening module clamps.

Tightening torque Middle clamp 10 Nm.
Tightening torque End clamp 8 Nm.



novo-tip:
For mounting contact latch, see page 24.



D Space requirement for Middle and End clamps.

The modules must be pushed all the way onto the rail nut of the Middle and End clamps.

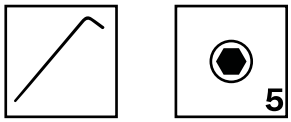
Tightening torque Middle clamp 10 Nm.
Tightening torque End clamp 8 Nm.

novo-tip:
The End clamp can also be installed aligned with the rail end.

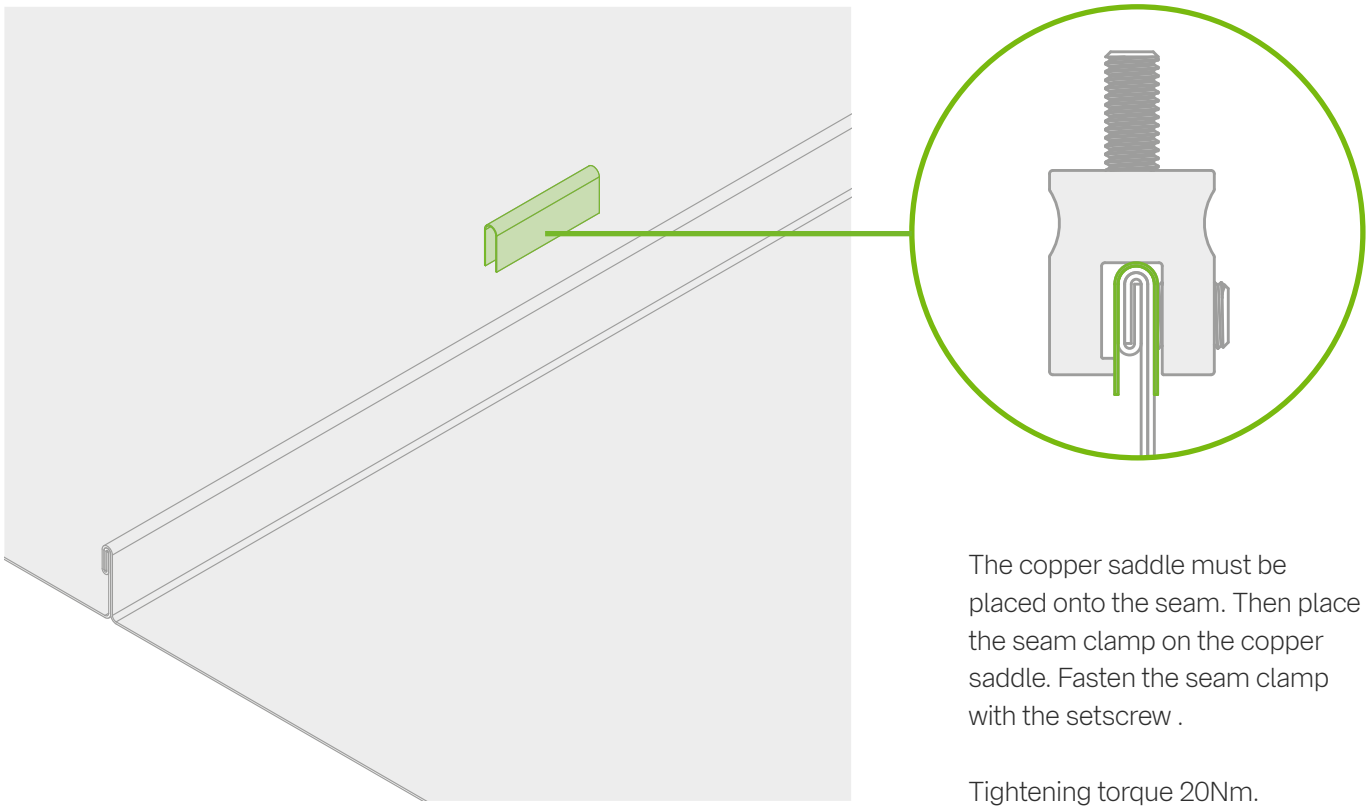
If End caps are fitted, the C-rail must be cut to length 1 cm longer than specified in the rail sawing plan.

Mounting variations

1 Clamp set for a copper roof covering



A Installing Standing seam clamp set for copper.

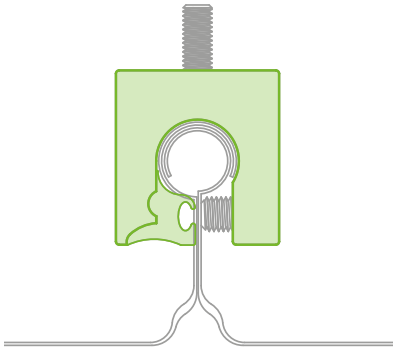


The copper saddle must be placed onto the seam. Then place the seam clamp on the copper saddle. Fasten the seam clamp with the setscrew .

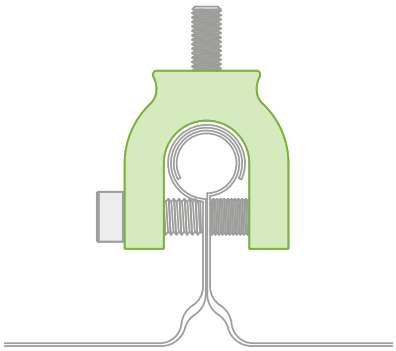
Tightening torque 20Nm.

Warning:
The clamps must not be installed on or near the metal retainers.

2 Seam clamps set variations



Variant 1

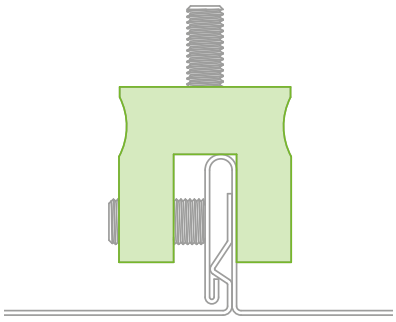


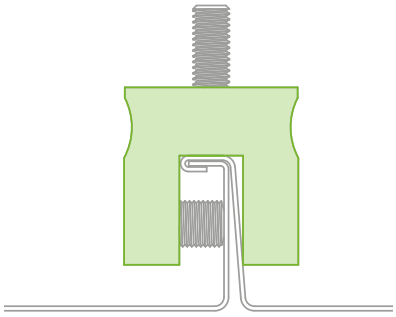
Variant 2

A Rounded seam clamp set

Variant 1:
for Kalzip roof coverings.
Place the seam clamp on the seam and push in the clamp insert. Fasten the clamp with the setscrew.
Tightening torque 15-17 Nm.

Variant 2:
for Kalzip roof coverings.
Place the seam clamp on the seam and tighten the cylinder head screw as far as it will go.
Then tighten the setscrew.
Tightening torque 18Nm.



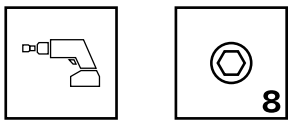


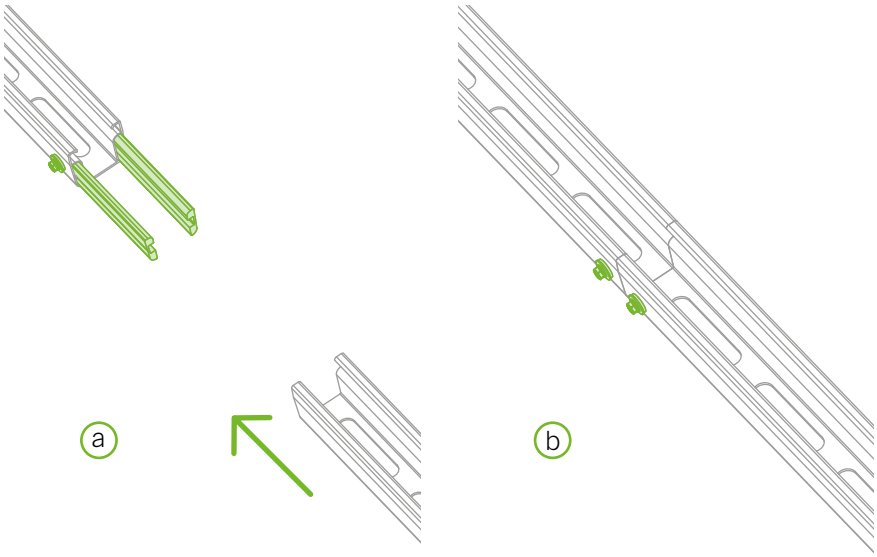
B Snap and angle fold seam set

Place the seam clamps on the seam and tighten the setscrew.
Tightening torque 18 Nm.

Warning:
The clamps must not be installed on or near the metal retainers.

3 Connecting C-rail





Warning:
Risk of injury when sawing the rail to size
There is a risk of cutting yourself on the sharp edges of the rail and the saw blade.

- Comply with UVV
- Wear protective gloves
- Wear safety goggles

A Mounting of the rail connector C 47 S.

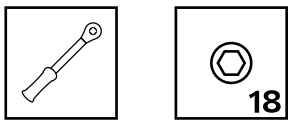
a Push the rail connector set halfway into one of the rails to be connected and secure it by self-tapping screws each on both sides approx. 20 mm from the rail end.

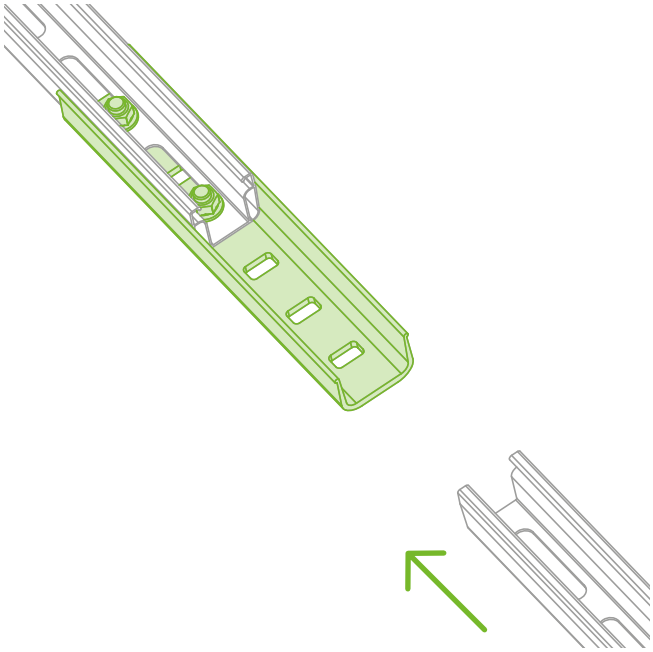
b Next push the other rail completely onto the rail connector set until both rail ends make contact and screw it tight as described above.

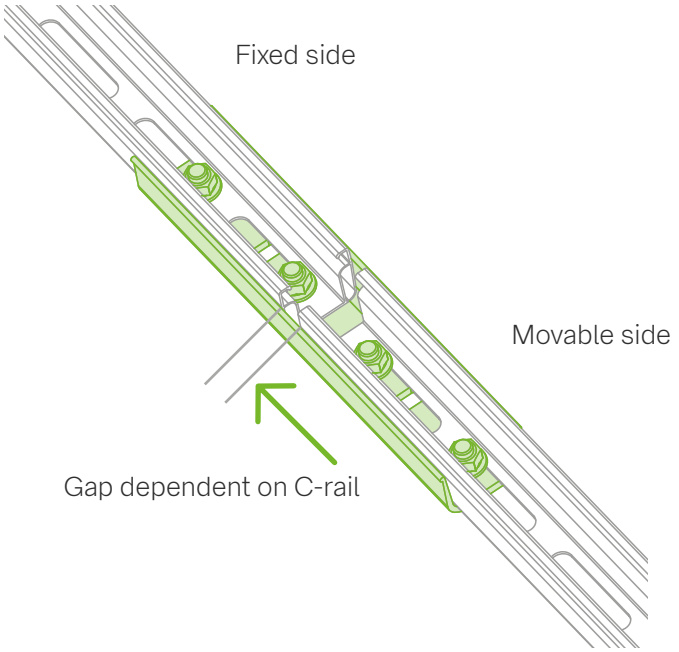
Maximum uninterrupted rail length 5,90 m.

Warning:
The installer must check on site whether the sheet metal used has manufacturer-specific requirements for the rail length.

4 Installing expansion joints on C-rails







Warning:
Risk of injury when sawing the rail to size
There is a risk of cutting yourself on the sharp edges of the rail and the saw blade.
- Comply with UVV
- Wear protective gloves
- Wear safety goggles

A Mounting of the expansion joint.

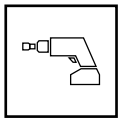
Place rail ends onto the gap, apply the rail connector and connect it to the rail at the fixed and movable sides using the mounting screws. Tighten the screws firmly on the fixed side. The screws on the movable side are coated in red and must be released again after tightening (approx. ½ turn).

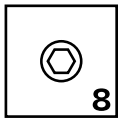
Distance of adjacent rail ends
C-rail 38 and 47: 20 mm
C-rail 71 and 95: 40-50 mm

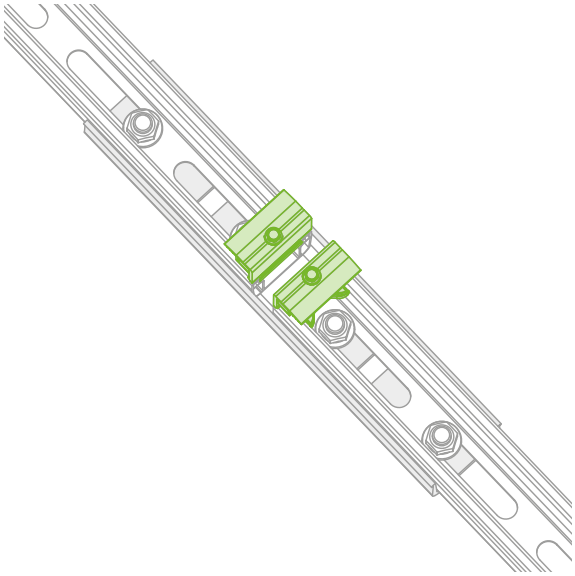
Tightening torque 50Nm
Maximum uninterrupted rail length 5,90 m.

Warning:
The installer must check on site whether the sheet metal used has manufacturer-specific requirements for the rail length.

Warning:
A expansion joint must not be installed under a module.







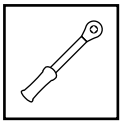
B Mounting end clamp by expansion joint.

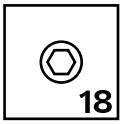
An end clamp must be placed on each side of a expansion joint.

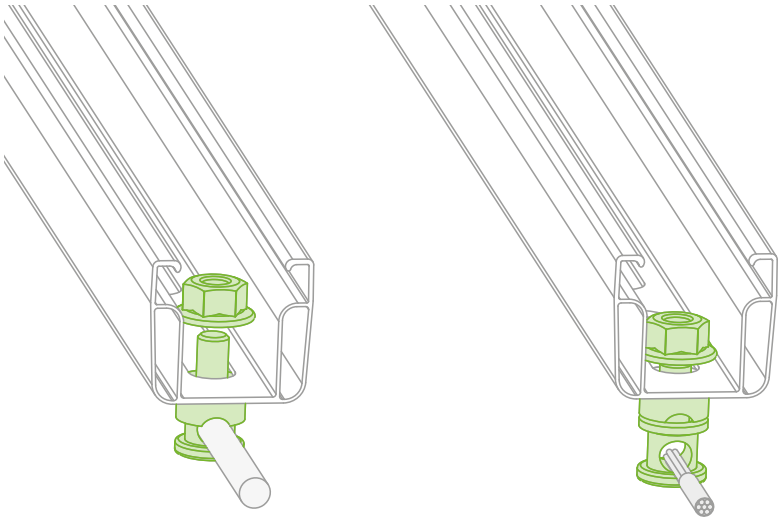
novo-tip:
It is possible to mount the end clamp flush with the end of the rail.

Warning:
A expansion joint must not be installed under a module.

5 Mounting grounding connector







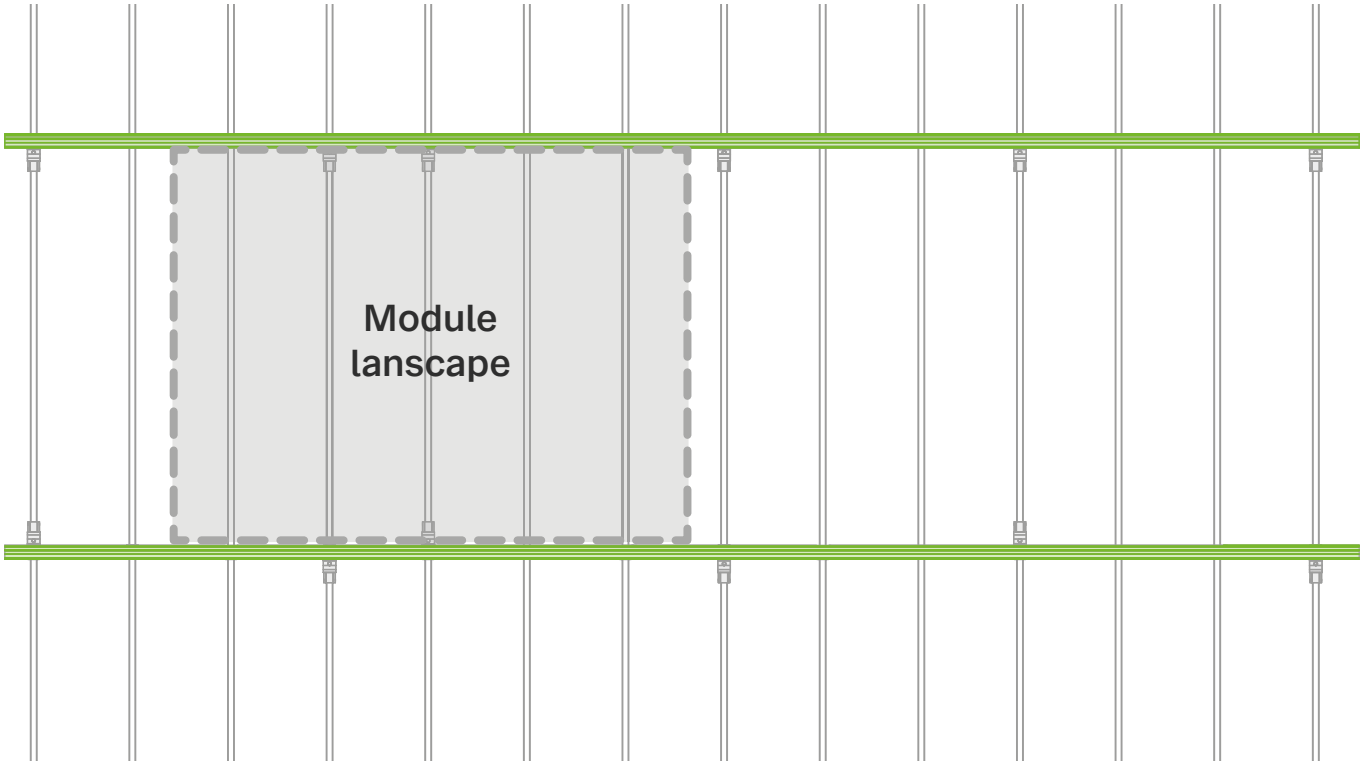
A Install grounding connector set. One grounding connector must be installed per module field.

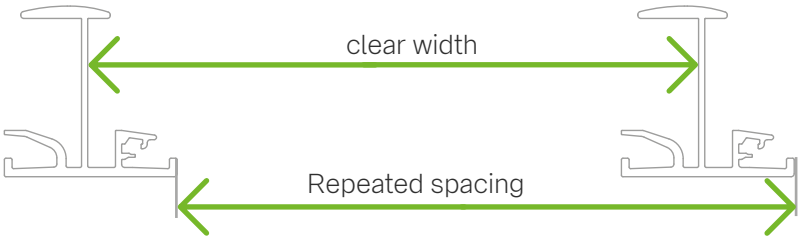
Earthing wire: 20 Nm
Earthing cable: 10 Nm

Warning:
The applicable standards and guidelines, e.g. lightning protection standard, must be observed.

Mounting variation insertion system

1 Mounting insertion rail



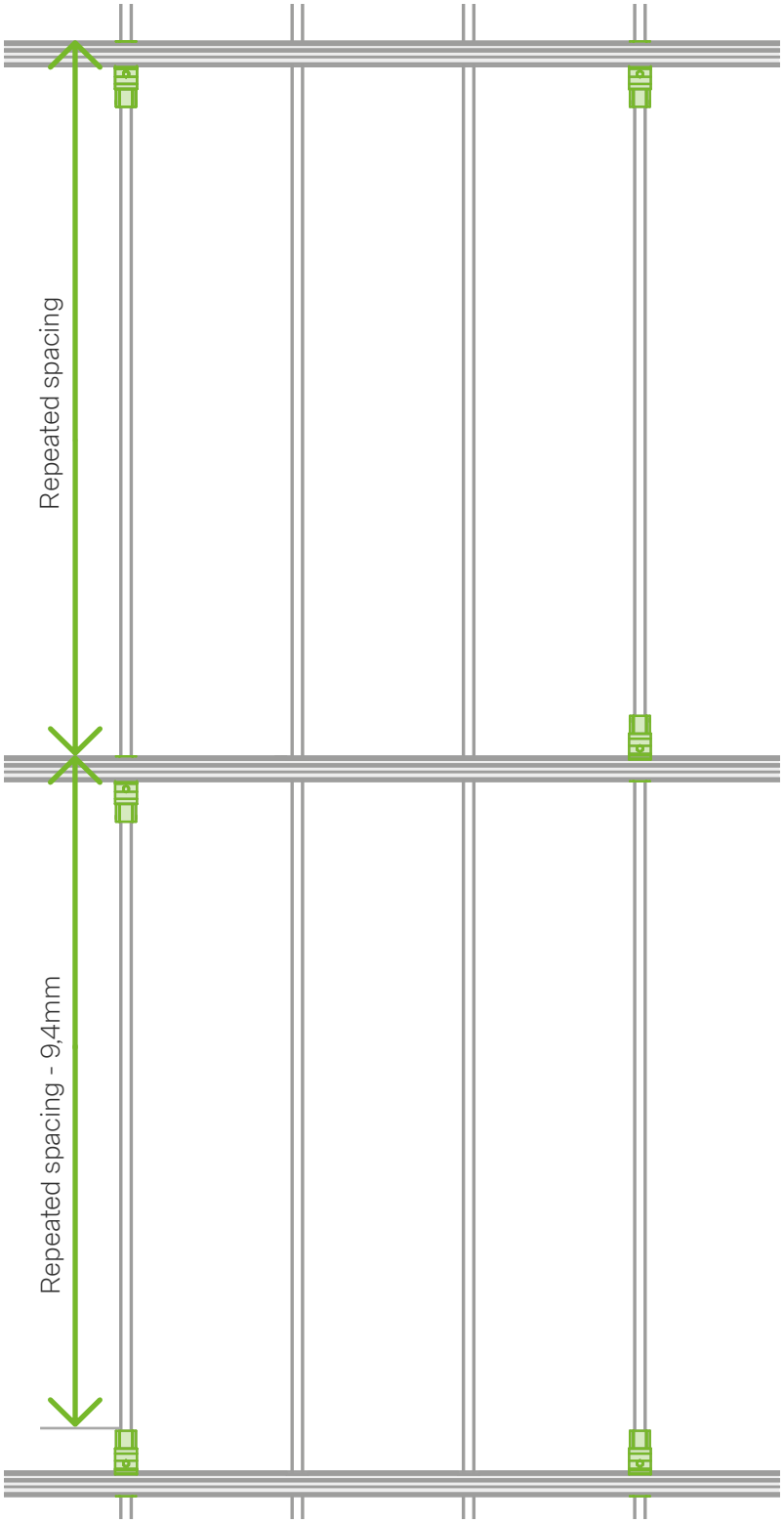


Repeated spacing = Module width W + 12 mm
Clear width of rails = Module width W + 10 mm

A Measuring the insertion rails.

The insertion rails must be marked on the seams depending on the module alignment.

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



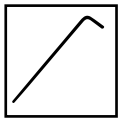
B Positioning clamp set IR.

On the top and bottom insertion rail of a module field, the seam clamp set must be fitted on the inside of the insertion rail.

On the centre insertion rails, the seam clamp set must be fitted alternately at the top and bottom in a W-shape.

novo-tip:
The assembling jig must be set to the module dimension + 10 mm. The valid module dimension is the width or length of the module and can be found in the module manufacturer‘s data sheet.

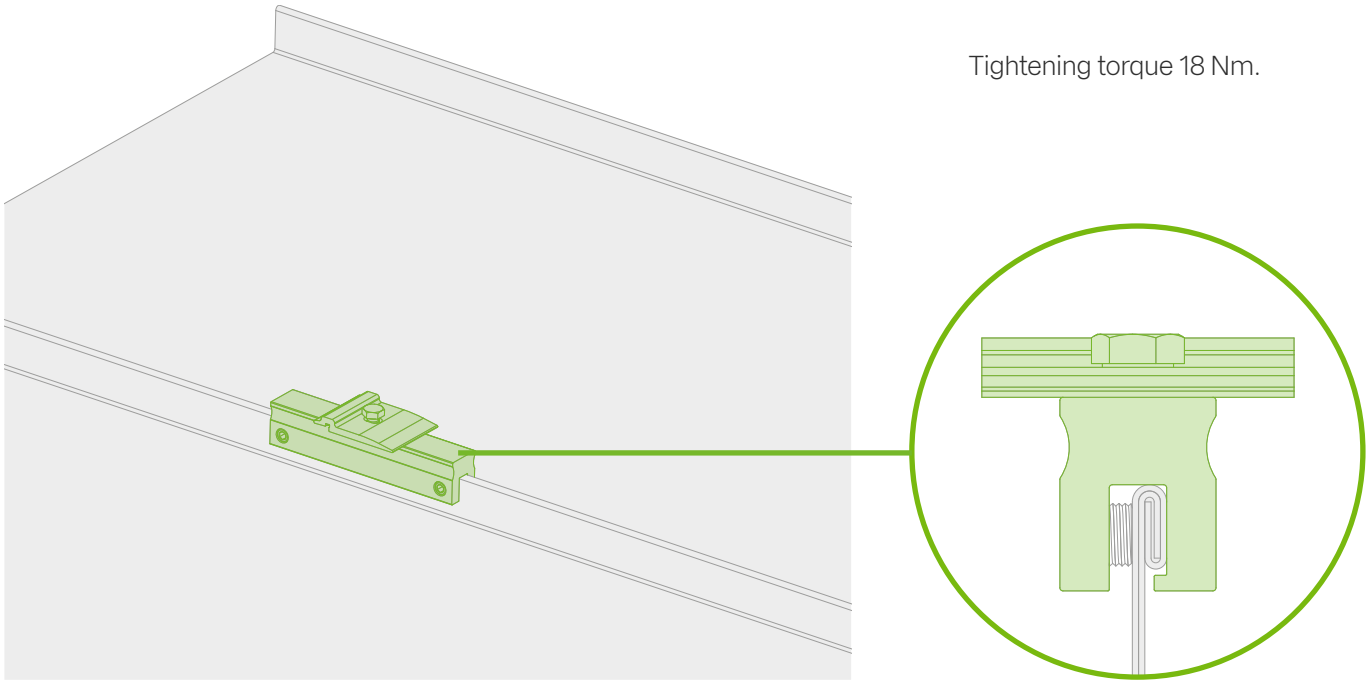
2 Mounting the seam clamp set IR



A Fixing seam clamp set IR.

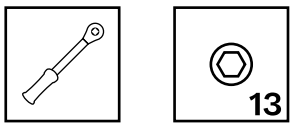
Place the clamp on the seamed metal and fix it with both set-screws.

Tightening torque 18 Nm.



Warning:
The clamps must not be installed on or near the metal retainers.

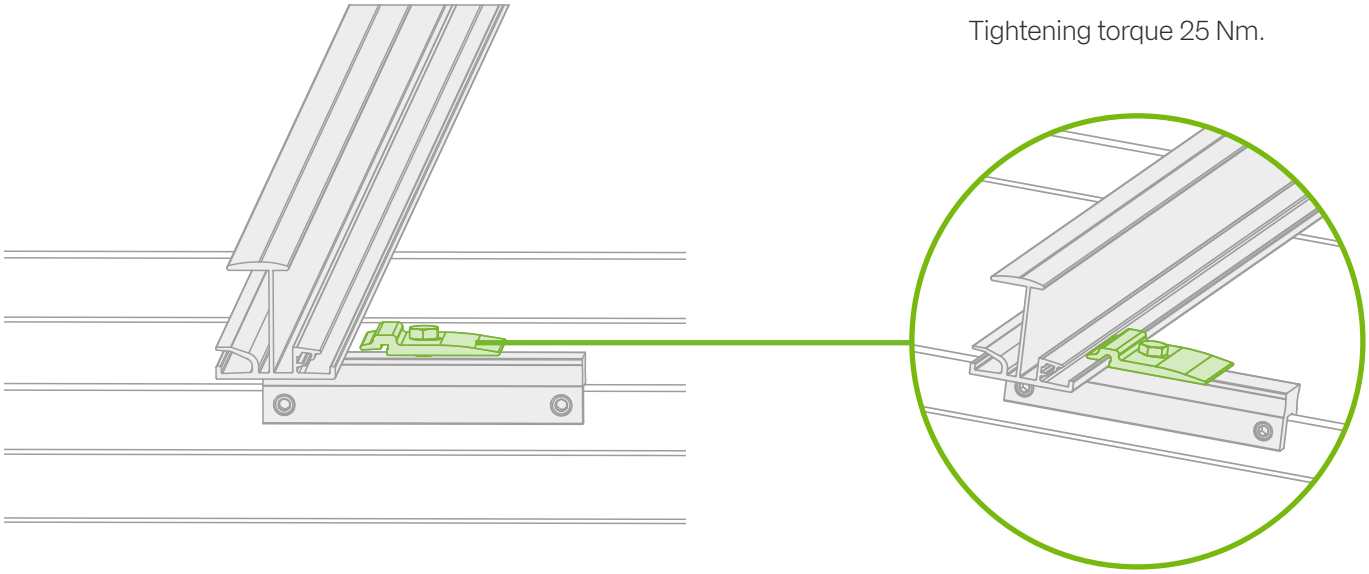
3 Installation of the insertion rail



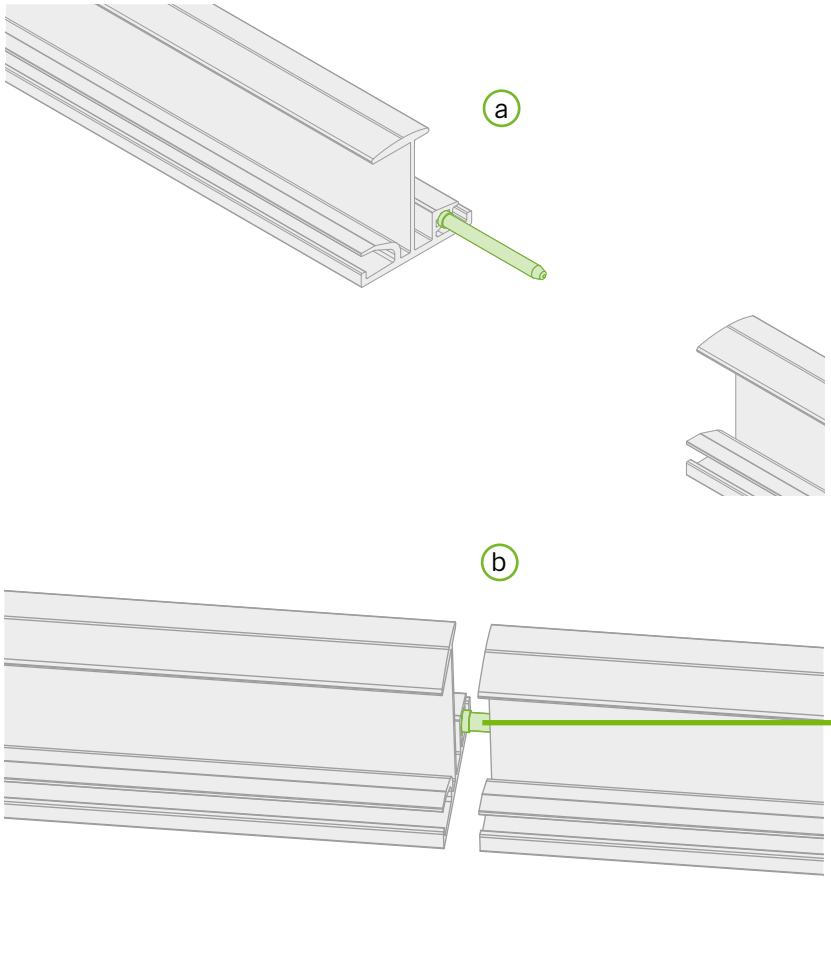
A Fixing insertion rail.

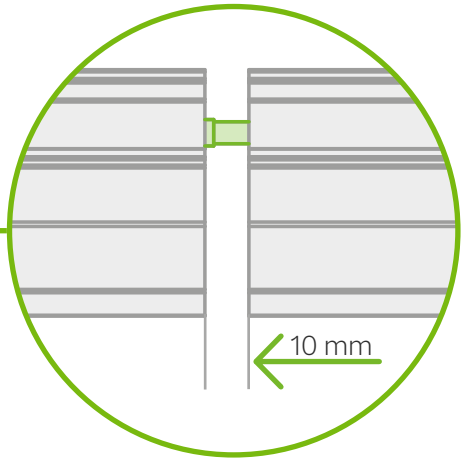
Place the insertion rail on the standing seam clamp, push it against the cross rail connector IR and hook it into the holding flange, align the rail and tighten the hexagon screw.

Tightening torque 25 Nm.



B Fitting rail connectors





(a) Push the connector into the secured rail piece up to half way into the screw channel.

(b) Push the lose rail piece with the screw channel onto the connector with a 10 mm gap between the rail ends, then attach the second rail piece.

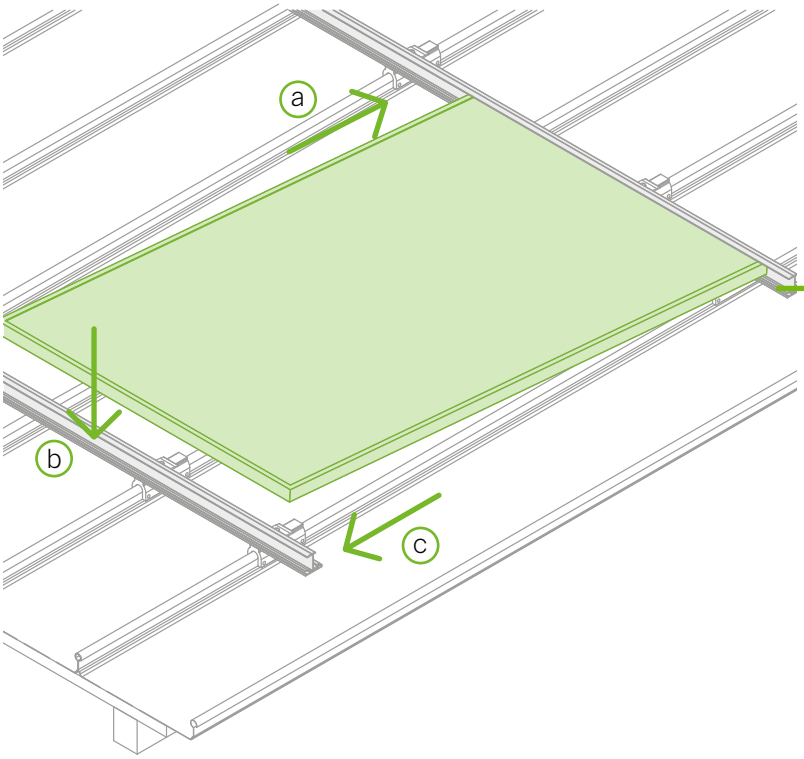
The gap between the rails must be 10 mm so that length expansion is not blocked during heating.

Maximum uninterrupted rail length 5,40 m.

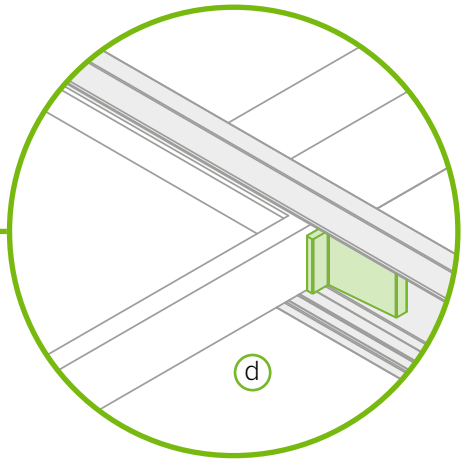
Warning:
The installer must check on site whether the sheet metal used has manufacturer-specific requirements for the rail length.

Warning:
Rails fixed only via the rail connector are not permitted. Both rail pieces must be attached via seam clamps.

4 Module mounting insertion rail



A Place module into the insertion rail.



a Place the module onto the top insertion rail and push it up.

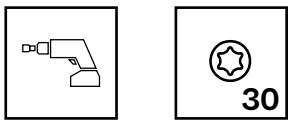
b Then lower the module onto the bottom insertion rail.

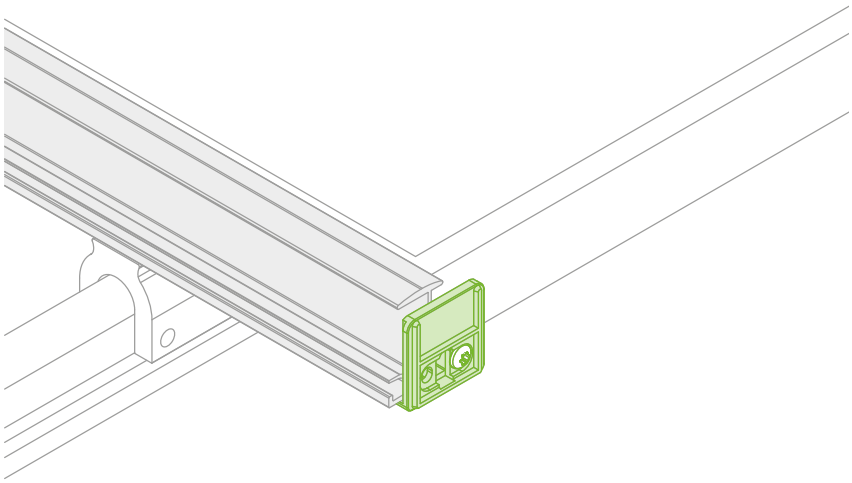
c Push it down against the insertion rail. Mount the next modules following the same principle. The gap between the modules must be min. 5 mm

d Install the EPDM-T protection IR between each module.

novo-tip:
If contact latches are required for the insertion rail, they must now be inserted. See step page 24.

5 Edge stop mounting



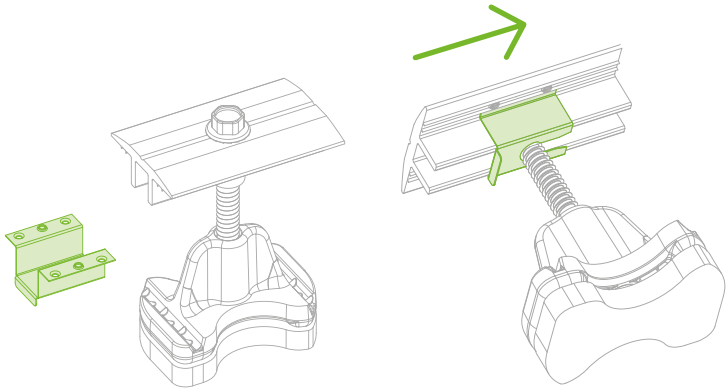


A Fit an edge stop set IR at the end of a module row at each insertion rail with a metal screw in the screw channel.

Warning:
The opening of the edge stop set IR must expose the drainage channel of the insertion rail.

Mounting optional articles

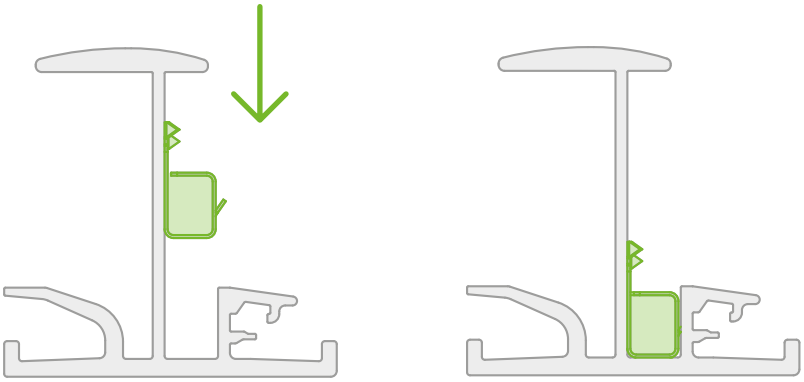
1 Installing contact latch



A Assembly of contact latch for middle clamp.

Push the contact latch on the sliding plate over the vertical webs of the middle clamp up to the screw.

Warning:
The applicable standards and guidelines, e.g. lightning protection standard, must be observed.



B Assembly of contact latch for insertion rails.

A contact latch must be fitted under each module. The contact plate must be pressed into the channel onto the bottom of the insertion rail.

Warning:
The applicable standards and guidelines, e.g. lightning protection standard, must be observed.

Maintance mountin system

The mounting system must be checked for stability and function at regular intervals during plant maintenance. We recommend an annual visual inspection.

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 ballasting on the base rails and ballast trays. The screw connections should also be checked and, if necessary, retightened in accordance with the tightening torques specified in the assembly instructions.

All system components should be checked for damage caused by, for example, weathering, animals, dirt, deposits, adhesions, fouling (especially on green roofs), roof penetration, sealing, stability and corrosion. The inspection of the system and maintenance work must be carried out by a specialist company that has experience with electrical systems and work with mounting systems, or by an expert. After unusually strong impacts (e.g. from earthquakes, heavy snowfall, storm events, etc.), an inspection of the system must always be carried out.

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