Solar module of the Solar-Fabrik AG

Instructions for installation and operation

1 On this user information

These instructions describe rapid and safe mounting of the photovoltaic modules. These instructions are intended for installers of photovoltaic systems and trained specialist personnel who are familiar with the mounting, operation, maintenance and dismantling of photovoltaic systems. These instructions apply only for modules of the Solar-Fabrik AG.

- ➔ Read these instructions attentively before mounting.
- ➔ Keep these instructions for the operating period of the photovoltaic system.
- ➔ Ensure that these instructions are available for the owner-operator at all times.
- ➔ Pass these instructions on to each subsequent owner or user of the photovoltaic system.
- ➔ Insert every supplement received from the manufacturer.
- ➔ Observe the further applicable documents.
- ➔ Observe the national regulations and standards during mounting and connecting.

2 Preclusion of liability

The Solar-Fabrik AG is not liable for damage which arises through:

- non-observance of the information in these instructions
- improper use
- incorrect installation, operation, usage and maintenance of the modules
- wear and tear
- improper modifications, repairs or servicing measures at the module
- continued use despite occurrence of a defect

The exclusion of liability does not apply for damage resulting from a defect of the product.

3 Safety and warning instructions

Solar current modules are designed exclusively for the generation of solar current. Any other use is regarded as improper. Connection and mounting is carried out exclusively in accordance with these instructions and by a qualified and authorised specialist. It is imperative that the following safety and warning instructions be observed.

Under normal conditions a PV module can supply a higher current and/or a higher voltage than was specified at the standardised test conditions. In order to determine the rated voltage values of components, rated current values of currents, strengths of the fuses and dimensioning of the control units that are connected to the output of PV modules, the values specified on the module of I_{SC} and U_{OC} should therefore be multiplied by a factor of 1.25.

⚠ DANGER

Danger to life through high voltages!
Individual modules have a voltage of less than 50 VDC. Through series connection of the modules the voltages of the modules accumulate so that the total no-load voltage of up to 1000 VDC can apply even under low solar irradiation.

- ➔ The electrical installation and commissioning must be carried out by a concessionary electrician.
- ➔ Observe the valid national safety and accident prevention regulations for the installation of electrical installations.
- ➔ During mounting ensure that the solar modules, cables, tools and connectors are dry.
- ➔ Ensure that the cable connection is faultless.
- ➔ It is imperative that the mounting regulations and safety instructions of the inverter manufacturer be observed.
- ➔ Do not connect damaged modules.
- ➔ Do not paste anything onto, paint, or use sharp objects on the rear of the modules.
- ➔ Do not disassemble modules.
- ➔ Observe the specifications on the maximum system voltage of the modules.
- ➔ Do not immerse the module in water.

⚠ DANGER

Danger to life through arc!
Fatal injury through simultaneous contact of both poles.

- ➔ Carry out work only on covered solar modules.
- ➔ Disconnect cables only when powerless.
- ➔ Connect or insulate bare cable ends.
- ➔ Never disconnect the solar generator and inverter while live.

⚠ CAUTION WHEN WORKING ON ROOF

Above a height of 3 m (eaves) a scaffold with arrester system is mandatory!

- ➔ Observe the pertinent national regulations when working on the roof.

CAUTION

Incorrect handling when unpacking or storing or improper mounting can cause damage to the module!

- ➔ Observe the warnings on the packaging.
- ➔ Carry or lift modules using both hands. Under no circumstances may it be carried or lifted at the power socket or at a frame part.
- ➔ Do not place the module on the corners.
- ➔ Do not place any objects on the module.
- ➔ Do not tread on the module.
- ➔ Do not drop modules.

GENERAL INSTRUCTIONS

The modules are assigned to the Application class A (in accordance with IEC 61730). The modules thus fulfil the requirements of Protection class II.

- ➔ As a documentation of the system write down the serial numbers of the modules in the layout plan.
- ➔ In addition to this information read the corresponding mounting instructions of the Profilink mounting system.
- ➔ When carrying out the electrical connections and during mounting observe the national regulations for such work.

INSTRUCTIONS ON FIRE PROTECTION

The structural fire protection is regulated in the corresponding statutes. Improper installation can result in danger in case of fire.

- ➔ Observe the applicable regulations in the building code of the responsible authorities.
- ➔ Do not mount the modules next to unshielded flames, easily flammable materials or near easily flammable gases or vapours.
- ➔ If the modules are mounted on a roof, ensure that mounting is carried out above fire-resistant materials.

INSTRUCTIONS FOR EARTHING

The frames of the solar modules have to be earthed. Please observe the corresponding national regulations and standards. Use one of the fastening holes in the frame to earth the module frame (for dimensions refer to the module data sheet).

- ➔ Use a copper earthing conductor with a minimum diameter of 16 mm² (heat resistance 90 °C).
- ➔ When fastening the earthing conductor use a tooth lock washer so that the anodised layer of the frame is penetrated.

4 Mounting

INSTRUCTIONS ON THE MOUNTING LOCATION

Please note that even partial shading can result in a decrease in yield. A vertical angle of incidence of the solar irradiation on the generator surface is optimal. Bundling of the sunlight by means of mirrors or lenses is not permissible. An angle of inclination of at least 15° is recommended in order to ensure self-cleaning of the modules.

- ➔ Ensure that the modules are not shaded.
- ➔ Ensure optimal alignment and inclination of the modules.
- ➔ Do not subject the module to unusual chemical contaminations (e.g. from industrial exhaust air, agriculture).
- ➔ Ensure that the rear of the PV generator is ventilated well (e.g. through sufficient distance from the roofing).

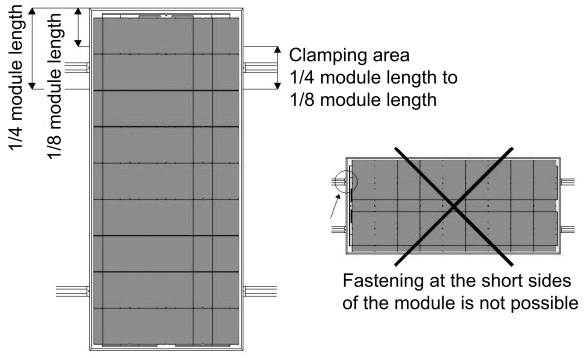

Figure 1-1: Clamping area

INSTRUCTIONS FOR MOUNTING

Horizontal mounting is also possible at framed modules. Please take into account that material expansion due to varying temperatures is possible.

- ➔ Place the clamping profiles for fastening in the area of the fastening points in the frame (for dimensions refer to the corresponding module).
- ➔ Observe the maximum mechanical load capability of the modules, also under consideration of the wind and snow load zones as well as the terrain category and the building height (for specifications refer to the module data sheet).
- ➔ Do not install the modules under mechanical strain.
- ➔ Avoid sagging at the module.
- ➔ In order to mount frameless modules use only the original module retainer brackets of Solar-Fabrik AG with EPDM insert.
- ➔ Mount the modules with a minimum distance of 10 mm.
- ➔ Do not drill any additional holes in the module frame.
- ➔ Use only non-corroding screws for mounting.

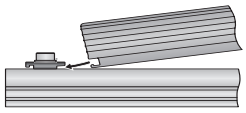

Figure 1-2: Fastening for framed modules

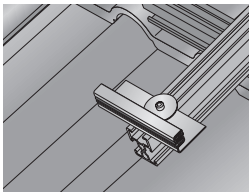

Figure 1-3: Fastening for unframed modules

5 Cabling

INSTRUCTIONS ON CABLING

The modules are supplied ex works with a solar cable, 4 mm² including connector and an installation coupling to the Lumberg LC 3 system power socket (for the length of the solar cable: see data sheet of the corresponding module type).

- ➔ Ensure that the maximum system values for voltage and current are not exceeded.
- ➔ When connecting modules in parallel ensure that they have the same voltage.
- ➔ When connecting modules in series ensure that the modules have the same current, the same alignment and inclination.
- ➔ When interconnecting the modules ensure that the maximum string voltage does not exceed the maximum system voltage of the respective module type (for values refer to the data sheet of the corresponding module).
- ➔ Do not open the power socket.
- ➔ Avoid large cable loops (see Figure 1-4).
- ➔ Ensure that the polarity is correct.
- ➔ Use only suitable connectors (Lumberg LC 3).
- ➔ Use only a suitable solar cable (for example Solarflex 400 of Solar-Fabrik AG) with a correspondingly suitable conductor cross-section (min. 4 mm², copper).
- ➔ Protect the cables against direct solar irradiation.
- ➔ Before commissioning the overall system check that the cabling and the DC voltages are correct.
- ➔ Fasten the cables with cable ties that are resistant to ultraviolet rays (e.g. to the mounting frame).
- ➔ Ensure that the connectors are connected correctly.

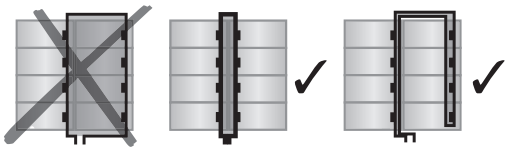

Figure 1-4: Avoid large cable loops

6 Cleaning, maintenance, disposal

INSTRUCTIONS ON CLEANING

Additional cleaning is not required from an angle of inclination of 15° on. If you nevertheless clean the system, observe the instructions listed below.

- ➔ Use a lot of water when cleaning.
- ➔ Do not use pointed or sharp objects for cleaning.
- ➔ Clean the modules with a sponge or cloth.
- ➔ Do not scratch dirt, snow or ice from the modules.

INSTRUCTIONS ON MAINTENANCE

The PV system should be cleaned at regular intervals.

- ➔ Check that all the screw and bracket connections are firm and free of corrosion.
- ➔ Check that all the cable connections are undamaged.
- ➔ Check that all the cables are connected securely and are free of corrosion.
- ➔ Check the modules optically for abnormalities.

INSTRUCTIONS ON DISPOSAL

- ➔ The national and regional regulations must be observed when disposing of or recycling the modules.
- ➔ Should you have any questions on disposing of the solar modules, contact an authorised specialist.

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