

Mounting Instructions

Agri PV



I. GENERAL INFORMATION AND NOTES	1
INTENDED USE	1
VARIANTS	1
MAIN COMPONENTS WITH ILLUSTRATION	2
RECOMMENDED TOOLS AND AUXILIARY EQUIPMENT	3
II. MOUNTING	4
STEP 1. FOUNDATION	4
Step 1.1. <i>Pile driving foundation</i>	4
MARK THE COURSE OF THE FENCE ROWS WITH THE HELP OF THE GUIDE.....	4
THE GUIDELINE SHOULD BE SET TO AN AVERAGE HEIGHT OF THE GUIDELINE: 600MM (ORIENTATION GUIDE FOR THE DRIVEN PILES)	4
THE GRID DIMENSION OF THE TWO DRIVEN PILES CAN BE TAKEN FROM THE ASSEMBLY DRAWING.	4
Step 1.2. <i>Foundation by setting in concrete (alternative to 1.1)</i>	7
STEP 2. ASSEMBLY FRAME	8
Step 2.1. <i>Fixing frame post</i>	8
Step 2.2. <i>Grounding</i>	9
STEP 3. ASSEMBLY CROSSBAR.....	10
Step 3.1. <i>Preparation of the lower crossbar</i>	10
Step 3.2. <i>Assembly of the lower crossbar</i>	11
Step 3.3. <i>Assembly of the middle crossbar</i>	12
Step 3.4. <i>Assembly of the upper crossbar</i>	13
STEP 4. INSERTING THE PV MODULES	14
Step 4.1. <i>Mounting the lower module</i>	14
Step 4.2. <i>Insert the upper module</i>	15
STEP 5. CABLING.....	16
Step 5.1. <i>Cabling half-cell modules</i>	16
Step 5.2. <i>Cabling full-cell modules</i>	17
Step 5.3. <i>Cable protection</i>	17
STEP 6. MOUNTING COVER PLATE (OPTIONAL).....	18
STEP 7. MOUNTING THE INVERTER SUPPORT (OPTIONAL)	19
Step 7.1. <i>Fasten profiles</i>	19
Step 7.2. <i>Drilling holes in square profile</i>	19
Step 7.3. <i>Screw profiles</i>	20
Step 7.4. <i>Attach C-rails</i>	21
Step 7.5. <i>Fix rails</i>	21
Step 7.6. <i>Attach mounting plate</i>	22
Step 7.7. <i>Attach inverter</i>	23
Step 7.8. <i>Bracket cover plate</i>	23
Step 7.9. <i>Mounting cover plate</i>	24
III. APPENDIX.....	25
ASSEMBLY DRAWING EXAMPLE: OUTER ROW/ SOLAR FENCE.....	25
ASSEMBLY DRAWING EXAMPLE: INNER ROW	26
HAZARAD ANALYSIS.....	27

I. General Information and Notes

Dear Sir or Madam, you have purchased a quality product from Next2Sun. Please read these installation instructions carefully before you start the installation. We would like to point out that we cannot accept any liability for consequential damage if you install the product yourself.

Intended Use

The Next2Sun Agri-PV mounting system has been developed exclusively for the mounting of photovoltaic modules and Next2Sun-certified additional components.

The system may only be used for this purpose. Next2Sun assumes no liability for improper application, use, maintenance, or installation. Only module types supplied by Next2Sun or approved in individual cases may be used.

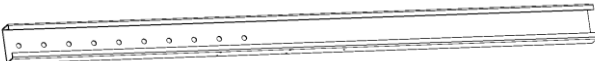



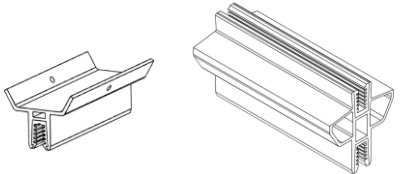

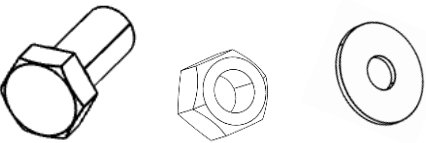

Variants

These installation instructions refer to the Agri-PV System GKI, or the double-row solar fence Standard, as an example. The assembly of other systems is analogous. However, the components used may differ in length, material thickness, or other specifications such as the number of connecting elements.

The exact configuration can be found in the project-specific datasheet, post plan, and assembly drawing.

Examples of the standard system, as well as an explanation, can be found in the appendix.

Main Components with Illustration

Description	Figure
Driven Pile	
Frame Post	
Crossbar	
Cover Plate	
Module Holder: Bottom/ Top Center	
Bolt Fastening: Bolt: M6 x 16 with locking teeth Nut: M6 with locking teeth	
Post Mounting: Bolt: M16 x M35 Nut: M16 Washer: D17	
Fastening Module Molder: Blind rivet: 4x12mm	

Recommended Tools and Auxiliary Equipment

- ✓ Impact wrench/wrench width across flats 10mm / 24mm
- ✓ Cordless drill incl. 4mm metal drill bit
- ✓ Riveting pliers (manual or battery-operated)
- ✓ (Magnetic) spirit level
- ✓ Rubber mallet
- ✓ Lubricant (for easier insertion of the solar modules into the module socket)
- ✓ Hydraulic pile driver incl. suitable pile driving head and routing
- ✓ Suitable and safe work equipment for elevated work (platform or similar)

II. Mounting

Step 1. Foundation

Before piling, check that the selected and prepared driven pile corresponds in length and cross-section to the post plan and assembly drawing.



Step 1.1. Pile driving foundation

Required materials:

The guideline, measuring tape, spirit level, marking aids, hydraulic pile driver incl. pile guide.

To avoid difficulties during subsequent frame mounting, pile driving should be carried out carefully and accurately. Otherwise, the time gained by rapid ramming will be lost again by time-consuming corrective measures.

Step 1.1.1. Prepare pile driving

Mark the course of the fence rows with the help of the guide.

The guideline should be set to an average height of the guideline: 600mm (orientation guide for the driven piles)

The grid dimension of the two driven piles can be taken from the assembly drawing.

Module Length	Grid Dimension
>2050mm	2280mm
<2050mm	2150mm

Note:

Check the perpendicular alignment of the pile several times during driving!

Subsequent correction of the fully driven pile, by pressure or tension, is not permitted!



Next2Sun Practical tip:

You can easily make a gauge for the post spacing from a square timber or similar.

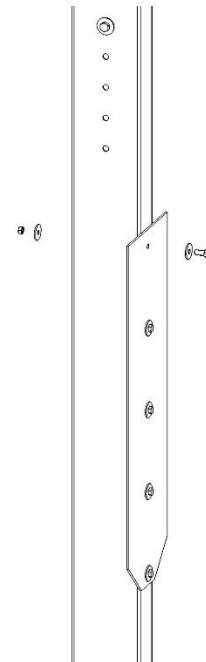
Step 1.1.2. Attach additional plate

For specific projects, it may be necessary to attach an additional plate to certain driven piles according to the post plan/assembly drawing.

An additional plate may have to be attached to certain piles according to the post plan/assembly drawing.

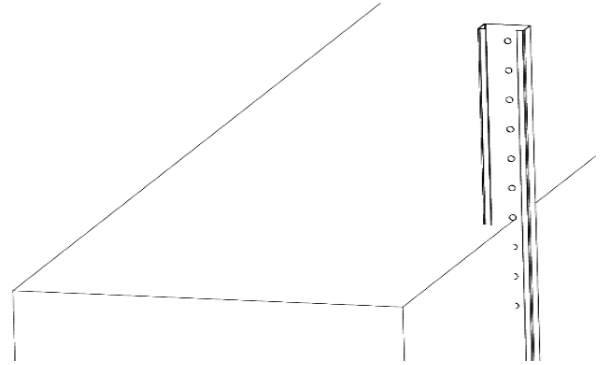
The additional plate increases the resistance surface in the ground and enables the foundation even in difficult ground conditions.

- ✓ Position the additional plate on the driven pile according to the hole pattern
- ✓ Fixing with five M12x25mm screw sets
- ✓ Before tightening the screws, apply a high-strength screw-locking agent
- ✓ Tightening torque: 110Nm



Step 1.1.3. Drive the driving pile into the ground

- ✓ Align the open profile side to the south if possible (minimize shading)
- ✓ Align hole pattern upwards
- ✓ Drive the pile into the ground using a hydraulic ram until the orientation guide is reached



Note:

If a driven pile encounters an insurmountable obstacle that prevents complete driving, the driven pile can be shortened. This is permissible if the driving depth is sufficient for the hole pattern to permit installation of the frame pile and a tensile test confirms that the forces prevailing according to the design can be transferred.

Step 1.2. Foundation by setting in concrete (alternative to 1.1)

As an alternative foundation variant, a concrete foundation is also used for the Agri-PV or solar fence. Here, the driven post is concreted into a point foundation.

Required materials:

Concrete (dry mixed), earth auger (hand tool or excavator), shovel, spirit level

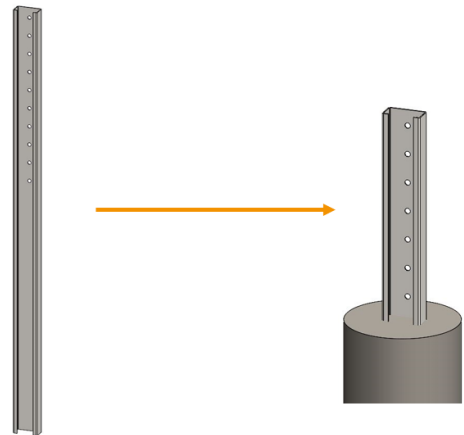
Step 1.2.1. Preparation of the holes

With the help of suitable tools (auger/excavator), holes are dug at least 40cm wide and at least 160cm deep

If drilling to this depth is not possible, the lack of embedment depth must be compensated by a larger diameter

Step 1.2.2. Set driving pile in concrete

- ✓ Align the pile in the foundation plumb in all directions and allow it to harden
- ✓ Do not change the position (fix if necessary)



Step 2. Assembly Frame

The next two STEP involves assembling the frame post and the bottom two crossbars. Once the frame post is attached to the driven pile, it must be stiffened by the crossbars. Otherwise, the frame post may start to vibrate in strong winds.

Before post-installation, ensure that the selected frame post matches the post plan/assembly drawing in length and material thickness. Furthermore, the number of screw fittings must also



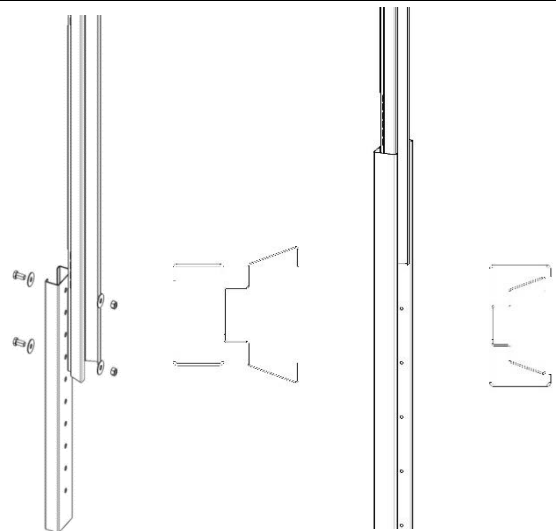
correspond to the assembly drawing.

Required materials:

Frame post, screw set M16-hot-dip galvanized, impact wrench & wrench (SW24mm), spirit level

Step 2.1. Fixing frame post

- ✓ The frame post is loosely screwed to the driven post using the M16 screw set (screw, nut strength class 10.9 DIN 933, hot-dip galvanized & two washers DIN 9021)
- ✓ Use a spirit level to align frame posts plumb in all directions
- ✓ Opening of the frame post as far as possible towards the south
- ✓ Tighten screws with 310Nm



Note:

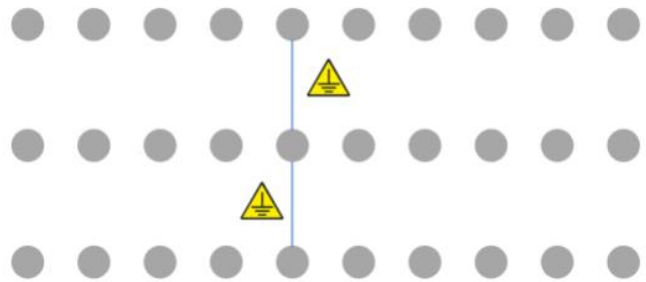
Transverse to the row direction, the rack system offers a compensation possibility of approx. 1° using a slotted hole on the rack post.

In the direction of the row, an incorrect position of the driving pile can be corrected by inserting additional shims (max. 2 pieces).

Step 2.2. Grounding

- ✓ Using ground clamp and 10mm² galvanized ground wire
- ✓ **Screw material must be of the same material Screw, nut strength class (10.9 DIN 933, hot dip galvanized & two washers DIN 9021)**
- ✓ The ground wire must be connected to every 10th rack post of the previous or the following row

For the connection, please refer to the grounding concept



Note:

With the supplied template, the posts must also be color-coded with the following symbol. For the connection of the grounding, please refer to the project-related grounding concept.



Step 3. Assembly Crossbar

Before assembling the crossbars, make sure that the crossbar provided corresponds to the assembly drawing in each case. The material thickness is the main criterion here.

Furthermore, the number of module holders per transom must be checked.

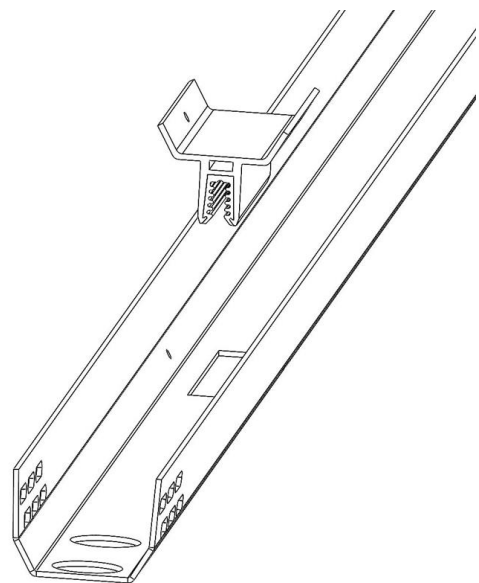
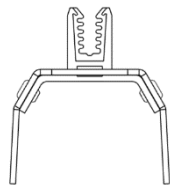


Required materials:

Crossbars, M6 screw sets, cable grommet, module holder, rivets, riveting pliers, drill with 4mm drill bit

Step 3.1. Preparation of the lower crossbar

- ✓ Insert the module holder from the open side of the crossbar
- ✓ Fasten the module holder with two rivets each
- ✓ Check for the correct seating: The module holder must be in positive contact with the profile:



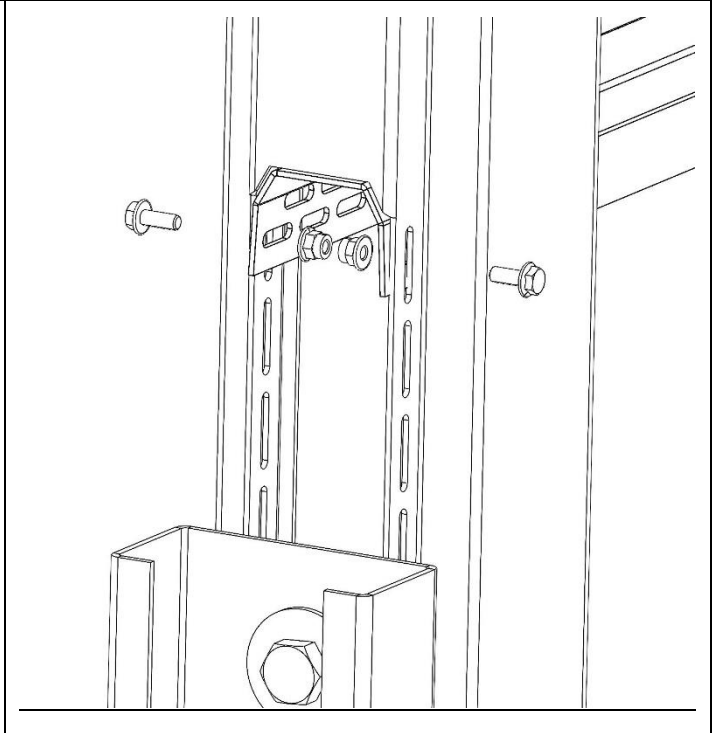
Note:

If the holes of the crossbar and the module holder do not match, they can be re-drilled with a 4 mm drill bit. For this purpose, the correct fit of the module holders must be ensured in advance.

Step 3.2. Assembly of the lower crossbar

As far as the terrain conditions allow, an arrangement of the crossbars as high as possible is to be aimed at avoiding shading as well as unfavorable projections of the post.

- ✓ Insert the prepared crossbar through the post opening with the open profile side facing downwards
- ✓ Align the crossbar horizontally using a spirit level
- ✓ Fasten cross ledgers on both sides with M6x16 flange screws and M6 flange nuts. Tightening torque: **5Nm**
- ✓ If necessary, secure the screw connection with shear nuts

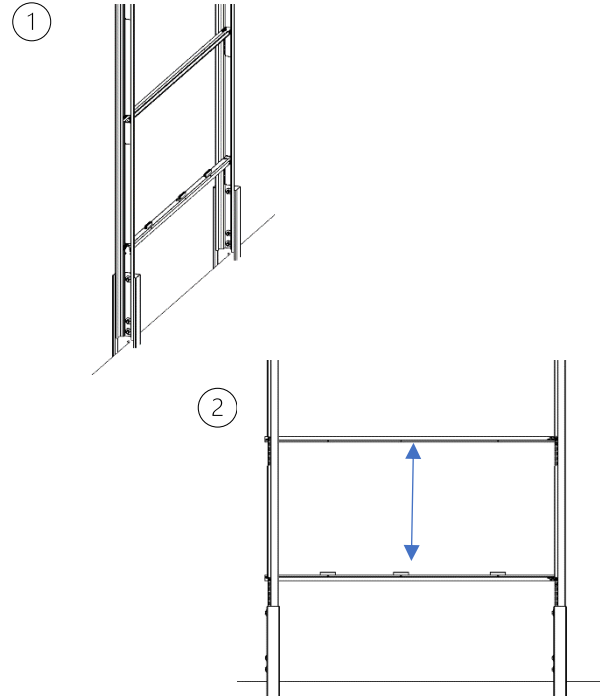


Note:

With this connection, the potential equalization between the crossbar and the frame post is ensured by the locking toothing. This is a secure connection. The specified tightening torque must be observed!

Step 3.3. Assembly of the middle crossbar

- ✓ Insert the crossbar (without module holder) with the open profile side facing up through the middle profile opening on the frame post
- ✓ The distance between the two crossbars depends on the module type and is calculated from module **width + 19mm** (this value must be validated on the first element)
- ✓ Align the crossbars horizontally and then fasten them with the M6 screw set
- ✓ Tightening torque: **5Nm**



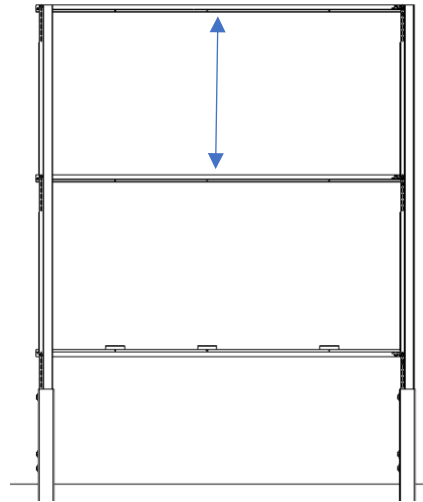
Next2Sun Practical tip:

Gauges for the spacing of the crossbars can easily be made using squared timber or similar. This makes alignment much easier on the follow-on elements.



Step 3.4. Assembly of the upper crossbar

- ✓ Insert the crossbar (without module holder) with the open profile side facing upwards through the upper profile opening on the frame post
- ✓ The distance between the two crossbars depends on the module type and is calculated from module width - 13mm (this value must be validated on the first element)
- ✓ Align the crossbars horizontally and then fasten them with M6 screw fittings
- ✓ Tightening torque: **5Nm**



Step 4. Inserting the PV Modules

Step 4.1. Mounting the lower module

When mounting the modules, pay attention to the orientation of the modules. The junction boxes of the respective string must always be oriented in the same way.

Due to the lower power of the rear side, the alignment of the rear side can be used to specifically adjust or balance the power peaks in the morning and evening hours (example: lower string: all junction boxes point to the east, upper string: all junction boxes point to the west).

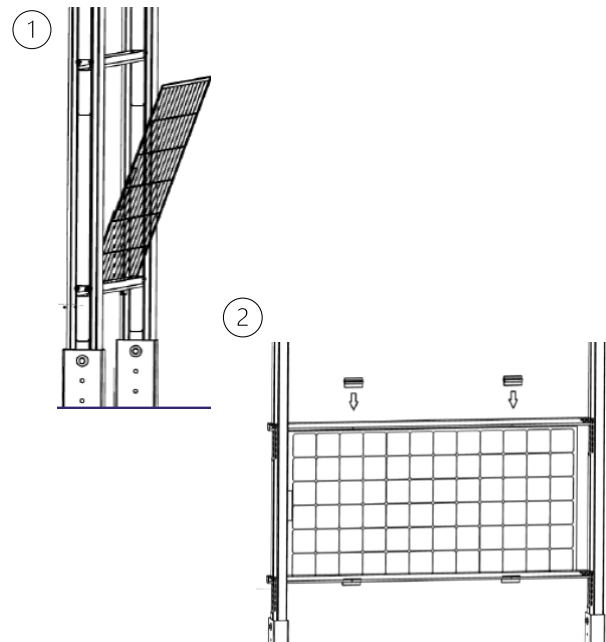
For full cells, the side with the junction box is inserted into the open rack post side and this arrangement is continued through the entire row.

For half-cells, one + junction box and one - junction box alternately point upwards. one + junction box and one - junction box alternately point upwards.

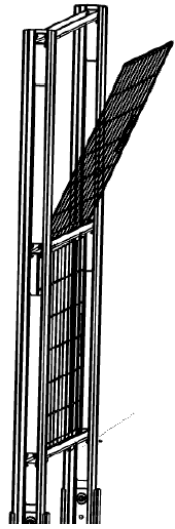
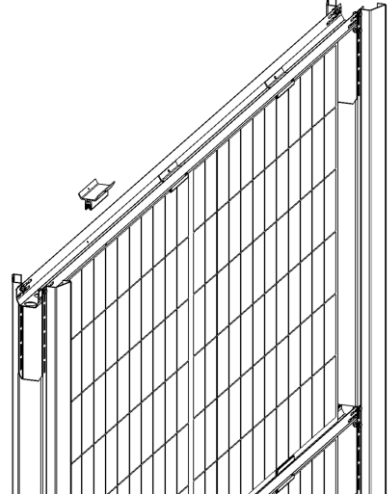
Required materials:

Bifacial PV modules, module holder, lubricant

- ✓ Lubricate the EPDM insert of the module holder
- ✓ Make sure that the module is oriented according to the appendix.
- ✓ Insert the module into the lower module holder at a slight angle
- ✓ Check the correct fit
- ✓ Insert the middle module holder from above through the push-through opening



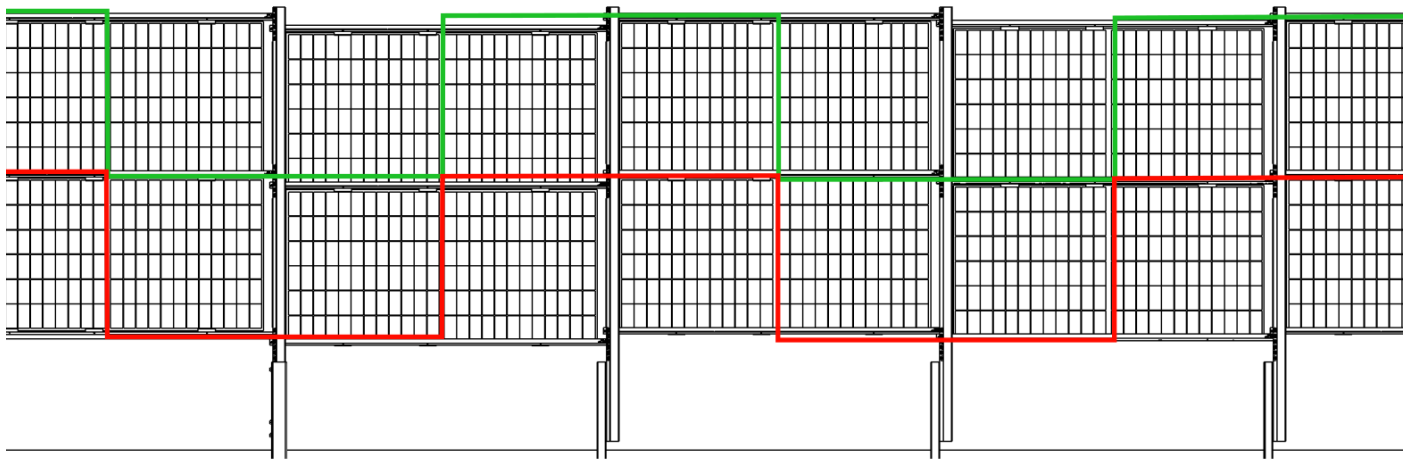
Step 4.2. Insert the upper module

<ul style="list-style-type: none"> ✓ Apply lubricant to the EPDM insert of the middle module holders ✓ Make sure that the module is oriented according to the appendix ✓ Insert the module into the middle module holders at a slight angle ✓ Check the correct fit 	
<ul style="list-style-type: none"> ✓ Lubricate the EPDM insert of the upper module holder ✓ Insert the module holder from above through the through hole ✓ Rivet upper module holders with two blind rivets 4x12mm each 	

Step 5. Cabling

Step 5.1. Cabling half-cell modules

When cabling the modules with a junction box in the middle, it is necessary to think about the alternate arrangement of the modules (see STEP 4.1).

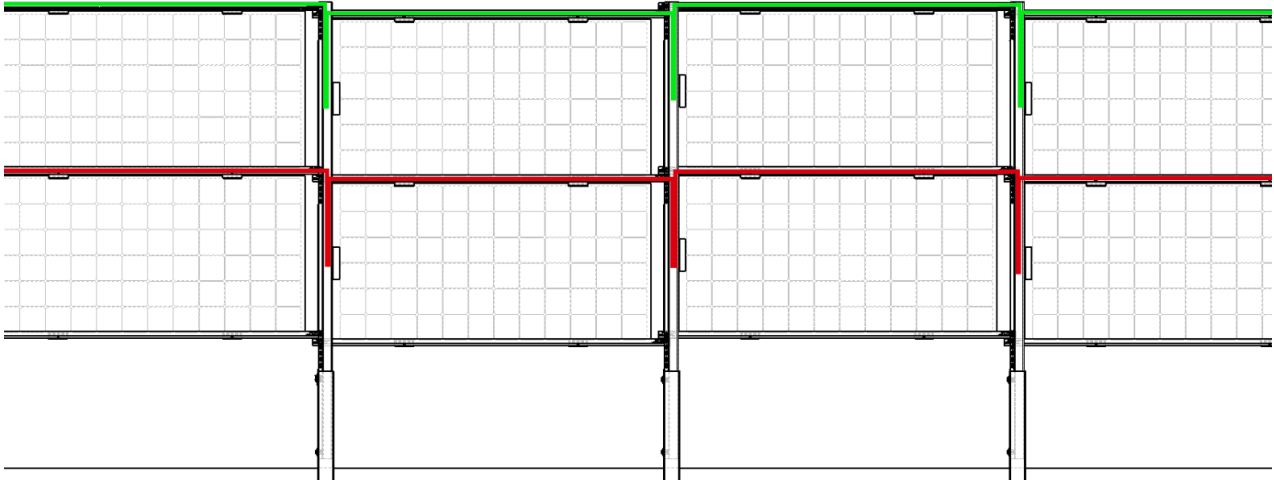


For supplied modules, the cable length is sufficient for the direct connection of two modules according to the figure (see above). A female plug is connected to the male counterpart of the next module.

String cables that are not protected by a profile and/or exposed to UV radiation must be protected with UV-resistant cable protection sleeves/corrugated tubes. This protection shall be placed so that it maintains its original position. In addition, the open end must be fixed to the PV module with a suitable adhesive.

The string cables to the inverter can be conveniently routed in the upper crossbar and optionally protected with a cover plate.

Step 5.2. Cabling full-cell modules



In the case of full cells, the junction box is usually located on the short side of the module. The junction box must therefore be oriented towards the north if possible in order to minimize shading.

The cabling of the modules is done according to the above diagram.

String cables that are not protected by a profile and/or exposed to UV radiation must be protected with UV-resistant cable protection sleeves/corrugated tubes. This protection shall be placed so that it maintains its original position. In addition, the open end must be fixed to the PV module with a suitable adhesive.

Step 5.3. Cable protection

The solar cables must be additionally protected at all unprotected points with a separable cable protection hose. This cable protection must be attached from the junction boxes to the entry into a closed profile. It must be ensured that the hose cannot be displaced when strongly tightened, therefore a power adhesive with extremely high initial adhesion and final strength is required. The adhesive is applied to the cable and then the divisible hose is attached to the adhesive, if necessary apply some more power adhesive to both ends of the divisible hose and then allow it to cure.

We recommend the power adhesive Hybrid from Förch with an article number: 6880 18 310

The material compatibility of other adhesives to the solar cable must be checked.

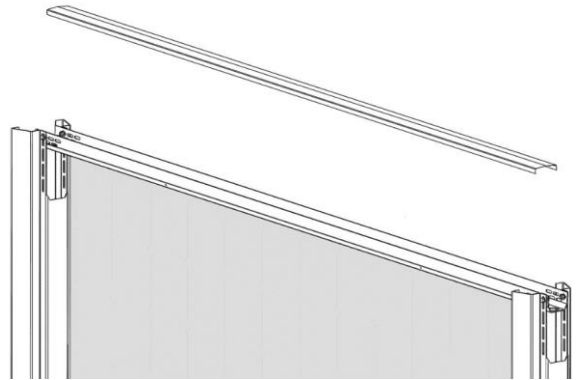
As a divisible hose, we use the one from the company Fränkische CO-FLEX PP-UV Type: 10 with the article number: 38401002

Step 6. Mounting Cover Plate (Optional)

Required materials:

Cover plate, cartridge press, adhesive (e.g. Sikaflex), rubber mallet

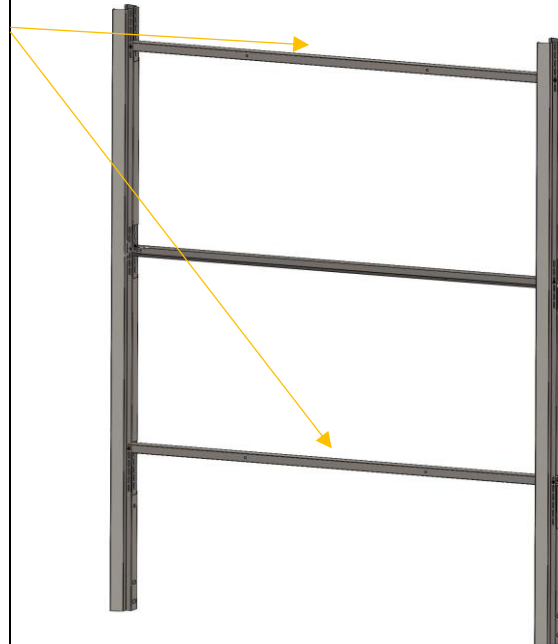
- ✓ Apply 4-6 small dots of adhesive to the cover plate
- ✓ Position in the center of the crossbar and press on by hand
- ✓ If necessary, help with light blows of a rubber mallet



Step 7. Mounting the Inverter Support (Optional)

Step 7.1. Fasten profiles

- ✓ Insert two square profiles (60x4x3mm) as upper and lower crossbars
- ✓ Position the lower crossbar as far up as possible
- ✓ Insert crossbar B150 in the middle and align it centrally
- ✓ Align all profiles horizontally
- ✓ Mark the position of the holes on the two square profiles



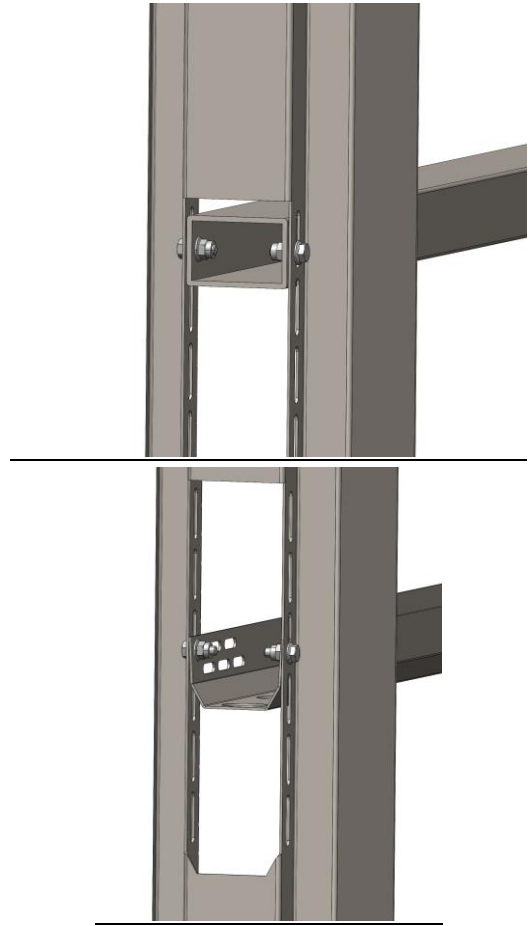
Step 7.2. Drilling holes in square profile

Guide the square profiles through the upper profile opening on the post and mark the position of the holes (right and left).

Remove the profiles again and drill a hole at the markings using a 6.5mm drill bit.

Step 7.3. Screw profiles

- ✓ Use the prepared square profile through the profile opening and screw it with M6 screw fittings.
- ✓ Guide the middle crossbar through the center of the opening and screw it in place as well
- ✓ The square profiles should be flush with the frame post



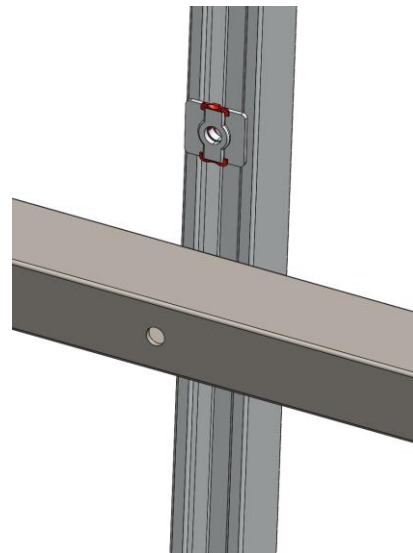
Step 7.4. Attach C-rails

- ✓ Align C-rails (Würth C41/41) vertically
- ✓ The intermediate space should be divided into three approximately equal areas
- ✓ Shorten rails flush with upper/lower crossbars

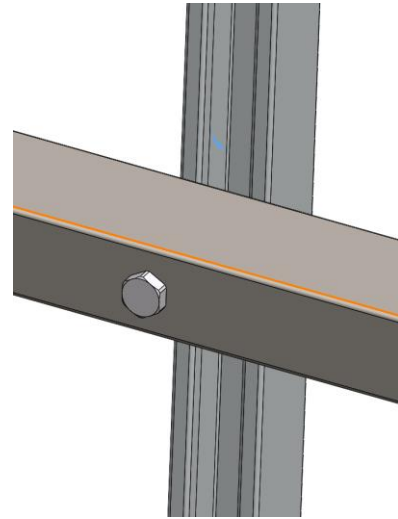


Step 7.5. Fix rails

- ✓ Drill holes with a hole spacing of 924mm using a drill bit of 8.5mm

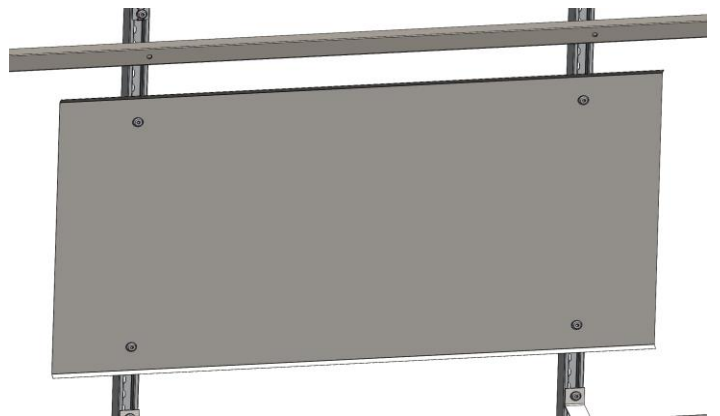


fix the rails with Würth Varifix M10 and screws M10x80mm.



Step 7.6. Attach mounting plate

- ✓ Drill holes (10.5 mm) in the mounting plate according to the grid.
- ✓ Then fasten the plate with Würth Varifix M10 and M10x30mm screws with a flattened semicircular head.



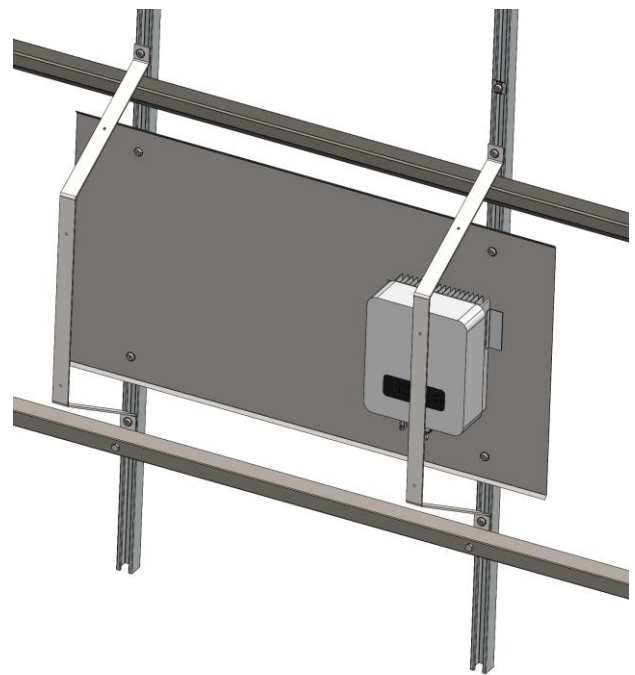
Step 7.7. Attach inverter

The mounting plate offers sufficient space to flexibly and conveniently install the inverter and cable routing.

To do this, proceed according to the inverter manufacturer's instructions.

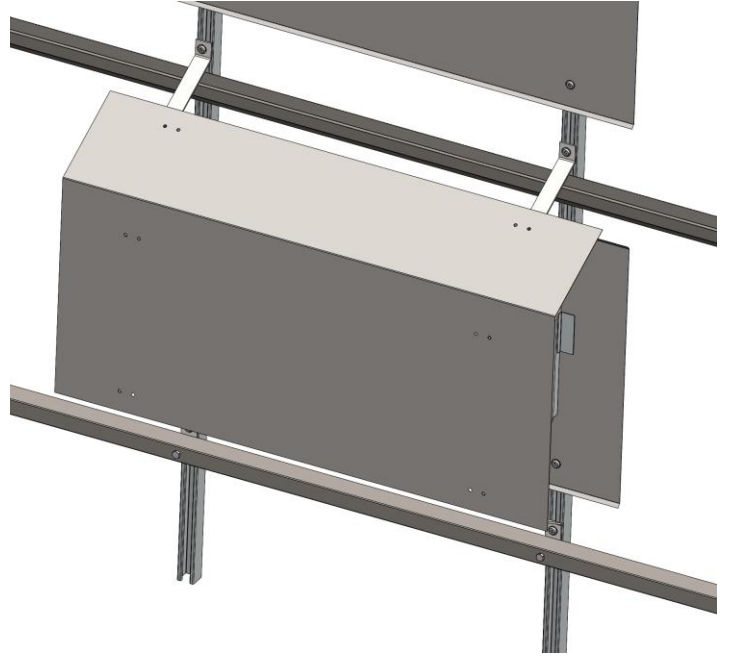
Step 7.8. Bracket cover plate

- ✓ Fasten the brackets to the C-rail using Varifix M10 and M10x30mm. When mounting two inverter places, the middle screw connections overlap



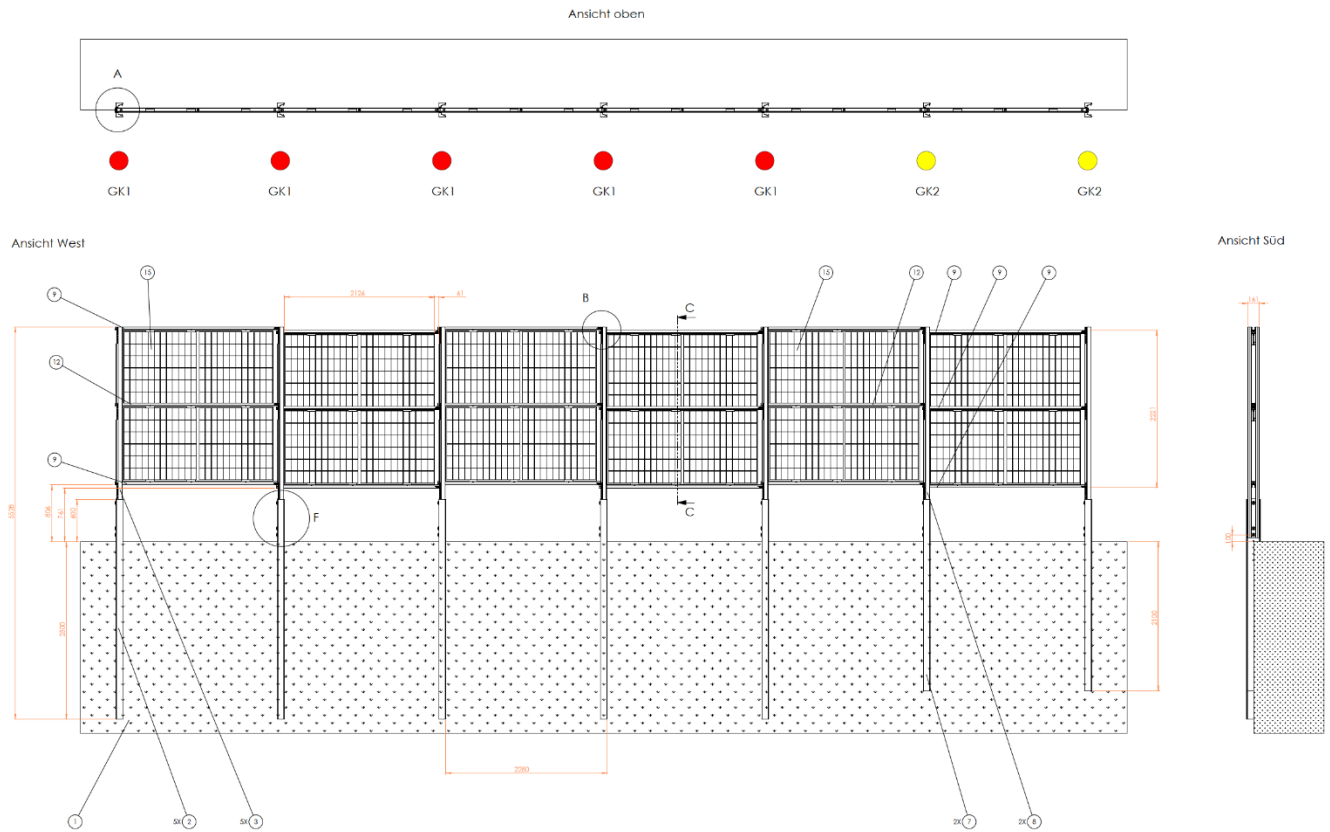
Step 7.9. Mounting cover plate

- ✓ Screw the cover plate with M6 screw fittings according to the hole pattern.

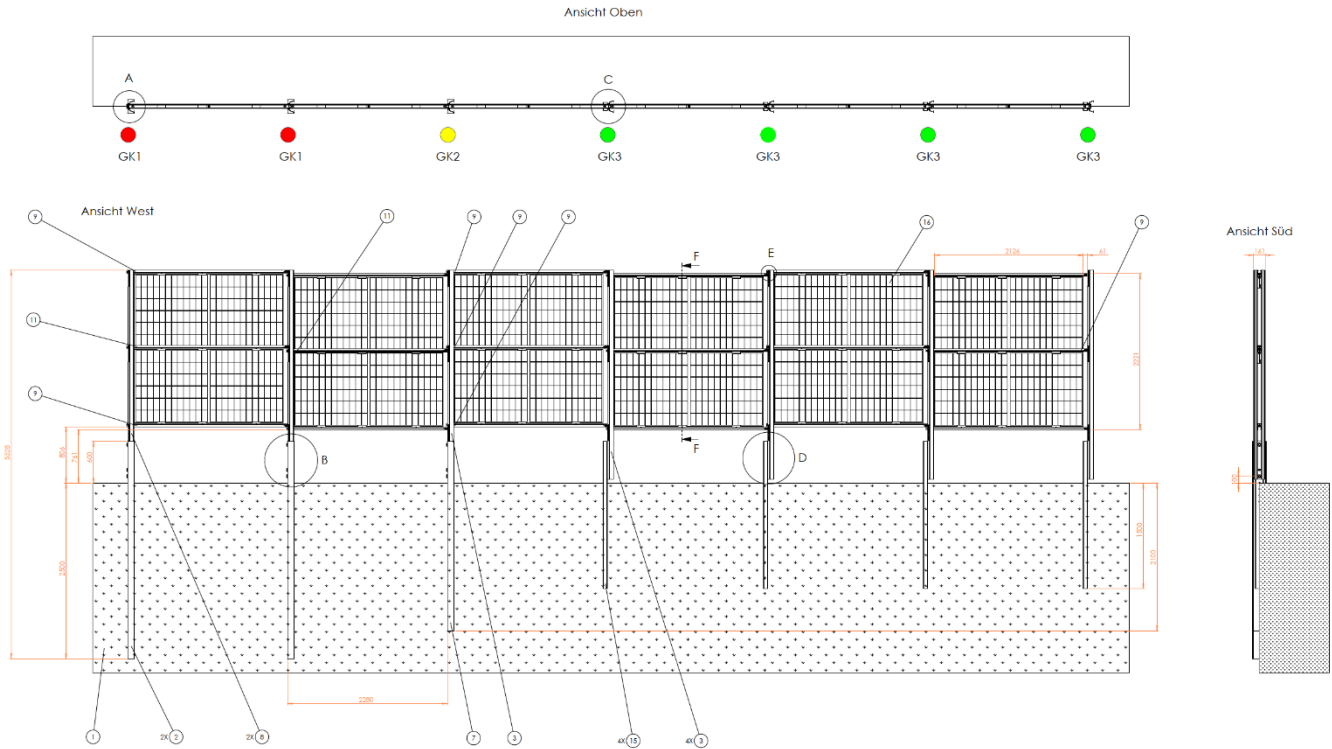


III. APPENDIX

Assembly drawing example: Outer row/ Solar fence



Assembly drawing example: Inner row



Hazard Analysis

Note:

When preparing a risk assessment for assembly, the following hazards in particular must be assumed:

Potential hazard	Measure
<p>Module crash: v.a. head injuries, foot injuries</p>	<p>Wearing suitable PPE (safety helmet, safety shoes)</p>
<p>Falling down of tools / attachments: especially head injuries, foot injuries</p>	<p>Wear suitable PPE (safety helmet, safety shoes)</p> <p>Safeguarding objects against falling down</p>
<p>Danger due to electric shock: Body flow, electric arc, startle reaction, burns, in the worst-case cardiac arrest</p>	<p>Prevent contact with live parts, do not work on damaged modules, cables or electrical connection elements,</p> <p>Electrical connection work may only be carried out by a qualified electrician; observe the increased risk of electric shock in damp conditions</p>
<p>Sharp edges: Cut injuries</p>	<p>Wear protective gloves (wearing gloves is not permitted when working with certain equipment),</p> <p>Avoid contact with sharp edges</p>
<p>Environmental influences: Sun, wind, precipitation, thunderstorms</p>	<p>Provide sufficient protection from the sun,</p> <p>Observe wind resistance, do not work during precipitation or thunderstorms</p>
<p>Traffic routes: Vehicles, components and tools lying around tools, stumbling</p>	<p>Wear warning clothing during vehicle traffic, place components and tools in a safe place, move with caution and foresight.</p>
<p>Stand: bad ground, unsafe stand</p>	<p>Ensure a safe footing when working, use aids such as suitable supports if necessary.</p>

<p>Work on ladder / platform: Danger of falling</p>	<p>Ensure that the ladder and platform are secure, if necessary suspend the platform securely, stand securely on the ladder and platform, if necessary use platform safety devices, observe the max. permissible load, only use tested work equipment.</p>
<p>Heavy loads: risk of injury from heavy lifting</p>	<p>Ensure appropriate number of persons when carrying loads, use aids if necessary.</p>
<p>Darkness and fog: poor visibility</p>	<p>When working in the dark, ensure adequate lighting, move in an adapted manner.</p>