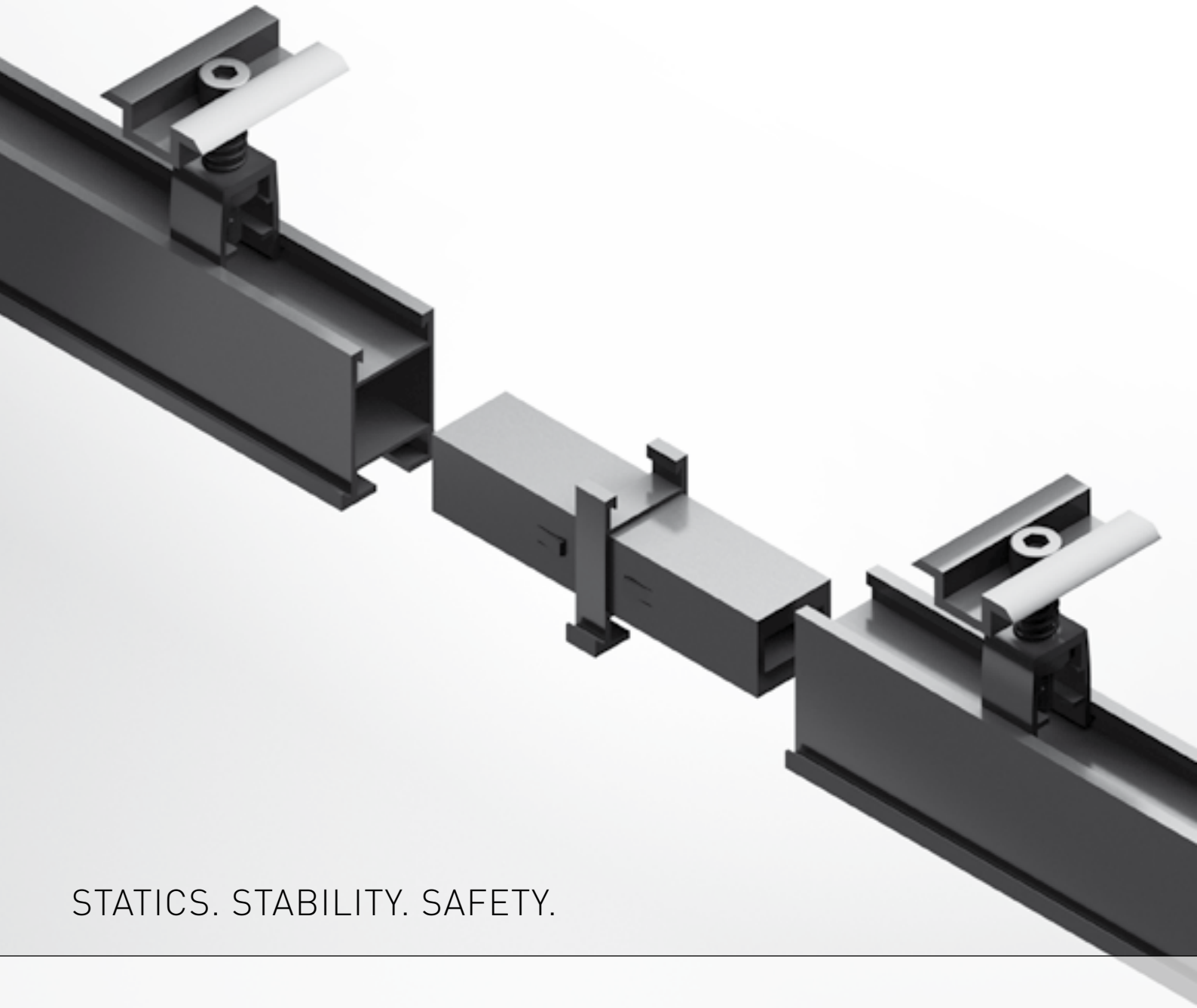
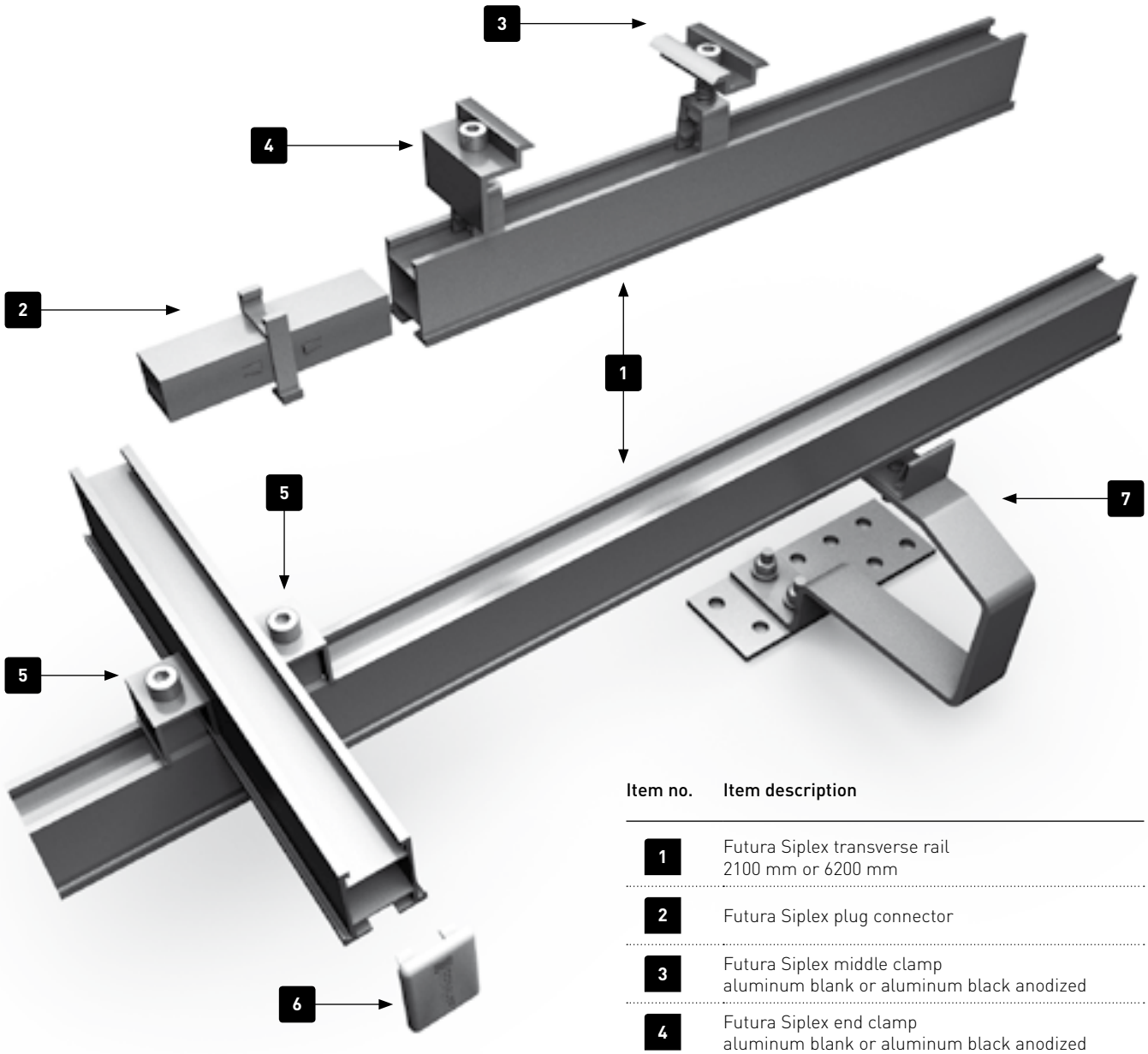


STATICS. STABILITY. SAFETY.

FUTURA SIPLEX ■

Installation Instructions

INTERSOL®
by Donauer



Item no.	Item description
1	Futura Siplex transverse rail 2100 mm or 6200 mm
2	Futura Siplex plug connector
3	Futura Siplex middle clamp aluminum blank or aluminum black anodized
4	Futura Siplex end clamp aluminum blank or aluminum black anodized
5	Futura Siplex cross connector
6	Futura Siplex end cap
7	Bolted roof hook, is delivered pre-assembled with profile clip

TOOLS

You require the following tools:

- 15 mm open-ended wrench (open-ended spanner)
- electric screwdriver
- 6 mm hexagonal socket key (Allen key)
- torque wrench

INSTALLATION INSTRUCTIONS

Please read the safety instructions carefully before beginning installation work. The Futura Siplex transverse rail system is compatible with all roof mounting elements such as roof hooks, sheet seam clamps, etc., from INTERSOL: The connection to the roof mounting is made as usual with M10 nuts in bolts. If you use the pre-assembled roof hooks with the Futura Siplex profile clip for tile roofs, you don't need the bolts. The transverse rail is simply pressed into the profile clip.

The transverse rail system can be used with all roof types. Regarding the installation of the roof mounting for the various roof types, please refer to the relevant installation instructions.

BOLTS

Please use only the M10 nuts and bolts provided on delivery for fastening the frame, and the M8 nuts and bolts for fastening the modules to the frame.

The following torques are to be adhered to:

- **M8 (A2-70 / A4-70): 15 Nm**
- **M10 (A2-70 / A4-70): 30 Nm**

Please note: **Use a torque wrench to ensure adherence to these torques. Align the frame and modules first before tightening the bolts.**

If you have any additional questions, use Donauer Solartechnik's professional and comprehensive consultation service. Our competent construction engineers and technicians are happy to help you.

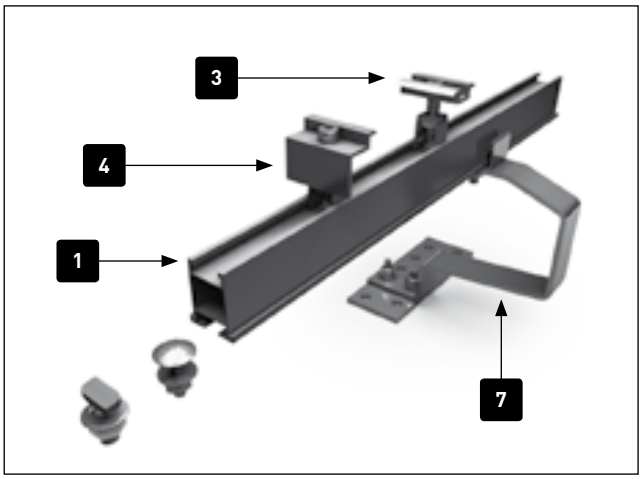
SPAN DATA

Maximum spans of the transverse rails for various wind and snow load zones for a pitched roof with 30° roof pitch. Considered is a solar module height x width = 1.65 m x 0.992 m, mounted upright and level on two transverse rails.

For this example span data, it is necessary that the transverse rails lie on at least 4 support points (e.g. roof hooks). With a smaller number of support points, a smaller span is required.

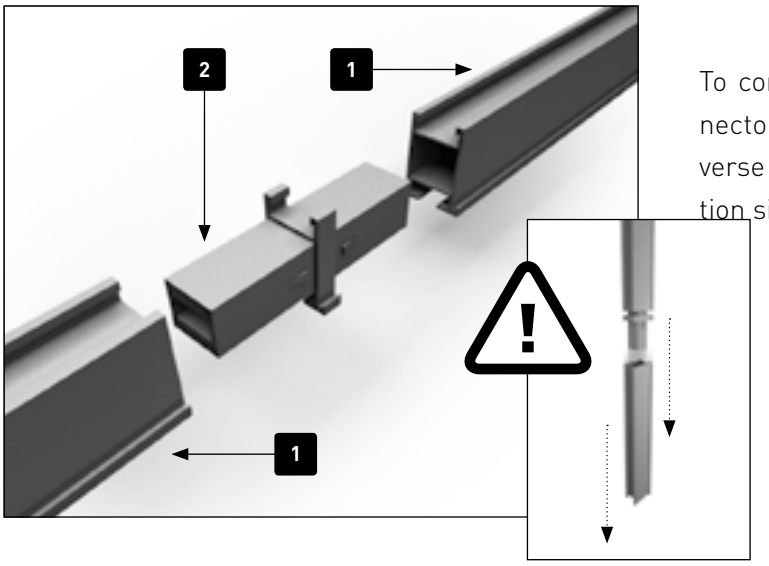
Maximum transverse rail spans wind and snow load zones

SZ1, <400 m above sea level, WZ1, building <10m	1.50 m
SZ1a, 450 m above sea level, WZ1, building <10m	1.30 m
SZ1, <285 m above sea level, WZ1, building <10m	1.35 m
SZ1, 450 m above sea level, WZ1, building <10m	1.10 m
SZ1, <400 m above sea level, WZ2, building <10m	1.45 m
SZ1a, 550 m above sea level, WZ2, building <10m	1.15 m
SZ1, 285 m above sea level, WZ2, building <10m	1.30 m
SZ1, 450 m above sea level, WZ2, building <10m	1.10 m



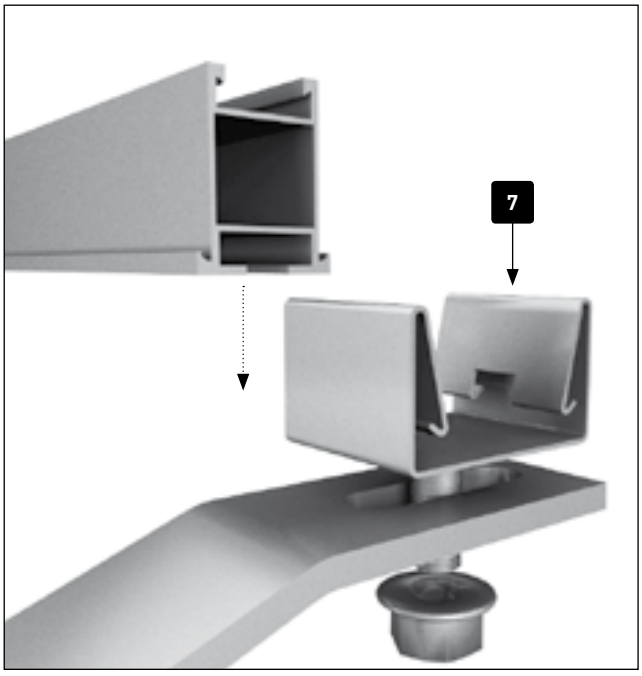
INSTALLATION AS SINGLE-LAYER SYSTEM

For tiled roofs, the Futura Siplex transverse rail **1** can be inserted with the lower groove into the pre-assembled roof hook with profile clip **7**. For other roof types, the Futura Siplex transverse rail 1 can accept M10 T-head bolts and M10 carriage bolts in the lower groove. The upper guide is used to snap in the end **4** and middle **3** clamps or the cross connector for transverse rail systems (see page 6).



To connect the transverse rails, **1** the plug connector **2** is plugged into the carrier rail. The transverse rails should first be assembled at the installation site, that is, on the roof.

Please note: **The assembled transverse rails may not be transported vertically. There is a risk that the connection could become unfastened.**



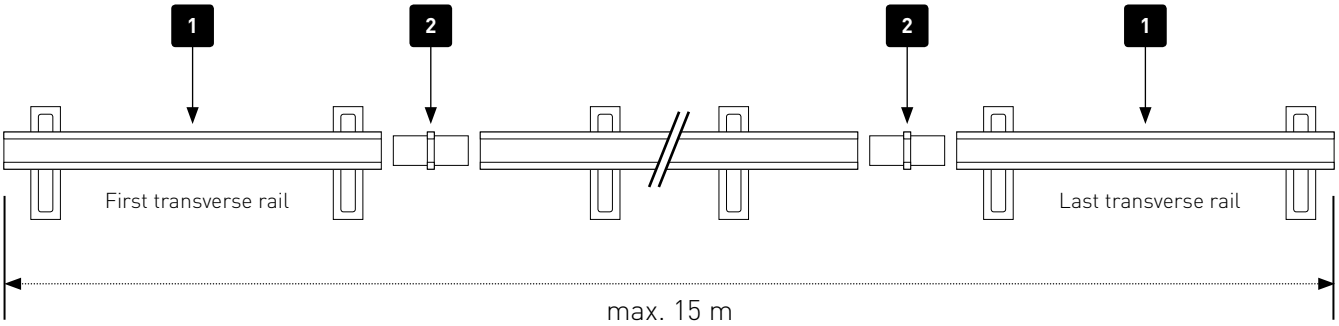
The bolts for the Futura Siplex profile clip **7** are hand-tightened, and the clip can be adjusted on-site. When using the pre-assembled roof hooks with profile clip, the transverse rail is pressed into the clip. **Please note that the transverse rail can no longer be moved sideways once it is locked in.** Finally, tighten the nut of the profile clip. To release the transverse rail from the profile clip, the profile clip can be pushed apart using two slotted screw drivers. To do so, insert the slotted screw drivers right and left of the transverse rail into the notches of the profile clip up to the lower edge of the transverse rail. Since the profile clip is made of spring steel, the transverse rail can be pressed back into it after opening once. Please only do this one time.

T-head bolt

Carriage bolt

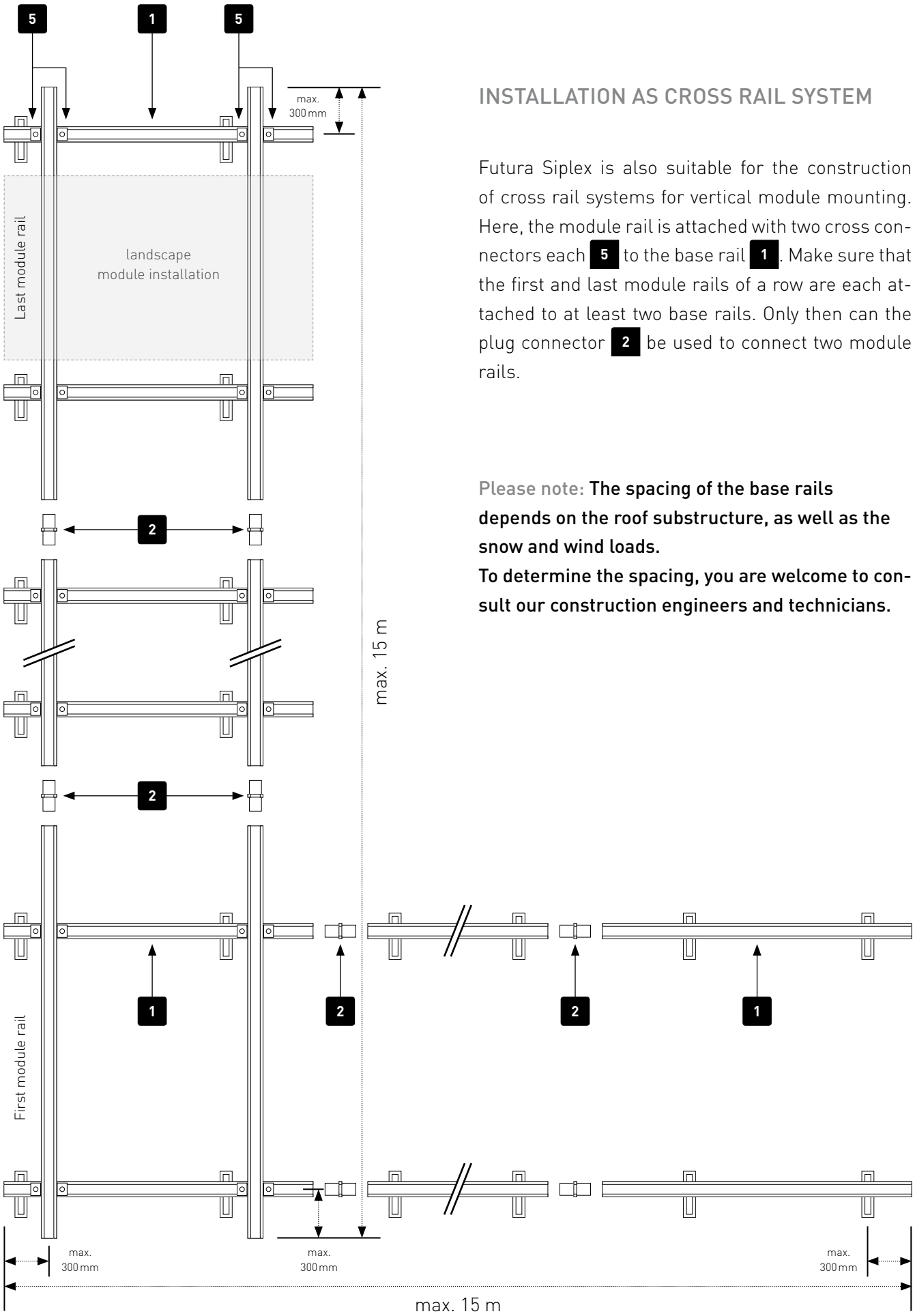
The transverse rail **1** is installed on the underside with a M10 T-head or carriage bolt and an M10 serrated hexagonal nut to the respective roof mounting. You can insert the T-head bolt anywhere in the lower groove of the transverse rail. Insert the carriage bolt into the groove at the end of the rail, and slide it to the desired position.

The first and last transverse rails **1** in a row must each be attached to at least two fastening points (e.g. roof hooks). Only then can the plug connector **2** be used to connect two supports.



Please note: **The maximum transverse rail length should not exceed 15.0 m. After 15.0 m, install an expansion joint of at least 5 cm.**

End caps **1** can be applied to the transverse rails **6** as optical finishing. Press these in manually.

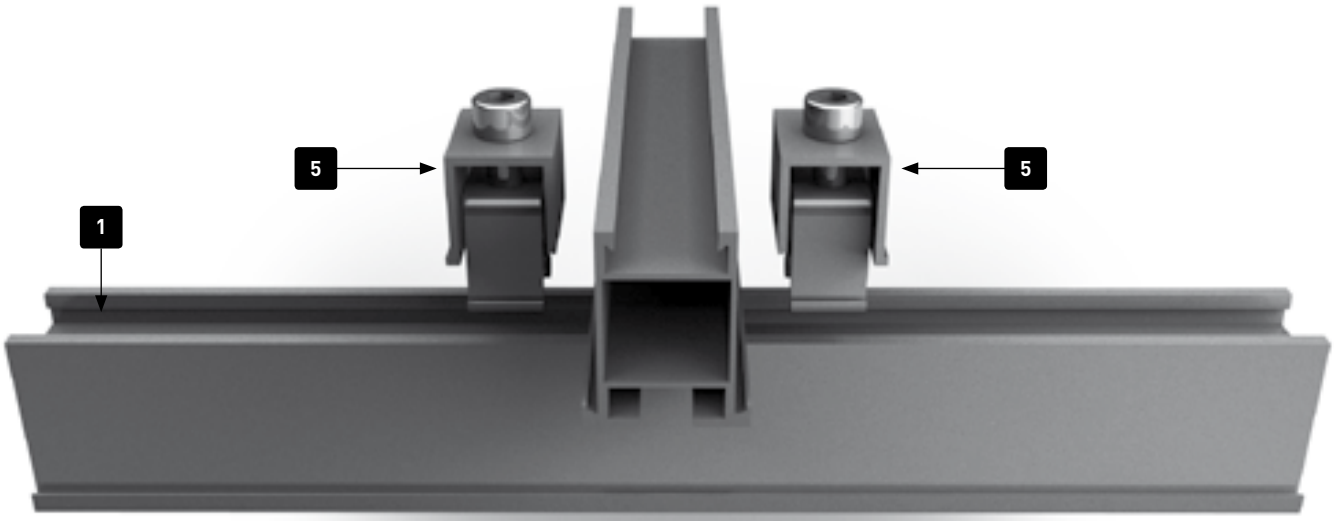


INSTALLATION AS CROSS RAIL SYSTEM

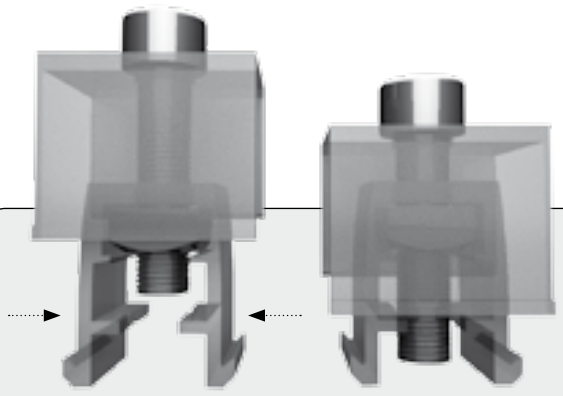
Futura Siplex is also suitable for the construction of cross rail systems for vertical module mounting. Here, the module rail is attached with two cross connectors each **5** to the base rail **1**. Make sure that the first and last module rails of a row are each attached to at least two base rails. Only then can the plug connector **2** be used to connect two module rails.

Please note: **The spacing of the base rails depends on the roof substructure, as well as the snow and wind loads.**
To determine the spacing, you are welcome to consult our construction engineers and technicians.

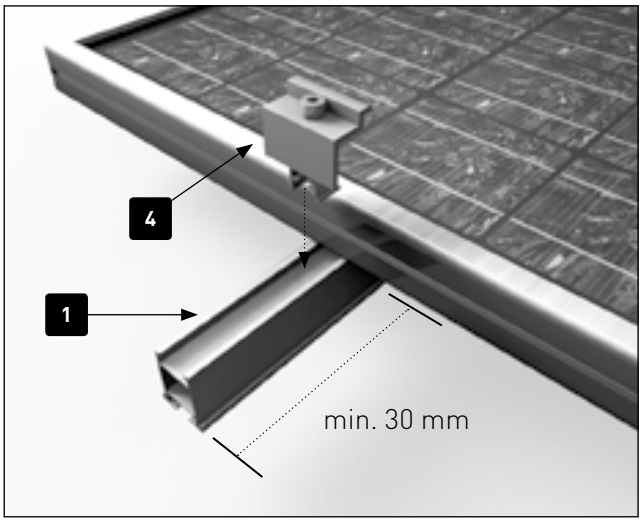
Manufacturing and distribution: Donauer Solartechnik Vertriebs GmbH. Subject to errors and technical modifications.
Date: Version: 05/2011; contact: info@donauer.eu // www.donauer.eu



Snap the cross connector sets 5 into the upper guide of the base rail 1. The cross connectors grip from both sides into the grooves of the module rail. Tighten the Allen bolts.

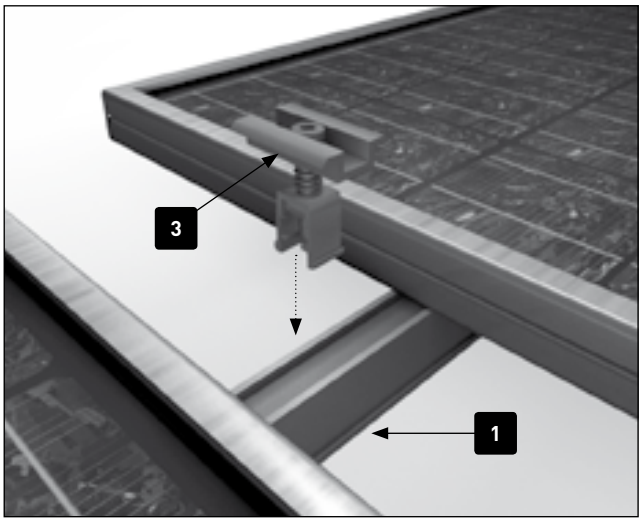


Only use the designated Allen bolt in the pre-mounted cross connector. The length of this bolt is selected so that when bolted, pressing the clips is no longer possible.



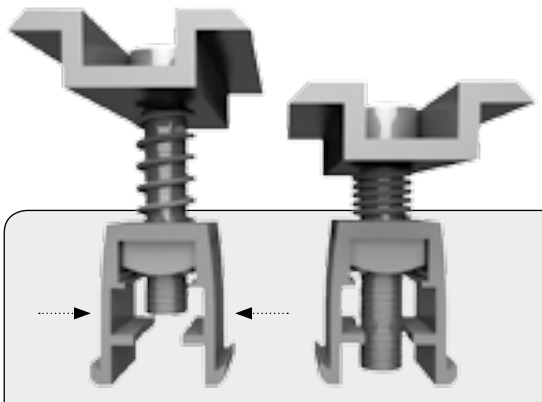
MODULE FASTENING

Place the first module on the transverse rail, with at least 30 mm clearance from the edge **1**. Snap in the end clamp **4** and tighten the bolts.

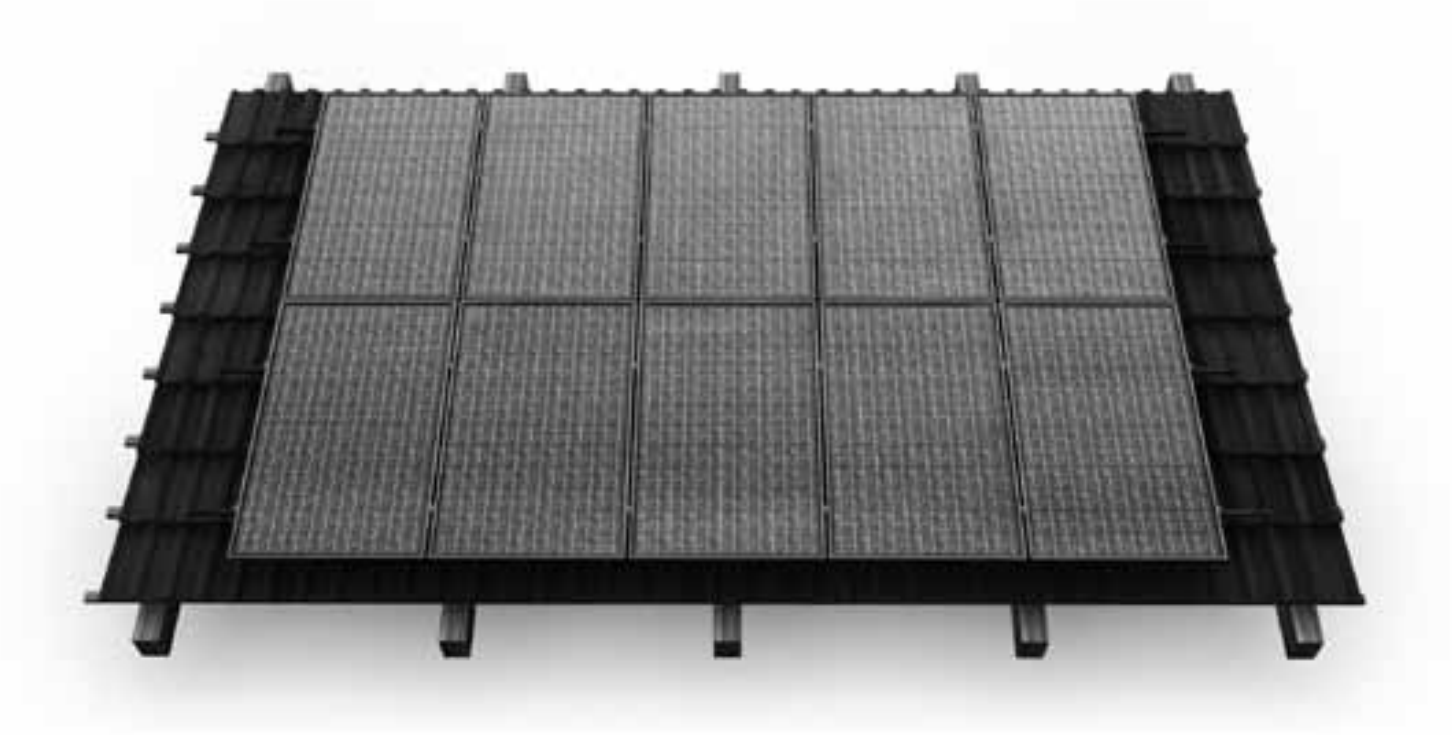


To fasten the module on the other side, place another module on the transverse rails **1** . Snap in the middle clamp **3** and tighten it.

Continue in this manner, and lock off the final module with end clamps.



Only use the designated Allen bolt in the pre-mounted end and middle clamps. The length of this bolt is selected so that when bolted, pressing the clips is no longer possible.



Please note: **The mounting areas prescribed by the module manufacturer can be found in the respective module data sheet.**

In order to secure the modules against theft, it is possible to insert a star-shaped anti-theft fitting into the M8 Allen bolt, and to fasten it with a center punch. This means that the hexagonal socket wrench can no longer be inserted, and the Allen bolt cannot be loosened.

We recommend that you read the following information carefully, as it is of great importance when handling the product. Observe the safety regulations applicable to the other system components too.

- You should adhere to these instructions precisely whenever working on the PV system. Installation, commissioning, maintenance and repairs may only be carried out by appropriately qualified and authorized persons.
- Please observe the applicable regulations and safety instructions.

You must observe the following accident prevention regulations:

- BGV A 1 – General regulations
- BGV A 2 – Electrical systems and equipment
- BGV C 22 – Construction work (personal fall protection equipment)
- The trade association health and safety at work rules (BGR 203 – Working on roofs) and DIN EN 516 "Equipment for accessing roofs"
- The trade association regulations regarding work clothing and work safety

You must adhere to the following DIN standards:

- DIN 18299 – General rules for all kinds of building works
- DIN 18338 – Roof covering and roof sealing works
- DIN 18360 – Metal construction and locksmith works
- DIN 4102 – Fire behavior of building materials and building components

Only authorized personnel may carry out work on Donauer Solartechnik Vertriebs GmbH systems. The operator of the system has the following safety-related obligations:

- Performance of regular annual maintenance work, e.g. inspection of cabling, bolt connections, and the roof covering.
- The frame may only be installed by persons with suitable qualifications, technical skills, and knowledge of the fundamentals of mechanics.
- It must be ensured that the assigned persons can assess the work allocated to them and identify possible dangers.
- The installation instructions are part of the product and must be available during installation.
- It must be ensured that the installation instructions, and particularly the safety instructions, have been read and understood by the assigned personnel before installation.
- The trade association regulations, the local work safety regulations, and the technical regulations must be adhered to.
- Suitable hoisting equipment and ladders are to be used for the installation work. No leaning ladders may be used.
- A qualified construction engineer must assess the building's existing static loading characteristics with regard to the additional loads resulting from a PV system.
- Any general load reduction measures specified by Donauer Solartechnik Vertriebs GmbH (e.g. the need to clear snow in order to limit the snow load) are to be observed.

WARRANTY / PRODUCT LIABILITY (LIABILITY EXCLUSION)

- The dimensioning information included in these instructions merely represents information gathered in practice. Binding static loading characteristics for mounting frames can be compiled upon request.
- As the installation company, you are responsible for correct execution of installation work.
- Donauer Solartechnik Vertriebs GmbH is not liable for the dimensioning information included in commercial system proposals.
- As the installation company, you are responsible for the mechanical stability of the installed interface connections at the building envelope, and in particular for their leak-tightness. The components from Donauer Solartechnik Vertriebs GmbH are designed for this purpose, according to the expected loads and the current state of technology. For this purpose, you must provide Donauer Solartechnik Vertriebs GmbH with written notification of all general technical framework conditions on the project data collection sheet (details of the support structure, snow load zone, building heights, wind loads etc.) as part of the query/order.
- Donauer Solartechnik Vertriebs GmbH is not liable for incorrect use of the installed parts.
- Use in the vicinity of the sea is prohibited due to the risk of corrosion.
- Donauer Solartechnik Vertriebs GmbH grants a 2-year product warranty on the service life and stability of the mounting systems, subject to correct use, dimensioning in accordance with the static loading conditions, normal environmental conditions, and normal ambient conditions. This applies for the generally prevalent weather conditions and environmental conditions.
- Material and workmanship guarantee: Donauer Solartechnik Vertriebs GmbH offers a 12-year material and workmanship guarantee on all materials used. Consult the specific guarantee conditions for more detailed information.

PRODUCT LIABILITY

The technical documentation constitutes part of the product. Donauer Solartechnik Vertriebs GmbH is not liable for damages caused by failure to observe the installation instructions, particularly the safety instructions, or caused by inappropriate use of the products.

NOTES ON ELECTRICAL INSTALLATION WORK

You may only carry out electrical work if you are a qualified electrician. The applicable DIN standards, VDE regulations, VDEW guidelines, VDN guidelines, accident prevention regulations, and the regulations of the local utility company are to be adhered to in this regard.

- DIN VDE 0100 (Installation of high voltage systems with nominal voltages up to 1000 V)
- VDEW guideline for parallel operation of domestic power-generation systems with the low voltage grid of the utility company
- VDI 6012 sheet 2, guideline for decentralized energy systems in buildings: Photovoltaics
- Leaflet for VDEW guideline "Domestic power-generation systems on the low voltage grid"
- VDN guideline "Domestic power-generation systems on the low voltage grid"
- DIN/VDE regulations, DIN/VDE 0100 "Installing high voltage systems with grid voltages up to 1000 V", in particular VDE 0100, Part 410, "Protection against direct and indirect contact (Direct current > 120 V, < 1000 V direct current)" and the "Accident prevention regulations of the commercial trade associations" VBG4 "Electrical systems and equipment"
- DIN VDE 0100-540 Selection and installation – Earthing, protective conductors and equipotential bonding conductors
- DIN 57185 VDE 0185 "Installation of a lightning protection system" and VDS 2010

IMPORTANT WARNINGS

Solar modules generate electricity as soon as they are exposed to light, meaning that there is always a voltage present. The fully insulated plug contacts provide a certain level of contact protection, but the following must nonetheless be observed when dealing with solar modules:

- Do not insert electrically conductive parts into the plugs or sockets.
- Do not install solar modules and wiring with plugs or sockets that are wet.
- Exercise utmost caution during all work on the wiring.
- Do not carry out any electrical installation work in damp conditions.
- Even at low light levels, connecting solar modules in series results in very high DC voltages that can be life-threatening upon contact. In particular, note the possibility of secondary damage in the event of electric shocks.

The inverter can produce high touch voltages, even when not connected:

- Exercise utmost caution when working on the wiring and inverter.
- After switching off the inverter, you must wait for the time interval specified by the manufacturer before beginning any further work. This allows the high voltage components time to discharge.
- Please also observe the inverter manufacturer's installation regulations.

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

- Never disconnect the solar generator from the inverter while the inverter is connected to the mains grid.

NOTES ON THE INSTALLATION OF MOUNTING FRAMES

For installation in roof areas, you must observe the currently applicable construction engineering regulations, especially the requirements specified in the DIN standards and in the "Regulations of the German Roofing Industry" (Regelwerk des Deutschen Dachdeckerhandwerks).

- Check whether all bolt connections are tight.
- Adhere to the specified torques.
- Regardless of verifiable static loading conditions, you must ensure that the product complies with the static loading requirements on site, as per DIN 1055, before every installation.
- DIN standard 1055 "Actions on structures"

  Part 1: Densities and weights of building materials, structural elements and stored materials

  Part 4: Wind loads

  Part 5: Snowloads and ice load

  Part 100: Basis of design – Safety concept and design rules
- The mounting frame is dimensioned as per DIN 4113 "Aluminum constructions under predominantly static loading" and DIN 18800 "Structural steelwork; dimensioning and construction" or the relevant Eurocode EC1, EC3, EC9.
- Make sure that the substructure is appropriate with regard to load capacity (dimensioning, state of maintenance, appropriate material specifications), supporting structure, and any other layers that it affects (e.g. insulation layer).
- Make sure that the rainwater runoff is not impeded.
- Pay attention to the physical construction aspects (e.g. possible condensation problems caused by penetration of insulating layers).

STANDARDS AND GUIDELINES

All standards and guidelines listed are issued for Germany, and are to be applied in Germany as per the currently valid version. Outside Germany, you must also observe the relevant national standards and guidelines.

STILL HAVE QUESTIONS?

We will be happy to provide you with more information.

If you still have unanswered questions or suggestions, you are welcome to call us. You can reach our expert consultants who will answer all your questions regarding products, planning and installation by calling +49 (0)8105 / 77 25 - 0. They will also provide you with information on the installation systems for all other roof types.

Just get in contact with us!

You can also visit us online at:

www.donauer.eu

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DONAUER SOLARTECHNIK

Distributed by

Donauer Solartechnik Vertriebs GmbH.
Zeppelinstr. 10
82205 Gilching, Germany
Phone +49 (0)8105 / 77 25 - 0
Fax +49 (0)8105 / 77 25 - 100

info@donauer.eu // www.donauer.eu