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Installation manual

AeroFix G3.1 Corner point clamping

IBC SOLAR AG

Version:26.01
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1. Introduction

Dear customer,

Congratulations, you have chosen an IBC product! Now you can enjoy the quality and reliability of the IBC AeroFix G3.1 flat roof system.

To ensure that you can install and start up your IBC AeroFlat G3.1 flat roof system quickly and simply, we have enclosed detailed assembly instructions. They should help you to quickly become familiar with the assembly of the bracket and the modules.

Please read these instructions carefully before installation. If you still have questions after reading them, please contact your IBC partner, who will be happy to assist you.

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Your team

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2. Tool list

- Cordless screwdriver with various bits (Torx 40, SW8, SW10, SW13 socket)
- Drill Ø3 mm, Ø5 mm
- Pencil
- Tape measure
- Folding rule
- Plumb line
- Angle grinder with diamond grinding wheel
- Torx screwdriver with T-handle (SW8, SW10, SW13, TX40)
- Torque wrench
- Assembly gloves
- Assembling jig
- Static friction measureing device (in the planning phase)

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3. General information, standards and regulations

The IBC AeroFix G3.1 flat roof system is for mounting solar modules onto flat roofs and pitched roofs.

The modules are attached on supports or base rails using clamps.

The number of parts varies depending on installation size.

Mounting system parts must not be treated with additional anti-corrosion protection in normal, atmospheric conditions (corrosivity categories C1-C3 according to EN ISO 12944-2 and surrounding temperatures of -30°C to +50°C). Take additional, suitable anti-corrosion protection measures in the event of other assembly locations (e.g. contact with grit, direct vicinity to the coast, acidic or alkaline environments).

ⓘ Important information

- Your IBC AeroFix G3.1 flat roof system will be delivered complete with all accessories!
- Before you begin, please check that all parts are included by using the attached packing list and parts list.
- Electrical work must be carried out by a qualified electrician!
- The processing guidelines and in individual cases specific guidelines from the relevant manufacturer for the roofing and modules must be adhered to!
- Condition for the 10-year guarantee or 15-year combined guarantee to be granted: this only applies with the use of IBC components. The guarantee is not valid for components from other suppliers. Complete guarantee conditions are stated in the guarantee document.
- We advise the use of gloves to avoid injuries.
- During the entire assembly time, it must be ensured that at least one copy of the current installation manual is available on the construction site.

ⓘ Other important information and dimensioning standards

The entire PV system must be mounted according to the generally recognized technical regulations. Please ensure that you observe the national accident prevention regulations e.g. of the German employer‘s liability insurance associations (Berufsgenossenschaften), in particular.

- DGUV Regulation 1 Principles of Preventation
- DGUV Regulation 3 Electrical installations and equipment
- DGUV Regulation 38 Construction work
- DGUV Information 208-016 the use of ladders and steps

Please ensure that installation is adapted to on-site conditions and corresponds to the respective generally recognized technical regulations. Local regulations must be observed.

Please observe all regulations and guidelines under public law during planning, erection, operation and maintenance of grid-connected PV plants including the following: EN standards, DIN standards, TAB, accident prevention regulations, the guidelines from the association of property insurers (VDS – fire protection guidelines), the professional guidelines of the roofing association and general guidelines (e.g. timber structures, roofing and roof-sealing works).

Please note in particular (this is not an exhaustive list):

- DIN / VDE 0100, particularly part 712 (erection of power installations with nominal voltage up to 1000 V)
- DIN / VDE 0298 (electric cables)
- VDI 6012 Blatt 1.4 (Integration of distributed and renewables-based energy systems in buildings - Fundamentals - Fixing of solar modules and solar collectors on buildings)
- DIN / VDE 0126 (solar energy systems for domestic use)
- DIN / VDE 0185 part 1 to 4 (lightning protection)
- DIN 18338 Roof covering and roof sealing works
- DIN 18451 Scaffolding work
- DIN 18531 Waterproofing of roofs
- DIN 18015 Planning and erection of electrical installations in residential buildings
- TAB (technical closing conditions for connecting to the low-voltage grid of power supply companies)
- VDEW guidelines (guidelines for connection and parallel operation of decentralized power generation in the low-voltage grid)
- Notes on solar from the German Institute of Civil Engineering (DIBt), in the current edition
- DIBt building regulation list, in the current edition
- DIN 4102-1:1998 Fire behaviour of building materials and elements – part 1: Building materials; classification, requirements and tests
- DIN EN 13501-1:2010-01 Fire classification of construction products and building elements – part 1: Classification using the results from fire behaviour tests on construction products
- EN 1990 (Basis of structural design)
- EN 1991-1-3 (General actions – snow loads)
- EN 1991-1-4 (General actions – wind loads)
- EN 1993-1-1 Design of steel structures: General rules and rules for buildings
- EN 1995-1-1 Design of timber structures
- EN 1999-1-1 Design of aluminium structures
- General certificate of building approval Z-30.3-6: Products, connecting devices and structural components made from stainless steel
- DIN 4426 Equipment for building maintenance - Safety requirements for workplaces and accesses - Design and construction

- DGUV Information 203-080 - Installation and maintenance of PV systems
- DGUV Information 201-056 - Planning principles of anchor devices on roofs
- Model Building Regulation (MBO) / state building regulations
- BSW Solar Reference paper on the positional securing of PV flat roof systems against shifting due to thermal expansion ("temperature creep")
- BSW Solar Load Application and Compression of Roof Insulation — A Calculation Guide for Flat Roofs on Which Solar Systems Are Installed
- BSW Solar The designer's guide to wind tunnel testing of solar racking systems

Solar modules

Framed solar modules may only be used if they fulfill the following criteria:

- Hold valid IEC 61215 / IEC 61646 and protection class II / IEC 61730
- Module dimensions according to Chapter 5 Technical data
- Module manufacturers approval regarding module clamping and module frame supports

Please note that the guarantee for the solar modules will expire if modifications are made to the module frames (e.g. by drilling additional holes). For warranty reasons, the assembly instructions from the respective solar module manufacturer must be strictly adhered to.

Lightning and surge protection

Please note that the lightning and surge protection of the PV system is to meet the current requirements for

- DIN EN 62305-3 / VDE 0185-305-3„
- DIN / VDE 0100 part 712 and
- VdS 2010

For more detailed information please refer to the local regulations and the aforementioned standards and guidelines.

In general, we recommend integrating the mounting system and module frames into the local equipotential bonding system and using surge protection devices.

Equipotential bonding is always necessary if the solar modules used do not comply with protection class II.

The cross-section of the equipotential bonding conductor must correspond to the cross-section of the DC main line, but at least equivalent to 6 mm² (copper).

If the building has a lightning protection system and the PV generator is not in the protection area of the arresting device, then the module frame and assembly system must be integrated into the external lightning protection and surge protection devices must also be installed.

The electrically conductive connection must be designed with at least an equivalent of 16 mm² (copper).

Information
The AeroFix G3.1 can carry lightning current with the internal butt connector.

Cable routing

Even when you are installing the frame, certain points regarding cable routing and wiring should be kept in mind.

- To avoid surge voltage couplings from lightning strikes, the resulting conductor loop must be kept as small as possible.
- The cable routing must allow for any future slipping caused by snow and ice.
- Water must not be allowed to collect around the wiring, continuous water drainage must be provided.
- The wires must be installed with maximum possible UV and weather protection.

4. System

4.1 AeroFix G3.1 10-S

Southern orientation

Center to center distance X ±100 (mm)	Module width Y (mm)
1650	1040 - 1150

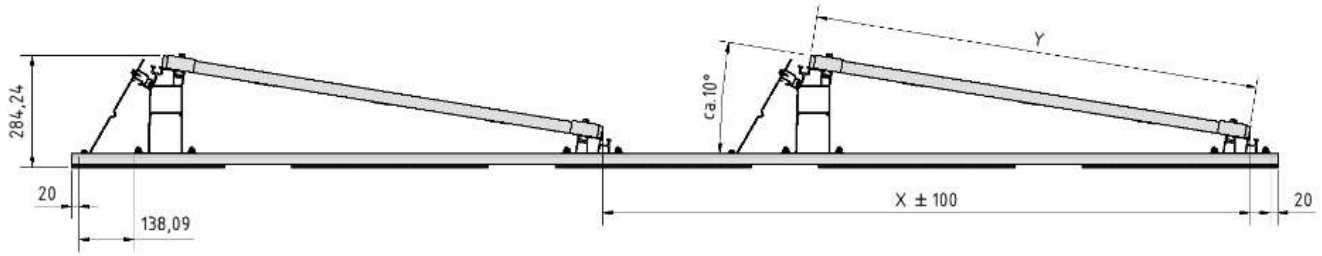

Figure 1 AeroFix G3.1 10-S

4.2 AeroFix G3.1 10-EW

East-west orientation

Center to center distance X ±50 (mm)	Module width Y (mm)
2450	1040 – 1099
2600	1100 - 1150

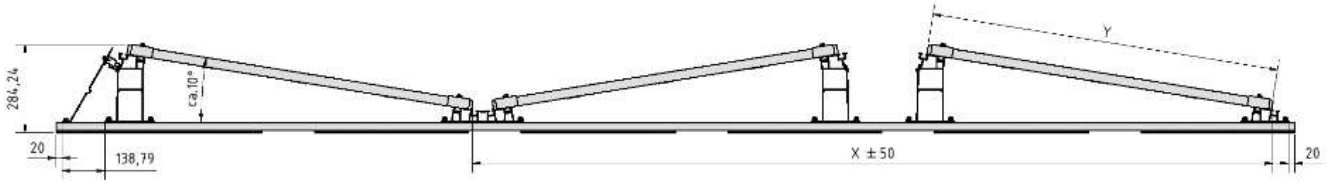

Figure 2 AeroFix G3.1 10-EW with wind plate and module finish

4.6 Overview of possible additional module support and load distribution

Additional module support increases the permissible pressure and suction loads of the modules. Please refer to the module installation manual for the individual load approvals. If a third base rail is used, the load on the insulation is reduced. The specific value of the surface pressure can be found in the PV Manager's structural analysis report.

	AeroFix G3.1 10-S 65 mm support	AeroFix G3.1 10-EW 65 mm support	AeroFix G3.1 10-S 100 mm support	AeroFix G3.1 10-EW 100 mm support
Third base rail with module clamp	x	x	x	x
Third base rail with module clamp and U-profile			x	x

Figure 3 Table of possible additional modules support

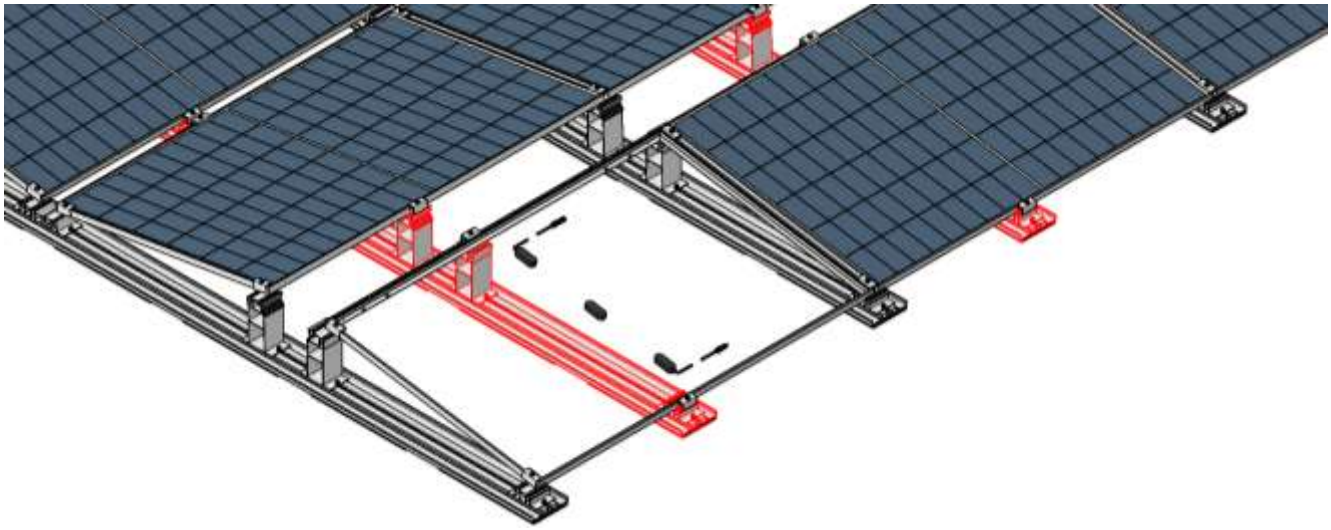

Figure 4 Example of the third base rail

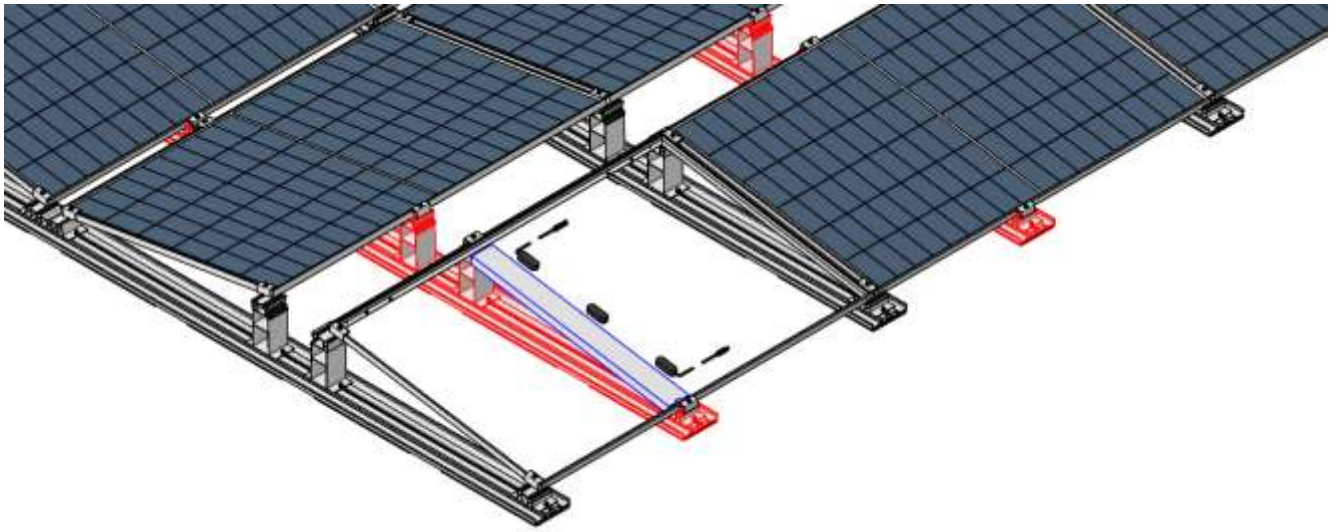

Figure 5 Example third base rail + U-profile

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5. Technical data

	AeroFix G3.1 10-S	AeroFix G3.1 10-EW
Application purpose	Flat roof	
Inclination approx. (°)	10	
Module orientation	South	East-West
Permissible roof pitch (°)	≤10	
Module width (mm)	1040 - 1150	
Module length (mm)	1500 - 2610	
Weight (kg/m²) ** Corner clamping Corner clamping + third base rail	 9,8 11	 12 13,4
Linear load (kg/m) ** Corner clamping Corner clamping + third base rail	 17,1 9,7	 21,3 11,8
Center-to-center distance (m)	1,65	2,45 / 2,6
Minimum module field size (module)	2 x 3 bzw. 3 x 2	
Maximum layout (m) (thermal separation)	20 x 20	
Minimum distance to roof edge (m)	No one***	
Material	Aluminium, stainless steel, rubber granulate	
Max. building height (m) *	35	
Approx. space reqirement m²/kWp (1,762 x 1,134 Modul 440 W)	6,2	5,2

Figure 6 Technical Data

The product guarantee shall be governed exclusively by the complete guarantee conditions in the version valid at the time of assembly, as provided to you by your IBC SOLAR trade partner. Guarantee assumes assembly is in accordance with applicable assembly instructions. We reserve the right to make modifications which will improve our product.

* For building height >35 m, project-specific testing and ballasting by IBC is required!

** Regular weight mounting system including module (25 kg), without additional ballast

*** If the edge distance is <0.6m, the ballast may increase.

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6. System planning

The planning and static calculation of AeroFlat G3.1 flat roof systems is carried out using the IBC PV Manager software or on basis of the fully completed and signed checklist, which must be submitted together with the corresponding module layout plan and can be used to determine the parts list and ballast plan. For the calculation, the total roof area and maximum attic height must always be specified in the checklist and in the PV Manager.

⚠ Attention!
The proof of the plant safety and the static load capacity of the system components have to be calculated for every single project!

Before initiating the planning phase, there must be an extensive check of the existing building and technical documentation must be completed. In particular, the constructor should be informed of any damage to the roof cladding. The functionality of existing roof waterproofing should be provided for the operating period of the new PV system to be installed.

⚠ Attention!
The verification of the roof structures and existing superstructures is not part of the static verifications as part of the design of the PV mounting system. The load increases and rearrangements caused by the photovoltaic system must be checked and approved by a building structural engineer on site.

Drainage

The customer must check that the structural condition is consistent with the design (building size, roof pitch, roof cladding, obstacles etc.).

It must be ensured at all times that rain water is discharged to drainage collection points. Water drainage should be incorporated in the planning process of the PV system.

Pitched roofs

See 9. System security device

Roof covering

The AeroFix G3.1 flat roof system can be built on bitumen, foil, concrete gravel and green roof. Basically, the building protection mats of the base rails should lie completely on the roof skin. There should not be any objects under building protection mats that could damage the roof skin, e.g. sharp objects, stones etc.

On gravel roofs it is advisable to remove the gravel beneath the base rails. If this is not possible due to the thickness of the gravel layer, the Base rails can be placed on the gravel but should be shaken in slightly to ensure a complete and stable support surface. One must ensure on site that the weight of the PV system does not push anything through the roof membrane.

For green roofs, it is recommended that a growth barrier is laid over the entire surface and glued to the joints. This prevents plants from growing in the gaps between the modules. A loss of module yield due to shade can be avoided. Changes to the mounting system may not be made (e.g. installation of additional metal sheets to close gaps).

Restriction of module field sizes

Due to different linear expansion coefficients for the structural profiles compared to those for the roof cladding, there may be thermal constraints on the roof waterproofing. This is avoided by restricting the module field sizes (splitting individual module fields). The thermic separations must not be between the clamping points inside a module. The center to center distance is continued normally via the separations.

The AeroFix G3.1 must be separated after 20 m x 20 m at the latest.

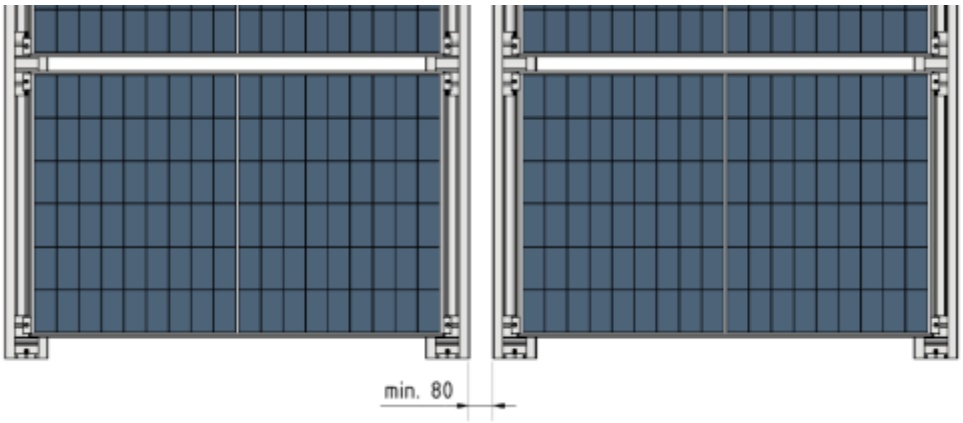

Figure 7 AeroFix G3.1 thermal separation within the module row

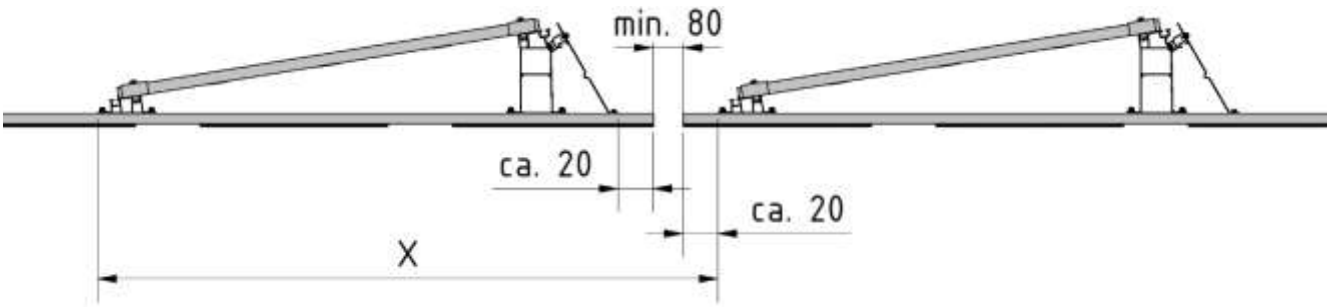

Figure 8 AeroFix G3.1 South thermal separation between the rows

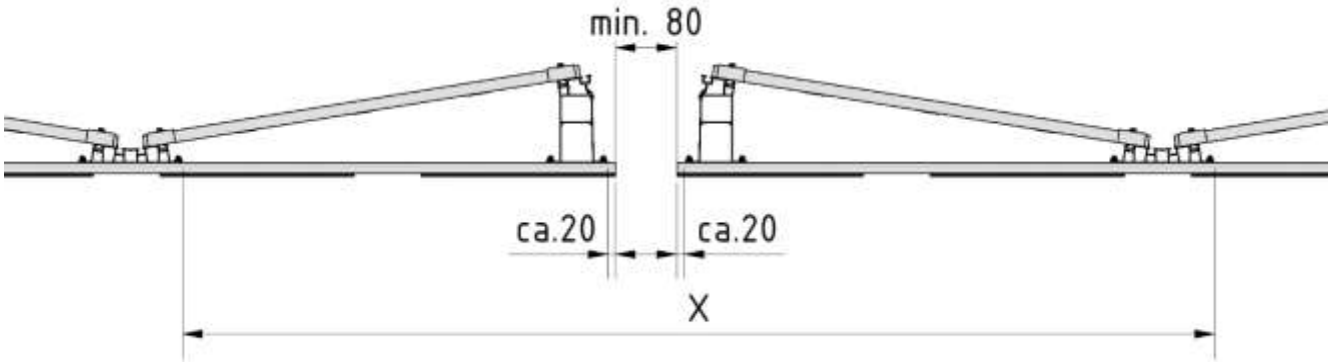

Figure 9 AeroFix G3 EW thermal separation between the rows

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ⓘ Important information on temperature migration (caterpillar effect) and measures to secure the position

Due to recurring temperature changes, the profile structures of the mounting system regularly expand and contract. As a result, even with minimal roof pitches, the structure can move in small increments across the roof waterproofing. This process is known as temperature migration or the caterpillar effect and occurs independently of wind loads or ballasting. In practice, this effect cannot be completely avoided, but it can be limited by taking appropriate measures. To prevent damage to the roof waterproofing, parapet, skylights, cable routes or electrical components, we recommend the following measures to secure the technical situation and reduce the track effect:

Measures to limit the caterpillar effect

- Module field segmentation
  Divide the system into smaller module fields, as temperature migration is highly dependent on the size of the connected module field.
- Module field coupling for roof surfaces with different inclinations
  Connect adjacent module fields to each other in a force-fit manner, e.g. connection of module fields (with similar mass) via the ridge of the roof surface.
- Use of suitable fixed points
  Connect selected system areas to structural fixed points on the building (e.g. parapet substructures), if permitted. Fixing the mounting system in this way prevents uncontrolled creep and keeps the necessary thermal expansion under control.
- Sufficient field spacing & collision control
  Maintain minimum distances from parapets, penetrations and other roof components to avoid collisions due to migration movements.
- Regular inspection and maintenance
  Check the position of the system regularly as part of maintenance. Without checking, the system can move towards the edge of the roof over several years. Check and correct displaced generator fields or building protection mats as necessary.

Plan the system taking into account the principles described in the BSW information paper ‘Securing the position of PV flat roof systems against displacement due to thermal expansion (’temperature migration‘)’.

Load-bearing reserve

In order to apply the additional loads from the PV system onto the roof, the load-bearing capacity of the roof and the insolation must be assured by a static expert before planning the installation of the photovoltaic system.

⚠ Attention!
The surface pressure of the AeroFix base rail G3 Eco is higher than of the AeroFix base rail G3 because of the smaller contact surface. The exact value of the existing surface pressure can be found in the statics report.

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Static friction coefficients

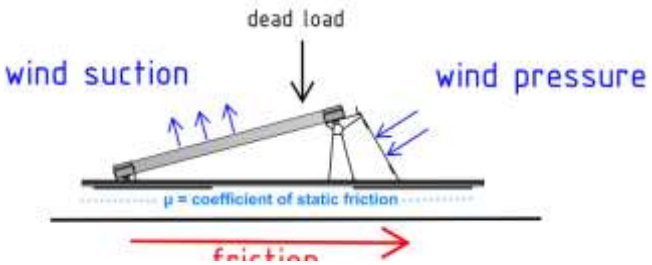

Figure 10 Coefficient of static friction

The proof of stability demands for a position-stability-analysis as well as a component analysis. For this, the system must be adequately secured against lifting off and shifting. A key factor influencing the proof of position stability is the static friction coefficient μ between the solar power system and roof.

The static friction coefficient depends on the materials used, the surface condition (rough, smooth, wet, dry, weathered), the temperature, the age and the general condition of the roof waterproofing. These factors must each be incorporated into the consideration of the static friction coefficients and if necessary lead to reductions.

For preliminary planning purposes, depending on the material combination the following values can be used as an approximation:

	Fleece* (Polyester)	Building protection mat (rubber-based)	Building protection mat (aluminium-laminated)
PVC	0,2	0,5**	0,5
Polyolefin (z.B. TPO)	0,2	0,5**	0,5
PE	0,2	0,5**	0,5
PVC, modified	0,2	0,5**	0,5
EVA	0,2	0,5**	0,5
Polypropylen	0,2	0,5**	0,3
Bitumen elastomer/ polymer bitumen	0,6	0,6	0,2
EPDM	0,6	0,6	0,7

Figure 11 Coefficient of static friction μ

* Fleece only partially recommended due to risk of rotting

** Only with the manufacturer's approval for roof waterproofing regarding the chemical compatibility (plasticizer migration)

⚠ Attention!

The values shown in the table are intended for preliminary planning only!

It is not possible to assess the actual existing and applicable static friction coefficients to prove position stability without on-site verification

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Determining the static friction coefficients

To determine the static friction coefficient between the building protection mat and roof cladding:

- Check that the measuring device is working properly. The tension spring is OK if it displays a reading between 9.5 and 10 with the test specimen hanging vertically.
- Place the measuring device on roof cladding where the base rails rest, e.g., if the base rails are resting on gravel, then measure on the gravel.
- Using a measuring device, pull the test specimen parallel from ridge to eaves
- Record result

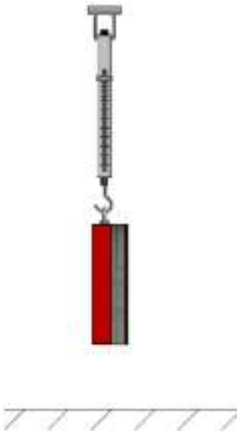
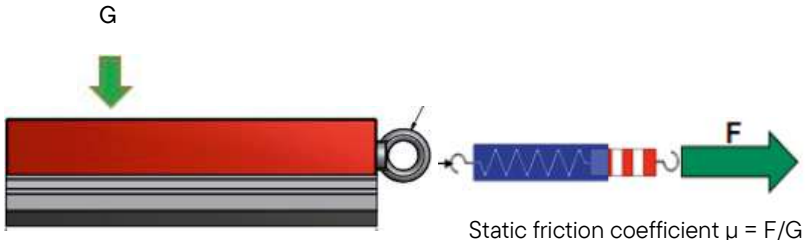


Figure 12 Checking tension spring

The testing is based on EN ISO 8295 Plastics – Film and sheeting – Determination of coefficient of friction, issue October 2004.

It is necessary to carry out 10 tests, 5 in a dry state, 5 in the wet state. The arrangement of the test has to be carried out uniformly on the roof surface. Visually different roof areas should be examined separately. In this case tests have to be repeated accordingly. The areas of the roof covering where the measurements are taken remain in the same condition as when the base rails were laid. Place the specimen on the roof and wait 30 seconds afterwards. In the next step the force (F) has to be applied steadily and parallel to the centre of the specimen and measured by the dynamometer. To determine the coefficient of friction, the decisive force is the maximum force that occurs prior to the movement of the specimen.



Static friction coefficient μ = F/G

Figure 13 : Static friction measuring device

Information
You can use the IBC test protocol “Determining static friction coefficients” to help you determine the static friction coefficients!

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7. System design/dimensioning

Proof of the load-bearing capacity of the assembly system is based on valid EN standards. Security against lift-off and lift-off with simultaneous displacement (position stability) is also proven.

The aerodynamic coefficients of the entire system were calculated in a boundary layer wind tunnel in order to optimize and reduce additional ballasting on the system, in accordance with EN 1991-1-4 point 1.5 “design assisted by testing and measurements” and the national appendix.

8. System installation AeroFix G3.1

Before constructing the PV system, the roof must be cleared of dirt.

8.1 Base rails

The assembly of the base rail G3 and G3 Eco is identical.

Lay base rails with integrated building protection mats on the roof as planned

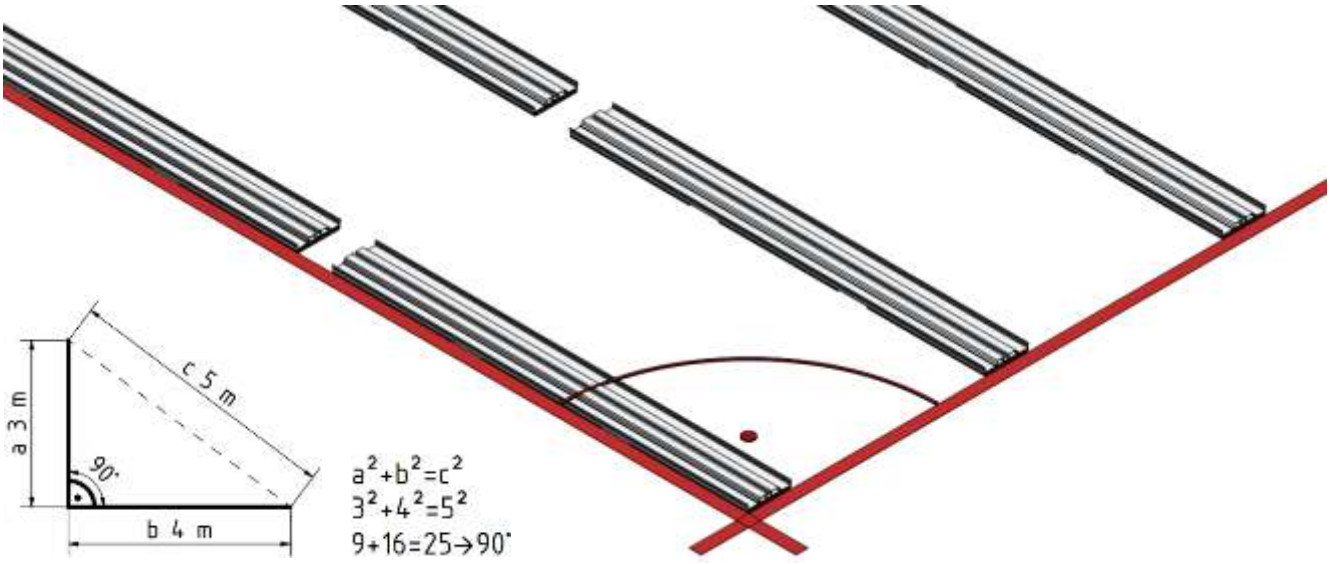

Figure 14 Lay out base rails

⚠ Attention!
The building protection mat is glued to the base rail only for internal production. A permanent bond cannot be guaranteed.

Using the Pythagorean theorem $a^2+b^2=c^2$, the base rails can be aligned at a 90° angle to the markings.

Extend base rails

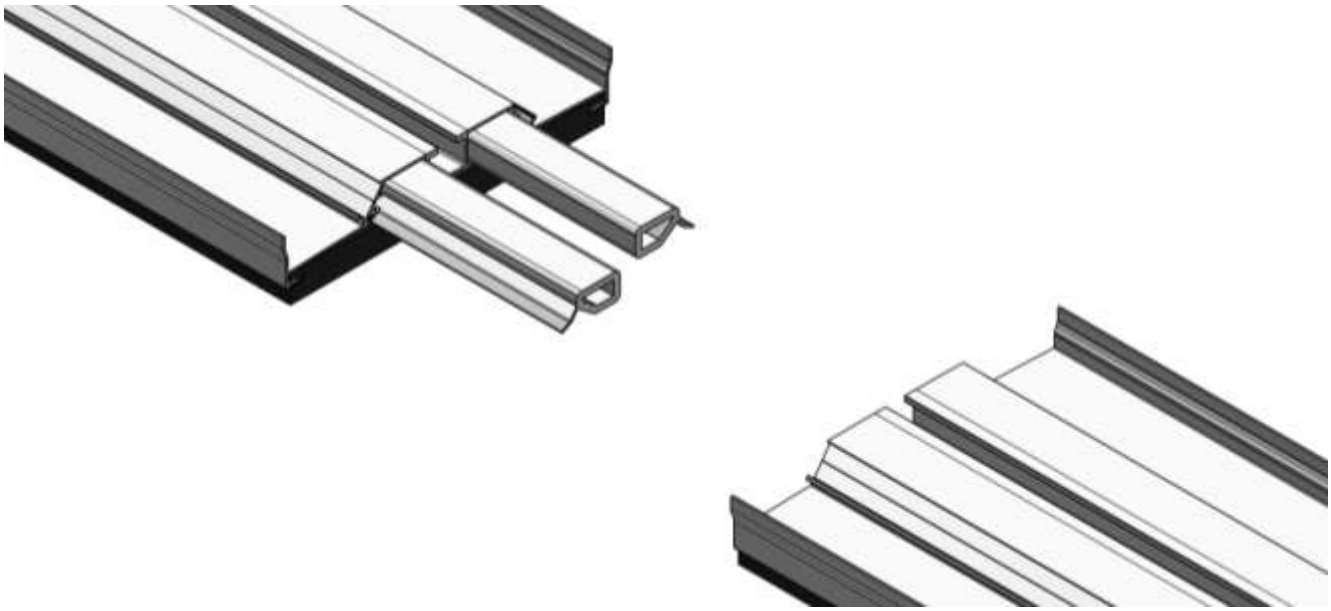

Figure 15 Insert both butt connectors as far as they will go

Information
To make it easier to insert the second base rail, the butt connectors protrude at different distances.

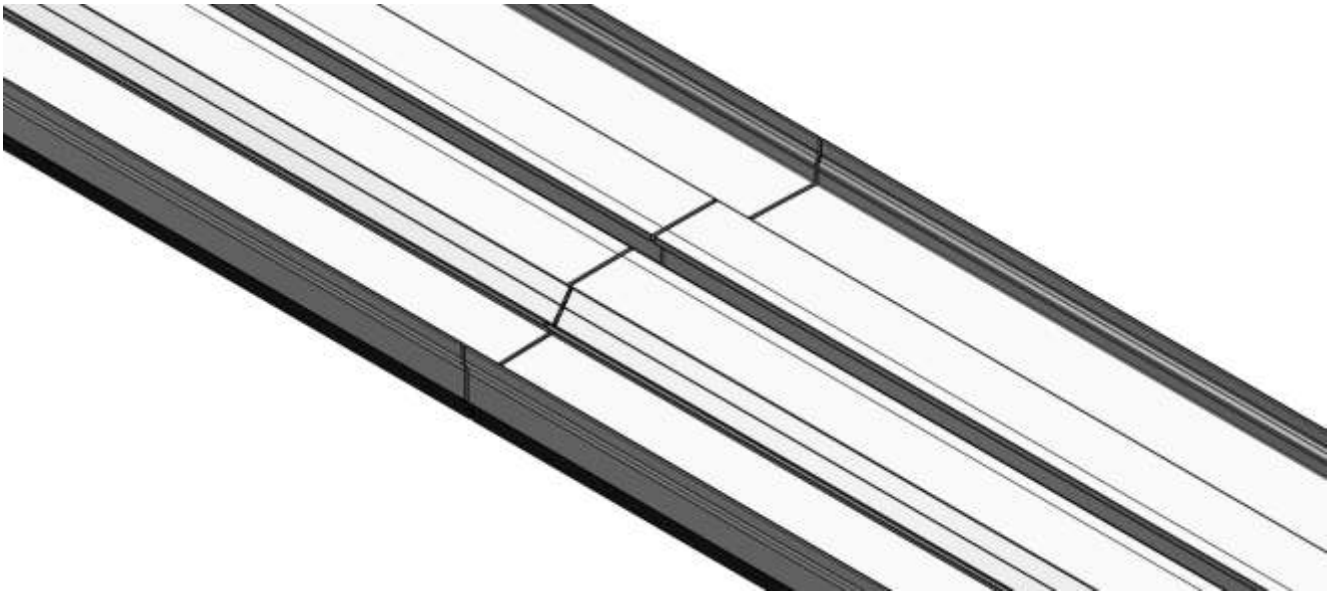

Figure 16 Put the base rails together completely

Attention!
The base rails have a gap of 1.5 mm due to the stop of the butt connectors. The gap in the slot Channel must not be larger if the tab of the support is exactly at that point.

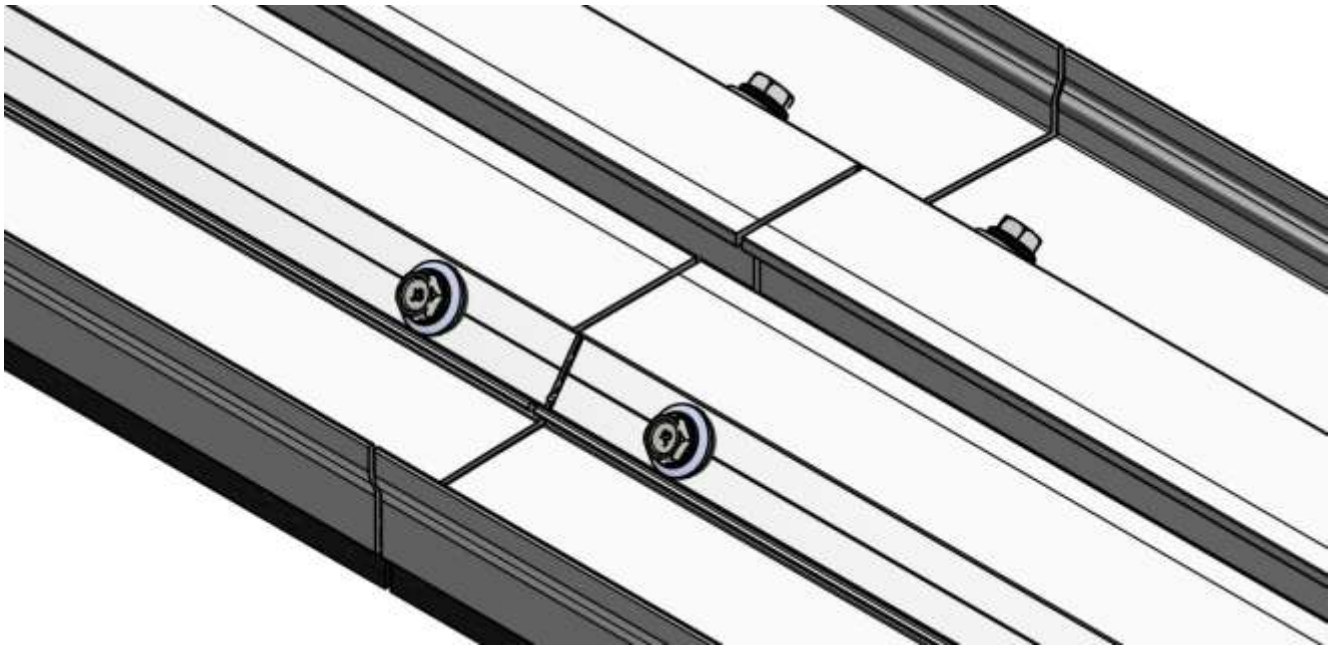

Figure 17 Fasten the butt connector on both sides with 2 thin sheet metal screws 4.8x19

Figure 18 Section view butt connector installed

Optional connection of base rail G3 with G3 Eco

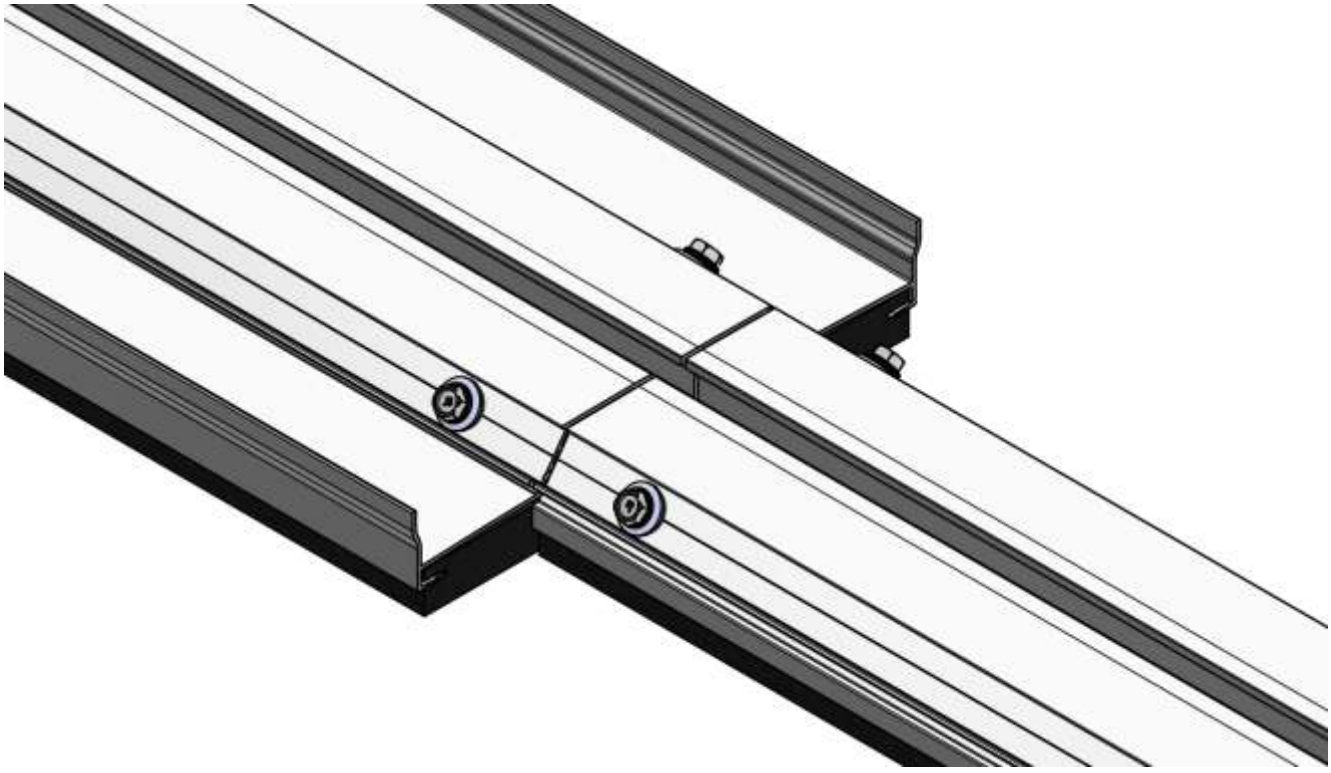

Figure 19 Base rail G3 and G3 Eco with internal butt connector

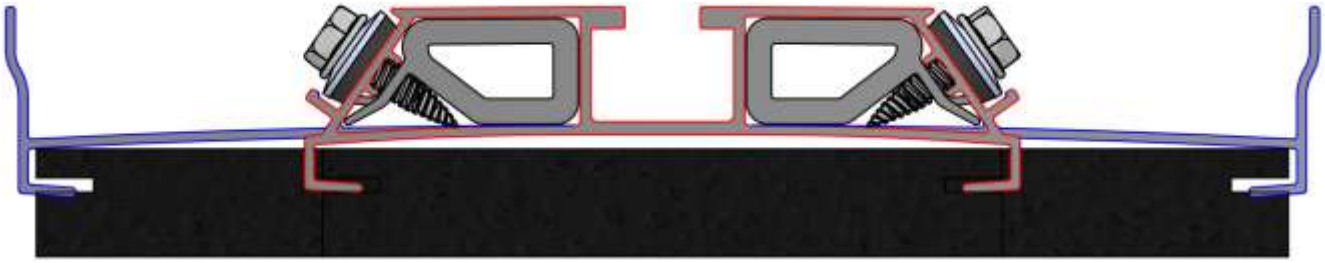

Figure 20 Section view base rail G3 (blue) and G3 Eco (red) with internal butt connector

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Base rail alignment

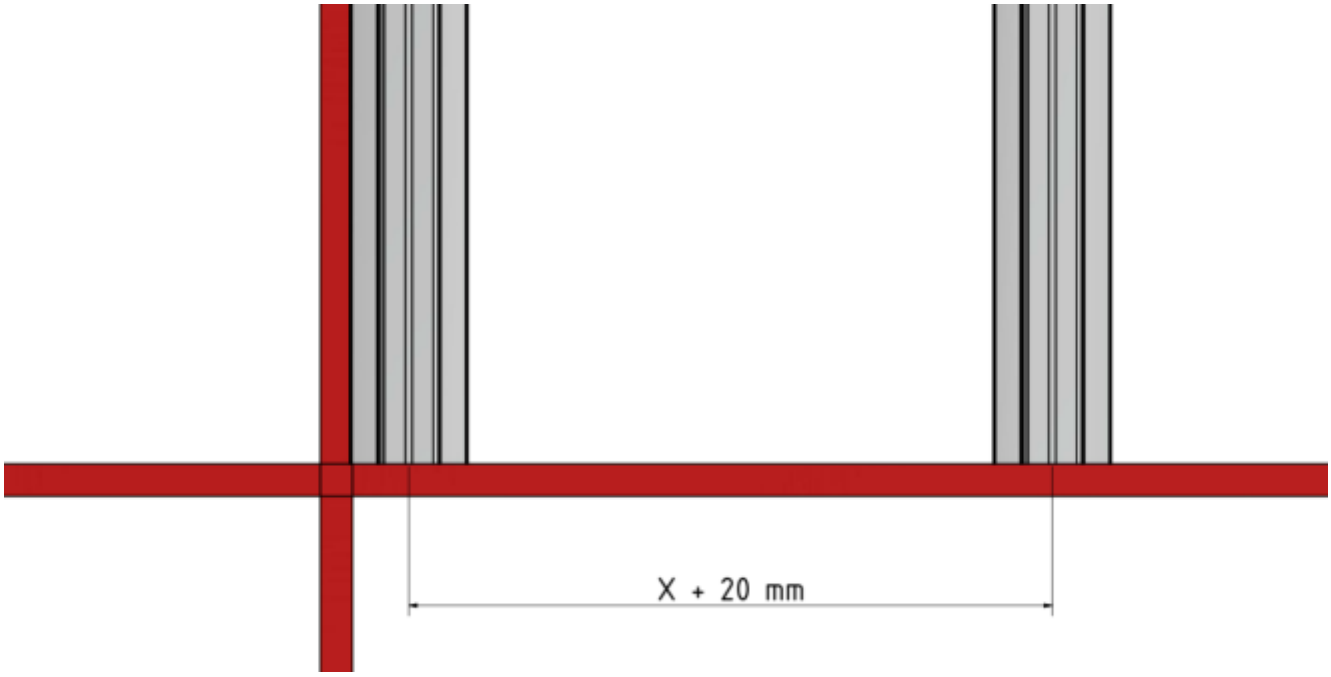


Figure 21 Align the base rails so that they are parallel and vertical. Depending on the system, X = module length or width

⚠ Attention!

- On uneven roofs, it can happen that the aluminum profile of the base rail rests on the roof surface. In this case additional protection mats must be placed. Existing building protection mats can be doubled with a building protection mat. In individual cases, two building protection mats are also permitted. Doubled building protection mats must be glued together to avoid slipping individually away. Building protection mats can be ordered separately.
- Make sure that no sharp edges at the beginning / end of the joined base rails damage the roof. Separate measures, e.g. overhanging of the building protection mats, may be necessary.

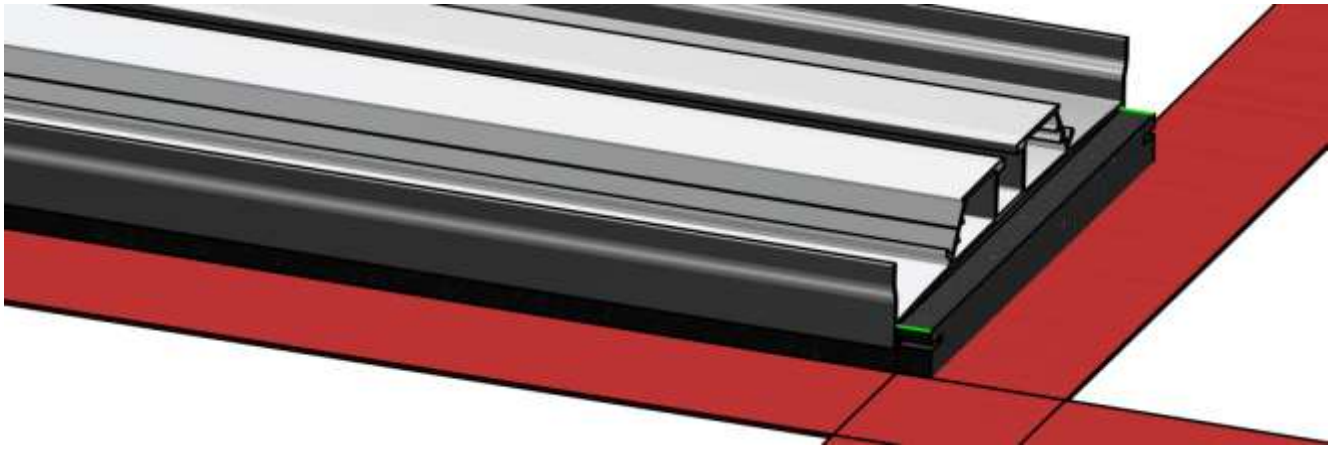


Figure 22 Exemplary representation of the overhanging building protection mat

⚠ Attention!

When using the assembly jig, only the existing module length needs to be set on the jig. The distance between the module clamps is automatically taken into account. Place the jig into the base rail's slot Channel. When aligning, ensure that the jig does not tilt or become misaligned unintentionally.

Example: Adjusting the assembly jig for a module length of 1762 mm.

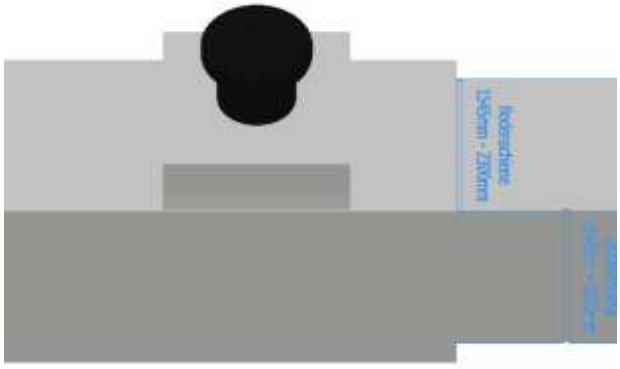


Figure 23 Set the middle tube of the jig on the side at "AeroFix G3 /3.1" to the locking point on the base rail 1545 mm - 2300 mm.

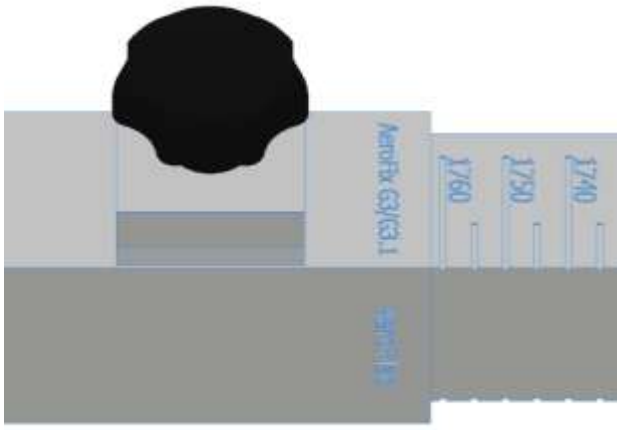


Figure 24 Set the scale to "1545 mm - 2300 mm" and measure 1762 mm. The clamp distance is calculated automatically.

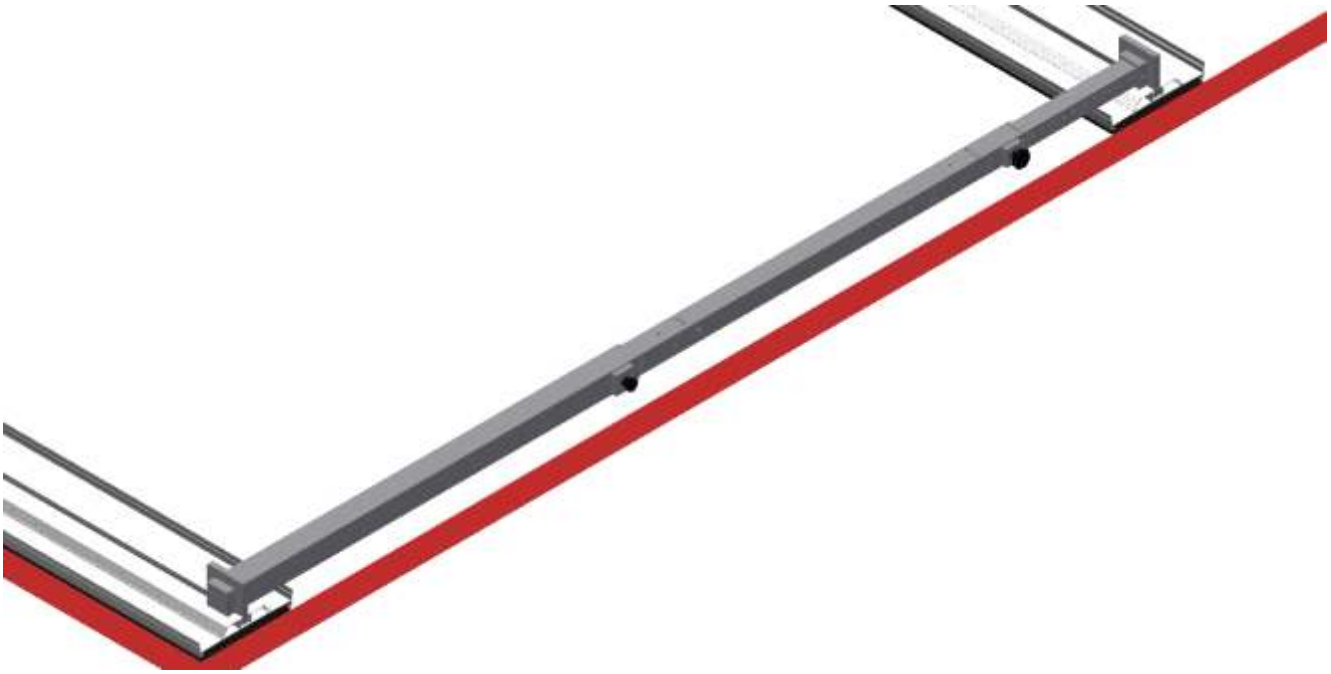


Figure 25 Place the assembly jig in the slot nut of the base rails.

8.2 Supports

⚠ Attention!
All supports must lie fully on the base rail. The M8x20 T-Head screws are used to attach the supports to the base rail. The tightening torque is 15 Nm! It is important to ensure that the T-Head screw is always fully swiveled into the slot channel.

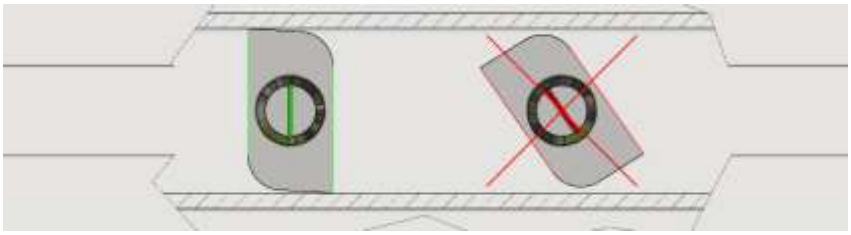


Figure 26 T-Head screw installed correctly (green) and incorrectly (red)

AeroFix G3.1 south orientation

⚠ Attention!
The base rail must protrude at least 20 mm. If a slip protection device is installed on the front side, an overhang of approx. 150 mm is recommended. If the AeroFix_Latch is installed, the floor rail must protrude approx. 300 mm.

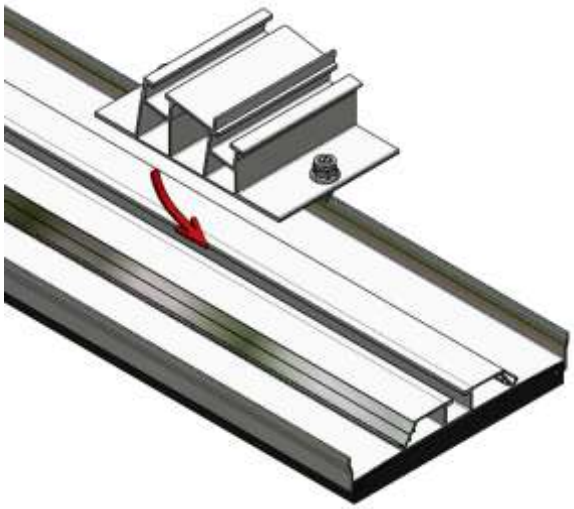


Figure 27 Slide the bottom support G3.1 onto the slot channel at the bottom

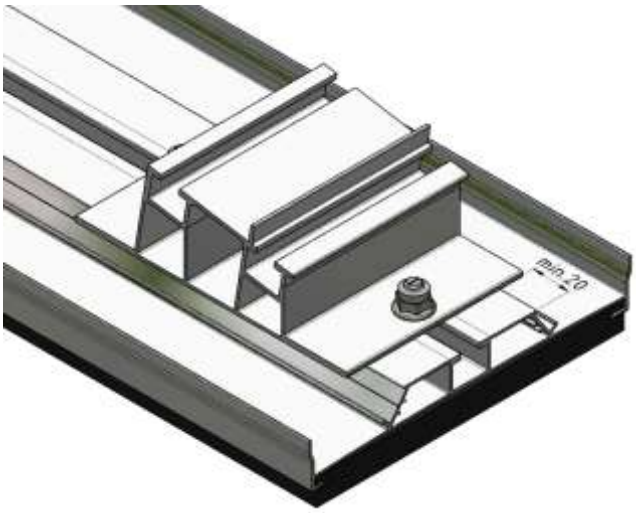


Figure 28 Bottom support G3.1 mounted with both T-Head screws

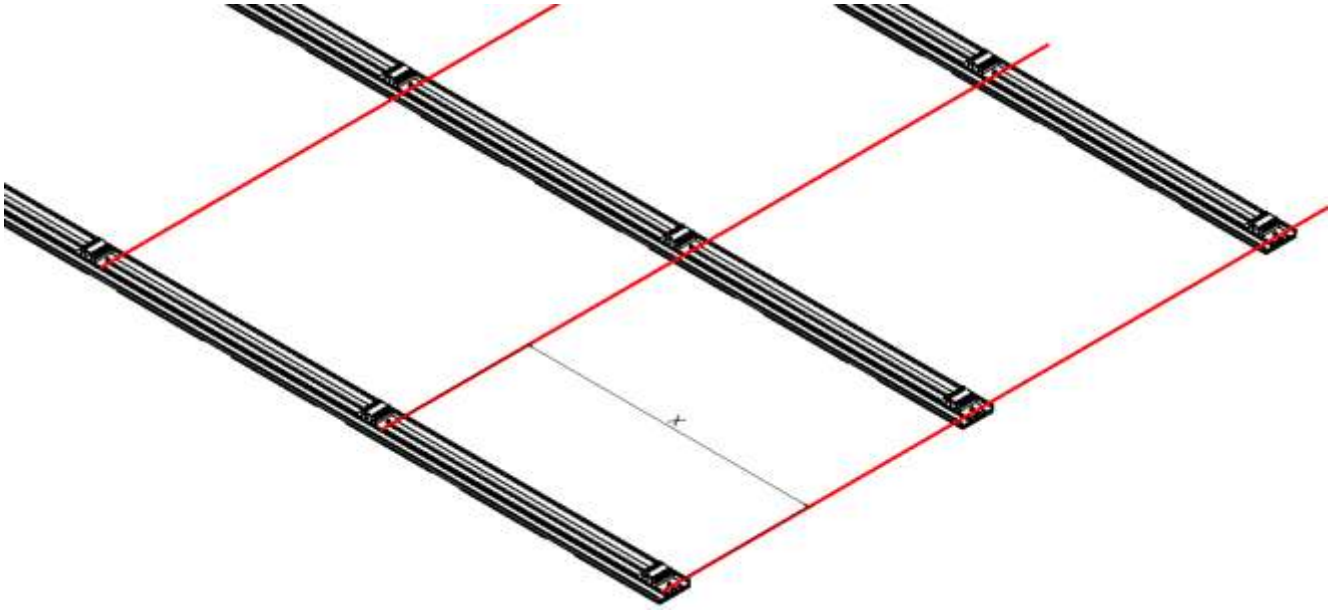


Figure 29 Mark center-to-center distance x

⚠ Attention!

The planned center to center distance is always applied at the same point on the bottom supports, e.g. trailing edge of the “bottom support G3.1” to the trailing edge of the “bottom support G3.1” next row or front edge of the module to the front edge of the module next row.

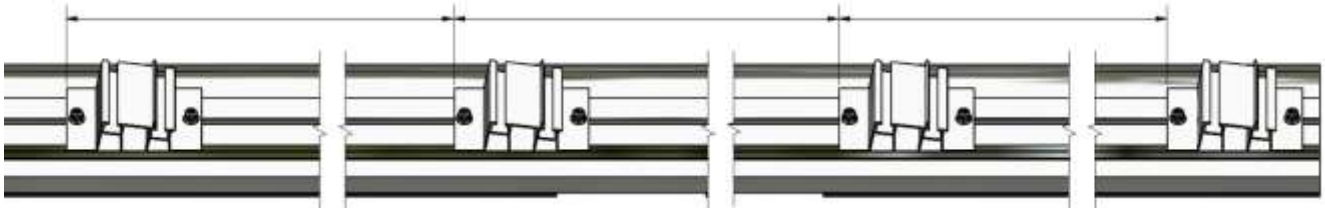


Figure 30 Applied center to center distance from the same point

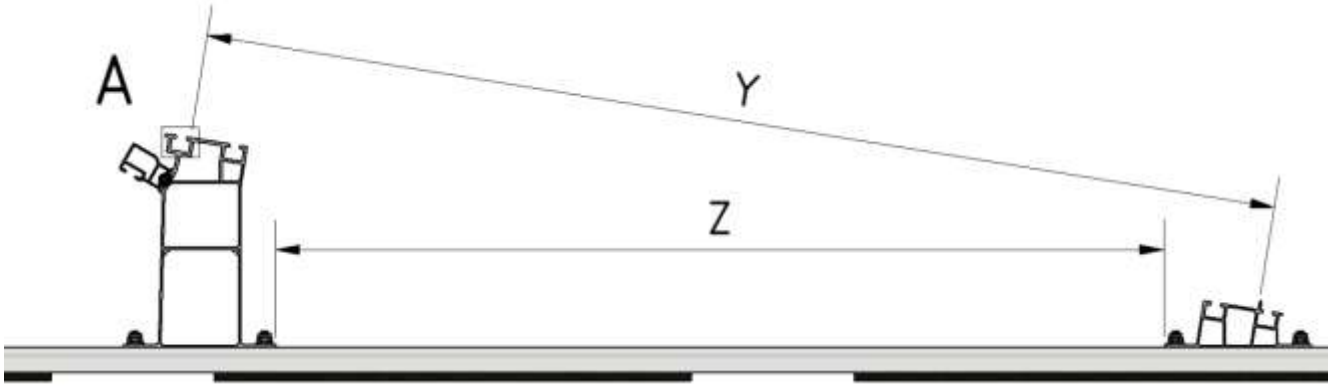


Figure 31 AeroFix G3.1 10-S: Y = module width, Z= inner distance supports

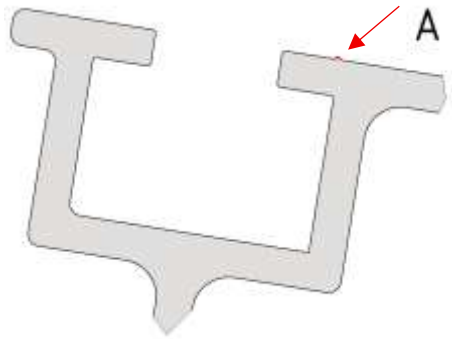


Figure 32 Marking notch for module position on “top support” for dimension Y

Module width Y (mm)	Inner distance of supports Z [mm]
1040	836,5
1100	897,3
1134	931,7
1150	947,9

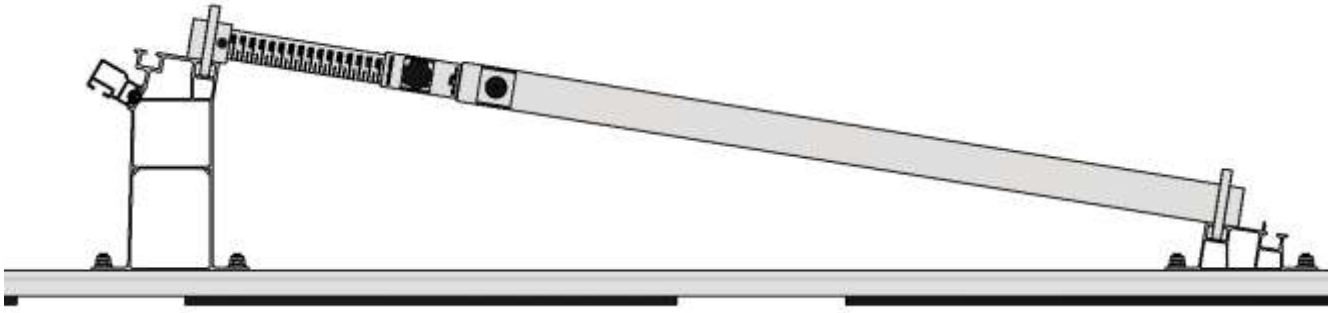


Figure 33 Position assembly jig

Example: Adjusting the assembly jig for a module width of 1134 mm.

Figure 34 Set the middle tube of the jig on the side at “AeroFix G3 /3.1” to the locking point “Support 975 mm - 1730 mm.”

Figure 35 Set scale “975 mm - 1730 mm” to 1134 mm.

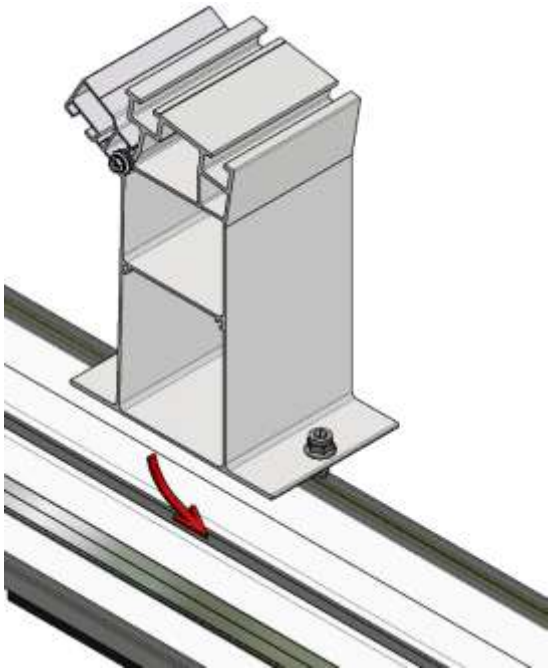


Figure 36 Slide the “top support G3.1 10 mWbh” onto the slot channel

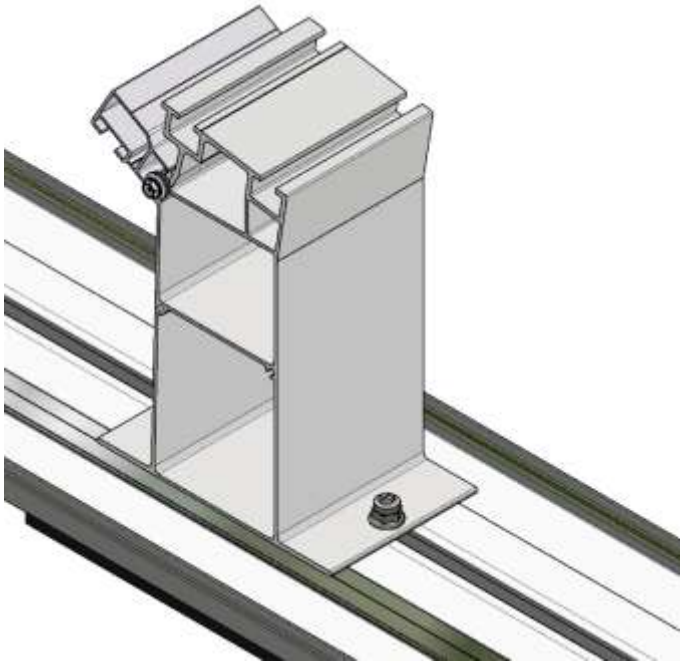


Figure 37 “Top support G3.1 10 mWbh” mounted with both T-head screws

AeroFix G3.1 10-EW east-west orientation

Figure 38 Module finish

Figure 39 Wind plate finish

⚠ Attention!

If you end with a wind plate you will need the “top support G3.1 10 **m**Wbh“ (with wind plate holder) instead the “top support G3.1 10 **o**Wbh“ (without wind plate holder)

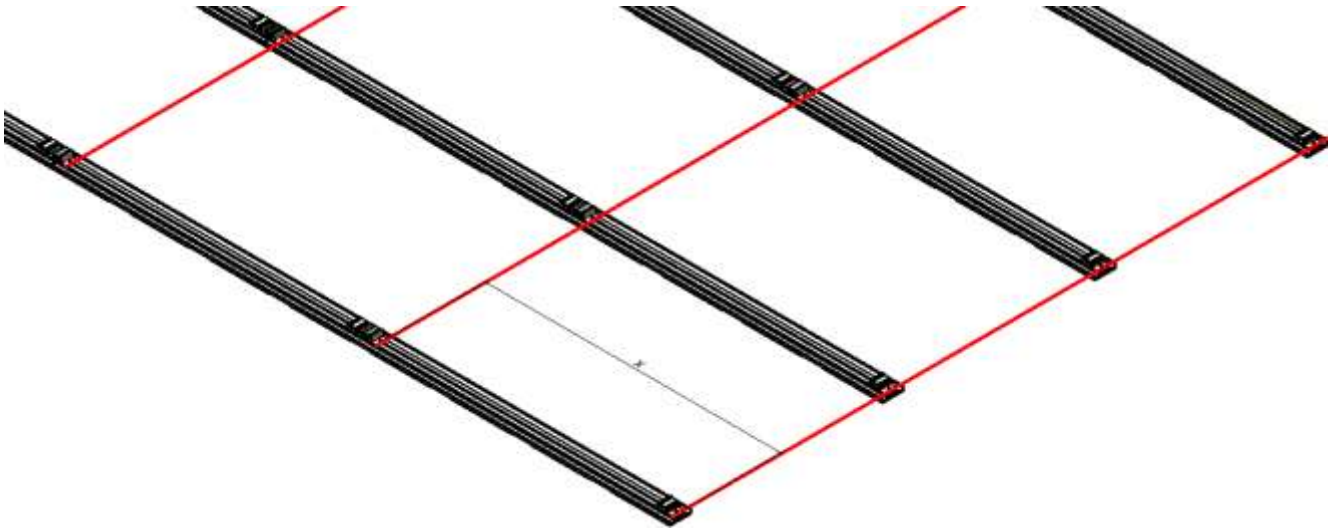


Figure 40 Mark center-to-center distance x

⚠ Attention!

The planned center to center distance is always applied to the supports at the same point, as shown in the following image.

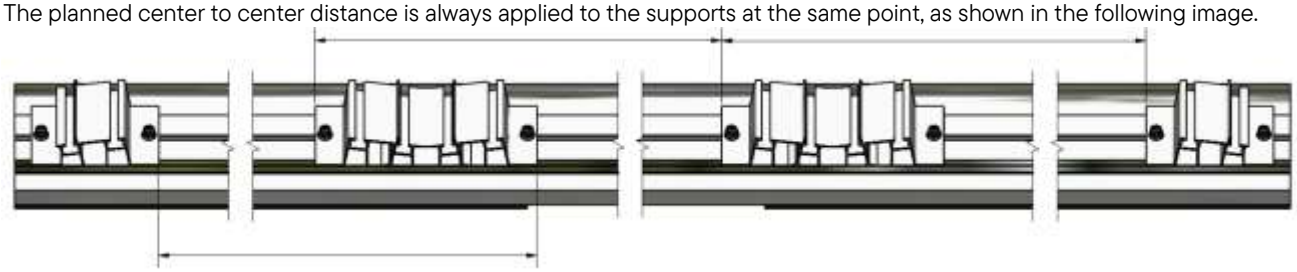


Figure 41 Measure center to center distance from the same point and module orientation

If the module field begins or ends with a module finish, a “bottom support” must be mounted.

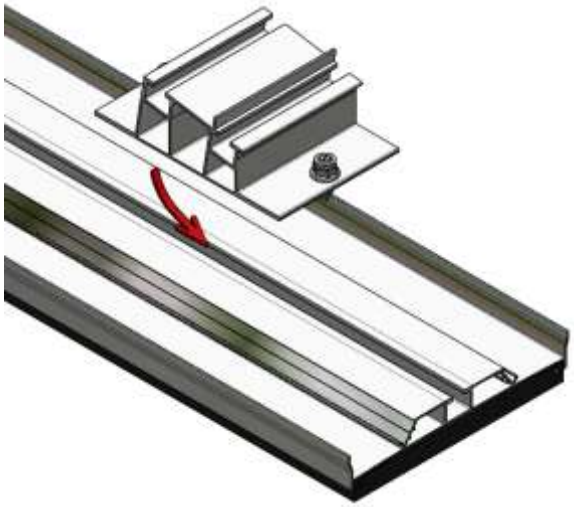


Figure 42 Slide the “bottom support G3.1” onto the slot channel

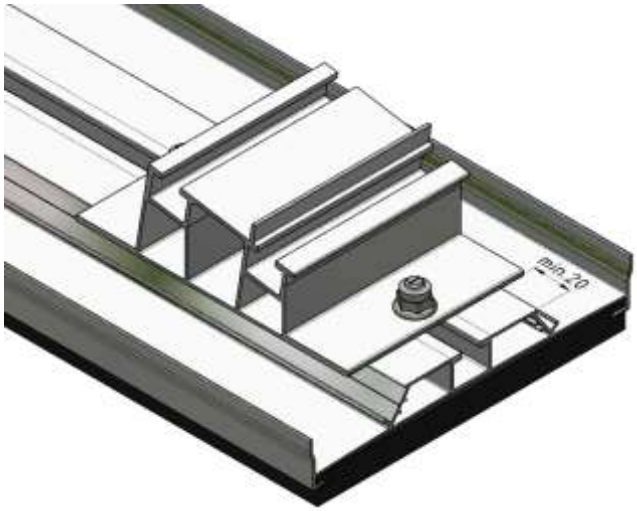


Figure 43 “Bottom support G3.1” mounted with both T-head screws

Within the module field, “bottom supports double” are installed.

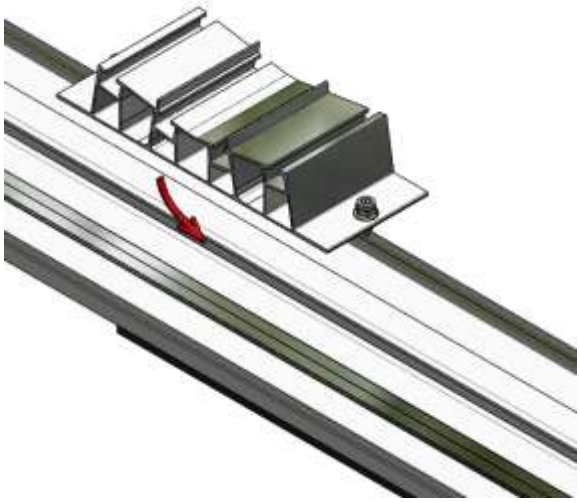


Figure 44 Slide the “bottom support double G3.1” onto the slot channel

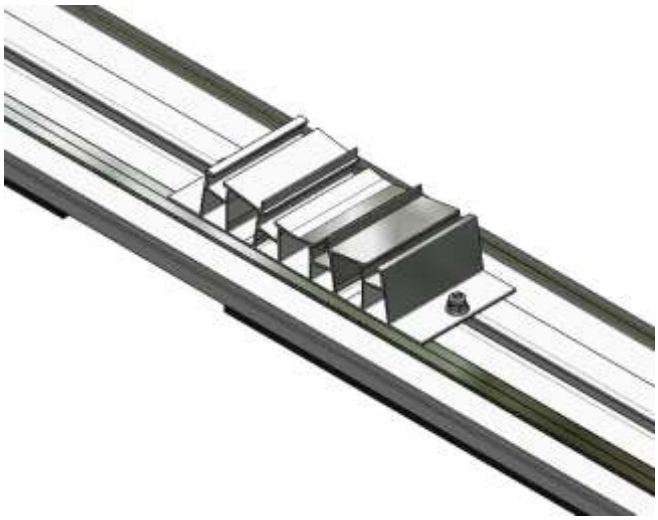


Figure 45 “Bottom support double G3.1” mounted with both T-head screws

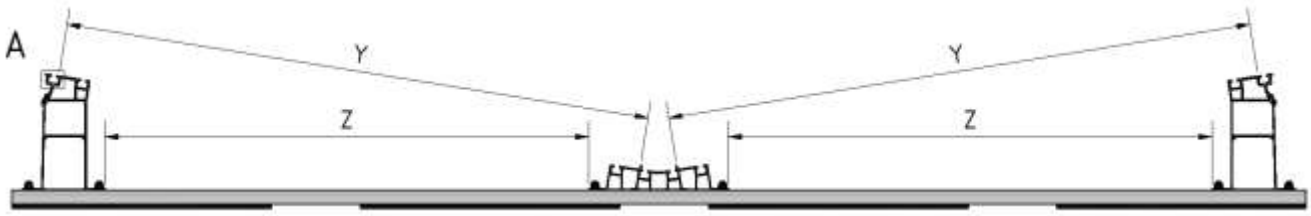


Figure 46 AeroFix G3.1 10-EW: Y = module width, Z= inner distance supports

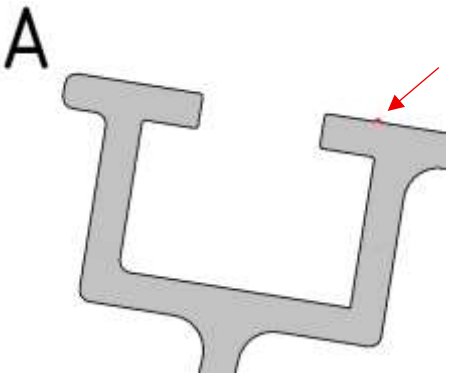


Figure 47 Marking notch for module position on “top support” for dimension Y

Module width Y (mm)	Inner distance of supports Z [mm]
1040	836,5
1100	897,3
1134	931,7
1150	947,9

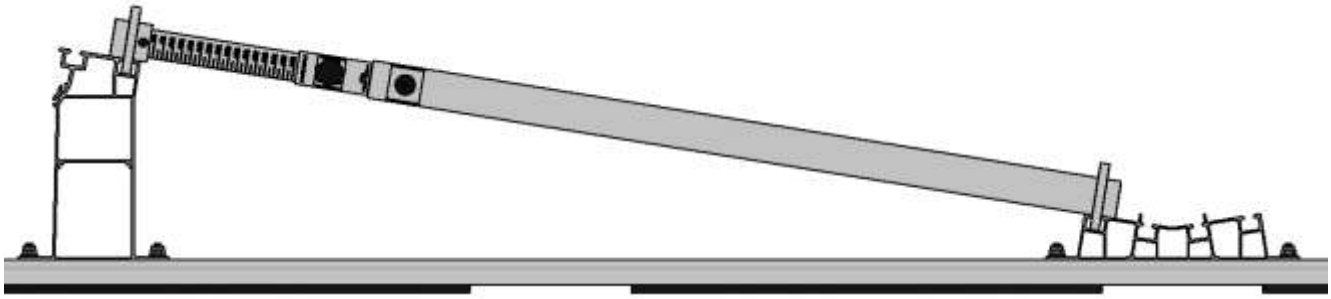


Figure 48 Position assembly jig

Example: Adjusting the assembly jig for a module width of 1134 mm.

Figure 50 Set the middle tube of the jig on the side at “AeroFix G3 /3.1” to the locking point “Support 975 mm - 1730 mm.”

Figure 49 Set scale “975 mm - 1730 mm” to 1134 mm.

⚠ Attention!

If you end with a wind plate you will need the “top support G3.1 10 **m**Wbh“ (with wind plate holder) instead the “top support G3.1 10 **o**Wbh“ (without wind plate holder)

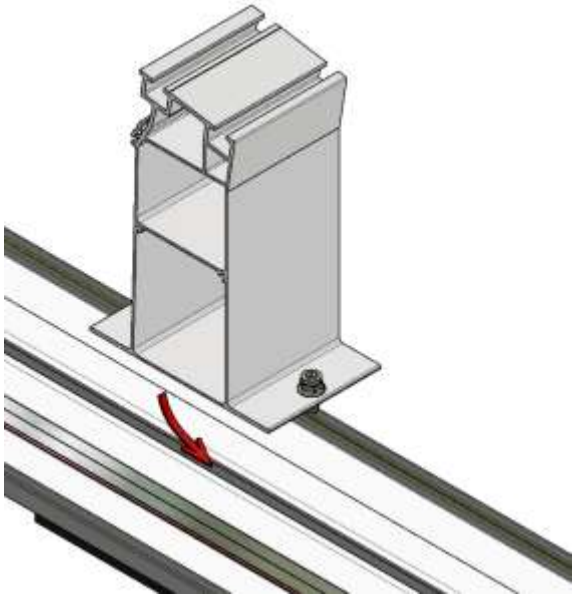


Figure 51 Slide the “top support G3.1 10 oWbh” onto the slot channel

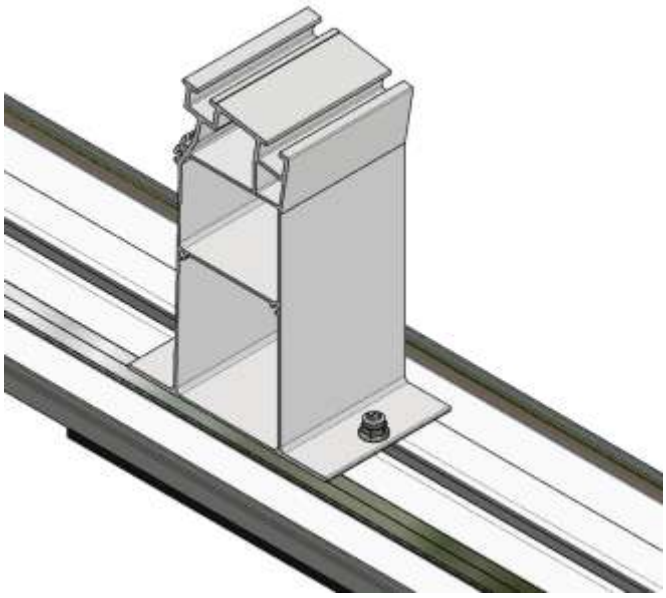


Figure 52 “Top support G3.1 10 oWbh” mounted with both T-head screws

8.3 Ballast

⚠ Attention!
When adding ballast to the base rail it is not permitted to completely seal the space between the base rail and the module with ballast stones!

⚠ Attention!
The ballast must stay safely and securely on the mounting system for the whole lifetime of the installation. An additional mechanical fixing of the ballast may be necessary. If alternative ballast rails or alternative ballast materials (for example concrete slabs) are used, they must have sufficient corrosion protection, be frost-resistant and must not cause any negative effects on the mounting system or the roof. Failure to meet these requirements may void the warranty.

⚠ Attention!
With long module lengths and/or high ballasting, the ballast rail or aluminum L-profile may bend in the middle and rest on the roof covering. In this case, suitable support and protective measures must be provided, e.g., short base rail sections with building protection mats that are fixed to the ballast rail or aluminum L-profile.

The ballast should always be placed under the module. The maximum possible ballast on the base rail is with 40 x 40 x 4 cm (approx. 14 kg) paving slabs for AeroFix G3 10-S / 10-EW 28 kg.

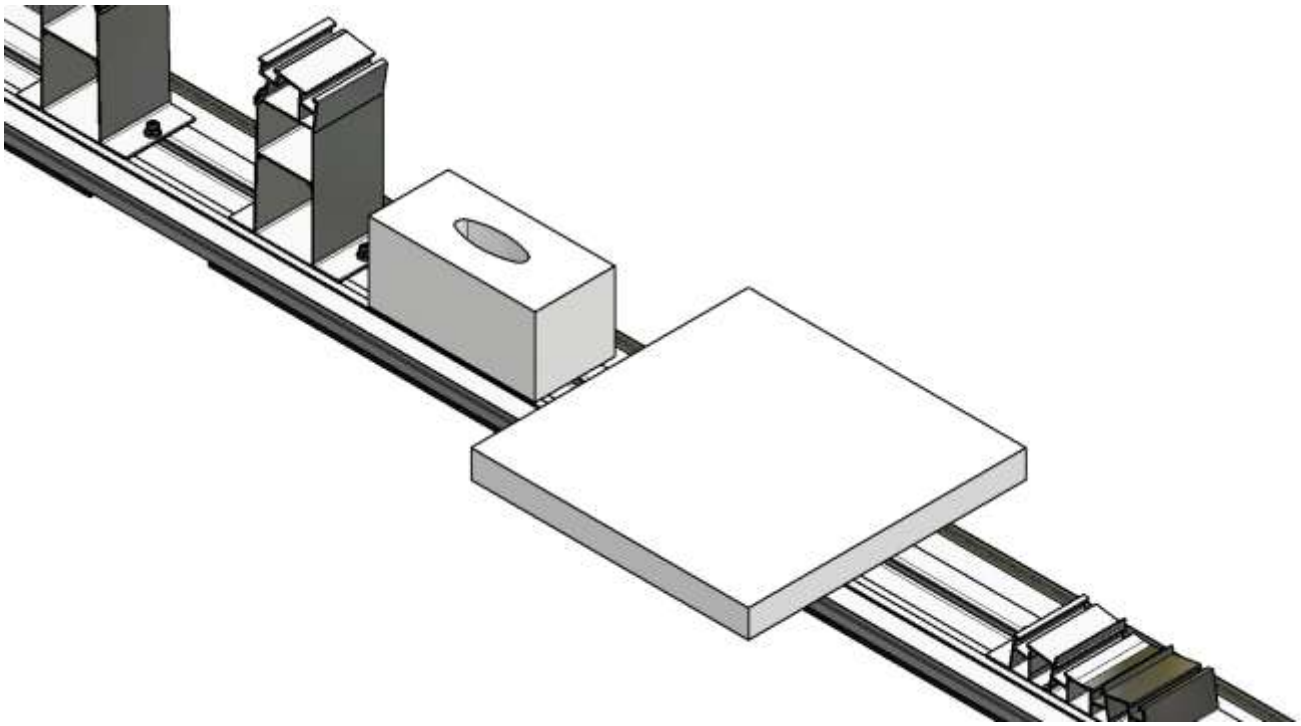


Figure 53 Example of ballast on the base rail

Attach ballast rail

Fastening ballast rail with Self-Drilling-Screw 4.8x19 with sealing washer

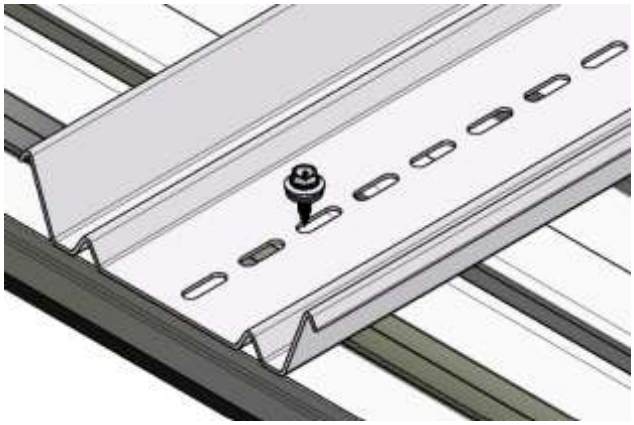


Figure 54 Mounting the ballast rail with Self-Drilling-Screw 4.8x19

Figure 55 Mounted ballast rail with Self-Drilling-Screw 4.8x19

Figure 56 Overlap the ballast rail and mount it with a Self-Drilling-Screw 4.8x19

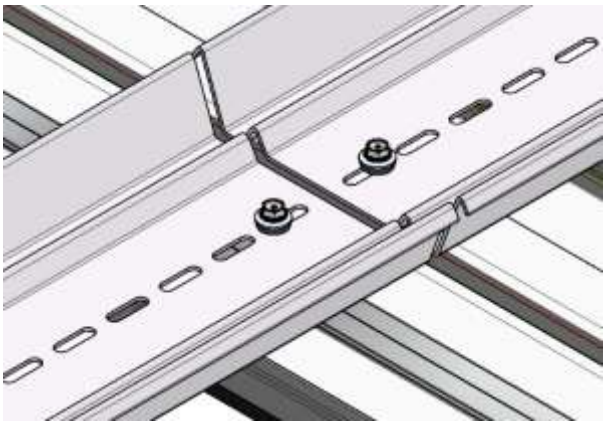


Figure 57 Assemble the ballast rail end to end, using a Self-Drilling-Screw 4.8x19

⚠ Attention!
If ballast rails are mounted end to end, an additional Self-Drilling-Screw 4.8x19 per ballast rail must be planned.

⚠ Attention!
If the internal butt connector (blue) is in the area where the ballast rail is fastened, you must pre-drill the base rail and butt connector with Ø3 mm (red). Otherwise the screw head will be turned off.

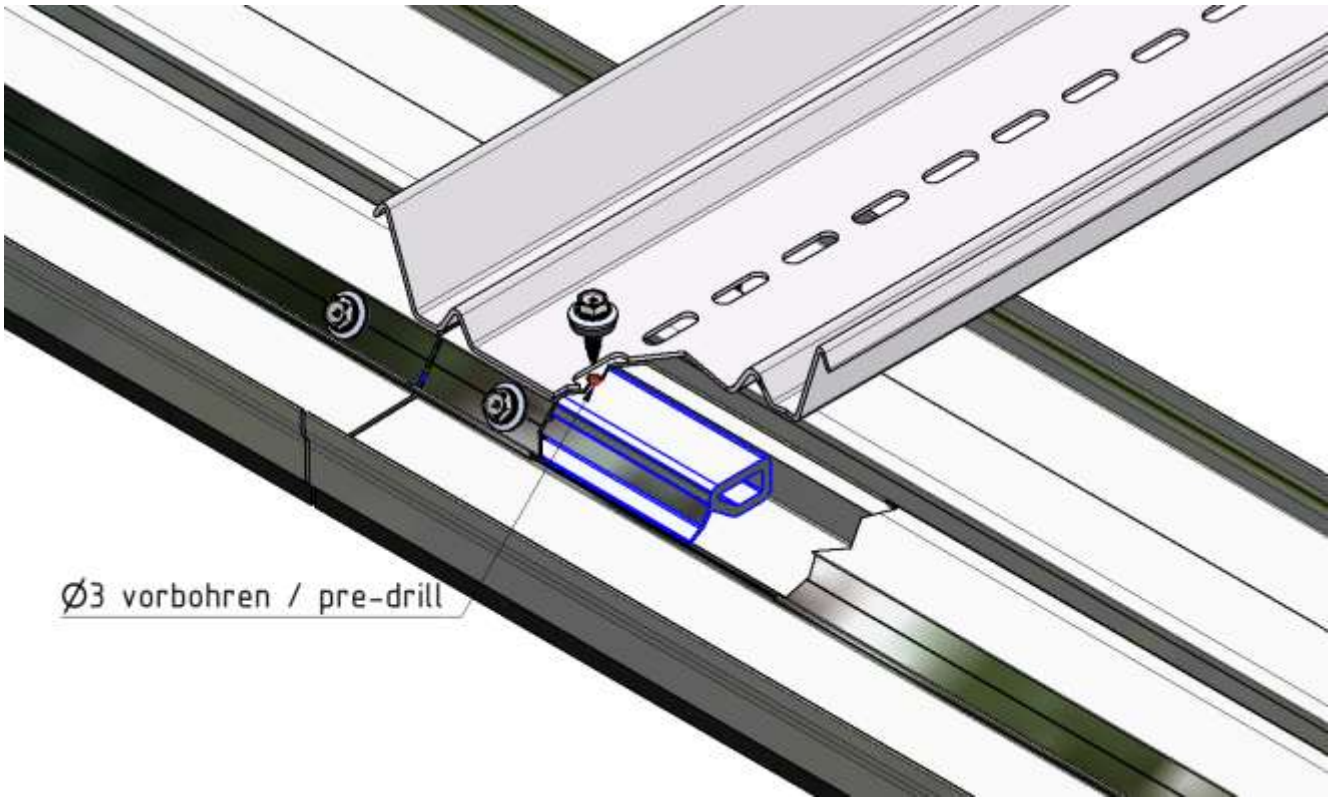


Figure 58 Pre-drill if the butt connector is in the area of the Self-Drilling-Screw 4.8x19

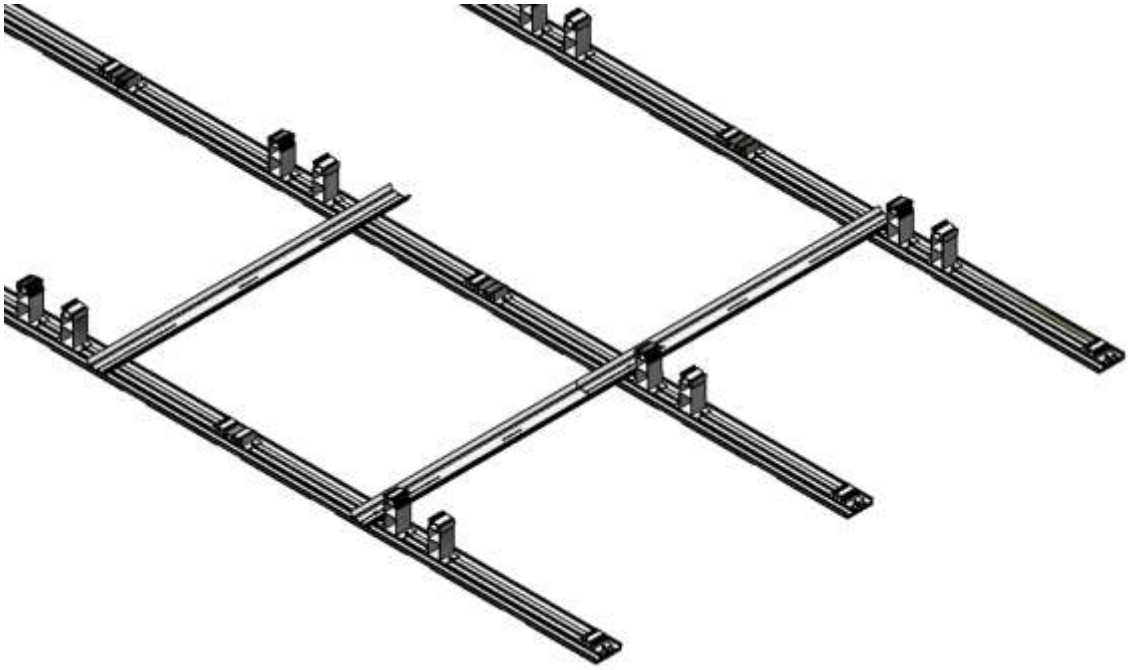


Figure 59 Example distributed ballast rails on the base rails

Information
The assignment of the ballast rail should always be done from the outside inward.

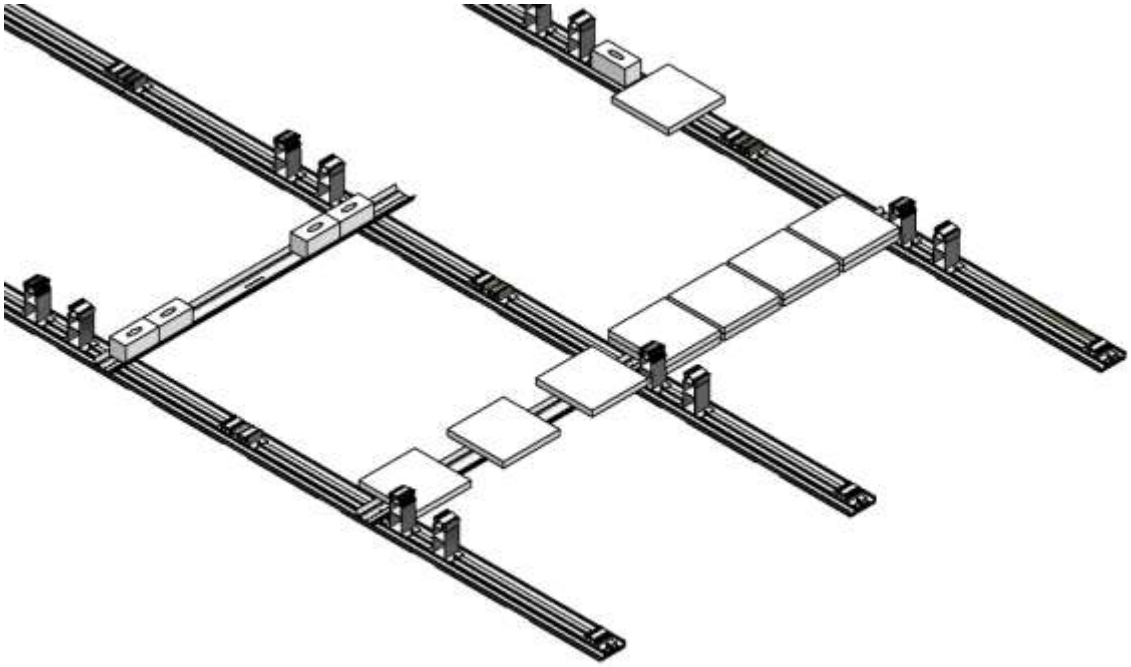


Figure 60 Distributing ballast according to specifications

Have sun!

Fitting Alu-L-Profile

Information
The size of the stones define the distance between the Alu-L-profiles.

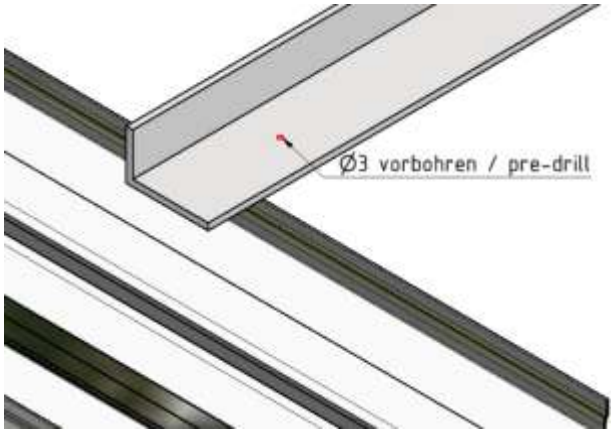


Figure 61 Pre-drill Alu-L-Profile

Figure 62 Place Alu-L-Profile on position and fix it with Self-Drilling-Screw 4.8x19 on the base rail.

Figure 63 Alu-L-profile with Self-Drilling-Screw 4.8x19 mounted on the base rail

Figure 64 Alu-L-Profile installed end to end or staggered

⚠ Attention!
If the internal butt connector (blue) is in the area where the Alu-L-Profile is fastened, you must pre-drill the base rail and butt connector with Ø3 mm (red). Otherwise the screw head will be turned off.

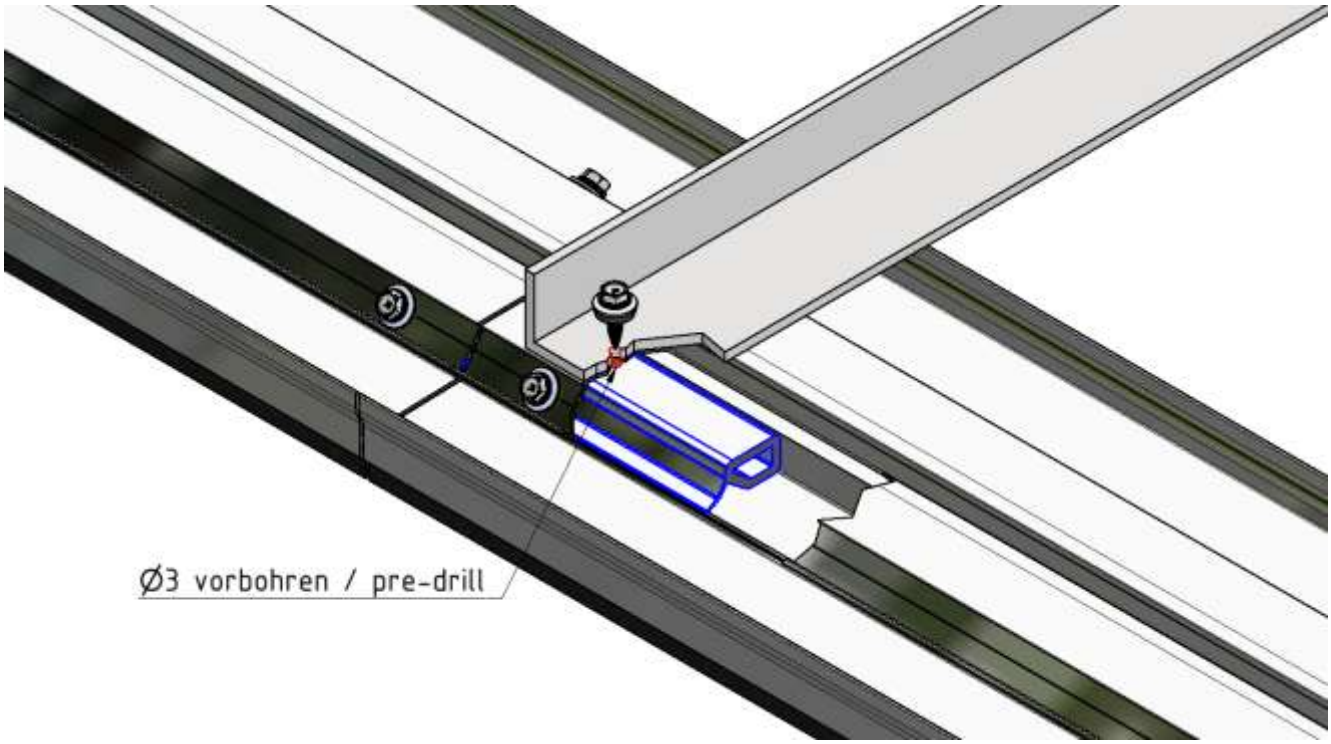


Figure 65 Pre-drill if the butt connector is in the area of the Self-Drilling-Screw 4.8x19

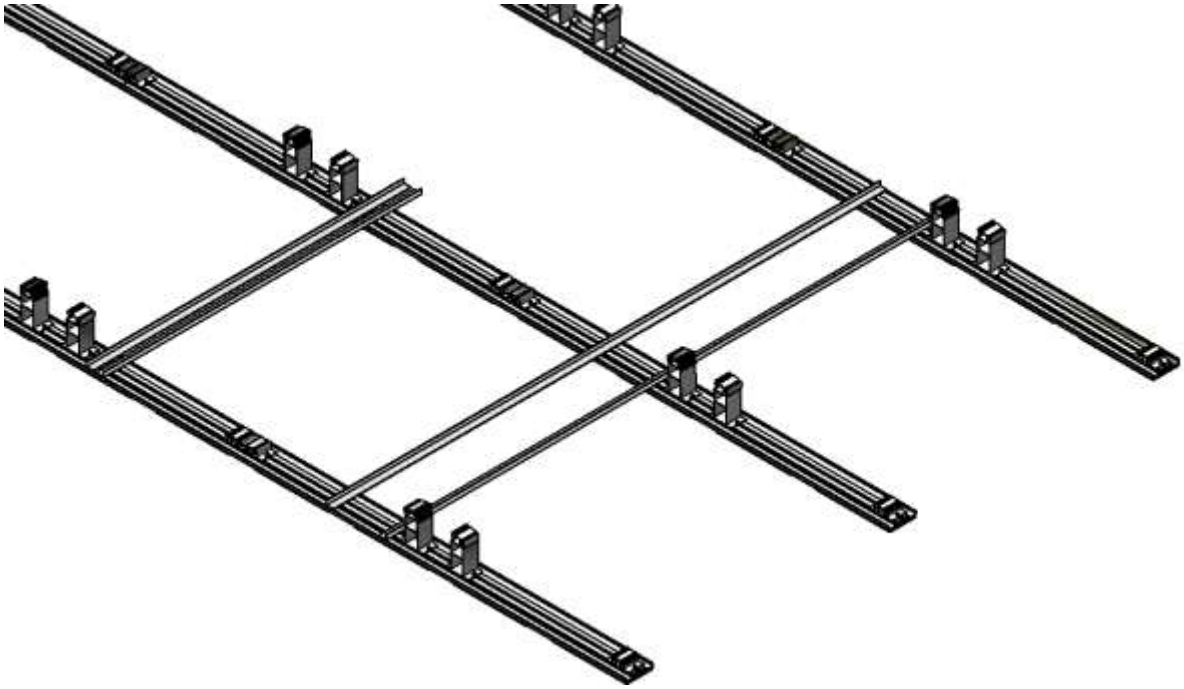


Figure 66 Distributed Alu-L profiles on the floor rails

Information
The assignment of the ballast rail should always be done from the outside inward.

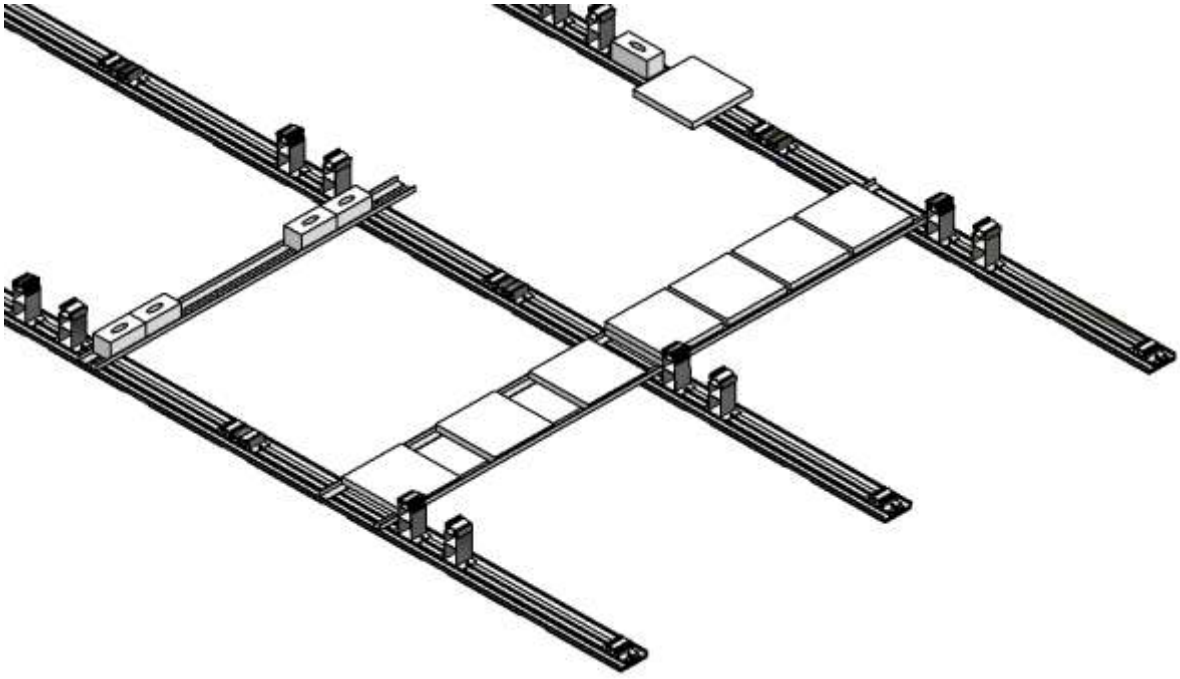


Figure 67 Distribute ballast according to the ballast plan

8.4 Module installation

The module assembly process is identical for AeroFix G3.1 10-S and AeroFix G3.1 10-EW.

In the case of corner point clamping, the fastening is carried out via the internal slot channel of the supports.

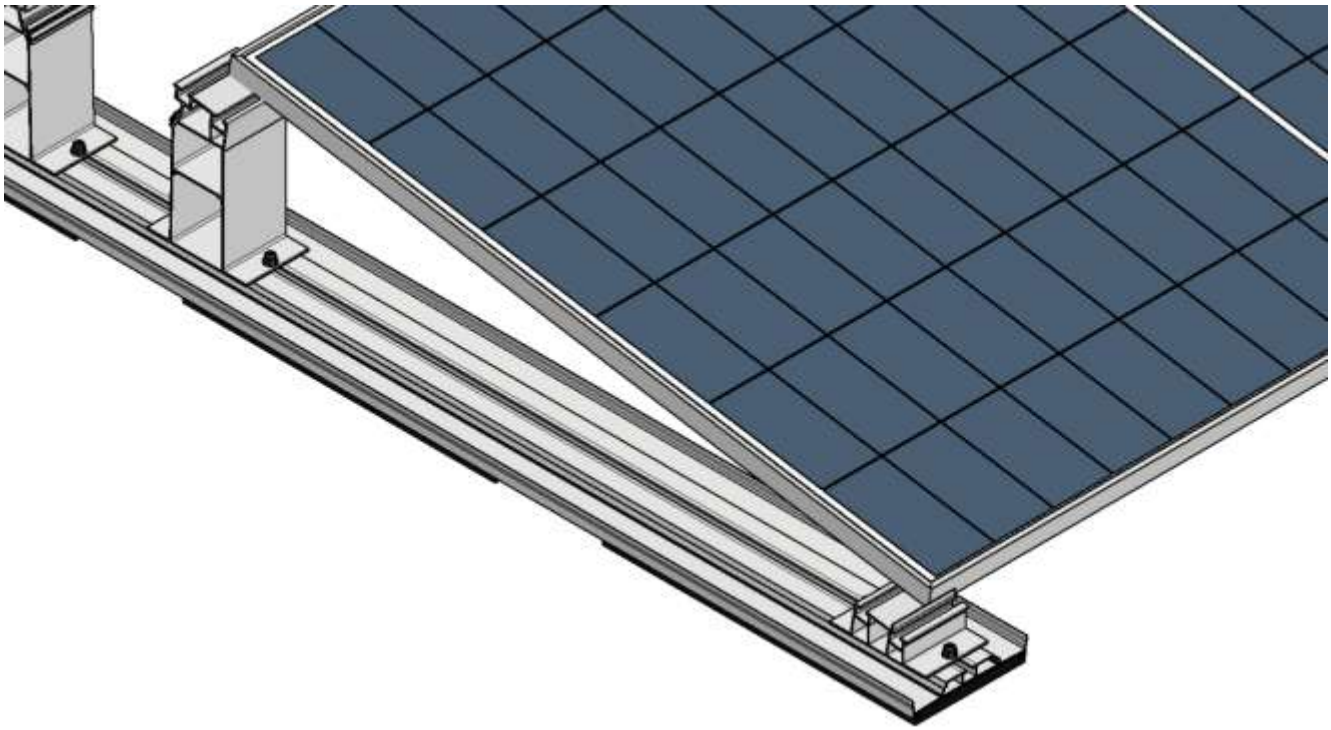


Figure 68 Insert the module into the supports

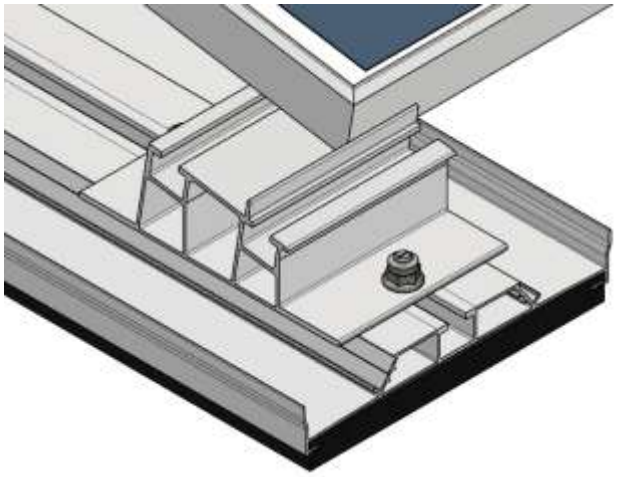


Figure 69 The module must be in full contact and rest against the stop of the module holder

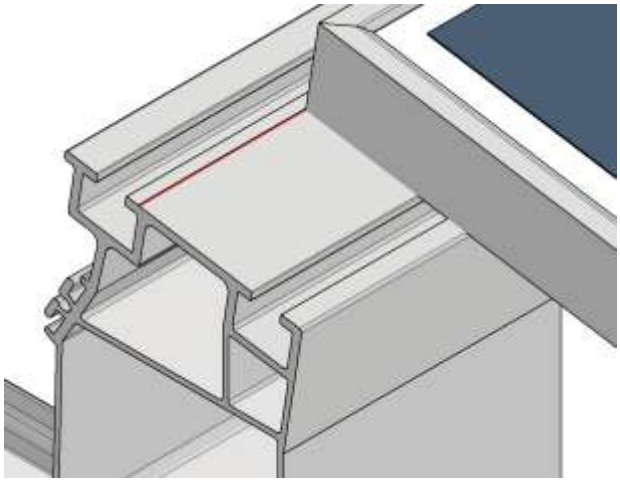


Figure 70 Module must rest over the entire surface and rest against the marking

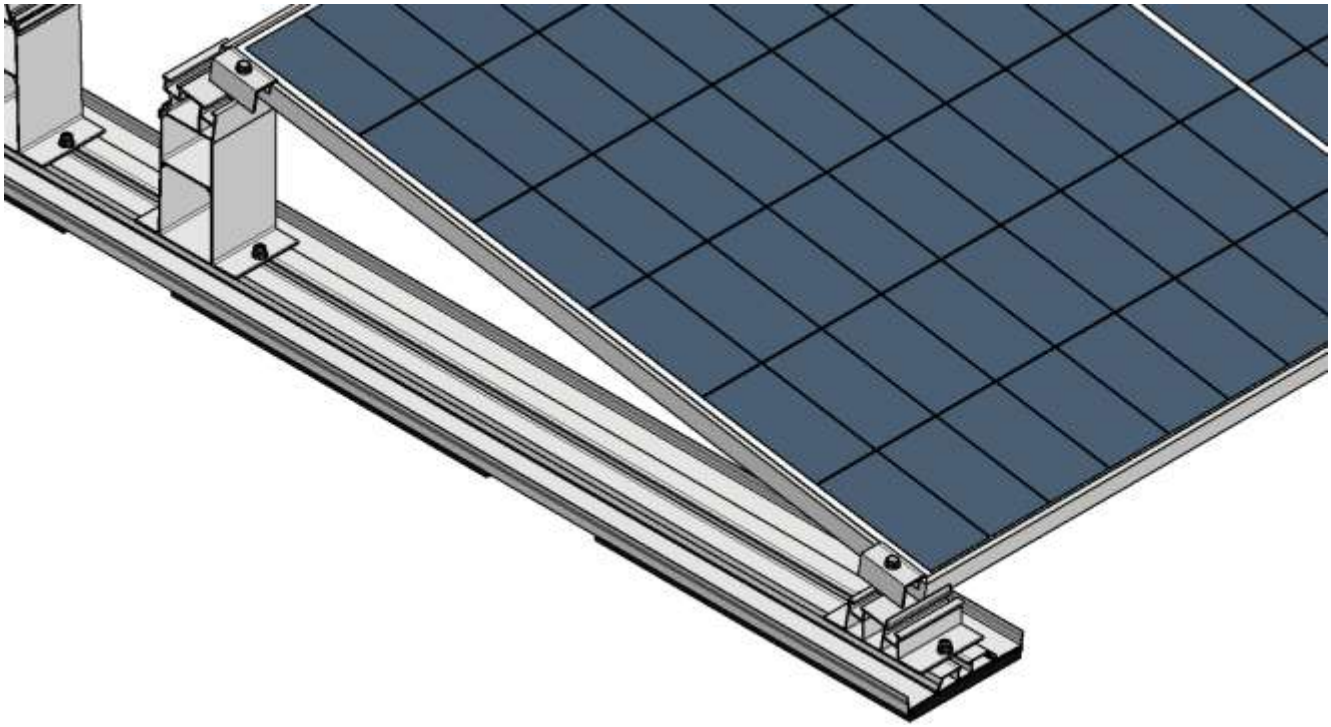


Figure 71 Attached module to the supports

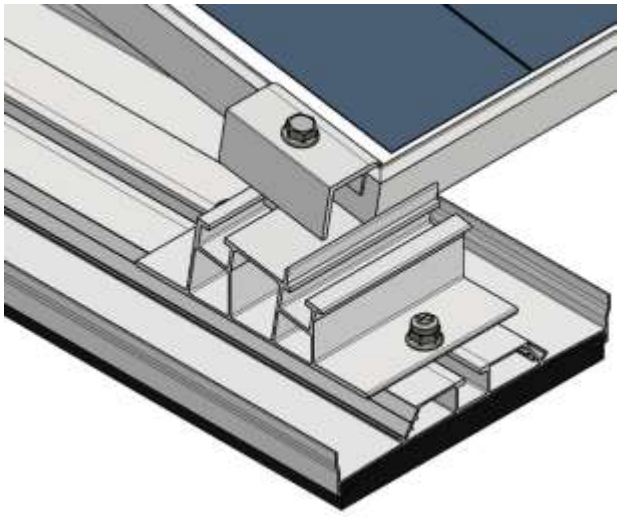


Figure 72 Module with module clamp attached to the “bottom support”

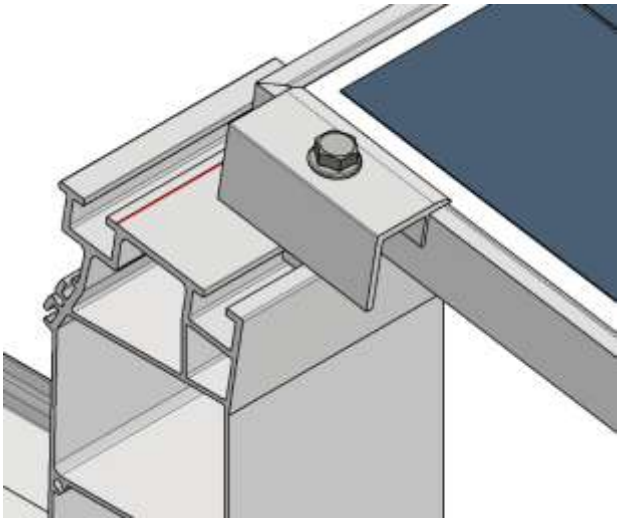
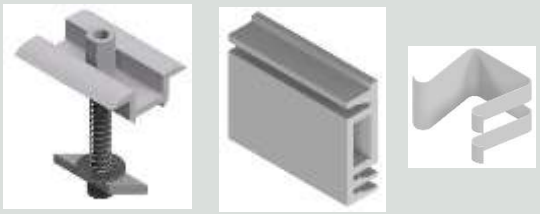


Figure 73 Module with module clamp attached to the “top support”

The Middle and End Clamp G3 are delivered pre-assembled. The Middle Clamp G3 covers a clamping area of 30-50 mm. The End Clamp G3 30 mm and G3 35 mm is intended for the respective module frame height. Other heights on request.	 G3 Middle, End Clamp
The Middle Clamp G5 covers a clamping area of 30-40 mm. The EC adapter 30-40 mm is installed with the Middle Clamp G5 and Secure clip for EC adapter / cable guide and replaces the traditional end clamp. The EC adapter 30-40 mm for G5 middle clamp covers only the frame sizes 30, 32, 35, 38 und 40 mm.	 G5 Middle Clamp and EC adapter 30-40 mm
The Middle and End Clamp G6 are delivered pre-assembled. The Middle Clamp G6 covers the clamping range of 28–40 mm. End clamp G6 in 30, 35, and 40 mm to fit the respective module frame height. Only the G6 End clamp can be installed on the supports of the third base rail.	 G6 Middle, End Clamp

⚠ Attention!

- The tightening torque of the G3 clamps is 15 Nm!
- The tightening torque of the G5 clamps is 10 Nm!

Do not use a ratchet or a wrench with high leverage as the maximum tightening torque could easily be exceeded.

The Middle and End Clamps G3 can be inserted into the supports directly from above where required.

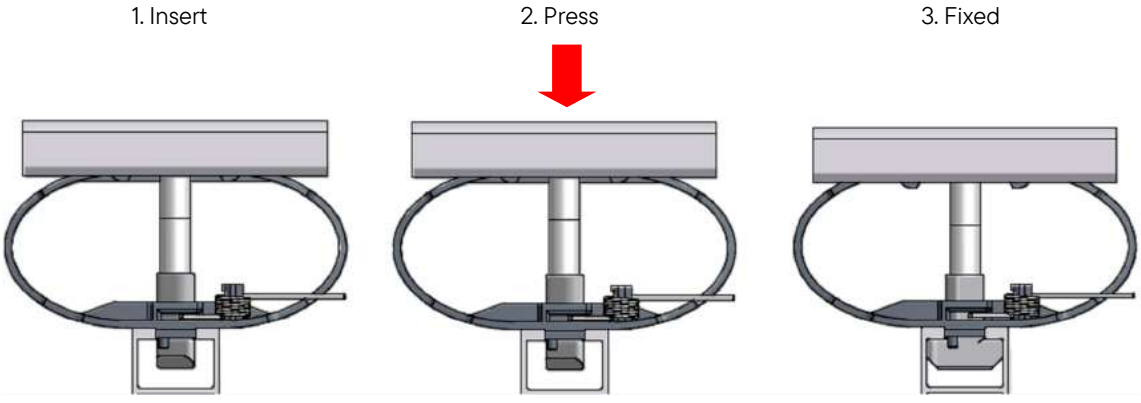


Figure 74 Inserting the Middle Clamp G3

The Middle Clamps G5 can be inserted into the supports directly from above where required

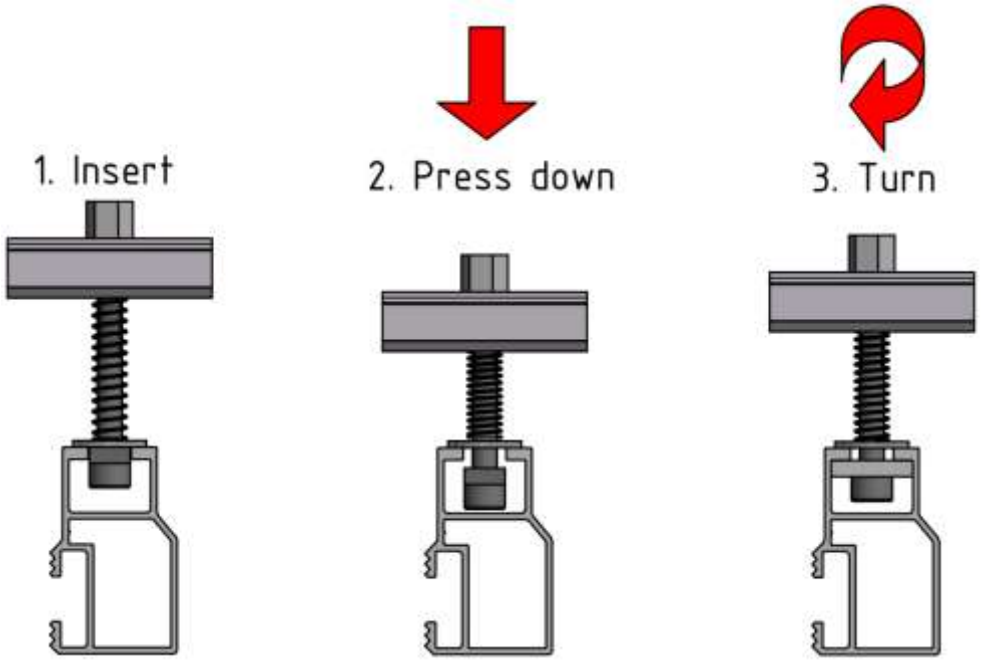


Figure 75 Inserting the Middle Clamp G5

The adaptor EC is clamped by the given frame height with the Middle Clamp G5 and substitutes thus the end clamp. Secure clip for EC adapter / cable guide fixes the AK adapter to the Middle Clamp G5.

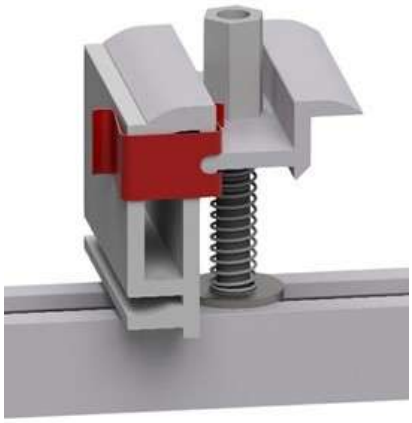


Figure 76 EC adapter with Middle Clamp G5 and secure clip

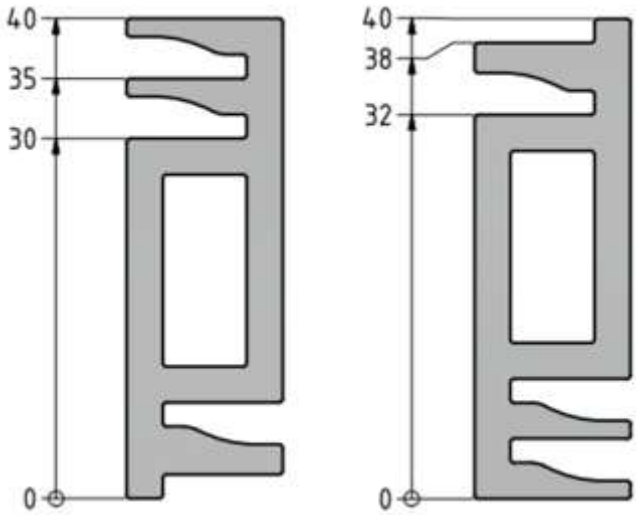


Figure 77 EC adapter G2 frame heights

The Middle and End Clamps G6 are inserted from the side into the inner slot channel of the supports.

Figure 78 Insertion of the G6 center terminals

8.5 Wind plate assembly

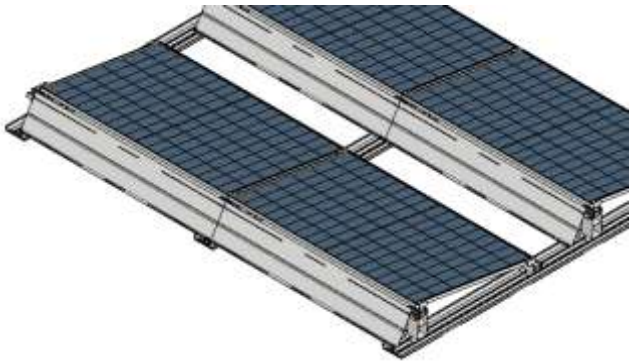


Figure 79 Mounted wind plates on the south systems

Figure 80 Mounted wind plates on the East-West systems

Attention!
The Self-Drilling-Screw 4.8x19 with sealing washer must lie over the entire surface so that the seal swells out a little and the screw has not been overtightened.

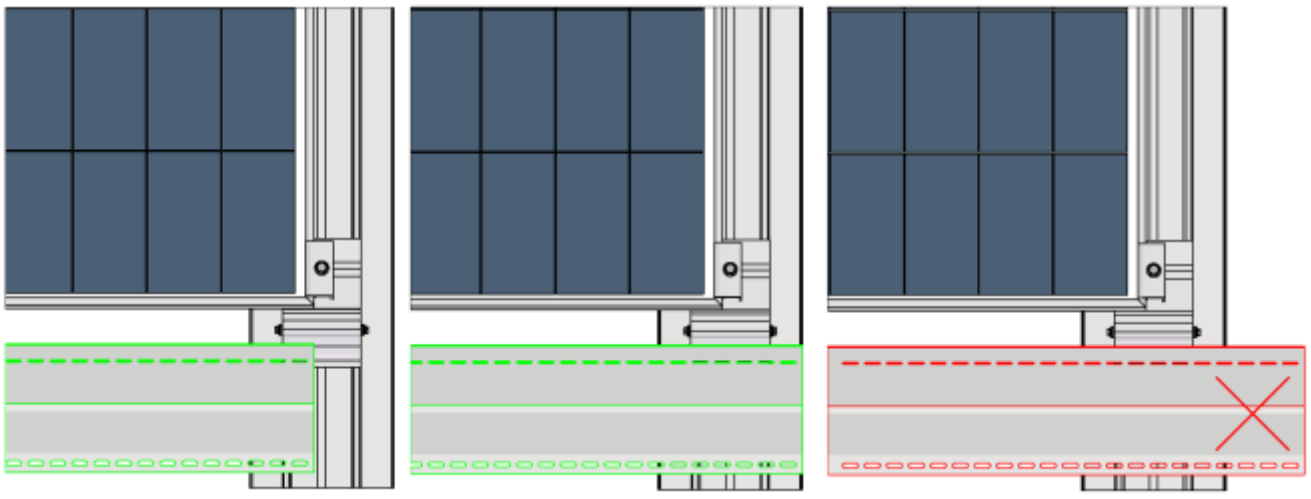


Figure 81 Lateral protrusion of the wind plates

Attention!
Wind plates must not protrude laterally beyond the base rail. Protruding wind plates must be shortened.

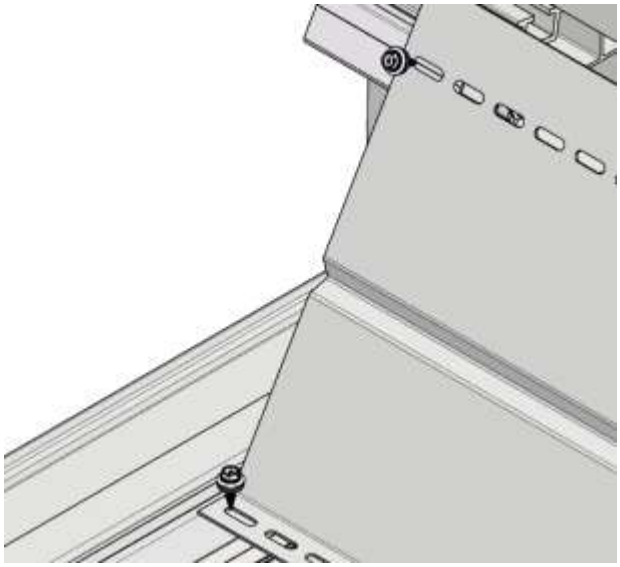


Figure 82 Mounting the wind plate on the edge with a Self-Drilling-Screw 4.8x19

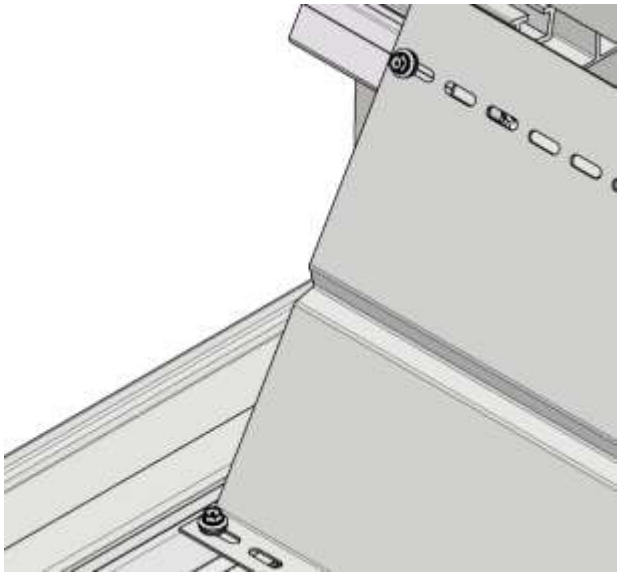


Figure 83 Wind plate mounted on the edge with Self-Drilling-Screw 4.8x19

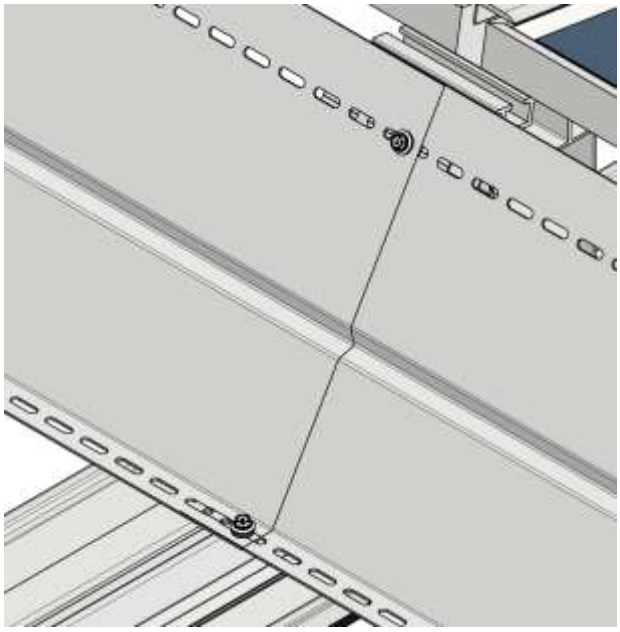


Figure 84 Overlap the wind plates and mount them with a Self-Drilling-Screw 4.8x19

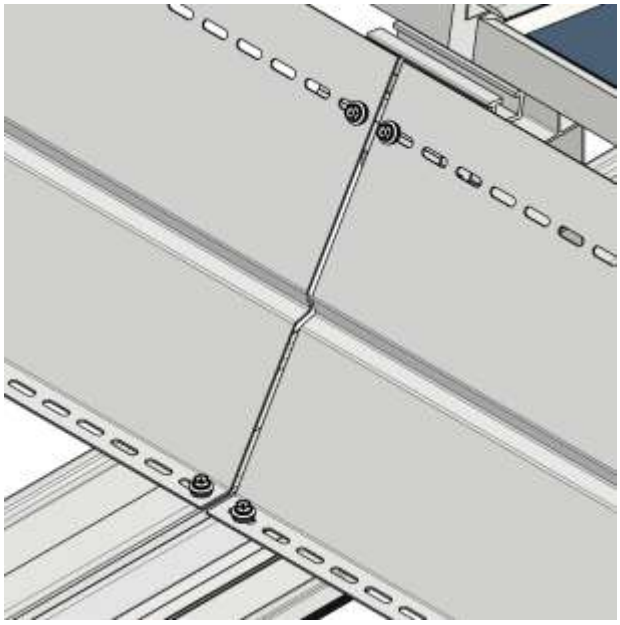


Figure 85 Assemble the wind plates end to end with a Self-Drilling-Screw 4.8x19 each.

⚠ Attention!
If wind plates are mounted end to end, an additional two Self-Drilling-Screw 4.8x19 per wind plate must be planned

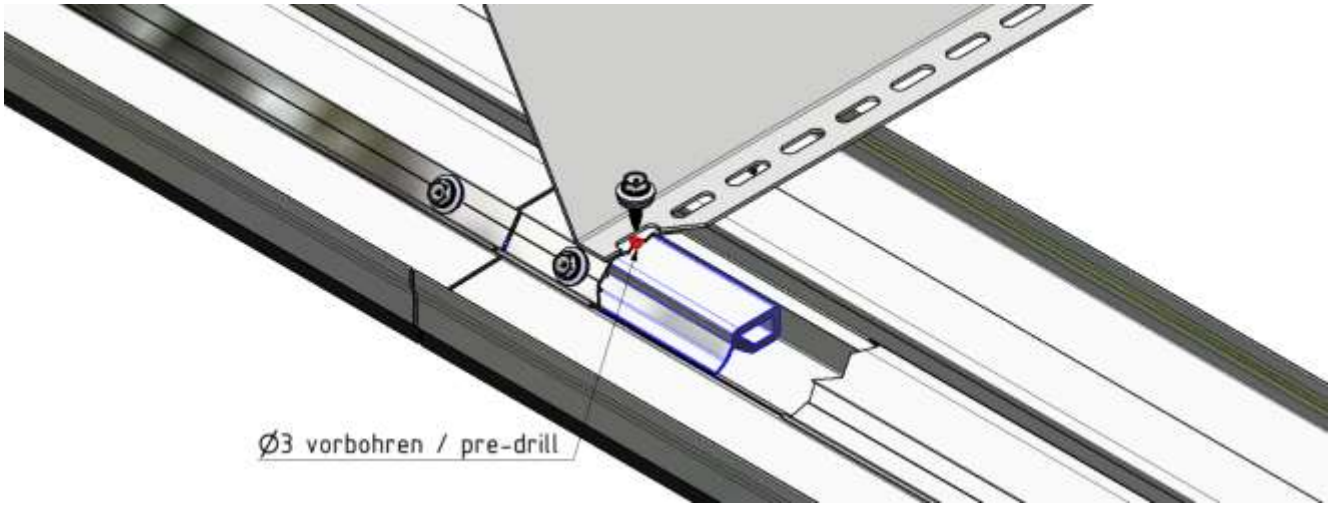


Figure 86 Pre-drill if the butt connector is in the area of the Self-Drilling-Screw 4.8x19

⚠ Attention!
If the internal butt connector (blue) is in the area where the wind plate is fastened, you must pre-drill the base rail and butt connector with Ø3 mm (red). Otherwise the screw head will be turned off.

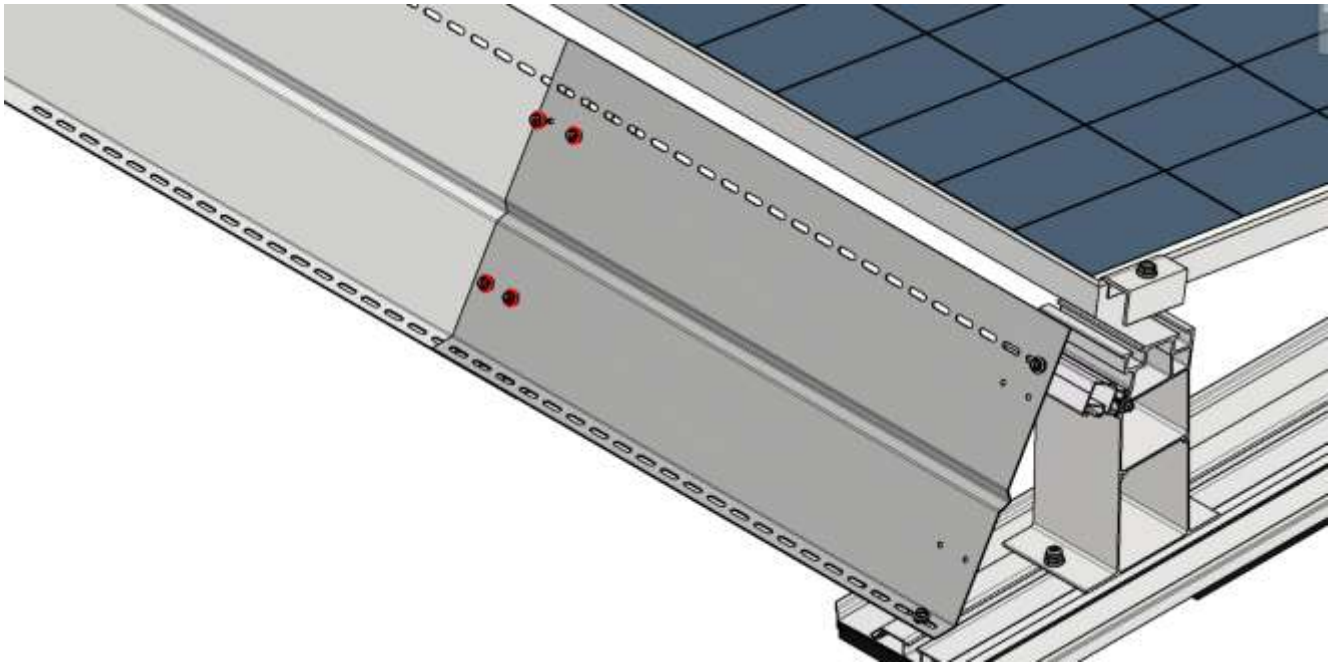


Figure 87 Extending wind plates

⚠ Attention!
For module lengths over 2.1 m, the wind plates are extended with a wind plate extension. The extension is attached to the wind plate with four Self-Drilling-Screw 4.8x19 so that the correct overall length is achieved.

9. System security device

For a roof inclination ≥5% (≥2,8°) an additional slide protection in the direction of the roof pitch is necessary. For a roof inclination <2,8° an additional slide protection is recommended. One way of slide protection is to connect module fields of the same size (in weight and size) via the ridge. Alternatively, the slide protection can be attached at the building. The fastening to the building must be planned and statically tested by the customer. The slide protection is installed every first to fourth row, depending on the loads. Damage to the roof surface by the slide protection system must be permanently prevented by suitable measures on the part of the building owner.

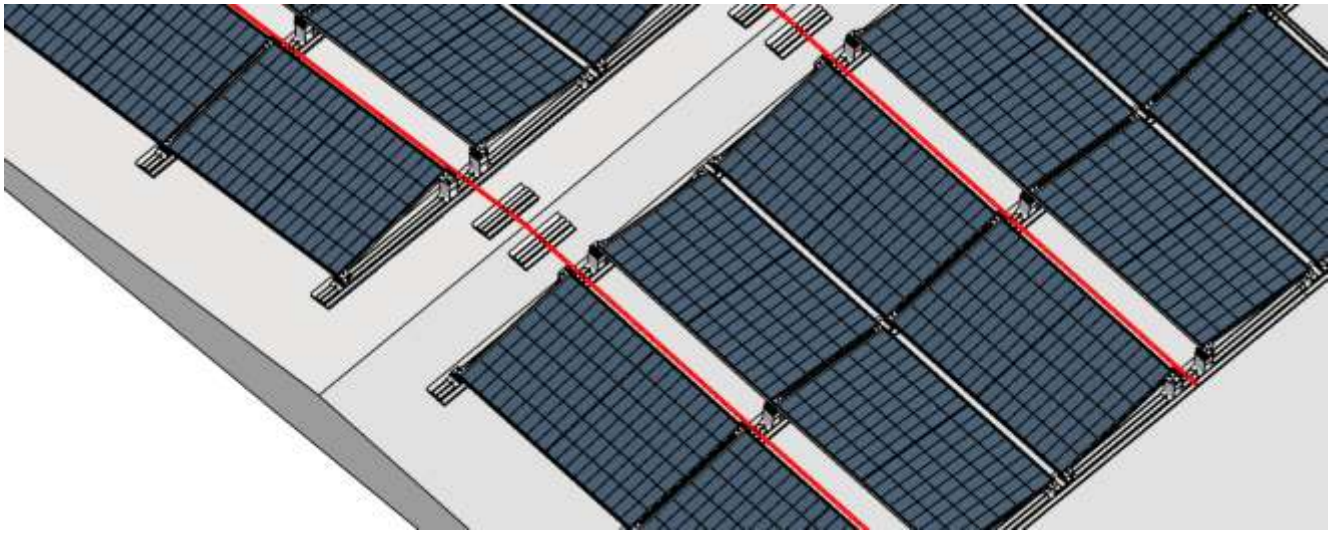


Figure 88 Cross-mounted anti-slip safety device

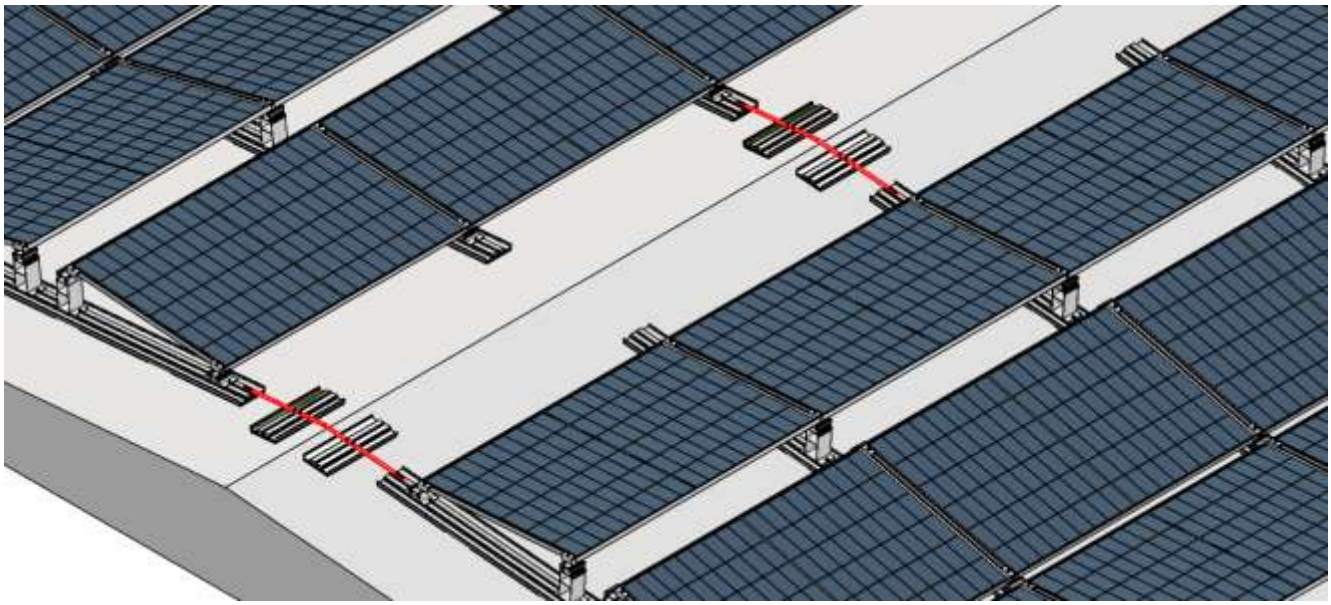


Figure 89 Longitudinally mounted anti-slip saftey device

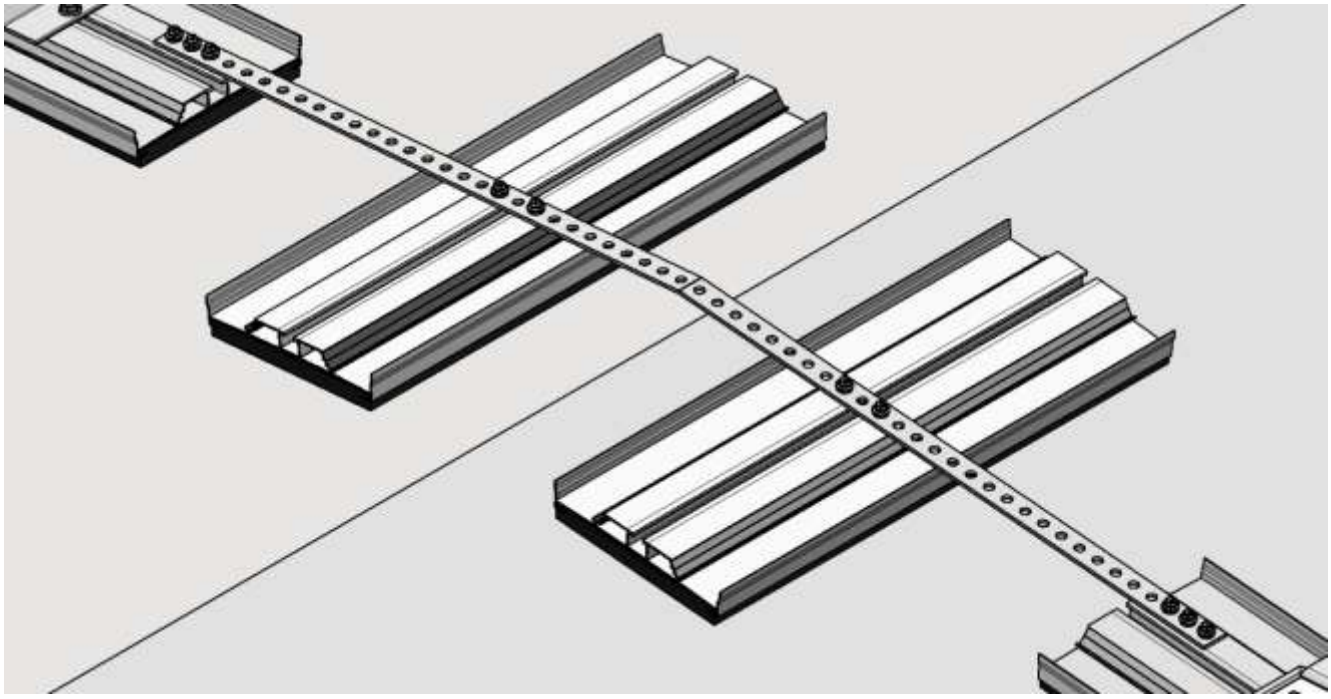


Figure 90 Ridge placement

⚠ Attention!
The roof skin must be protected from damage. Especially take care at the transition of the ridge.

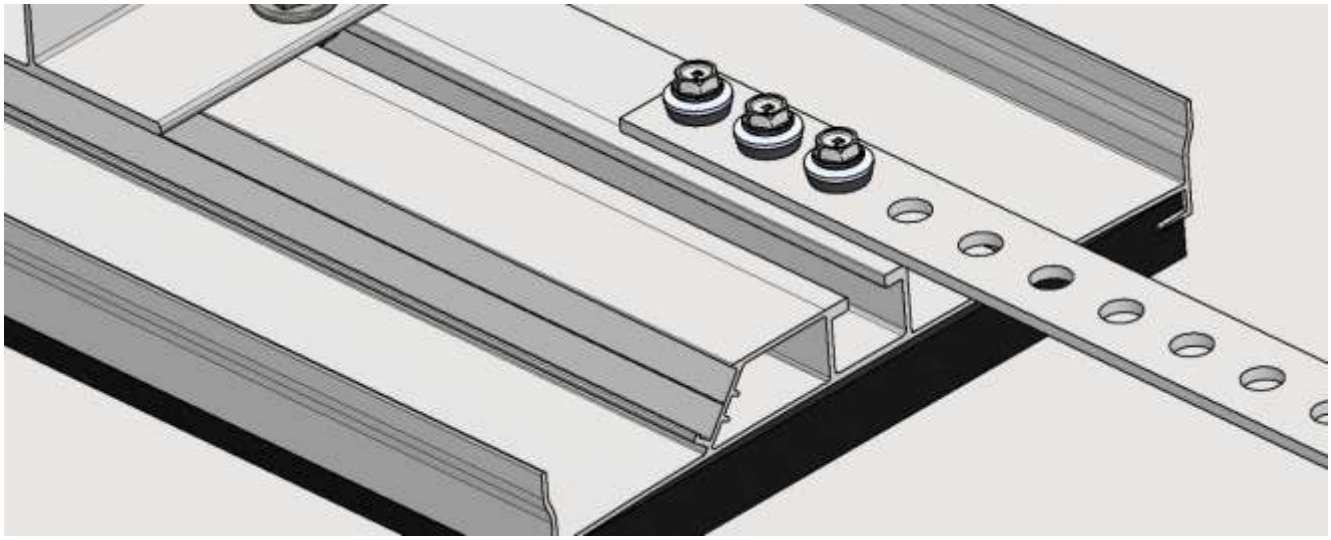


Figure 91 Longitudinal connection of base rail to anti-slip device with at least three Self-Drilling-Screw 4.8x19

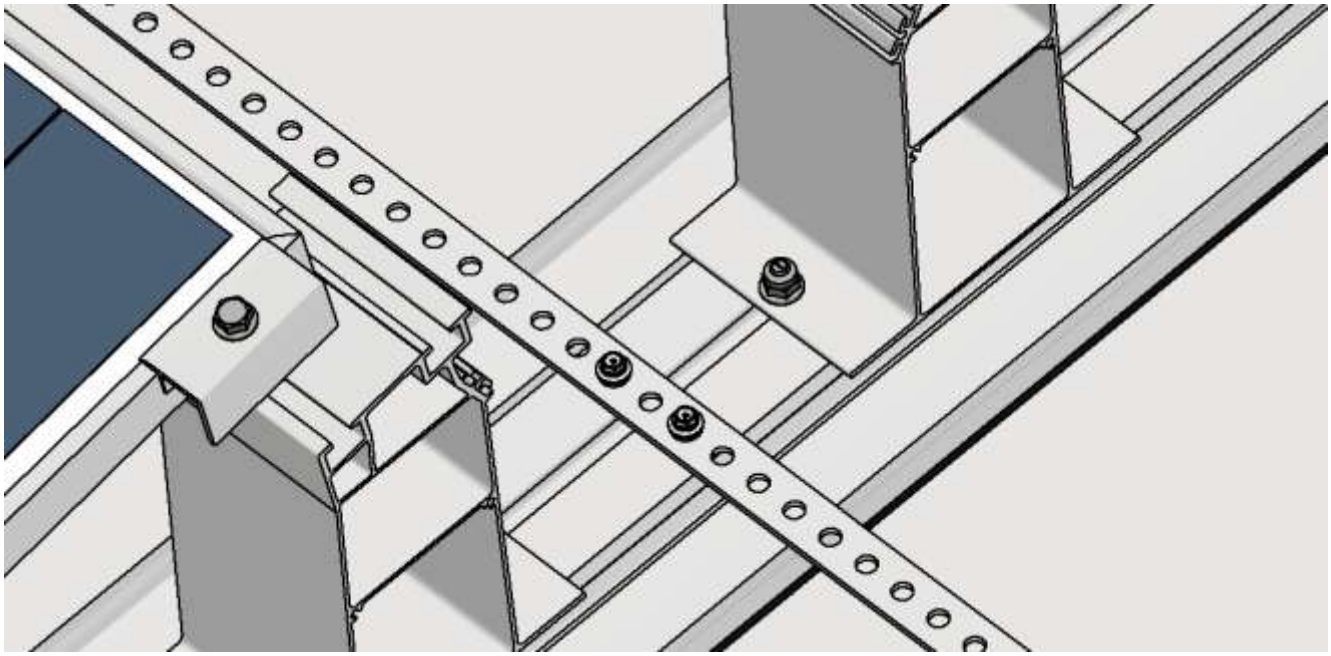


Figure 92 Fasten the cross-connection of the base rail to the anti-slip device with at least two Self-Drilling-Screw 4.8x19.

Attention!

Additional safety measures may be required for larger roof pitches and/or loads. The system security device must be adapted to the on-site conditions of the building and statically tested by the installer.

10 Cable management

The g3 base rail offers space for cables , both on the left and right side. 10 to 14 cables at 6 mm² can be placed in each side of the base rail. The cable should be laid before the ballast rails, Alu-L Profiles and ballast stones are assembled.

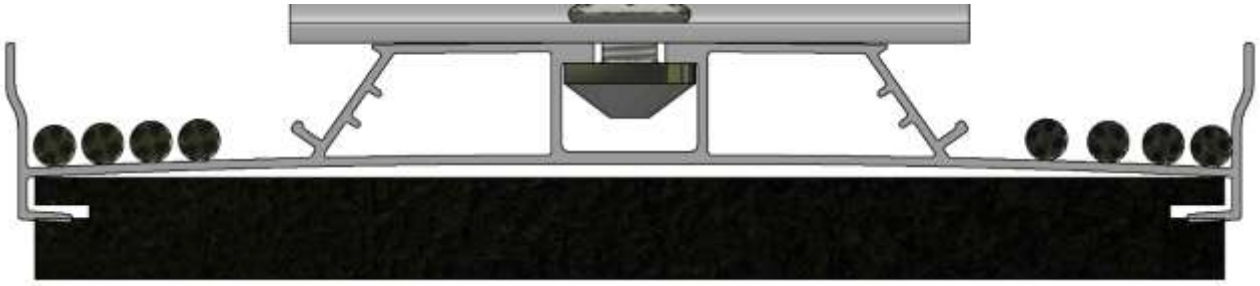


Figure 93 Cables in the base rail G3

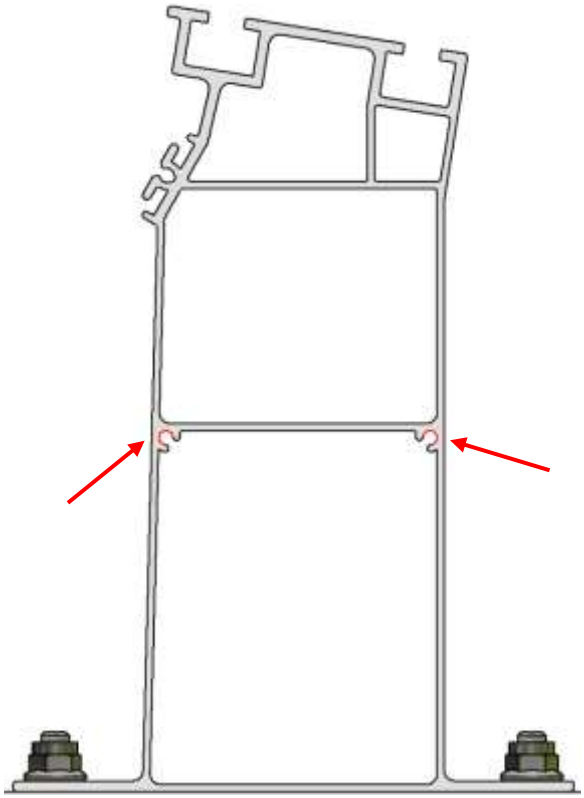


Figure 94 Drilled holes for side mounting

Side holes on the G3.1 supports offer installation options for different components with Self-Drilling-Screw 4.8x19.

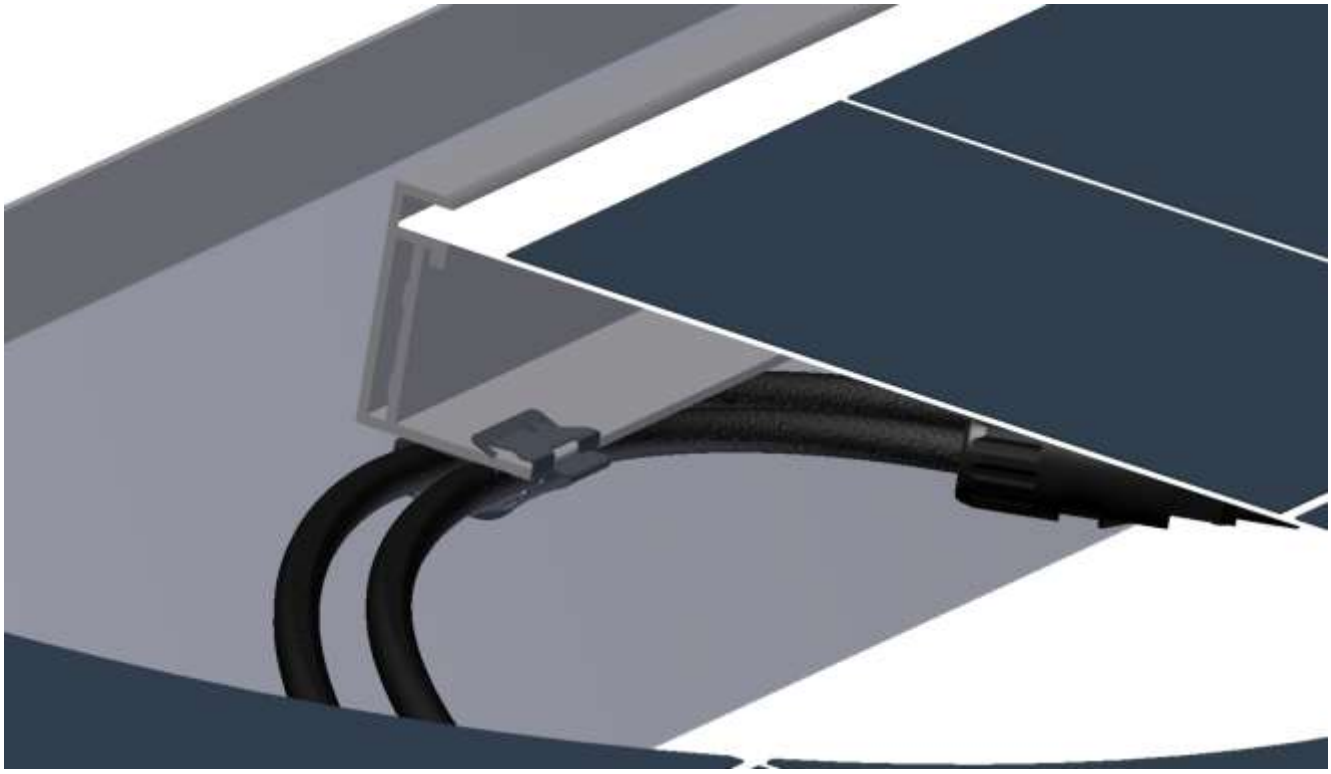


Figure 95 Assembly cable clip 0° at the module frame

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11. Module support

In the following, various options are presented on how the module can be supported for higher pressure and suction loads. For the individual load releases, please refer to the assembly instructions for the module.

Information
When using the third base rail, the surface pressure on the insulation is reduced. The exact value of the existing surface pressure can be found in the statics report.

11.1 Third base rail

The additional third base rails, including the supports, are placed below the modules. The exact position of the third floor rail is specified by the module manufacturer.

Attention!
The module can only be attached to the supports of the third floor rail with the G6 end clamp.

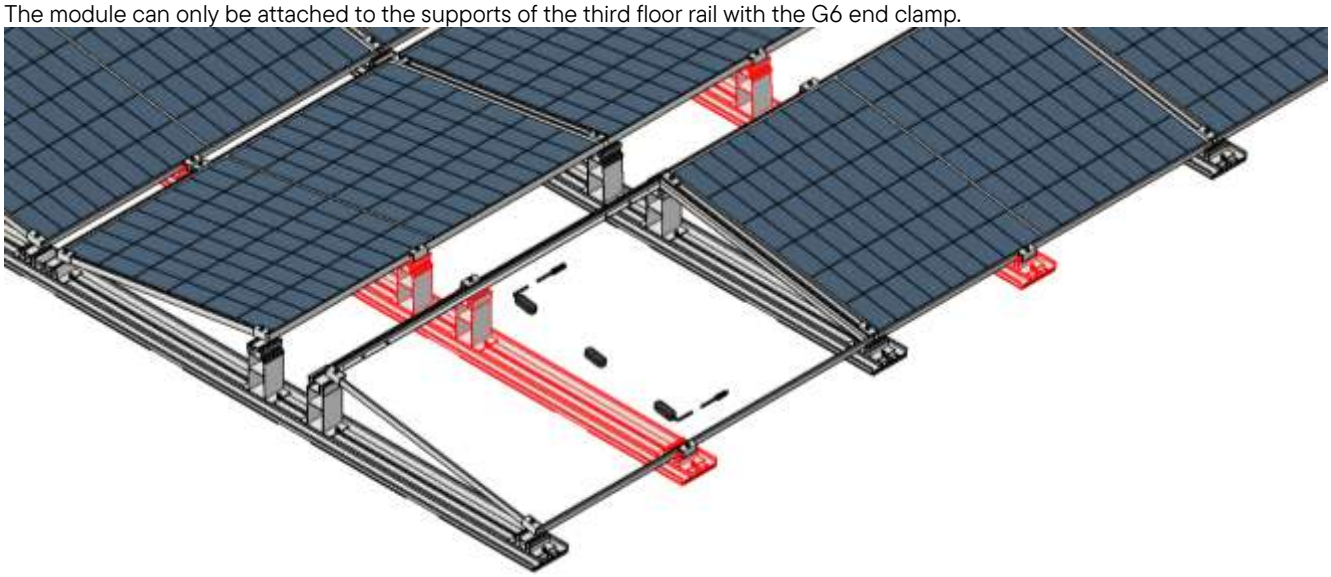

Figure 96 Overview of the position of the third floor rail (red)

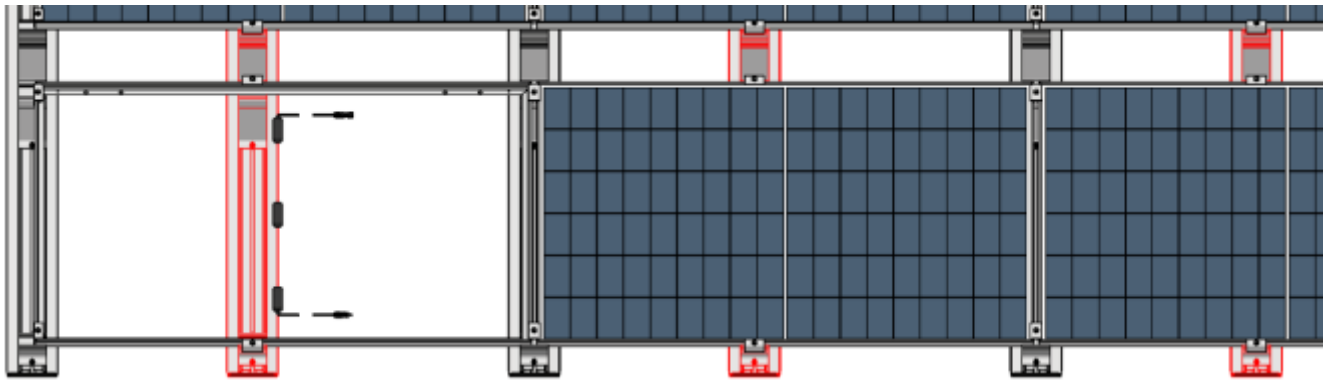

Figure 97 Overview of the position of the third floor rail (red)

When clamping on the long side of the module, the fastening is done via the outer slot channel of the supports.

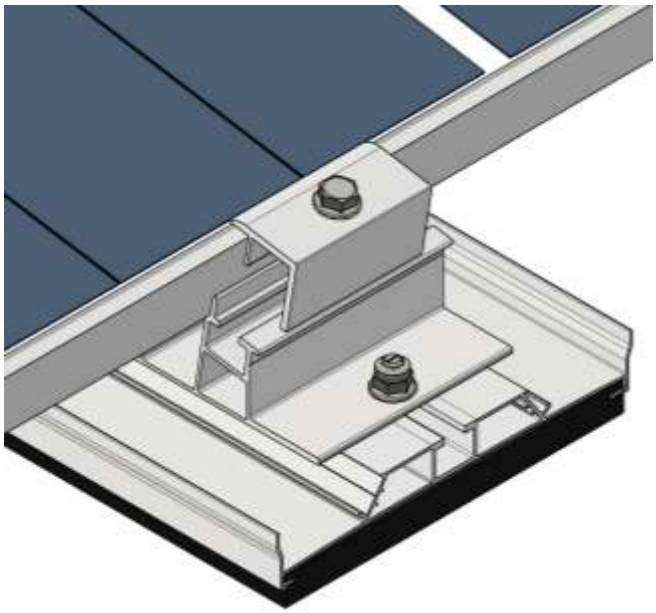

Figure 98 Position of end clamp G6 on the “bottom support”

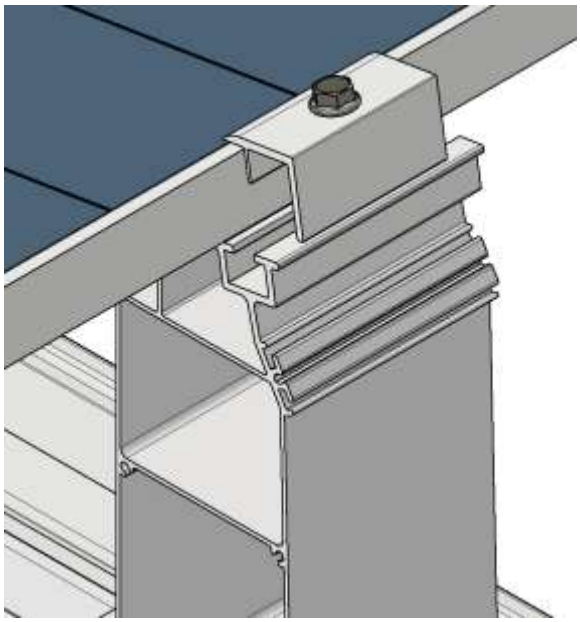

Figure 99 Position of end clamp G6 on the “top support”

11.1 Third base rail and U-profile

The requirements under point 11.1 must be observed.

To limit the deflection of the module under higher pressure loads, a U-profile is used as additional support on the supports of the third base rail. The required length of the U-profile depends on the respective module width.

The U-profile is only designed for supports with a width of 100 mm.

⚠ Attention!
The U-Profile must not be positioned beneath of the junction boxes on the module. This could cause damage to the module.

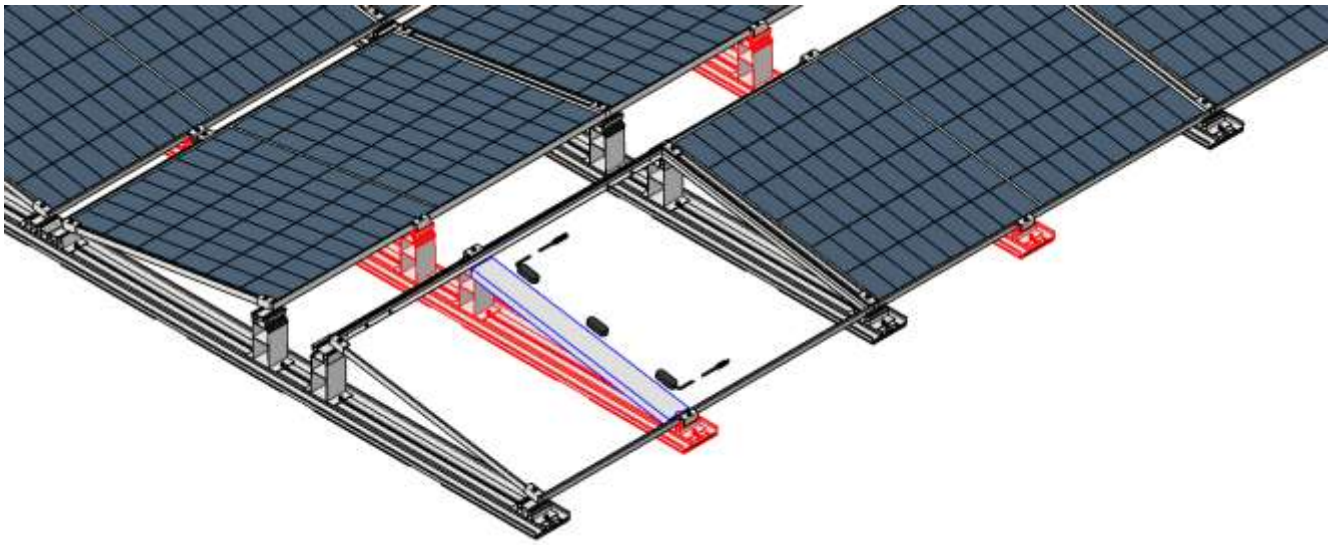

Figure 100 Overview of the position of the third floor rail (red) and U-profile (blue)

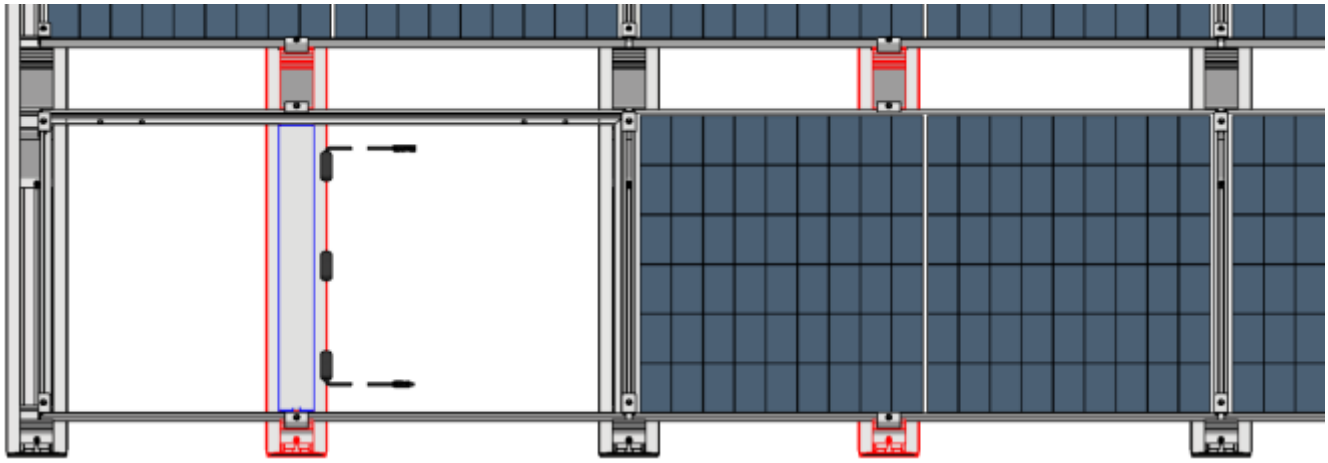

Figure 101 Overview of the position of the third base rail (red) and U-profile (blue)

The U-profile is simply inserted onto the 100 mm wide supports. It is important to ensure that the tab rests against the inner slot channel of the bottom support.

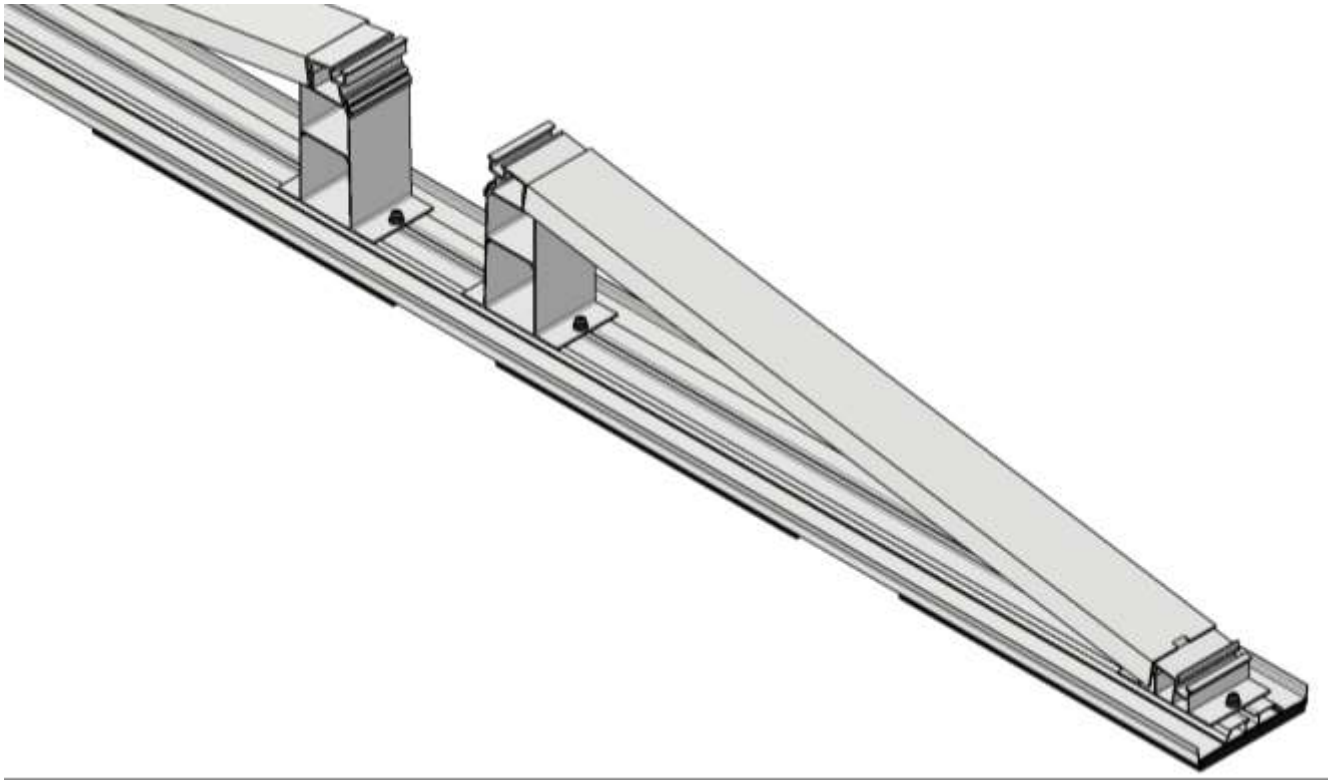

Figure 102 U-profile inserted on the supports

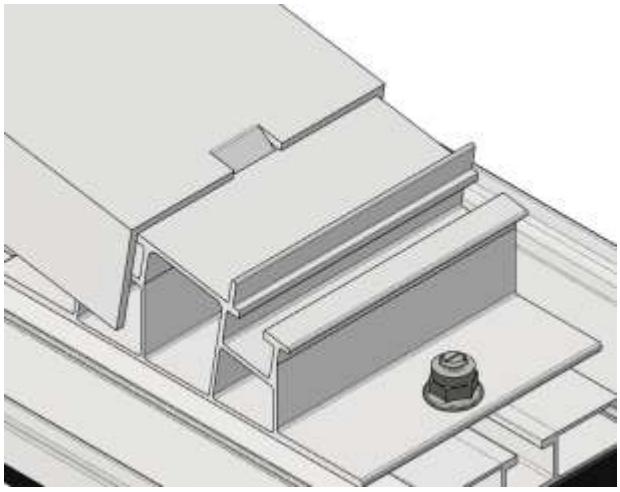

Figure 103 U-profile positioned on the “bottom support”

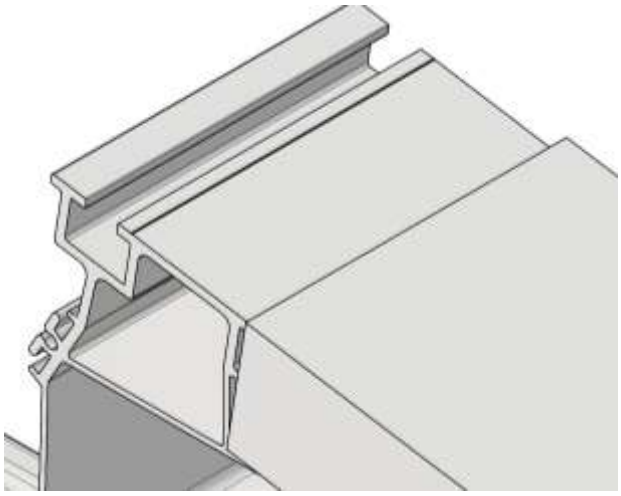

Figure 104 U-profile positioned on the “top support”

12. Final inspection

After completing the PV system, inspect the screw and clamp connections. Check the entire structure for strength and stability and check the roof cladding for damage.

It is advisable to document the completed system.

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13 Part list

Image	Product no,	Description
		Base rail with integrated building protection mat
	6101100078	base rail G3 0,5 m
	6101100079	base rail G3 1,75 m
	6101100080	base rail G3 2,3 m
	6101100081	base rail G3 5,2 m
	6101100082	base rail G3 Eco 0,5 m
	6101100083	base rail G3 Eco 2,3 m
	6101100084	base rail G3 Eco 5,2 m
		Base rail with integrated building protection mat foil-laminated (ak)
	6101100085	base rail ak G3 0,5 m
	6101100086	base rail ak G3 1,75 m
	6101100087	base rail ak G3 2,3 m
	6101100088	base rail ak G3 5,2 m
	6101100089	base rail ak G3 Eco 0,5 m
	6101100090	base rail ak G3 Eco 2,3 m
	6101100091	base rail ak G3 Eco 5,2 m

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Image	Product no,	Description
		Base rail with integrated building protection mat universal
	6101100078	base rail universal G3 0,5 m
	6101100079	base rail universal G3 1,75 m
	6101100080	base rail universal G3 2,3 m
	6101100081	base rail universal G3 5,2 m
	6101100082	base rail universal G3 Eco 0,5 m
	6101100083	base rail universal G3 Eco 2,3 m
	6101100084	base rail universal G3 Eco 5,2 m
	6101100123	butt connector base rail G3 inside
	6101100148	Bottom Support G3.1 10 Eco 65mm
	6101100149	Bottom Support G3.1 10 100mm
	6101100150	Support double G3.1 10 Eco 65mm
	6101100151	Support double G3.1 10 Eco 100mm

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Image	Product no,	Description
	6101100152	Top Support G3.1 10 oWbh Eco 65mm
	6101100153	Top Support G3.1 10 oWbh Eco 100mm
	6101100154	Top Support G3.1 10 mWbh Eco 65mm
	6101100155	Top Support G3.1 10 mWbh Eco 100mm
	6101100118	Wind plate 10°, module width max. 1750mm 4PK
	6101100119	Wind plate 10°, module width max. 2100mm 4PK
	6101100166	Wind plate extension 10 4PK

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Image	Product no,	Description
	6101100124	Ballast rail 1,2 m; 4PK module length max. 1150mm
	6101100125	Ballast rail 1,8 m; 4PK module length max. 1750mm
	6101100126	Ballast rail 2,15 m; 4PK module length max. 2100mm
	6802100009	Alu-L-Profile 50x30x4, 6060mm
	6802100010	Alu-L-Profile 50x30x4, 2150mm
	6101100112	Alu-L-Profile 50x30x4 support PIECE 180mm
	6101100163	T-Profiles 6m
	6101100164	T-Profiles 1,8m
	6101100165	Butt Connector T-Profile
	6101100156	U-profile L:1055/106x40x3 Modul 1130-1140
	6101100157	U- profile L:1065/106x40x3 Modul 1140-1150
	6101100158	U- profile L:1045/106x40x3 Modul 1120-1130
	6101100159	U- profile L:1035/106x40x3 Modul 1110-1120
	6101100160	U- profile L:1025/106x40x3 Modul 1100-1110
	6101100161	U- profile L:1015/106x40x3 Modul 1090-1100
	6101100162	U- profile L:1005/106x40x3 Modul 1080-1090

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Image	Product no,	Description
	6700400125	Middle Clamp G3 30-50 mm
	6700400126	Middle Clamp G3 30-50mm black
	6700400170	End Clamp G3 30 mm
	6700400171	End Clamp G3 30 mm black
	6700400130	End Clamp G3 35 mm
	6700400131	End Clamp G3 35 mm black
	on request	Other heights
	6700400172	End Clamp G3 30 mm
	6700400173	Middle Clamp G5 30-40mm
	6700400174	EC Adapter 30-40mm
	6700400175	EC Adapter 30-40mm black
	6700300067	Secure clip for EC adapter / cable guide
	6700400180	Middle Clamp G6 AeroFix, clamping range 28-40mm

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Image	Product no,	Description
	6700400181	End Clamp G6 30 mm AeroFix
	6700400182	End Clamp G6 35 mm AeroFix
	6700400184	End Clamp G6 40 mm AeroFix
	6900600014	Self-Drilling-Screw 4.8x19 SW8, with sealing washer 2mm
	6101100113	Roof protection mat G3 500x175x15mm
	6101100114	Roof protection mat ak G3 500x175x15mm
	6101100140	Roof protection mat universal G3 500x175x15mm
	6101100115	Roof protection mat ak G3 Eco 500x95x15mm
	6101100116	Roof protection mat ak G3 Eco 500x95x15mm
	6101100141	Roof protection mat universal G3 Eco 500x95x15mm
	6101100025	Slide protection Coil 10 m - 25 mm width - Ø 9 mm

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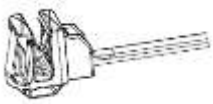
Image	Product no,	Description
	6101100027	Cable clip 0°
	6101100028	Cable clip 90°
	6700300070	Cable Clip MC4-Plug
	6700300086	Plastic cable clip
	6011400089	Plastic drainage clip 30-36 mm
	6700200013	Clamp For Potential Equalization, TopFix 200 (Discontinued product)
	6700200067	Clamp For Earthing-Potential Equalization
	6000300021	Assembly jig
	6101100024	Static Friction Measuring Device
	6101100172	Lehmann mounting plate for flat roof solar systems

Figure 105 Parts list, for illustration only

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14. Appendix

14.1 Information about IBC AeroFix G3.1

Tightening torques of screw connections

The tightening torques of the screw connections used in the IBC AeroFix G3.1 flat roof system should be dimensioned in accordance with DIN ISO 3506 and archived for at least 10 years. Due to the difficulty in determining the friction coefficients in the external area, dimensioning in accordance with DIN ISO 3506 can prove difficult. We therefore recommend the following tightening torques:

Screw connection	Tightening torque
M6	10 Nm
M8	15 Nm
Self-Drilling-Screw 4.8x19	approx. 4 Nm (tighten until the sealing screw swells out slightly)

Figure 106 Torques

14.2 Maintenance instructions

Regular (annual and event-dependent, e.g. severe storms, hail, etc.) inspection and maintenance of the system are essential to ensure the long-term functionality of the mounting system. Without inspection, the system can slide towards the edge of the roof over several years. Check and correct displaced generator fields or building protection mats as necessary. Mechanical connections, such as module clamps, must be checked for tightness and torque and retightened if necessary. Any faults noted in the maintenance log must be repaired immediately to prevent further damage. The template for the maintenance log can be found in the appendix.

Disassembly of the mounting system is carried out in the reverse order of assembly steps.

Module cleaning only with clear water. No chemical cleaning products.

The modules can easily be replaced by removing the module cabling and releasing the corresponding module clamps. Please observe the relevant safety requirements when doing this.

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14.3 Documents

Checkliste IBC AeroFlat | IBC AeroFix
Checklist IBC AeroFlat | IBC AeroFix

☐ IBC AeroFlat

☐ IBC AeroFix G3 15-S ☐ IBC AeroFix G3 10-S ☐ IBC AeroFix G3 8-S
☐ IBC AeroFix G3.1 10-S 65 mm ☐ IBC AeroFix G3.1 10-S 100 mm

☐ IBC AeroFix G3 15-EW ☐ IBC AeroFix G3 10-EW ☐ IBC AeroFix G3 8-EW
☐ IBC AeroFix G3.1 10-EW 65 mm ☐ IBC AeroFix G3.1 10-EW 100 mm

☐ Bodenschiene  ☐ Bodenschiene Eco ☐ Bodenschiene 77 mm

Bitte füllen Sie dieses Formular vollständig aus, um eine schnelle Bearbeitung Ihrer Anfrage zu gewährleisten.
Please fill in this questionnaire completely to guarantee a quick processing of your request.

Achtung: Für jede Dachfläche ist eine eigene Checkliste zu erstellen!
Attention: For every roof area is to create a separate checklist!

Kundeninformationen (Installateur) | Owner information (Installer)

Name | Name _____

Firma | Company _____

Straße/Nr. | Street address _____

PLZ/Stadt | ZIP code/city _____

Ansprechpartner | Contact person _____

Telefon | Telephone _____

Mobil | Cell phone _____

Fax | Fax _____

E-Mail | E-mail _____

Kom. | Com. _____

Standortinformationen (PV-Anlage) | Site information

PLZ/Stadt | ZIP code/city _____

Straße/Nr. | Street address _____

Land | Country _____

Windlastzone nach EN 1991-1-4 | Wind load zone according to EN 1991-1-4 _____

Schneelastzone nach EN 1991-1-3 | Snow load zone according to EN 1991-1-3 _____

Höhe über N.N. | Height above sea level _____

Wichtig! Zusätzlich mögliche Auflast laut Gebäudestatik (Lastreserve)
Important! Possible additional load in accordance with building statics (load Reserve) _____ kg/m²

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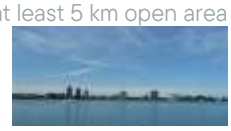
Umgebung des Standorts (PV-Anlage) | Site Surroundings (PV system)

Geländekategorie
(Ist in einem 15° Sektor um das Gebäude eine niedrigere Geländekategorie, so muss diese genommen werden.)
Terrain category
(If there is a lower terrain category in a 15 ° sector around the building, the lower one must be taken.)

☐ Geländekategorie I | Terrain category I
Offene See, Küstennahes Gebiet
Open sea, lake with at least 5 km open area

☐ Geländekategorie II | Terrain category II
Offenes Gelände mit vereinzelten Hindernissen
Open terrain with isolated obstacles


☐ Geländekategorie III | Terrain category III
Dörfer, vorstädtische Bebauung, Waldgebiete
Village, suburban, woodland


☐ Geländekategorie IV | Terrain category IV
Stadt
Urban


Angaben zum Dach | Roof information

Art der Konstruktion
Type of construction
☐ Bestehendes Dach
Existing roof
☐ Saniertes Dach
Restored roof
☐ Neubau
New building

Höhe der Dachfläche
Height of roof _____m

Neigung des Dachs (AeroFix max. 10°, AeroFlat max. 30°)
Slope of roof (AeroFix max. 10°, AeroFlat max. 30°) _____Grad
degrees

Gebäudemaße
Building dimensions _____m
Länge
length X _____m
Breite
width

☐ Einseitneigung
single pitch roof

Alter des Dachs
Age of roof _____Jahre
years

☐ Dachprofilneigung
double pitch roof

Attika vorhanden ☐ Ja
Parapet existent Yes
Höhe
Height _____m
☐ Nein
No

Angaben zur Dachart | Details of roof type

☐ Foliendach
Membrane of roof
☐ Bitumen
Bitumen
☐ Beton
Concrete
☐ Gründach
Green roof

☐ Zusätzliche Kiesauflage
Additional gravel covering

Hersteller der Dachhaut (falls bekannt)
Manufacturer of the roof skin (if known) _____

Haftreibungskoeffizient
Coefficient of static friction _____

Sonstiges
Other _____

Moduldaten | Module data

Modulhersteller
Modul manufacturer _____

Modulmaße (L x B x H)
Modul dimensions (L x W x H) _____ mm

Leistung
Output _____Wp

Modulgewicht
Module weight _____ kg

Anzahl der Module
Number of modules _____

Have sun!

Bitte ausschließlich zuvor ausgewähltes System ausfüllen | Please only fill in the previously selected system

IBC AeroFlat G3

Sprungmaß
Center to center distance

IBC AeroFix G3 15-S

Sprungmaß
Center to center distance
_____m

Sprungmaß X ±100 (mm)	Modulbreite Y (mm)
1850	980 - 1150

IBC AeroFix G3 15-EW

Sprungmaß
Center to center distance
_____m

Sprungmaß X ±50 (mm)	Modulbreite Y (mm)
2300	980 - 1039
2400	1040 - 1099
2550	1100 - 1150

IBC AeroFix G3 & G3.1 10-S

Sprungmaß
Center to center distance
_____m

	Sprungmaß X ±100 (mm)	Modulbreite Y (mm)
G3	1650	980 - 1150
G3.1	1650	1040 - 1150

IBC AeroFix G3 & G3.1 10-EW

Sprungmaß
Center to center distance
_____m

	Sprungmaß X ±50 (mm)	Modulbreite Y (mm)
G3	2350	980 - 1039
G3 / G3.1	2450	1040 - 1099
	2600	1100 - 1150

IBC AeroFix G3 8-S

Sprungmaß
Center to center distance
_____m

Sprungmaß X ±100 (mm)	Modulbreite Y (mm)
2450	1500 - 1699
2650	1700 - 1899
2850	1900 - 2100

IBC AeroFix G3 8-EW

Sprungmaß
Center to center distance
_____m

Sprungmaß X ±50 (mm)	Modulbreite Y (mm)
3400	1500 - 1549
3500	1550 - 1599
3600	1600 - 1649
3700	1650 - 1699
3800	1700 - 1749
3900	1750 - 1799
4000	1800 - 1849
4100	1850 - 1899
4200	1900 - 1949
4300	1950 - 1999
4400	2000 - 2049
4500	2050 - 2100

Have sun!

Zwingend einzureichen | **Must be submitted**

☐ Zeichnung des Dachs (als AutoCAD oder PDF-Datei) mit Modulanordnung und Dachmaßen, First und Kehlen, Himmelsrichtungen
Drawing of the roof (as AutoCAD or PDF file) with module arrangement and roof dimensions, ridge and coving, points of the compass

☐ Fotos von Dach, Standort und Umgebung (in alle Himmelsrichtungen), Luftbild (bitte einzeichnen, falls nicht verfügbar)
Photos of roof, location and environment (in all directions), Aerial view (please draw in if not available)

☐ Schnitt des Gebäudes
Cross-section of building

☐ Moduldatenblatt
Module data sheet

Sind Ablademöglichkeiten vorhanden (Stapler, Kran, etc)?
Are unloading aids available (Fork-lift, crane etc.)?

☐ Ja
Yes

☐ Nein
No

Hiermit bestätige ich die Richtigkeit der Angaben
Herewith confirm the correctness of the statements.

_____
Ort, Datum | Town, date

_____
Unterschrift, Stempel | Signature, stamp

Achtung:
Eine Bearbeitung der Anfrage kann nur nach Einreichung einer vollständigen und unterschriebenen Checkliste erfolgen. Nicht ausgefüllte Checklisten führen zu Verzögerungen der Planung.
Attention:
Editing of the request can be made only after submission of a complete and signed checklist. Not completed checklists lead to delays in planning.

Have sun!

IBC AeroFix flat-roof system

Test record

Determination of stiction coefficients

CUSTOMER INFORMATION

Name		Phone	
Company		Mobile	
Street / No.		Fax	
Post code/city		E-mail	

CONSTRUCTION PROJECT

Customer name		Phone	
Street / No.		Mobile	
Post code/city		Fax	
Com.:		E-mail	

TEST PROCEDURE

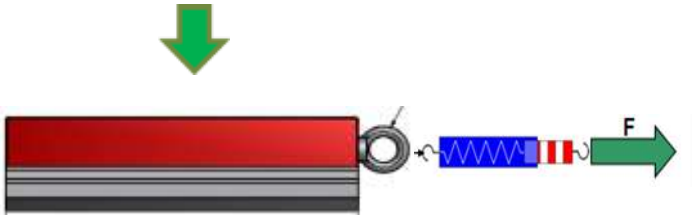
The tests are to be performed in accordance with the October 2004 edition of DIN EN ISO 8295, Plastics - Films and sheeting - Determining coefficients of friction.

A total of 10 tests are to be carried out: five dry, five wet. The tests are to be distributed evenly across the roof surface.

Visually dissimilar roof areas are to be tested separately from one another. The tests are to be repeated accordingly.

The areas of the roof membrane where the measurements are taken remain in the same condition as when the base rails were laid.

The test specimen (10 kg on IBC stiction gauge) is placed onto the roof membrane with the appropriate protective matting. After the defined waiting period (around 30 seconds) has elapsed, parallel force is applied centrally to the test specimen using the tension spring, and then measured using the spring scale. It is important that the force be applied evenly. The maximum force that can be applied before the test specimen begins to move indicates the coefficient of friction.



Static friction coefficient μ = F /G

Have sun!

Sketch of roof structure (from top to bottom)

Date:

Time:

Temperature:

Test No.	Dry			Wet		
	Test specimen weight	Measured force	µ	Test specimen weight	Measured force	µ
	G (kg)	F (kg)	F / G	G (kg)	F (kg)	F / G
1						
2						
3						
4						
5						

Evaluation (based on lowest measured value) **µ =**

Appendix: Roof layout plan with measuring point locations / test procedures

Signature person in charge

Have sun!

Wartungsprotokoll ☐ TopFix 200 ☐ AeroFix ☐ AeroFlat
Maintenance log ☐ TopFix 200 ☐ AeroFix ☐ AeroFlat

Kommission:
Commission: .....

Standort:
Place: .....

i.O. Ok	n.i.O. not Ok	behoben fixed	
☐	☐	☐	Anlage befindet sich in einem optisch einwandfreien Zustand und laut Montageplan auf korrekter Position The system is in a visually perfect condition and according to the installation plan in the correct position
☐	☐	☐	Montagesystem auf Standfestigkeit und Korrosion geprüft Mounting system tested for stability and corrosion
☐	☐	☐	Keine Beschädigungen der Dachhaut durch die PV Anlage No damage to the roof by the PV system
☐	☐	☐	Mechanische Verbindungen auf festen Sitz und Anzugsmoment gemäß Montageanleitung geprüft Mechanical connections for tight fit and tightening torque tested according the installation manual

Zusätzlich nur bei AeroFix und AeroFlat
Additional only with AeroFix and AeroFlat

☐	☐	☐	Bautenschutzmatten befinden sich in korrekter Position Building protection mats are in the correct position
☐	☐	☐	Ballast befindet sich auf richtiger Position (auf der Bodenschiene oder Ballastschiene) Ballast is in the correct position (on the base rail or ballast rail)
☐	☐	☐	Ballast ist optisch in Ordnung (keine Risse, Brüche etc.) Ballast is visually fine (no cracks, breaks etc.)
☐	☐	☐	ungehinderter Wasserablauf Unhindered water drainage

Anmerkungen
Comments

.....

.....

.....

Have sun!

Wartung wurde durchgeführt von
Maintenance was carried out by

Firma:
Company: .....

Person:
Person: .....

Die Wartungsarbeiten sind durch eine Fachfirma, die Erfahrung mit elektrischen Anlagen und Arbeiten mit dem Montagesystem vorweisen kann, auszuführen.
The maintenance work must be carried out by a technical company that has experience with electrical systems and works with the mounting systems.

Das ausgefüllte Wartungsprotokoll muss in Kopie der anlagebetreibenden Person ausgehändigt werden.
The completed maintenance log must be handed over in copy to the plant

Alle erfassten n.i.O.-Punkte sind gemäß den technischen Vorgaben unverzüglich fachgerecht zu beheben.
All recorded not.OK. points must be rectified immediately and professionally in accordance with the technical specifications..

Hiermit bestätige ich die Korrektheit und Ausführung der Wartung
I confirm the correctness and execution of the maintenance

Ort, Datum
Place, date .....

Unterschrift
Signature .....

Bedarf der eigenhändigen Schriftform einer bevollmächtigten Person!
Need of the written form of an authorized person!

Name in Druckbuchstaben
Printed Name .....

Have sun!

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