



SOLAR
INSTALLATION INSTRUCTION

ALUMERO

AL 13
ROOF HOOK

EN

We recommend you to read carefully the following information and instruction and especially the safety instructions, because it is very important in dealing with the products!

The design and planning of the ALUMERO pitched roof mounting system AS2.1 should be carried out with our online-software ALUMERO .Solar.Pro.Tool. You can find the required material, the position and configuration of the components in the project report, which is resulting of the Solar.Pro.Tool. You will receive the report from your ALUMERO partner / wholesaler. All data in the project report base on a structural calculation, which is necessary for a safe and proper function of the system.

The following mounting instruction explain the installation of the ALUMERO roof hook system.

The roof hooks have to be always fixed in the stable roof substructure. Normally you will find rafter roofs as substructure of tiled roofs. Usually the pv-modules will be mounted in portrait, so that the mounting profiles are located parallel to the ridge. By default two mounting profiles are in use per module row. In case of high wind and/or snow loads it might be necessary to use a third mounting profile.

The ALUMERO roof hook system is exclusively designed to be used as mounting system for pv-modules.

Each other application is not in accordance with its intended use.

The installation is only allowed to be carried out by qualified personnel. Especially works on the roofing should be done by roofers.

If you have any other questions, make use of ALUMERO's professional and comprehensive consulting service. Our competent engineers will be happy to help.

GENERAL INFORMATION

Roof inclination: 10° – 65°

Max. size of modules in one continuous row: 12 m length



ASSEMBLY OF SCREWS / BOLTS (TIGHTENING TORQUE)

15 Nm
M8 (A2-70)

30 Nm
M10 (A2-70)

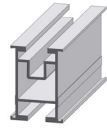
screw in with end stop
Wood screws

DELIVERY PROGRAM

STANDARD



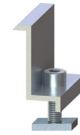
Roof Hook AL 13
product number:
802413



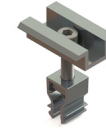
Mounting Profile*
product number:
80210x



Profile Connector
product number:
80215x



premounted End Clamp
product number:
802304-xx

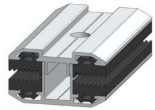


premounted Middle Clamp Click
product number:
802301C



Flat Head Screw
product number:
80064x

OPTIONAL



Laminate Middle Clamp Click
product number:
800323



Laminate End Clamp Click
product number:
800324



Safety Hook for Laminate Clamps

*we recommend Mounting Profile 37 (802105) or 45 (802100)

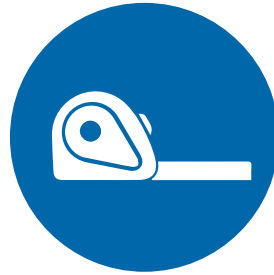
REQUIRED TOOLS



Cordless screwdriver
bits: **TX45, Allen key**
(wrench size 6mm)



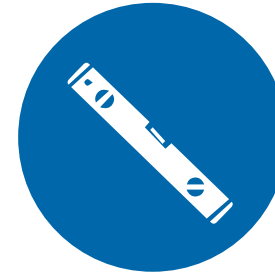
Torque wrench



Tape measure



Snap line



Level



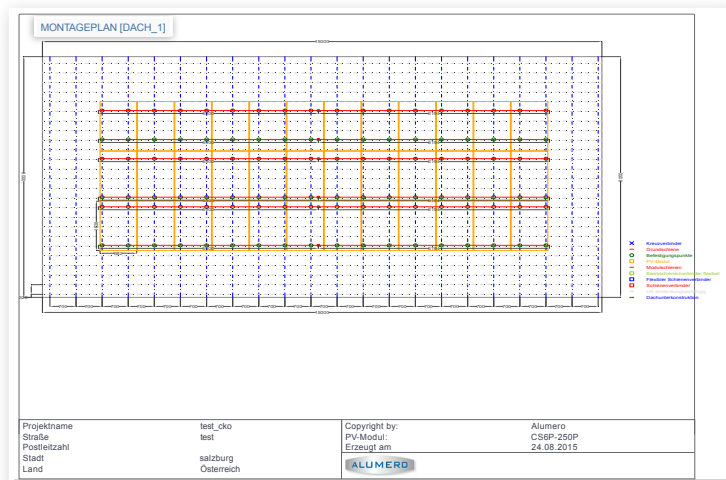
Angle grinder



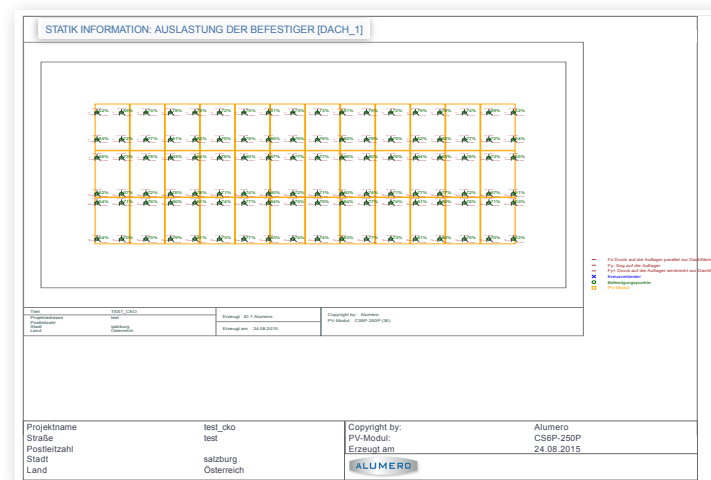
Open-end spanner
15 mm / 17 mm

ADDITIONAL INSTALLATION DOCUMENTS

CAD-layout and statics-plan from Solar.Pro.Tool.



CAD-Plan



Statics

INSTALLATION INSTRUCTION



Please note:

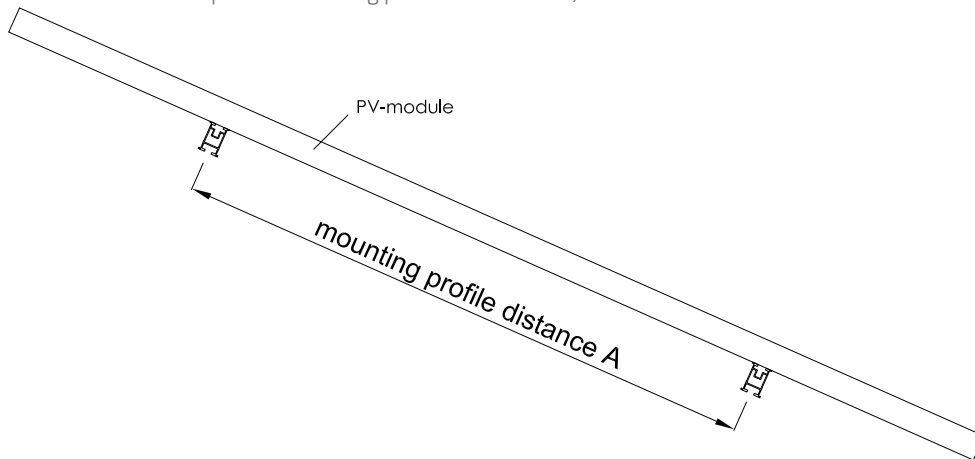
- ✓ Don't use mounted roof hooks as climbing assistance!
The material and the roof tiles could be damaged.
- ✓ All technical rules of roofers craft have to be observed!



1 DEFINE POSITION OF PV-MODULES ON THE ROOF

Measure and mark the necessary location on the roof according to the Solar.Pro.Tool-project report or according to the responsible engineering design.

Please observe the rules for module fixation of the module supplier (e.g. location of the clamps and mounting profiles: distance A)

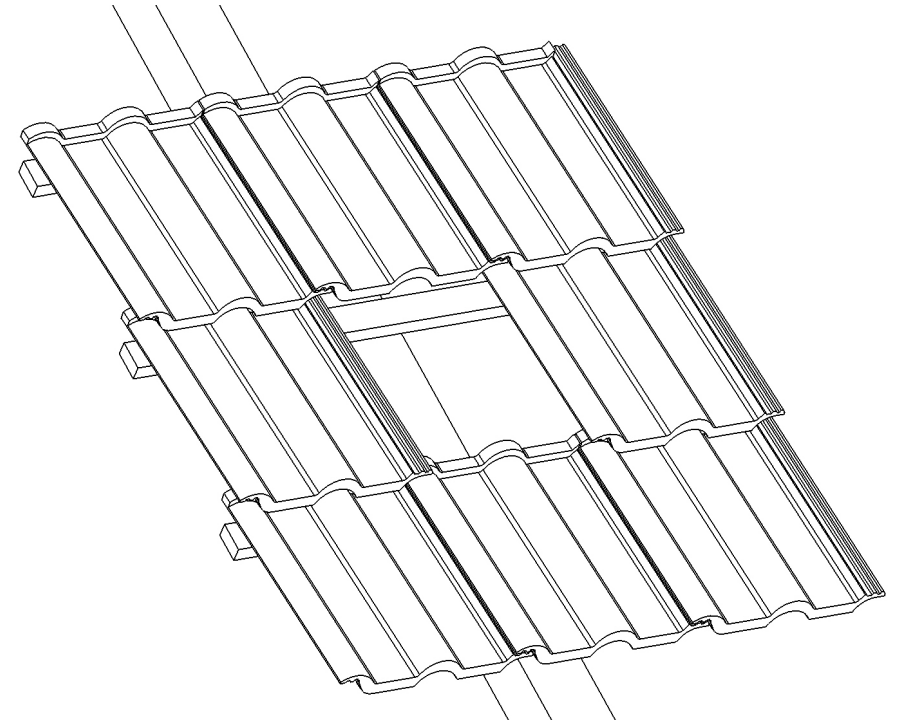


We advise to carry out the following mounting steps with the help of a roofer !



2 SELECT POSITION ALONG THE EXISTING RAFTER

Remove the tile.

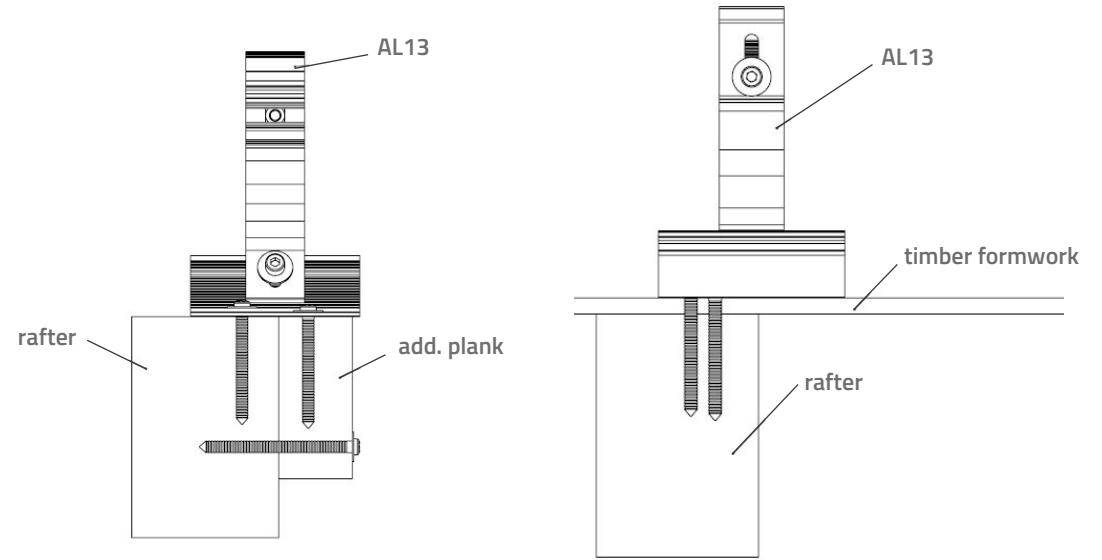
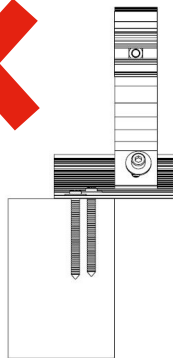
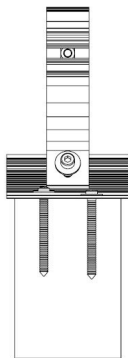
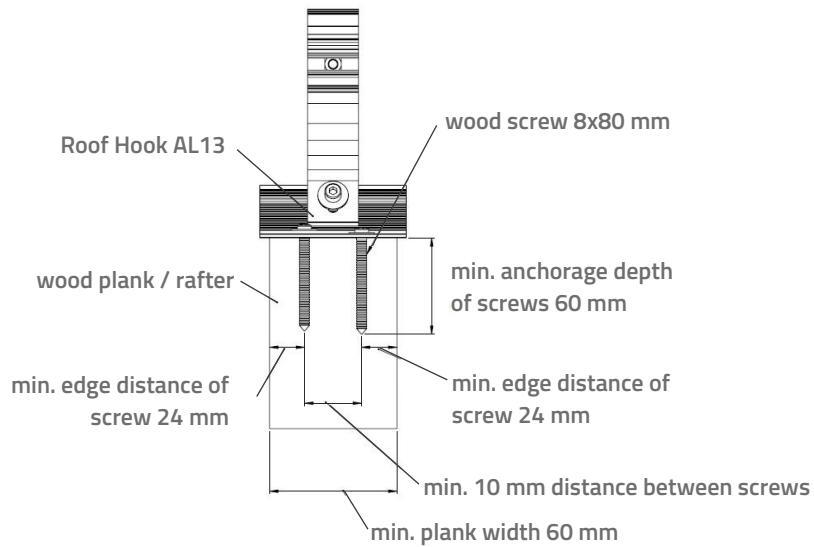


Place the roof hook on the rafter, so that the roof bracket will be situated in the trough of the tile beneath the roof hook.

Hang up a hook, ensuring a minimum distance of 3-5 mm between the lower bar of the hook and the tile beneath (see dimensions diagram).

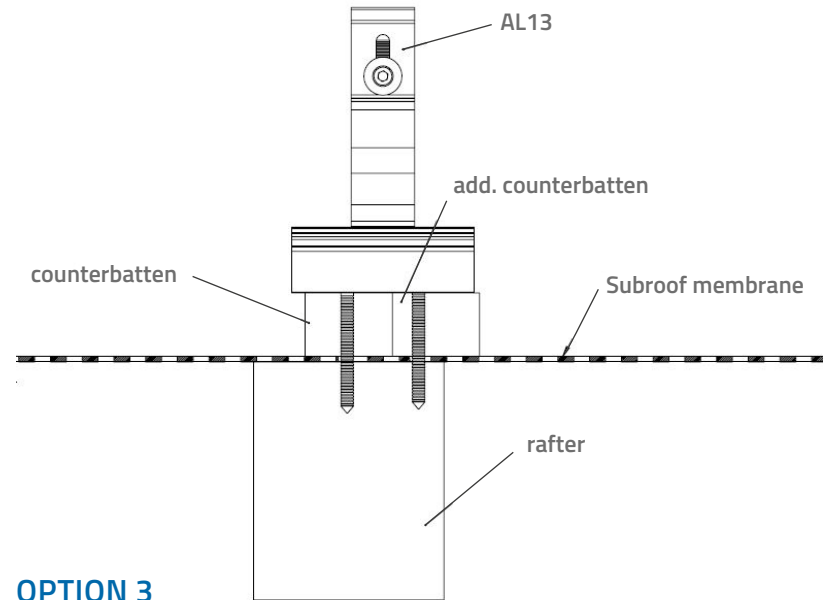


The roof hook ground plate should be placed on a stable support point, in the area where the roof hook bracket is located!
 This could be realized e.g. by adding additional planks lateral of the rafter or with additional counter battens underneath the roof hook. If on top of the rafters a timber formwork is existing, this could also be used as support.



OPTION 1

OPTION 2



OPTION 3



For the following steps, the standard rules for working on a roof must be observed. Any modification to previously laid tile arrangements can lead to a loss of warranty and/or guarantee for the roof covering. Errors of precision can result in substantial damage caused by leaks in the roof.



The roof hook AL13 can be adjusted in three directions to fit with the roof tiles.

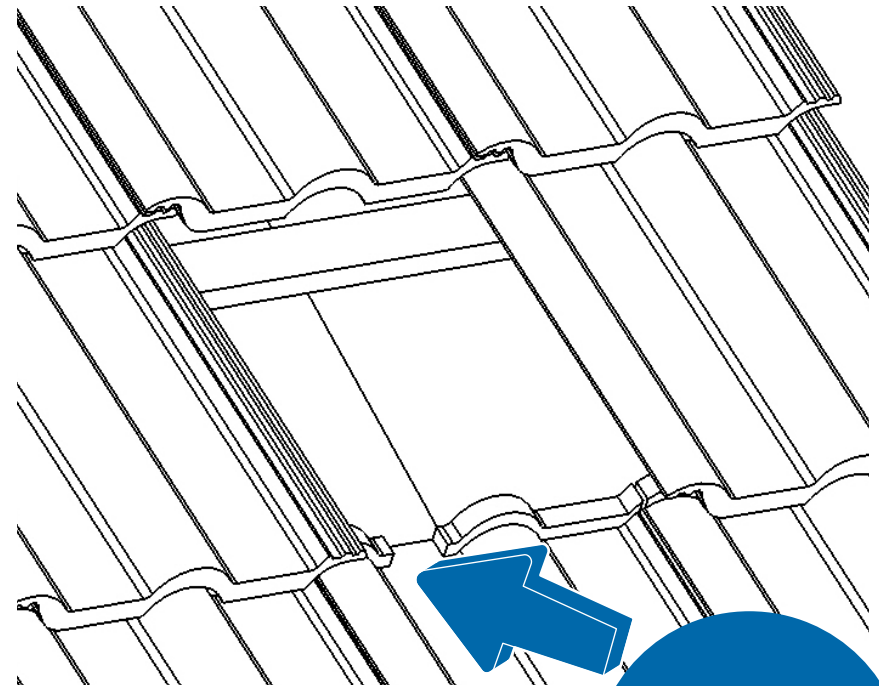
3

GRIND THE TILE BENEATH

If the tile beneath the hook has an upturned lip, this can be removed in order to achieve the minimum clearance. Please use an angle-grinder with diamond blade.



Remove the upturned lip only, under no circumstances grind into the tile itself. Grind the upturned lip just enough to achieve the minimum clearance.



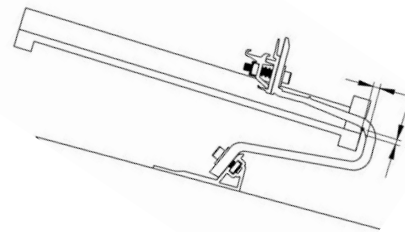
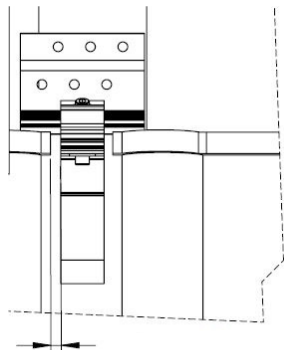
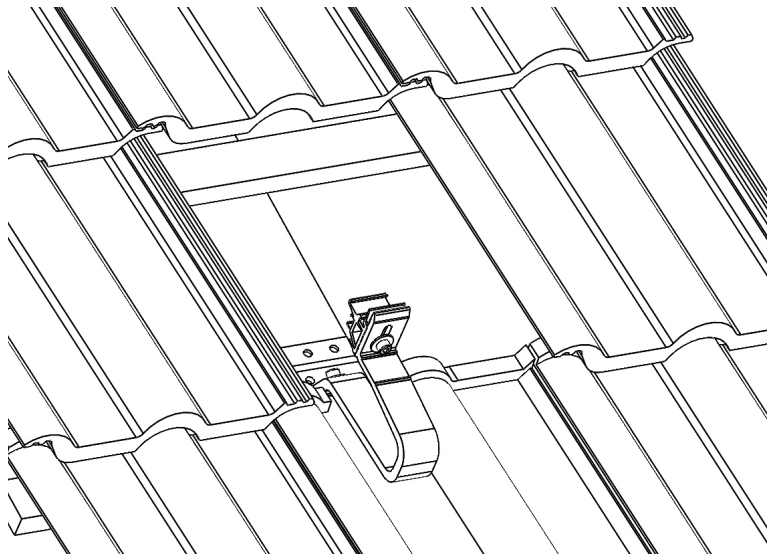
4

HANG UP THE ROOF HOOK

Check for clearance of min. 3-5 mm around the roof hook.



With shallower roof inclinations and unusual tile formats we recommend applying a „Sealing tape for roofing tiles“ prior to hanging up each roof hook.



In each case, min. 3-5 mm

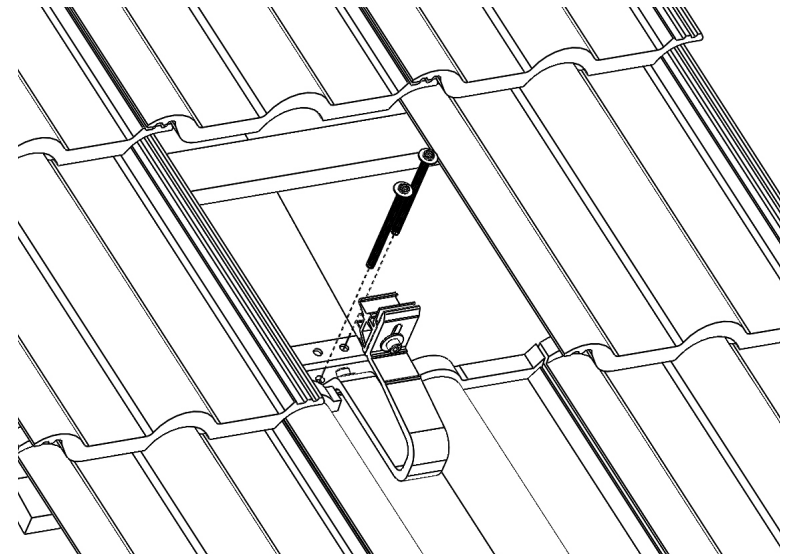
5

MOUNT THE ROOF HOOK

Use 2 x 8 mm wood screws to fasten hook to the rafter.

Take care of the min. edge distance of the screw in the rafter = 24mm

Select screw length so as to ensure a minimum thread engagement of 60 mm



6

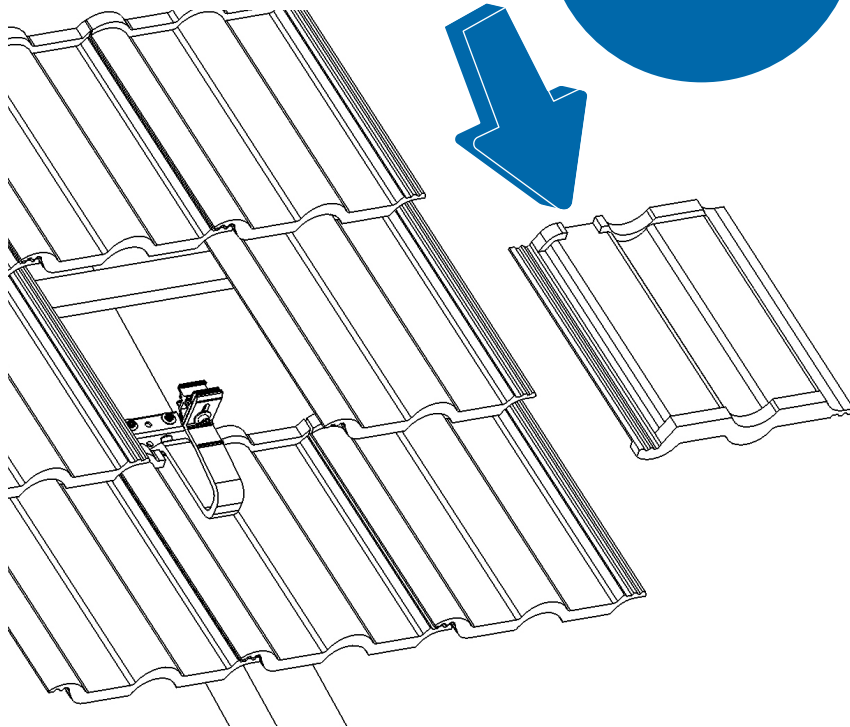
GRIND THE TILE ABOVE

Turn the respective tile

Using a diamond angle grinder remove a portion of the protruding lip around the roof hook.

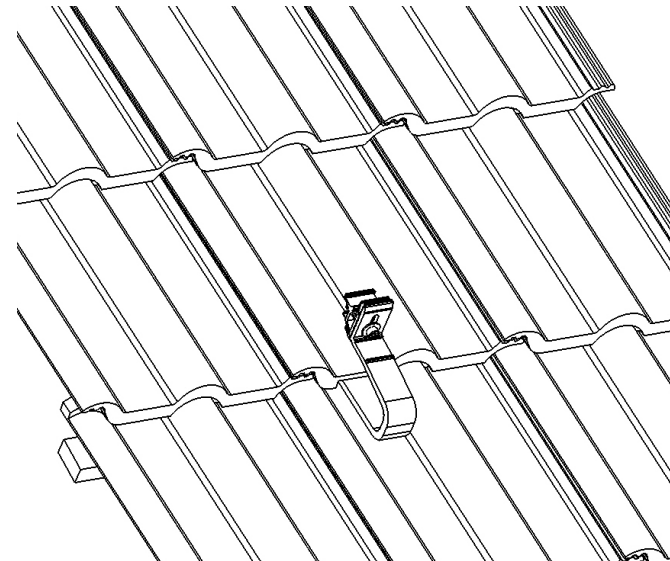
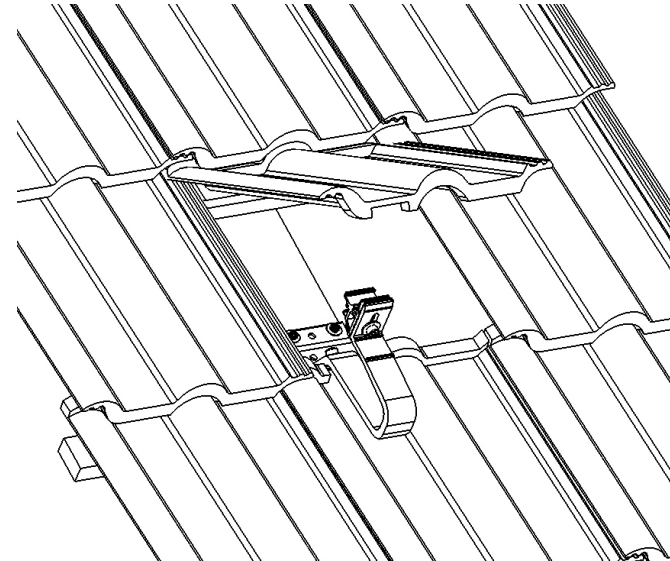


Grind the lip to allow for a 3-5 mm clearance around the roof hook. Remove the lip only! Do not grind deeper into the tile!



7

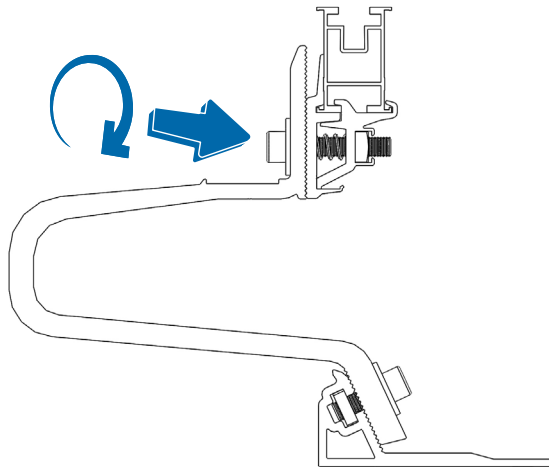
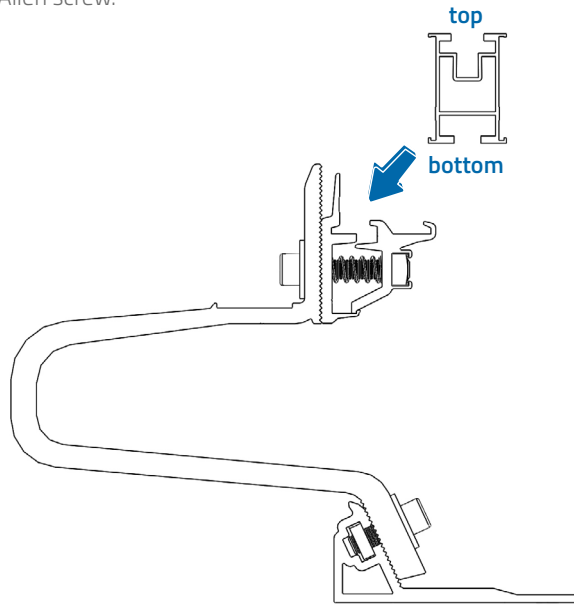
HANG UP THE TILE



8

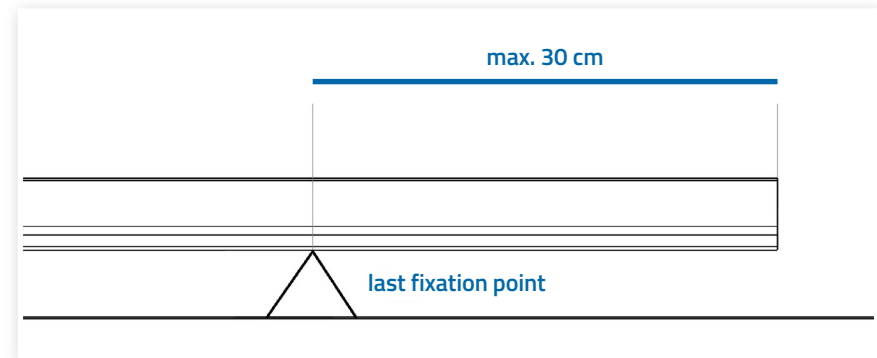
INSTALLATION OF MOUNTING PROFILES

Place the mounting profile with the correct side up on the roof hook and fix it with the Allen screw.



Please note:

- ✓ The maximum length of one mounting profile is 12m!
- ✓ Provide an expansion joint of min. 5cm at least every 12m!
- ✓ The cantilever of the mounting profile over the last fixation point must not exceed 30cm! The cantilever should be the same for both sides.

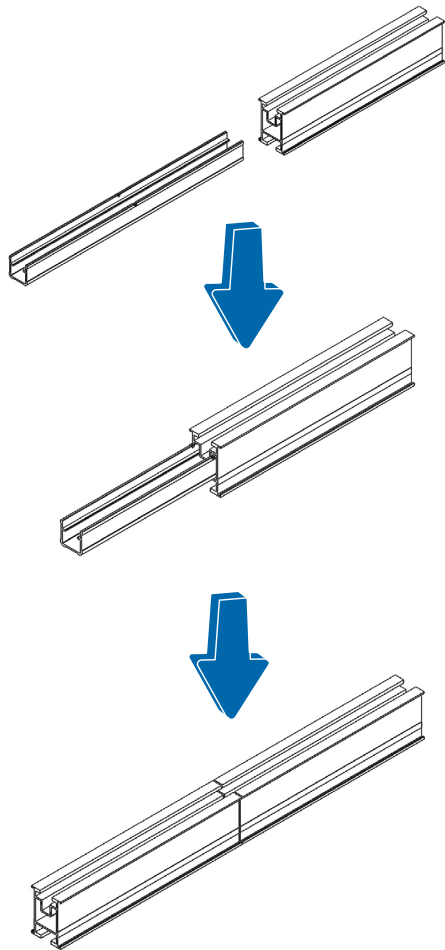


9

CONNECTION OF MOUNTING PROFILES

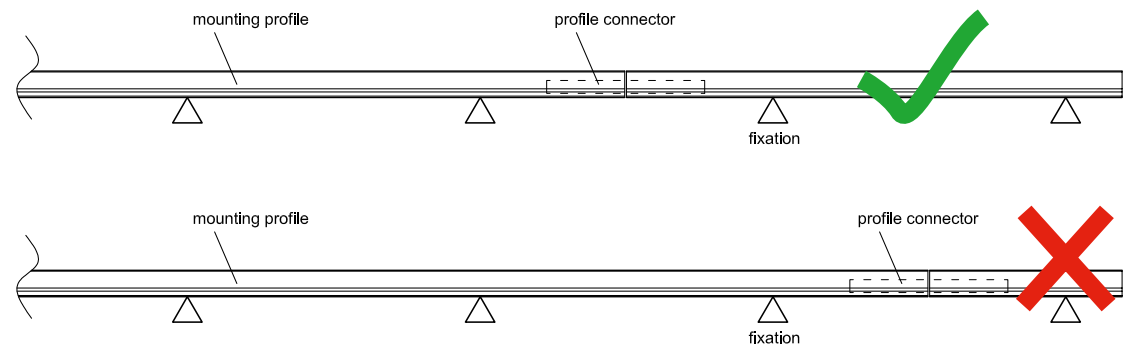
If the width of the module field is larger than the length of one mounting profile, the mounting profiles need to be connected.

Stick the profile connector into the mounting profile up to half the length of the profile connector. Then slide on the second mounting profile onto the profile connector.



Please note:

- ✓ Every mounting profile must be fastened on at least two fixation points (roof hooks)!
- ✓ Connect the mounting profiles only at the mounting site (=on the roof)!
- ✓ Connected mounting profiles must not be transported vertically!
- ✓ Connection points of mounting profiles must not be located in the area of a fixation point (roof hook)!

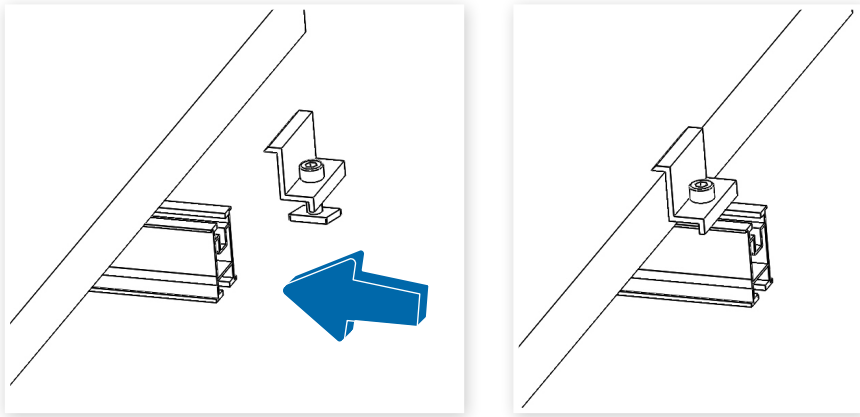


10

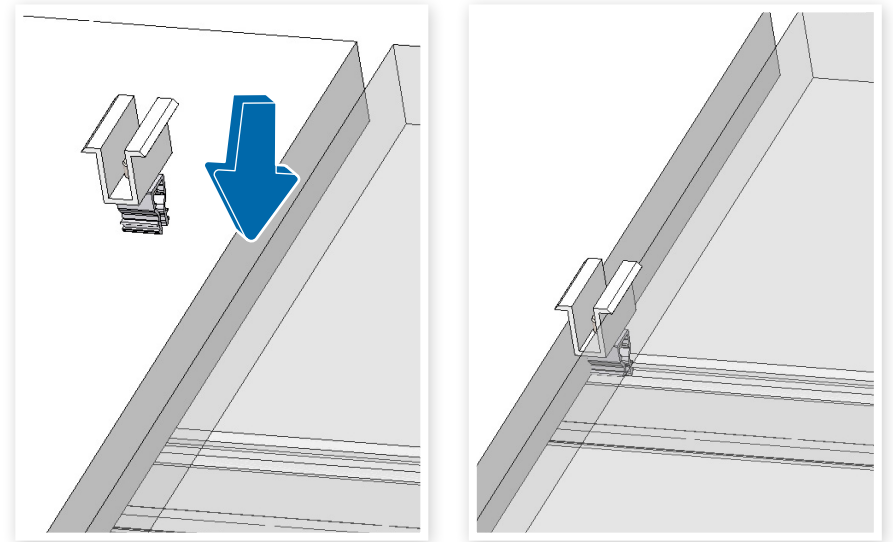
INSTALLATION OF PV-MODULES

Start with the bottom row of modules. Put the first module on the mounting profiles and align it.

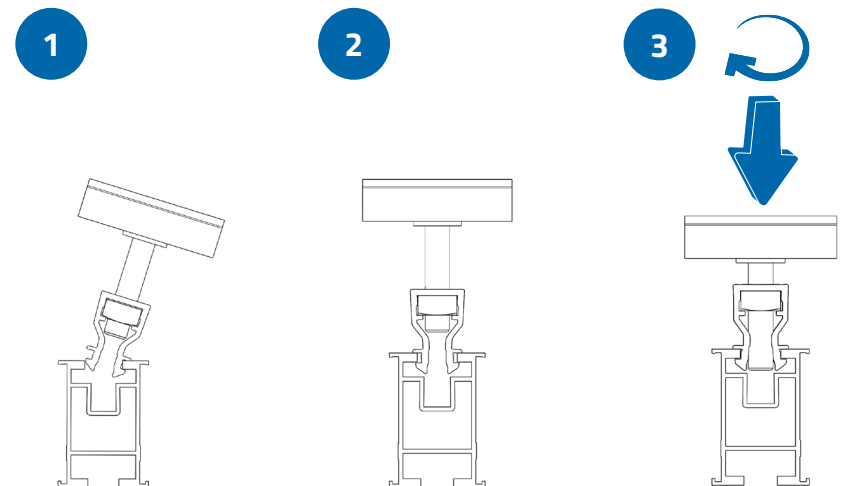
Place the end clamps for fast mounting on the module frame so that the threaded plate of the clamp could be inserted in the upper slot of the mounting profile. Fix the clamps with the Allen screw.



Place the middle clamp CLICK on the module frame and click it into the mounting profile acc. to the sketch below. Lay down the next module on the mounting profiles and push it towards the middle clamps. Fix the clamps with the Allen key. The last module of a module row is mounted with end clamps for fast mounting, as described above.



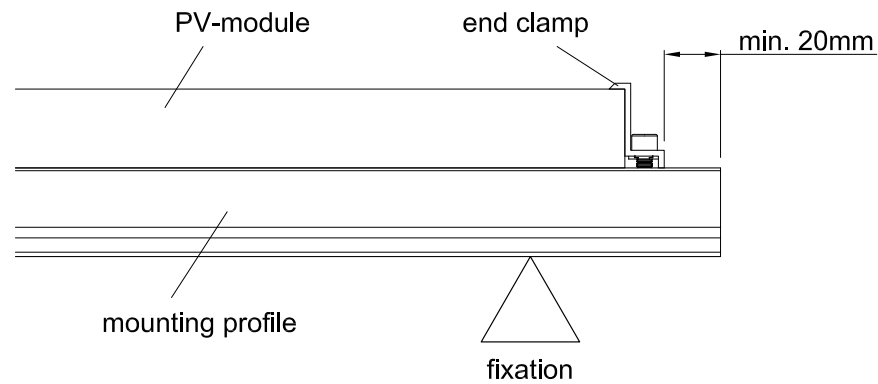
Install the remaining module row in the same way.





Please note:

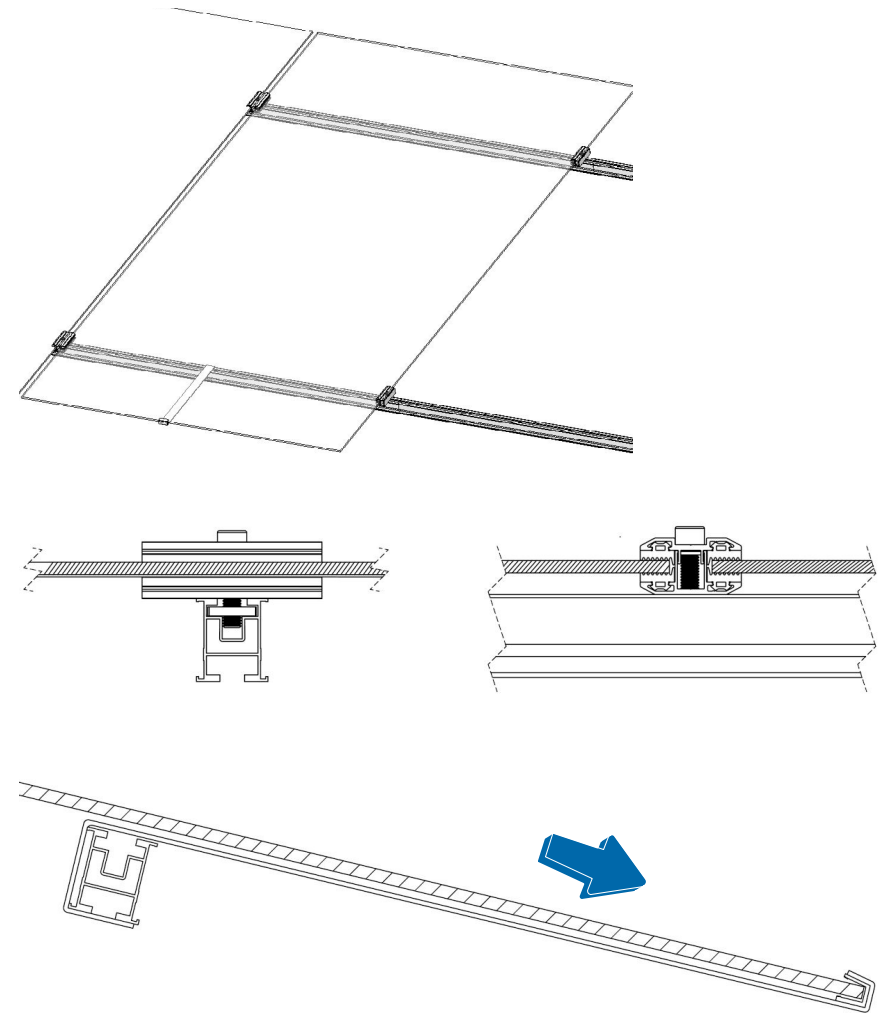
- ✓ Middle clamps must not be placed in the area of profile connectors!
- ✓ Modules can be clamped only in prescribed areas. These areas are indicated on the data sheet of the module producer.
- ✓ The distance between modules should be approx. 20mm in horizontal and vertical direction.
- ✓ End clamps need to be ordered in the right height to match the frame height of the module.

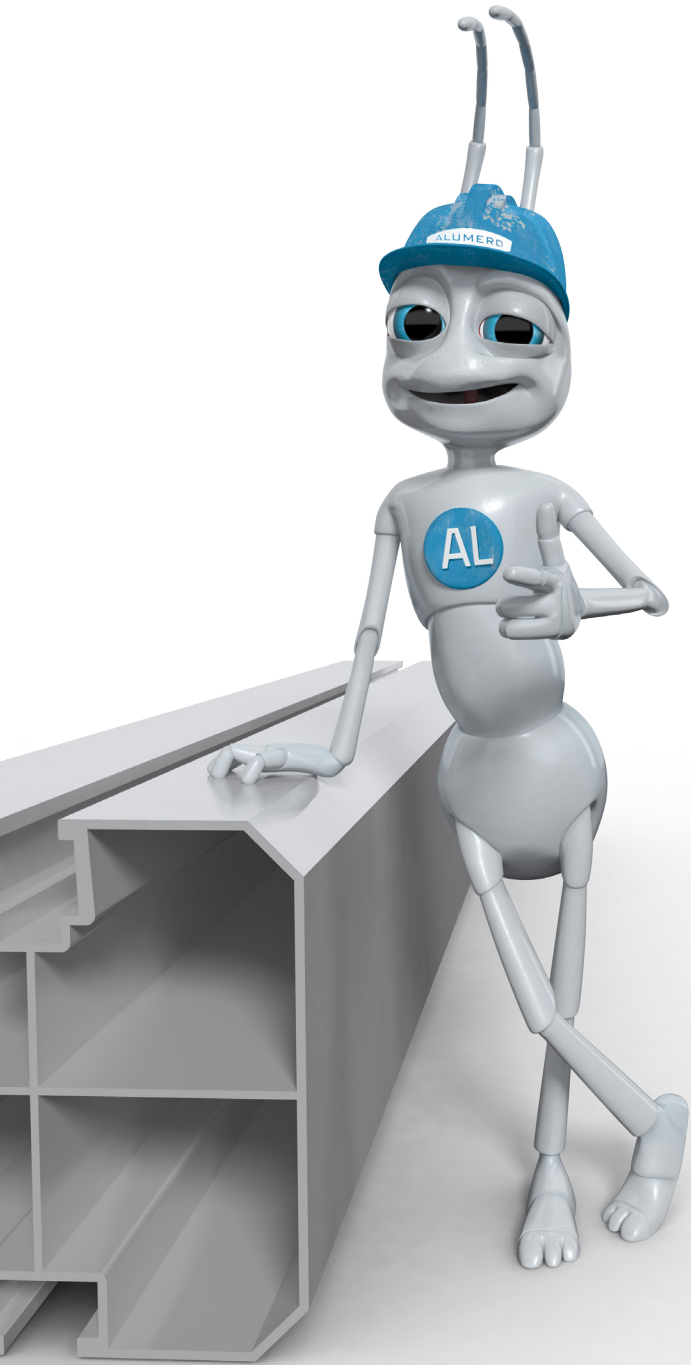


10a

LAMINATE CLAMPS

For security of the laminate modules install the safety hook on the lower mounting profile. Insert the laminate end clamps and middle clamps in the mounting profile as described above. Open the clamps and slide the PV-module in the clamps and the safety hook. Fasten the clamps with the Allen screw.





PLEASE FOLLOW THESE INSTRUCTIONS!

We recommend you read the following information carefully because it is very important in dealing with the product. Please inform yourself about the safety requirements of other system components.

SAFETY INFORMATIONS AND WARNINGS

The pitched roof mounting system AS 2.1 is only designed to hold PV modules. Any other use is considered improper. Proper use also means adhering to the contents of this installation manual. ALUMERO accepts no responsibility for damage incurred as a result of noncompliance with the installation instructions or of using the product improperly.

- + ALUMERO accepts no responsibility for performance degradation or damage to the module of any kind whatsoever.

When any work is done on the PV installation, these instructions should be followed exactly. The modules may only be installed, started, serviced and repaired by people who are properly trained and authorised.

Please observe the applicable regulations and safety advice.

These accident prevention guidelines must be adhered to:

- + BGV A 1 – General rules
- + BGV A 3 – Electrical installations and equipment
- + BGV C 22 – Construction work (individual protective equipment to prevent falls)
- + BGV D 36 – Ladders and steps
- + Trade association rules for health and safety at work BGR 203 (working on roofs) and DIN EN 516 (equipment for accessing roofs)
- + Work clothes and industrial safety regulations pursuant to the rules of the trade association

The following DIN norms must be complied with:

- + DIN 18299 – General rules for all types of building work
- + DIN 18338 – Roof covering and roof sealing work
- + DIN 18360 – Steelwork and locksmith work
- + DIN 4102 – Fire behaviour of building materials and structural elements



Work on ALUMERO systems may only be carried out by authorised persons. The operator of the installation has the following safety obligations:



- + We assume, that min. once per year an inspection and service of the installed components and the roof cladding will be carried out. At this the following points have to be reviewed at least:
 - » all mechanical connections on their correct fitting and stability
 - » the position of the generator on the roof and the complete system itself regarding deformations
 - » all pv-modules and cables to their intactness
- + The mounting frame may only be installed by people with the appropriate training, skills and knowledge of mechanics.
- + The operator must ensure that contracted persons are able to judge the tasks assigned to them and recognize any potential dangers.
- + The operator must ensure that the installation instructions are available during installation. The installation instructions are an integral part of the product.
- + The operator must ensure that the installation instructions and particularly the warnings were read and understood by the engaged personnel prior to installation.
- + The local health and safety at work regulations and codes of practice must be observed.
- + Suitable lifting equipment and ladders are to be used for installation. No freestanding ladders may be used.
- + It is necessary to arrange for a qualified construction engineer to assess the building's existing static loading characteristics with regard to the additional loads of a PV system.
- + Any general load reduction measures specified by ALUMERO (e.g. the need to clear snow, so as to limit the snow load) are to be observed.



WARRANTY / PRODUCT LIABILITY (EXCLUSION)

The information on sizes provided in these instructions is only information from daily practice. We can provide binding structural frame installation data with the program SOLAR.PRO.TOOL.

As installer, you are responsible for the precise execution of the installation. ALUMERO is not liable for the size information contained in the system offers.



As installer, you are responsible for the mechanical durability of the interface connections mounted on the building's structure. In particular, this includes that these are leak-tight. The components of ALUMERO Systematic Solutions GmbH are designed for the expected loads and they are in compliance with the effective state of the art. For this purpose, you have to specify in writing all general technical framework conditions in the project documentation form (information on the support structure, snow load zone, building heights, wind loads, etc.) when requesting information/ordering from ALUMERO Systematic Solutions GmbH.

ALUMERO Systematic Solutions GmbH is not liable if the installed components are not properly handled.

Any use close to the sea is excluded because of the increased risk of corrosion.

If the components are properly handled, the sizes comply with the structural framework conditions and normal environmental conditions and normal conditions of the surroundings, and then ALUMERO Systematic Solutions GmbH grants a 2-year product warranty on the service life and durability of the frame system. This applies within the framework of generally prevalent weather and environmental conditions.

Warranty on material and workmanship: ALUMERO Systematic Solutions GmbH grants a warranty of 10 years on material and workmanship. For additional information, please consult the Warranty Terms and Conditions.



NOTES ON ELECTRICAL INSTALLATION

Only if you are a qualified electrician, may you perform any electrical work. The applicable DIN standards, VDE regulations, VDEW guidelines, VDN guidelines, accident prevention regulations and the regulations of the local utility company are authoritative in this regard.

- + DIN VDE 0100 (Installation of high voltage systems with nominal voltages up to 1000 V)
- + VDEW Guideline for parallel operation of private power generation systems with the low voltage grid of the utility company
- + VDI 6012 sheet 2 guideline for local energy systems in buildings - Photovoltaic
- + Leaflet on the VDEW guideline "Private power generation systems in the low-voltage grid"
- + VDN-guideline "Private power generation systems in the low-voltage grid"
- + DIN/VDE provisions, DIN/VDE 0100 "Building high-voltage systems with operational voltages of up to 1000 V"; in particular VDE 0100 part 410 "Protection against direct and indirect contact (DC voltage > 120 V, < 1000 V DC voltage) and the "accident prevention regulation of the industrial trade cooperative associations" VBG4 "Electrical installations and equipment"
- + DIN VDE 0100-540 Selection and setup – grounding, protective conductor and potential equalisation conductor
- + VDE 0185 Setting up a lightning protection system and VDS 2010



IMPORTANT NOTES

Solar modules produce electricity as soon as they are subjected to light and are always energised. Although touch protection is provided in the form of the fully insulated plug contacts, you must take be aware of the following when handling solar modules:

- + Do not insert any conductive parts into the sockets and connectors
- + Do not install solar modules and cables with wet sockets and connectors
- + Perform any work on cabling with extreme caution
- + Do not perform any electrical installation work in damp conditions
- + Even if there is only little light, very high direct voltages arise at the series connection of modules, which can be life life-threatening in case of direct contact. Especially the danger of secondary damage in case of electric shocks has to be considered



Even when the unit is switched off, high contact voltages may still be present inside the inverter:

- + Be particularly careful when working on the inverter and the cables
- + After switching off the inverter, it is essential to wait for the time interval specified by the manufacturer before beginning any further work to allow the high-voltage components to discharge
- + Please also observe the installation guidelines provided by the inverter manufacturer



When breaking a connected string of modules (e.g. when disconnecting the DC line from the inverter under load), a lethally strong arc can occur:

- + Never disconnect the solar generator from the inverter as long as it is connected to the mains.

NORMS AND GUIDELINES

All of the norms and guidelines listed here are published for and applicable to Germany. They are to be complied with in their current version. Outside of Germany, please also observe the corresponding national norms and guidelines.

NOTES ON FRAME INSTALLATION



When mounting on a roof, you must adhere to the applicable structural engineering rules, in particular the requirements set out in the DIN norms and in the rules and regulations of the German roofing trade.

- + Check to see if all screw connections are tightened correctly
- + Keep to the specified torques
- + Notwithstanding a verifiable static equilibrium, it is your responsibility to ensure before every installation that the product meets the local static requirements pursuant to DIN EN 1991
 - » Teil 1-1: Weight and surface loads of building materials, components and support materials
 - » Teil 1-3: Snow and ice load
 - » Teil 1-4: Wind loads
- + DIN EN 1991 "Actions on structures" and all corresponding National Annex
- + DIN EN 1990 „Basis of structural design" and all corresponding National Annex
- + The mounting frame is designed in accordance with DIN EN 1993 "Aluminum constructions under predominantly static loading" and DIN 1999 "Steel structures; design and construction"
- + Ensure that the substructure, support structure and other affected layers (such as an insulation layer) have adequate load capacity (based on dimensions, condition and suitable material properties)
- + Make sure that the runoff of rainwater is not impeded
- + Consider structural aspects (e.g. possible condensation if insulation layers are penetrated).



PRODUCT LIABILITY

Technical documentation is part of the project to be supplied. ALUMERO Systematic Solutions GmbH accepts no responsibility for damage incurred as a result of noncompliance with the installation instructions or of using products improperly. Furthermore, the general terms and conditions available at www.alumero.at also apply.



WWW.ALUMERO.AT

CONGRATULATIONS,
WELL DONE!



CONTACT HEADQUARTER

ALUMERO Systematic Solutions GmbH
Sonnenweg 1-2
5164 Seeham - Österreich
T +43 6217 / 68 41-0
F +43 6217 / 68 41-41
solar@alumero.at
www.alumero.at