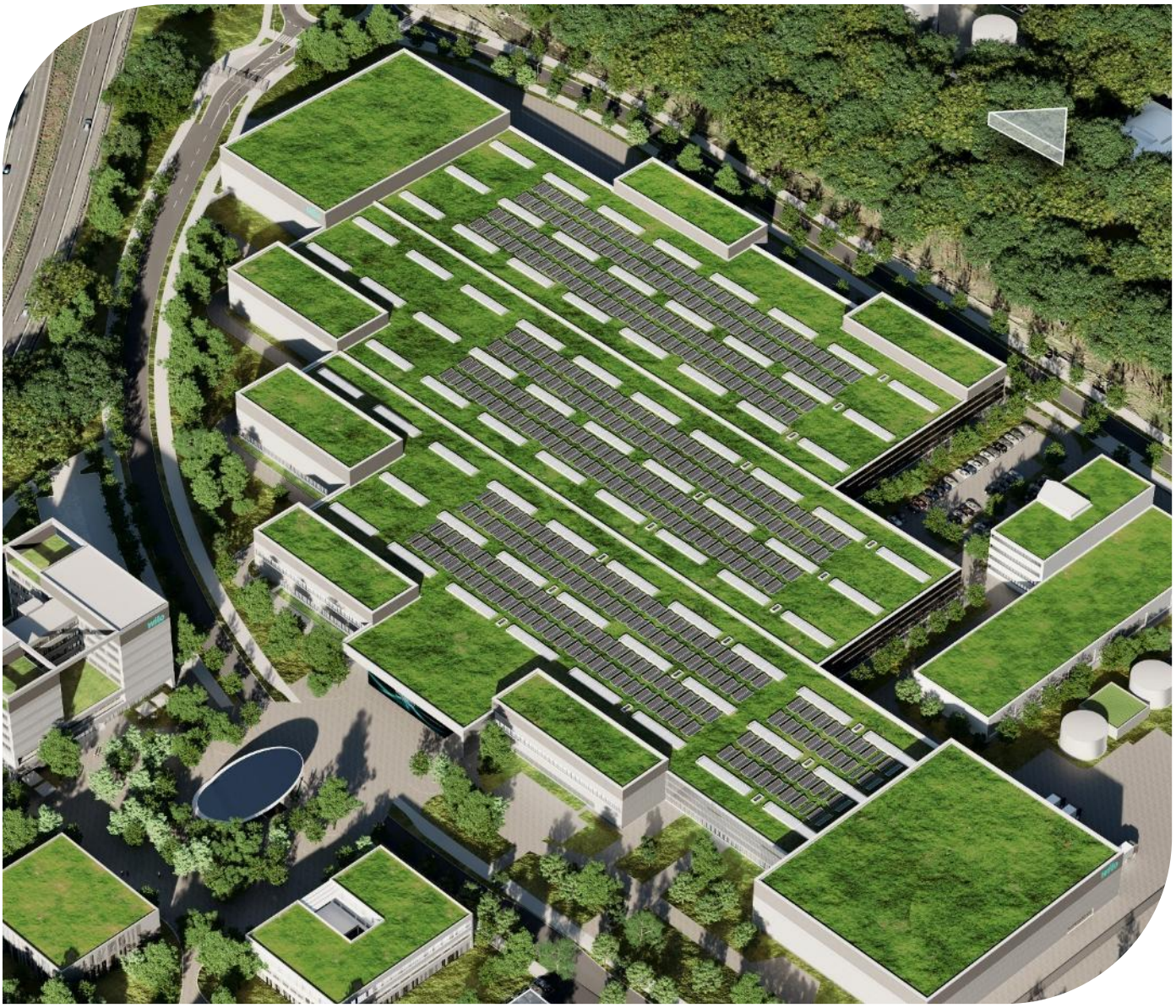
ASSEMBLY AND LAYING INSTRUCTIONS

Optigrün-Solar TOP



Assembly and installation instructions - Subject to technical changes and errors - Status 07/2025

ASSEMBLY AND LAYING INSTRUCTIONS – OPTIGRÜN-SOLAR TOP

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1. PRELIMINARY REMARKS

Before assembling and using the solar mounting system, it is essential that you read and understand this installation manual. This is the only way to ensure proper use. It also helps prevent damage to the product and personal injury.

Due to the variety of applications and installation methods, the solar mounting system must not be combined with other materials or manufacturers' products.

Provide this manual to the personnel responsible for assembly and use in a timely manner and ensure that they have taken note of the information.

If you have any questions, please contact Optigrün international AG.

Note:

The information in this publication is based on our current knowledge and experience. It does not constitute a legally binding assurance. The specific conditions of each application must always be considered, especially with regard to building physics, construction technology, and legal regulations.

2. OVERVIEW

Load-supported solar mount with 10° inclination for the retrofit, penetration-free installation of PV modules on green roofs.

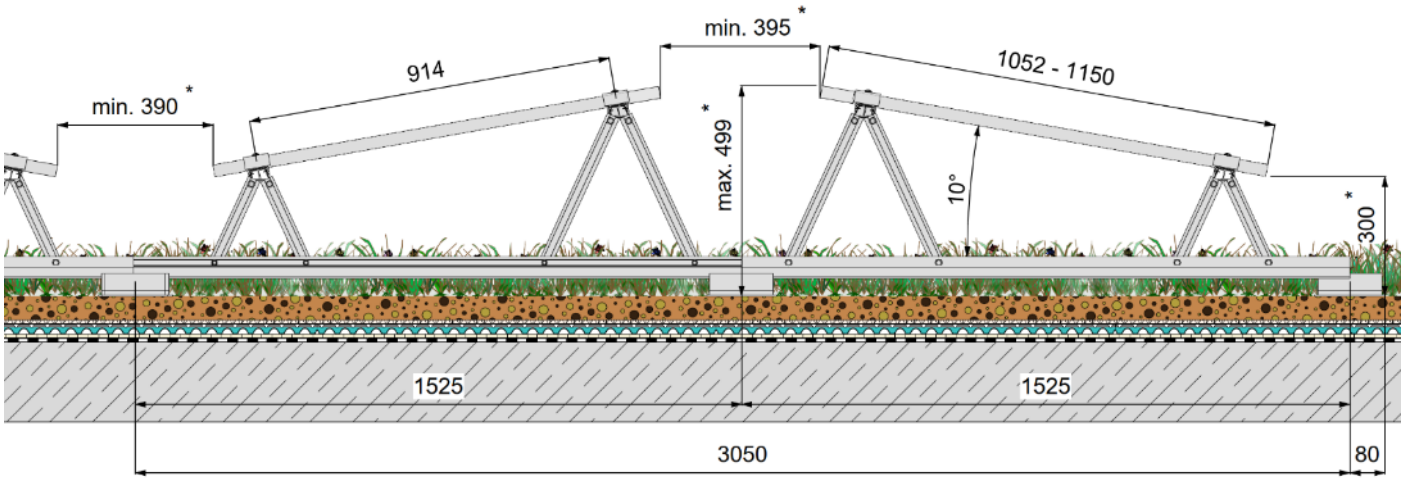
Can be used up to a roof pitch of 5°.

Alignment in east-west orientation.

2.1 Area of Application

- Subsequent installation of solar mounting systems on existing extensive green roofs
- Usable for roof slopes between 0° and 5°
- Distance from the bottom edge of the PV module to the substrate: approx. 30 cm
- Maintenance paths at the high and low points of the PV modules
- PV modules are installed in landscape orientation
- Clamping at the short side of the module frame
- Orientation in east-west direction
- Always installed as a double-module arrangement
- Ballasting can be done using paving stones (20x10x6 cm, 2.6 kg each) and paving slabs (40x40 cm, 14.4 kg each)

2.2 System sections and components



* Dimensions depend on module size and installation situation

2.2.1 Fundamental components

Optigrün-Solar TOP Basic Set	Optigrün-Solar TOP Foot	Optigrün-Solar TOP Module End Clamp Set
OR		
Optigrün-Solar TOP Module Centre Clamp Set	Optigrün-Solar TOP Module Centre Clamp Set	

2.2.2 Optional components

Optigrün-Solar TOP Ballast Clip	Optigrün-Solar TOP Ballast Profile	Optigrün-Solar TOP Cross Plate

2.2.3 Accessories

Optigrün-Solar TOP Mounting Template	Optigrün-Solar TOP Cable Duct	Optigrün-Solar TOP Adapter Cable Duct

3. GENERAL INFORMATION

3.1 General Notes

Attention!
Only the complete Optigrün system structure in accordance with the manufacturer's project-specific planning forms a tested and statically verified overall system.

For safety reasons, only original system components may be used. The use of damaged, used products or materials that have already been used elsewhere is prohibited.

Any replacement and any changes to the components or to the intended use lead to the loss of the warranty and liability by Optigrün international AG.

The statements provided in these assembly and laying instructions do not release the planners, the performing company and the user from inspecting and assessing the solar mounting system, the local conditions and other occurrences themselves under the given technical guidelines. Optigrün international AG is to be informed in the event of any doubts concerning the installation and/or use.

3.2 Transport

3.2.1 Delivery

Attention!
Site access must be ensured. A stable, load-bearing, level surface and sufficiently large storage area are required. The contractor is liable for damage and towing costs resulting from driving on an unsuitable surface at their instruction.

Please check the completeness and integrity of the delivered goods immediately upon delivery using the parts list on the enclosed delivery note:

Are the solar mounting brackets complete and undamaged?
Are all accessories according to the delivery note present and undamaged?

If there is (transport) damage, report this immediately to the carrier and have it confirmed by signing the delivery note. In addition, report the damage to Optigrün international AG.
If parts or the essential installation plan are missing, please report this to the Optigrün head office immediately.

Contact: Phone +49 7576 772-0
E-mail info@optigruen.de

3.2.2 Unloading

As the delivering vehicle does not usually have its own lifting device, the client is to provide a suitable method of unloading the components. This must be a forklift or a crane (with fork or loops) with a lifting capacity of at least 700 kg. Delivery by HGV with its own lifting device may be requested in advance. Suitable level, stable storage space is to be provided for the pallets.

Flat and load-bearing areas must be available for storing unloaded pallets.

Caution!

Caution of falling pallets or elements!

Always check that pallets are stable.

Never try to support a falling pallet.

Caution!

Beware of suspended loads!

There is a risk of injury due to suspended loads. Do not go underneath suspended loads!

Wear a safety helmet!

3.2.3 Opening and storage of the packaging units

Before opening the package units, it must be ensured that the structural components lie safely in layers and cannot fall off. When opening, it must be ensured that the elements are not damaged by tools or similar.

Protect from mechanical damage.

Protect cardboard packaging from moisture penetration by covering with a waterproof layer.

3.3 Handling and safety

Please be sure to respect the following information

Non-compliance can lead to injuries.

Caution!

Warning of injuries!

Always be careful when handling the components in order to avoid injuries.

There is a risk of injury as components may have sharp edges and ridges due to the manufacturing process. *

There is a risk of squashing or otherwise hurting fingers and other body parts.

Always wear protective clothes, such as safety shoes, cut-resistant gloves, safety goggles and long-sleeved clothes.

*this is not a deficiency.

Use the products according to these assembly and laying instructions.

Ensure that the products and the materials used meet the requirements (e.g. load-bearing capacity of the base).

Do not use any damaged, old or previously used products or materials.

Please be aware of any specific conditions or regulations in force on the individual site.

In situations that are not covered in these instructions and the valid standards and regulations, a written agreement with Optigrün international AG is required.

3.3.1 Handling rules for aluminium components

- Material compatibility with jointly processed materials is to be verified with regard to possible contact corrosion.
- In the event of contact with (salty) sea air, seawater, (dissolved) grit, chemicals and other special environmental influences, the use of the solar mounting system is to be checked.
- It should be ensured that the material of the solar mounting system and its associated structural components are not exposed to any aggressive leaching from other materials.
- Abrasive and/or aggressive detergents may not be used.

3.3.2 Risk of falling when working on unsecured roof surfaces

CAUTION!

Warning of danger of falling!

There is a risk of falling when working on unsecured roof surfaces.

Use fall protection.

When working on unsecured roof surfaces where there is a risk of falling, provide temporary fall protection for the installation personnel. For this purpose, use individual fall protection on the roof (PPE/PASgA) or collective fall protection (e.g. temporary guardrails).

The contractor is responsible for protecting the installation personnel from falling.

The standardised regulations of DIN EN 795 (personal protective equipment - anchorage devices), the Occupational Health and Safety Act (ArbSchG), the Workplace Ordinance (ArbstVO) and the specifications of the employers' liability insurance associations on occupational safety must be observed.

Before starting the installation work, prepare a risk assessment and, if necessary, obtain approval for the fall protection measures from the responsible health and safety coordinator.

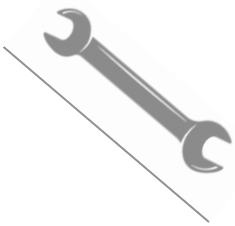
3.4 Tools and materials

Tools and materials required for the installation

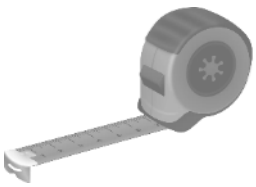
- Cordless screwdriver with a Torx 40 Bit

- Screwdriver with 13 mm/1/2" socket (insertion depth min. 15 mm)

OR



- Spanner 13 mm



- Tape measure

- Gloves

- if necessary: cord

4. INSTALLATION

4.1 General information

An approved installation plan from Optigrün international AG must be available for the installation of the solar mounting system. The dimensions given in this plan for edge and row spacing, the specified sky orientation and the required minimum loads must be strictly adhered to.

In addition to the components listed and supplied as accessories, there may be a need for further installation materials (lightning protection, cable ducts, etc.). These requirements must be agreed in advance with the solar installer and, if necessary, the lightning protection installer and must be available in good time for installation.

Only PV modules with the following valid certificates may be used:

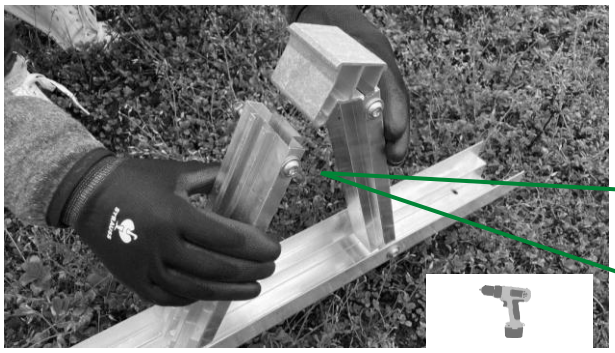
IEC 61215 / IEC 61730 (Further standards, regulations and safety instructions ▸ page 21)

4.2 Preparation of the roof surface

For green roofs with vegetation, the area should be maintained beforehand. Severely uneven areas must be levelled out.

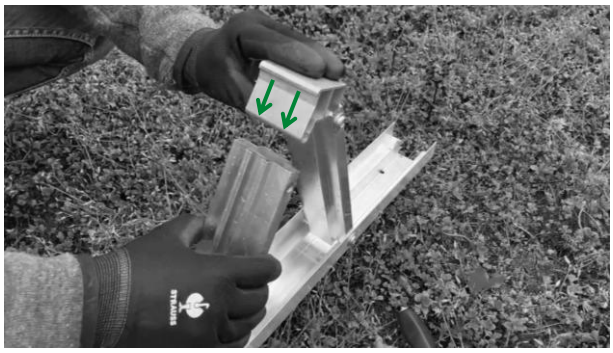
4.3 Installation and work steps

Step 1: Assembly of the basic sets



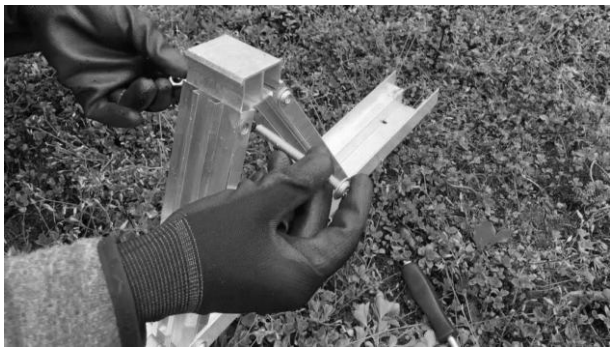
Open the four moveable rails in the basic set.

Remove the screw

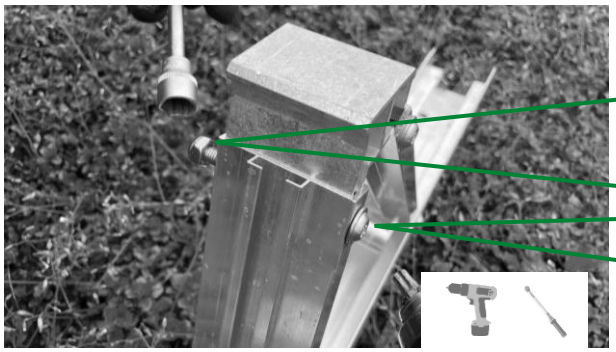


Insert clamping block.

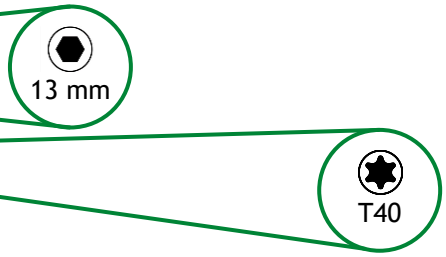
If necessary, tap lightly until the component sits fully in the rail and all holes are aligned



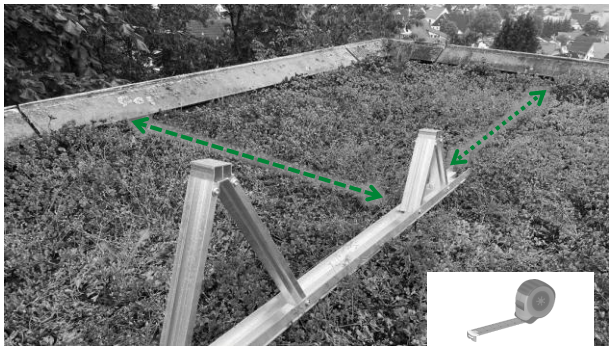
Fit the screw and nut. Tighten by hand.



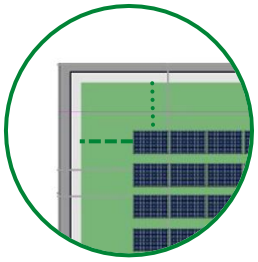
Secure the nut with the screwdriver and tighten the screw with the cordless screwdriver



Step 2: Roughly position the basic sets

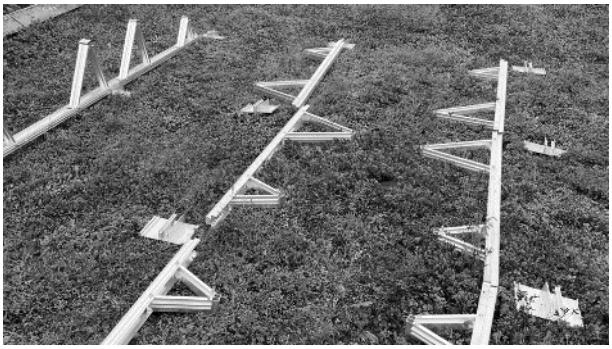


Place the corner module according to the plan. Make sure to know whether measurements are given incl. or excl. roof parapet



Distribute the remaining basic sets on the roof area and position them roughly.

Step 3: Mount feet according to the ballasting plan

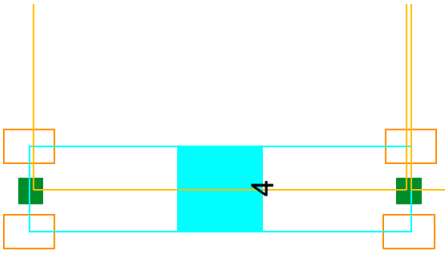


Distribute feet along the basic sets.

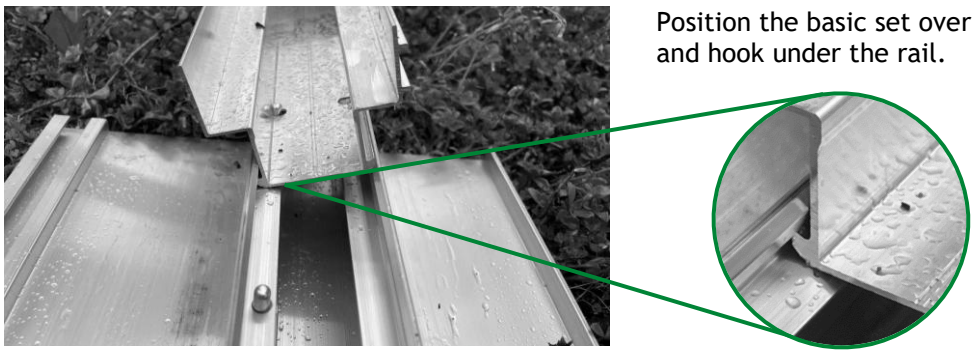
Important **Caution!**

The feet are asymmetric. Pay close attention to the ballasting plan.

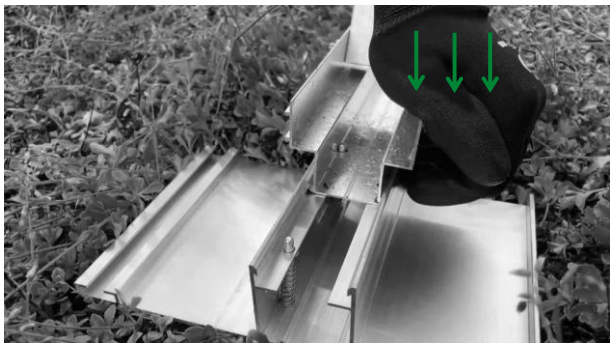
Only the side with the displayed rail can hold the hammer head screw in order to mount a ballasting profile.



HINT This illustration shows what a ballasting profile looks like on the plan.



Position the basic set over the pin in the foot at an angle and hook under the rail.



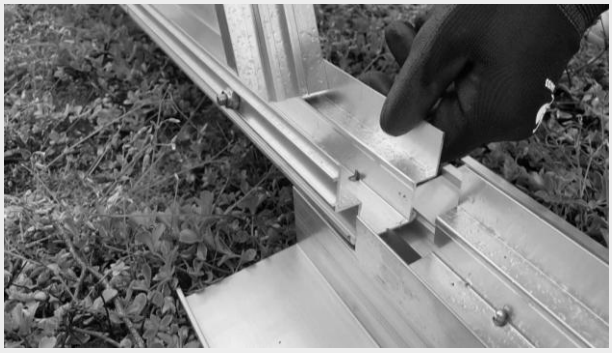
Then press the profile down with a little force until you feel it click into place.

End of a row:

Locking via the rear pin so that the basic set is flush with the base.

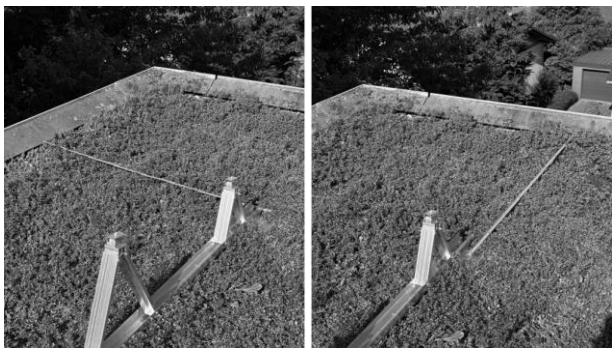
Within a row:

Locking via the front pin so that another rail can be mounted in the same base.



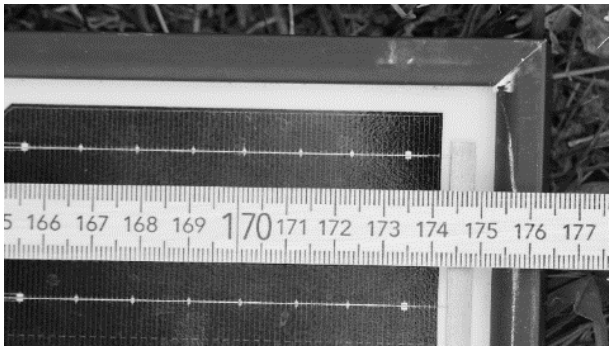
Attach the second rail from the other side and use the second pin.

Step 4: Exact alignment of the rows



Double-check the positioning of the first row from the roof edge.

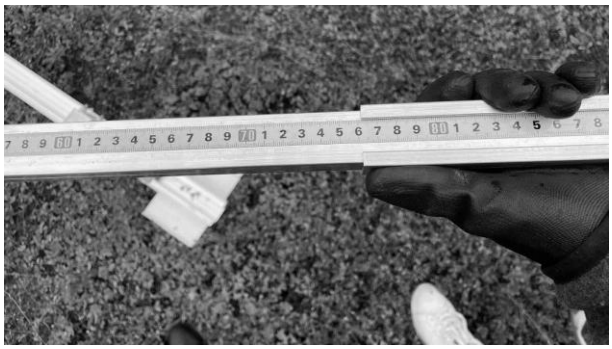
This row serves as the base on which all other rows are aligned.



Measure the PV module

Example in the image: 176.2 cm

With Optigrün-mounting template



Set the mounting template to the measured module dimension – example in the image: 176.2 cm

Place the mounting template in the parallel basic sets in the same spot.

HINT

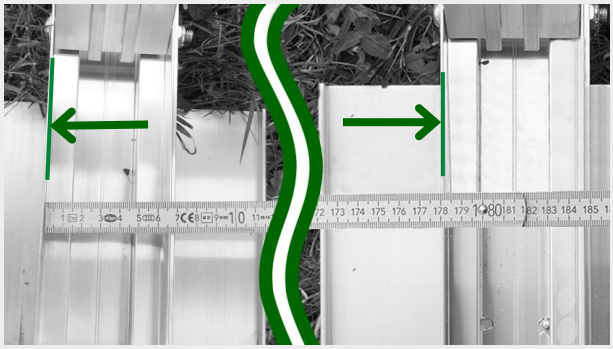
In order to easily align the basic sets in parallel we recommend using two mounting templates.

Important

In addition to vertically aligned basic sets they must also be level horizontally.

Without the mounting template

Measure row spacing with the tape measure



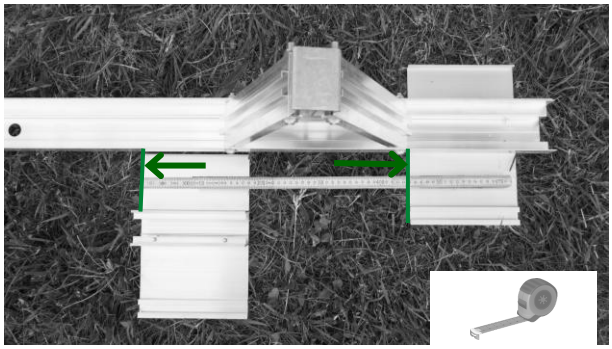
Place the tape measure at the left edge of one basic set and measure to the left edge of the next row.

Important

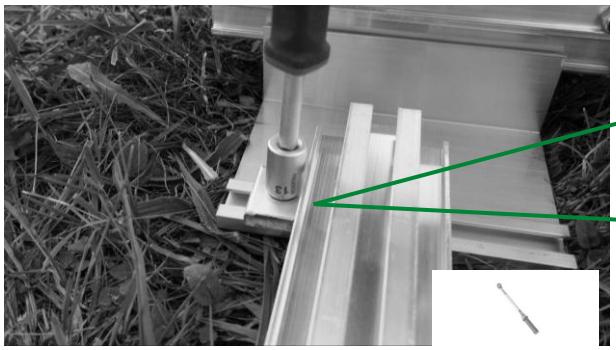
20 mm must be added for the width of the center clamp

If required

Mount ballast profiles

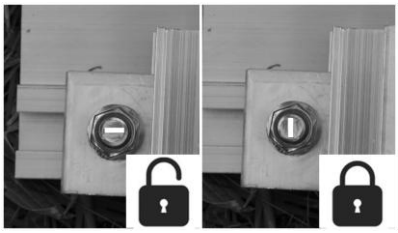


Place an additional base with 45 cm spacing between the left edges of each foot.



Mount the two ballast profiles with the cross plate on the outer rail of each profile (Slot transverse to the groove = fixed, see illustration)

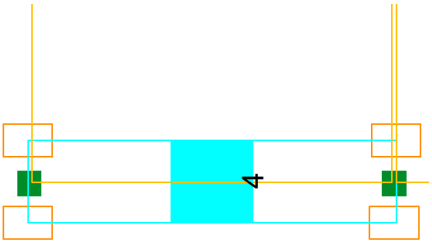
Position the cross plate in a way that they are not being covered by the paving slabs.



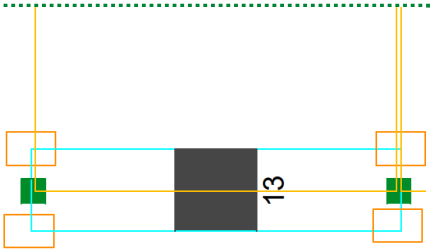
Ballasting with paving slabs
(40x40x4 cm ≙ 14,4 kg)

If required

Additional ballasting with ballast profile

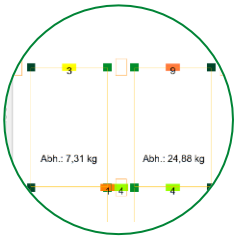


Maximum ballasting with ballast profile



Step 5: Ballasting

Apply ballasting according to the plan.



If required

Attach three ballast clips to the base set for subsequent ballasting with paving slabs. Arrange the clips as shown.

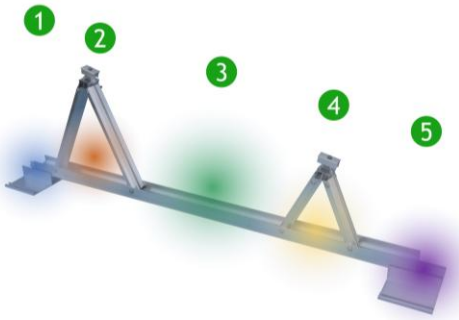
Example ballasting

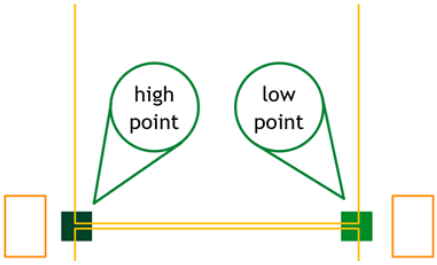
paving slabs
40 x 40 x 4 cm
14,4 kg

plaster stones
20 x 10 x 6 cm
2,6 kg

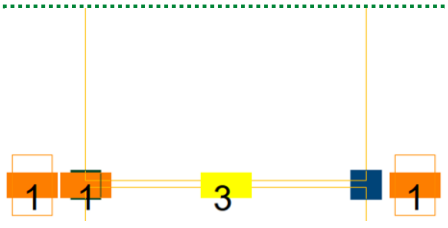
Five ballasting zones

(only 3 suitable for paving slabs)

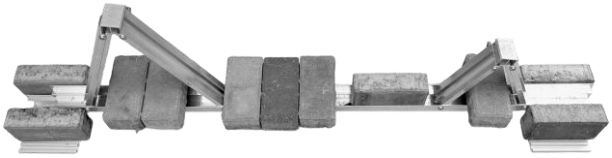




Ballasting in rail

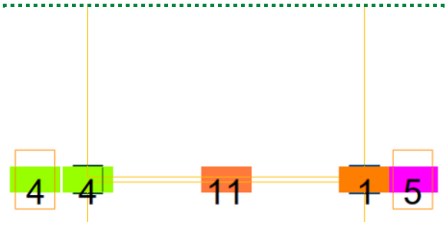


Ballasting in and on top of rail

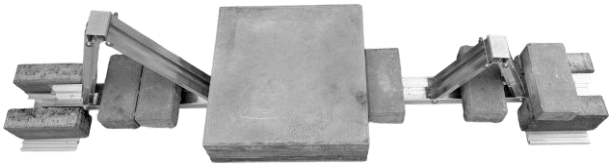


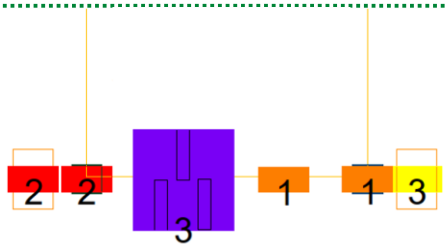
Ballasting on rail

Max. ballasting with plaster stones

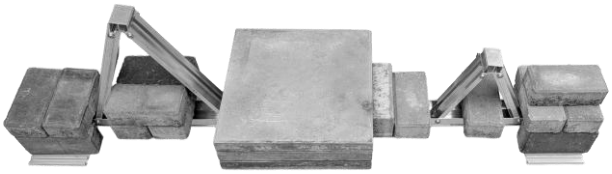


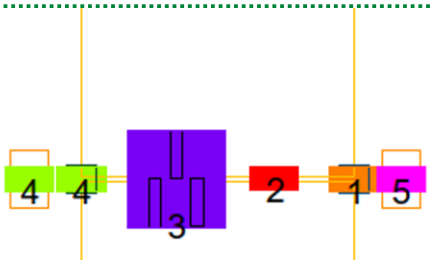
Mixed ballasting with plaster stones and paving slabs (incl. ballast clamps)





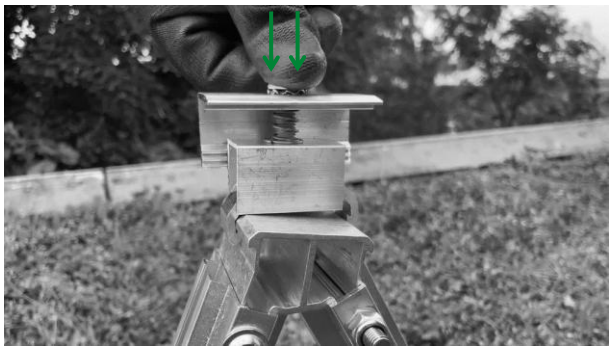
Maximum mixed ballasting with plaster stones and paving slabs (incl. ballast clamps)



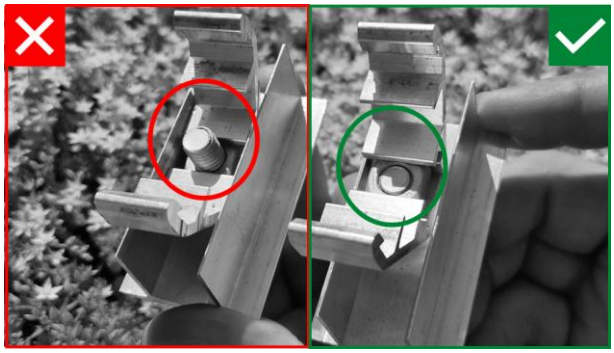


Step 6: Mounting the module clamps

Select module clamps according to the plans
(left: End clamp; right: Centre clamp)



Position the clamp centrally on the clamping block and click into place by pressing the screw.



HINT

The screws being screwed in too far can cause the clamp to be a little stiff and though to click into place.

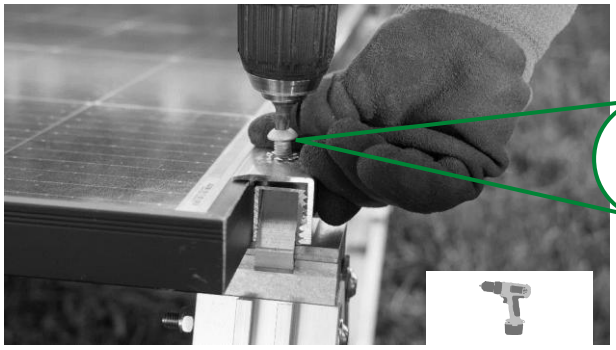
The following points must be noted during the assembly:

- Contact corrosion between the PV module frame and substructure is to be prevented when using different materials.
- Do not drill, nail or weld the module frame.
- Only use corrosion-free screws for assembly.

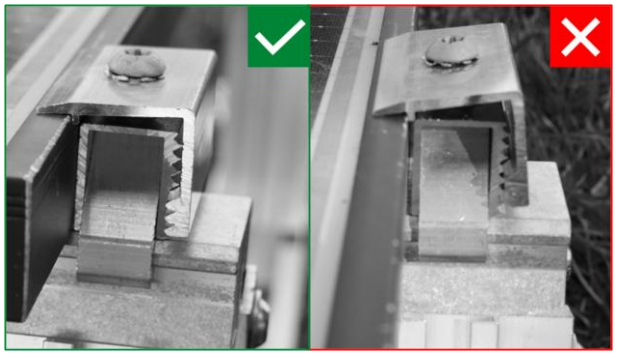
Step 7: Mounting the modules

Place modules on the basic sets and position them. Row by row, beginning with the end clamp on one end.

End clamp:

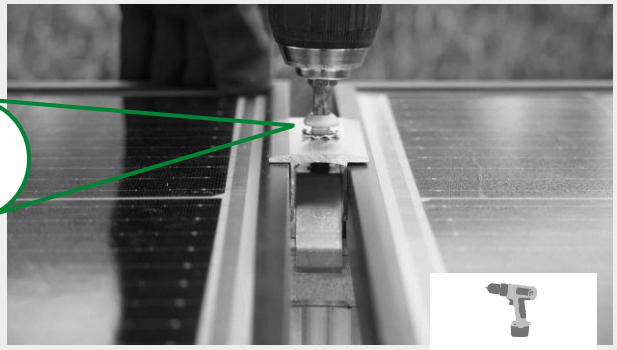


Tighten the screw while pressing down on the clamp

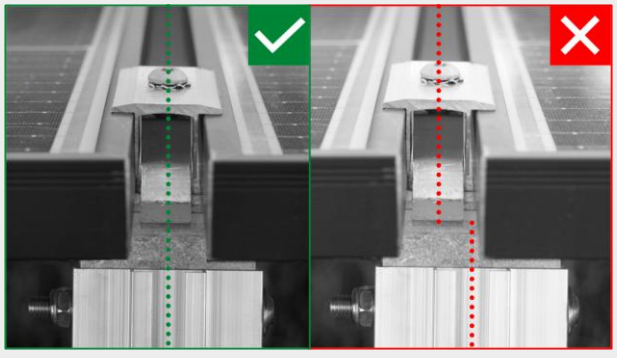


Before tightening: press down on the end clamp for the grooves to engage and the clamp to be in full contact with the module. Check if the fit is correct.

Centre clamp:



Only tighten once both modules are in position.

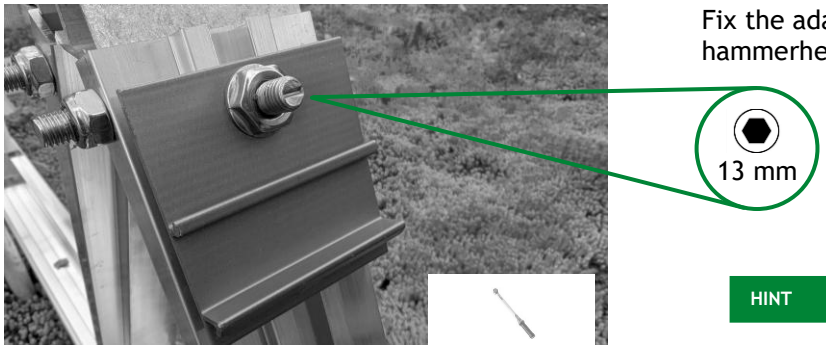


Place the clamp centre on the clamping block in order for both modules to have the same contact surface on the block.

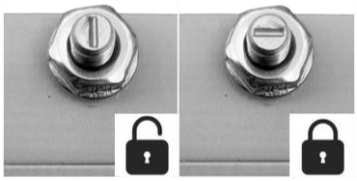
Additional steps if necessary

Optional

Mounting the cable ducts (ahead of mounting the modules)



Fix the adapter plate to the basic set with the hammerhead screw.



HINT

For easier maintenance, we recommend using the bigger triangle (and mount all the way at the top).

Hook the cable duct into the upper part of the adapter and click it into place by pressing down.

Optional

Installation of the Lightning Protection Connector

Connect the ground rails to the lightning protection connector using the specified drill holes at the ends of the rails.

Finished Optigrün-Solar TOP-structure

If necessary

Dismantle basic set from foot

Push the pin in the lower area out of the base by hand (use a screwdriver to help if necessary)

The basic set can then be pushed out.

4.4 Electrical connections

(Exclusively carried out by an electrician/solar installer)

Observe the instructions of the PV module manufacturer for the electrical connection of the PV modules.

4.5 Maintenance

The maintenance and care instructions for extensive greening must be observed. The latest version is available on the Optigrün website.

To prevent danger to people or property, regular maintenance by qualified specialist personnel is absolutely essential. The following steps must be observed:

- Visually inspect all system components for damage; replace affected parts immediately if damaged.
- Check all screw connections for tightness; tighten loose connections and observe the tightening torques specified in these instructions.
- Check all components for damage caused by weather, animals, dirt or vegetation; clean, repair or replace damaged elements.
- The ballast applied to the system must be checked at least every six months.
- Check the ballast at least every six months in accordance with the implementation plan; ideally more frequently together with the regular roof drain maintenance in accordance with DIN 1986-3 or with each maintenance programme.
- The ballast should also be checked after the winter season and after storm events.

4.6 Additional information

Setting up individual PV module pairs and setting up the modules in a manner that deviates from the design by Optigrün international AG is only permissible following coordination and written approval from the manufacturer of the solar mounting system (Optigrün international AG).

Information on statics:

In the event of an order, the solar mounting system is installed according to the superimposed load and static calculations of Optigrün international AG. The customer is responsible for the static approval of the building area to be covered.

In case further consultation is needed, feel free to contact our Optigrün HQ:

Contact: Phone +49 7576 772-0
Mail info@optigruen.de

5. STANDARDS, REGULATIONS AND SAFETY INFORMATION

When assembling the solar mounting system, the accepted rules of technology and the accident prevention regulations must be fundamentally observed.
This particularly includes:

- DGUV Regulation 1 (Principles of prevention)
- DGUV Regulation 3 (Electrical installations and equipment)
- DGUV Rule 101-601 (Construction work)
- TRBS 2121 (Protection against falling during roof work)
- DGUV Information 203-006 (Safety instructions for the installation and maintenance of PV systems on roofs)

Furthermore, local/regional regulations and all regulations under public law, DIN standards, TAB (technical connection conditions), accident prevention regulations, the guidelines of the Verband der Sachversicherer (VdS), the technical regulations of the German roofing trade and general guidelines (e.g. timber wood constructions, roof covering and roof sealing work) are to be observed when designing, installing, operating and maintaining the PV system.
This particularly includes:

- DIN /VDE 0100 (Installing high-voltage systems with nominal voltages of up to 1000V)
- DIN /VDE 0100 Teil 712 (Installing (low-voltage) solar photovoltaics (PV) power supply systems)
  DIN /VDE 0298 (Application of cables and cords in power installations)
- DIN /VDE 0298 (Electrical wiring)
- VDI 6012 (Local energy systems in buildings - photovoltaics
- DIN EN IEC 62446-1/VDE 0126 (Testing & commissioning of PV systems)
- DIN /VDE 0185 Teil 1 bis 4 (Protection against lightning)
- DIN EN 1991-1 1 bis 4/NA (Snow and Wind events)
- DIN 18338 Roofing work
- DIN 18451 Scaffolding works
- DIN 1052 Part 1 and Part 2 Dimensioning of the substructure (timber and wood constructions)
- DIN EN 1995-1-1 (Statics and dimensioning of timber structures)
- TAB (Technical connection conditions of the energy supply companies)
- VDEW directives (guideline for connection and parallel operation of own generation systems on the low-voltage grid)

Lightning and surge protection:

The installation of lightning and surge protection is the responsibility of the solar installer or lightning protection engineer.

Lightning and overvoltage protection is to be provided in accordance with the current requirements of the standards DIN/VDE 0185 Part 1 to 4, DIN/VDE 0100 Part 712 and VdS 2010. Please find detailed recommendations and information in the directives and standards listed. Sufficient lightning protection is recommended, particularly in exposed locations. Integration into existing lightning protection facilities must take place while abiding by the valid country-specific standards and regulations.

Please note the instructions of the manufacturer of the PV modules!

Cable laying:

When assembling the frame, certain points of cable routing and cable laying should be taken into account.

- To avoid surge voltage coupling due to lightning, the conductor loop that is created should be kept as small as possible.
- Cable laying must safely ensure that snow and ice can slide off later on.
- The cables must be laid where possible with UV and weather protection. It is recommended that the cables are laid in suitable cable conduits. It should be ensured that no water can accumulate as a result of this.