

## Setting-up instructions

In order to achieve the highest possible yield per year, we recommend the following module set-up:

- Always set up the front glass side of the solar modules directed toward the position of the sun at noontime (in the northern hemisphere directed toward the south and in the southern hemisphere directed toward the north.) Do not expose backside of the module to the sunlight.
- To ensure sufficient self-cleaning the inclination angle must not be less than  $10^\circ$ .
- The module must be set up so that any form of shading is avoided.
- Make sure that the rear side of the module is well ventilated.
- Take proper steps in order to maintain reliability and safety, in case the module is used or in areas which require high reliability: areas with heavy snow, areas with strong wind, salt water damage area, over water, areas with a constant water flow, etc.
- Do not exceed 24 modules in series.
- Do not connect modules in parallel
- For the application where extension wire are used, use only special solar cable, and use MC connector type PV-KST3 and PV-KBT3. Minimum wire conduit is 4 mm<sup>2</sup>. Make sure that cable used is in accordance with local fire, building and electrical code.

**Do not focus sunlight on any part of the module using reflectors or lenses or by any other means.**

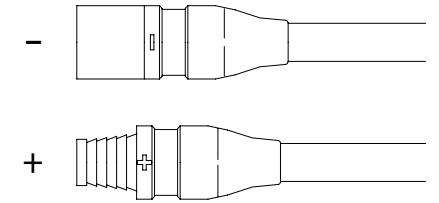
## Instruction for mounting

- Mount the module on suitable base structures for permanent installation recommended by the specialized trade.
- To install the module use four existing holes in the module frame using only M8 bolt. Do not drill holes into the module frame, and do not nail or weld it. Only use non-corroding bolt with rubber seal to install the module.
- Mount the solar module free of mechanical stress and, in order to ensure proper temperature expansion compensation, with a gap of at least 5mm to the next module on either side.
- All modules must be grounded from the aluminum frame.
- Observe the polarity of the cables when connecting the module in strings.
- When connecting the module, use cables suitable for outdoor installations. Recommended wiring size is 4 mm<sup>2</sup>.
- When connecting the solar modules to batteries, the correct polarity must be observed. Incorrect polarity will result in destruction of the protective diodes.
- Take extra care not to scratch the back of the module with sharp object. Damages to the backsheet may corrode the module.
- Especially in exposed areas, sufficient lightning protection must be provided. Integration with existing lightning protection equipment must be carried out in compliance with valid official rules and regulations.
- Install modules with the junction-box facing downwards. Make sure that no rainwater or condensation water can run into the cable glands.
- Make sure that vent holes of the module frame are open. The module may not stand in water.
- Fix the earth wire at the ground hole next to the ground marking on the module at the center of aluminum frame. It is recommended that the crimp-type terminal be assembled at the end of earth wire and that it be mounted by 5M none-corroding tapping screw. Prepare these parts separately with the mounting parts of the modules.
- Install the module at least 30mm apart from the roof. Roof must be classification C fire resistant roof.

## Cable connection

It is not necessary to open the junction-box as the connection-cables can be used for the installation of the modules!

**Attention:**  
**Do not connect or disconnect the module under load!**

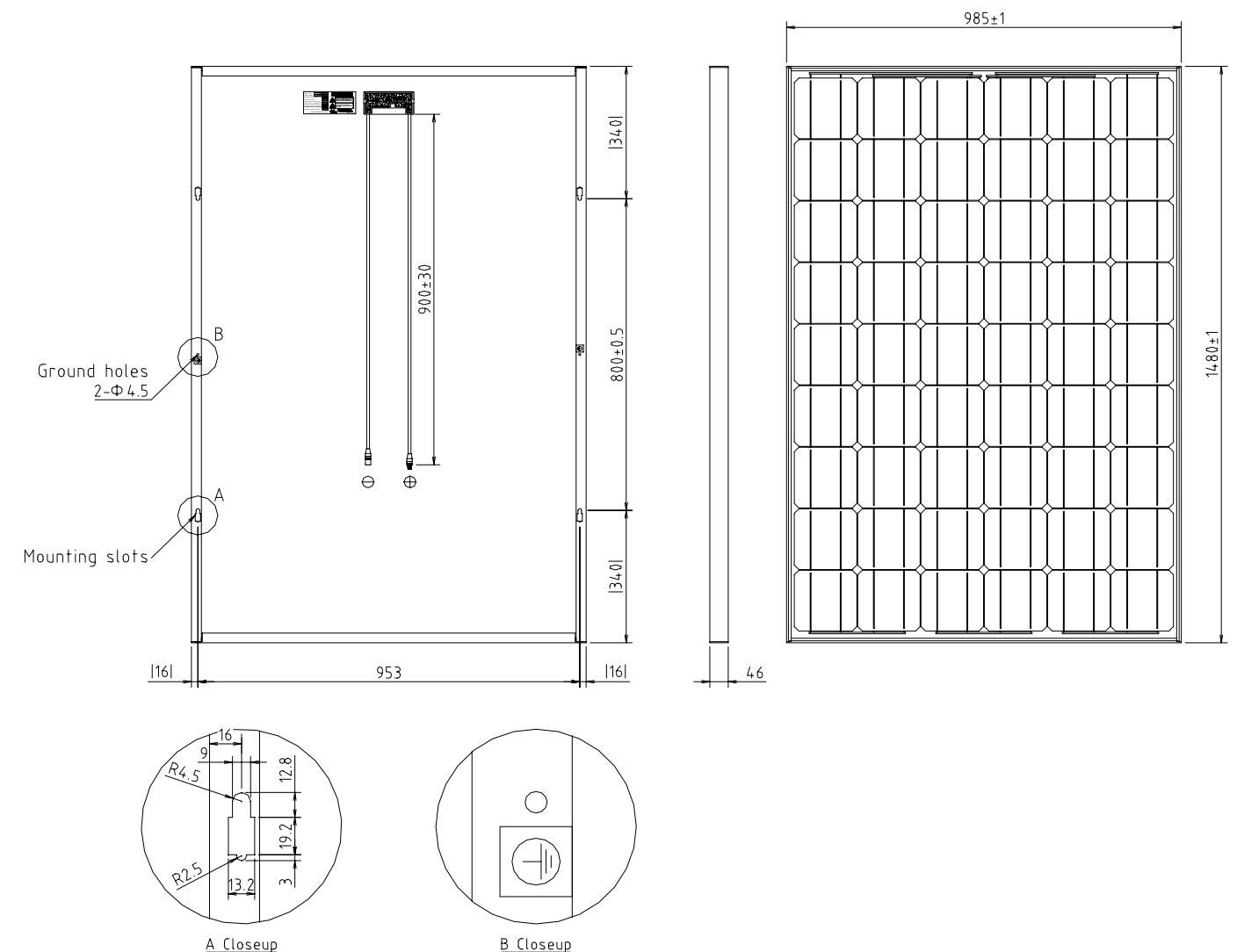


## Maintenance

- Dirtying of the front-side glass will reduce the incidence of light onto the solar cells and thus decrease the output of electrical power as well as lead to corrosion of the aluminum frame. In case of extreme dirt or dust, it is advisable to clean the front-side glass surface – especially in order to remove coarse dirt (e.g. bird excrement). To prevent damage of the hardened surface layer of the glass, this cleaning work should be done using plenty of water and a soft brush. Aggressive cleaning agents are not to be used.
- Check the electrical lines at regular intervals for any form of damage or corrosion and for firm fit of cable connections and replace them as required.
- your specialized dealer or module supplier will be glad to help you any further information.

## Module description

### ■ PCA Series, PCB Series



## Product specification

### Common Characteristics

PCA,PCB	
<b>Standard operating conditions</b>	
Temperature	-20~+40°C
Operating humidity	45~95%RH
Special environment	Avoid excess exposure to smoke, dust, saltwater
Maximum system voltage	DC1000V
<b>Insulation performance</b>	
Insulation resistance	50MΩ or over (DC500V)
Ability to withstand voltage	DC3000V for 1min
<b>Mechanical data</b>	
Maximum Wind load	2400Pa
Maximum Snow load	2400Pa
<b>Dimensions</b>	
W/L/D	985 x 1480 x 46(mm)
Weight	19kg
<b>Certification</b>	
IEC61215	Certified
IEC61730	Certified
Application class	A

### Electrical Characteristics

	PCA				
Maximum output	190W	195W	200W	205W	210W
Maximum power voltage	25.6V	25.7V	25.7V	25.8V	25.8V
Maximum power current	7.42A	7.60A	7.78A	7.96A	8.14A
Open circuit voltage	32.7V	32.8V	32.8V	32.9V	32.9V
Short circuit current	8.62A	8.65A	8.68A	8.71A	8.74A
	PCB				
Maximum output	180W	185W	190W	195W	200W
Maximum power voltage	25.6V	25.7V	25.8V	26.0V	26.2V
Maximum power current	7.03A	7.20A	7.36A	7.50A	7.63A
Open circuit voltage	32.0V	32.1V	32.3V	32.5V	32.7V
Short circuit current	8.04A	8.11A	8.18A	8.27A	8.36A

Electrical characteristics of the module is measured at standard test conditions of 1000 W/m<sup>2</sup> irradiance, AM 1.5 spectrum, 25°C cell temperature. Maximum performance limits conform to IEC 61215 standards.

Tolerance P<sub>max</sub> +5% -3% Voc ±10% I<sub>sc</sub> 90% or over

Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the values of ISC and VOC marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.

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## Solar Module

Model ;  
PCA Series, PCB Series

# Installation and Operating Instruction

Please follow the instructions mentioned below for the proper use of the module.

### Warning

- Do not disassemble or repair the module on your own. Contact your specialized dealer or module supplier for trouble-shooting.
- Do not pull on the cables or touch the junction box when the module is in operation.
- This module is not suitable for powering equipments which require extremely high reliability such as nuclear control system, space equipment, unit concerning control and safety of a vehicle (air plane, train, automobile, vessels,) medical equipment, safety equipment, etc.

### Safety Instructions

The electrical installation and commissioning can only be carried out by an electric specialist. Errors in the execution or commissioning could damage modules and can be hazardous to life and health.

Please use appropriate safety arrangements on the roof for working with the solar generator.

For your own safety and to ensure proper protection of your solar modules, please observe the following instructions:

- For proper installation and maintenance of solar modules, the regulations and safety instructions valid for the installation of electrical components and electrical systems as well as the rules and regulations of the grid operator must be observed.
- If the modules are connected in series, the voltages of the individual modules will add up to a voltage above the safety low voltage of 120VDC!
- The total open-circuit voltage of the modules must be taken into account even at minimum illumination.
- When working with the modules, it is important to make sure that the modules are either completely covered up or disconnected by means of an isolating device from the consumer unit due to the fact that electric arcs can easily be produced while performing tasks on direct-current conductors.
- The allowed maximum system voltage of the solar modules must not be exceeded, this also applies for low temperatures (see data sheet and module type plate.)
- The solar module must be treated like a glass product and is not suitable to be walked on.
- To prevent fire, do not allow outside current to flow into the module.
- For over current protection use 10A fuse.