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A large array of solar panels is shown in a black and white photograph, tilted at an angle. The panels are arranged in a grid pattern. A semi-transparent grey box with a grid pattern is overlaid on the bottom left of the image, containing the title and version information.

***Global Installation Guide for
Suntech Power Double Glass Module***

Version 20170101

- * **Please read carefully. This document is binding for any warranty case.**
- * **Any installed PV system less than 500m from coastline, please refer to the Near-coast installation manual.**

- This guide contains information regarding the installation and safe handling of Suntech Power Co., Ltd photovoltaic module (hereafter is referred to as “module”). Suntech Power Co., Ltd hereafter is referred to as “Suntech”.
- Installers must read and understand the guide before installation. Any questions, please contact our sales department for further explanations. The installer should conform to all safety precautions in the guide and local codes when installing a module.
- Before installing a solar photovoltaic system, installers should become familiar with the mechanical and electrical requirement for such a system. Keep this guide in a safe place for future reference (care and maintenance) and in case of sale or disposal of the modules.

General safety

- Modules rated for use in this application class may be used in systems operation at greater than 50V DC or 240W, where general contact access is anticipated. Modules qualified for safety through this part of IEC61730-2 and within this application class are considered to meet the requirements for safety class II.
- Installing solar photovoltaic systems may require specialized skills and knowledge. Installation should be performed only by qualified persons.
- Installers should assume the risk of all injury that might occur during installation, including, without limitation, the risk of electric shock.
- One individual module may generate DC voltages greater than 30 volts when exposed to direct sunlight. Contact with a DC voltage is potentially hazardous and should be always avoided.
- Do not disconnect the modules or any electrical part under load..
- Photovoltaic solar modules change light energy to direct-current electrical energy. They are designed for outdoor use. Modules may be ground mounted, mounted on rooftops, vehicles or boats. Proper design of support structures is responsibility of the system designers and installers.
- Do not use mirrors or other magnifiers to artificially concentrate sunlight on the modules.
- When installing the system, abide with all local, regional and national statutory regulations. Obtain a building permit where necessary.
- The electrical characteristics are within ± 10 percent of the indicated values of I_{sc} , V_{oc} and P_{max} under standard test conditions (irradiance of 1000 W/m^2 , AM 1.5 spectrum, and a cell temperature of 25°C (77°F)).
- Only use equipment, connectors, wiring and support frames suitable for a solar electric systems.
- Do not permit constant dew on any part of backsheet of the module.

Handling safety

- Do not lift the module by grasping the module's junction box or electrical leads.
- Do not stand or step on module.
- Do not drop the module or allow objects to fall on the module.
- To avoid glass breakage, do not place any heavy objects on the module.
- Do not set the module down hard on any surface.
- Inappropriate transport and installation may break module.
- Do not attempt to disassemble the modules, and do not remove any attached nameplates or components from the modules.
- Do not apply paint or adhesive to module top surface.
- To avoid damage to the back sheet, do not scratch or hit the backsheet.
- Avoid setting the panel down hard on any surface, particularly when placing it on a corner.
- A panel with broken glass or torn back-skin cannot be repaired and must not be used since contact with any panel surface or the frame can produce electrical shock.
- Work only under dry conditions, and use only dry tools. Do not handle panels when they are wet unless wearing the appropriate protective equipment.
- When storing un-connected panels outside for any length of time, always cover panels which have the glass facing down to stop water collecting inside the panel and causing damage to exposed connectors.

Installation safety

- Never open electrical connections or unplug connectors while the circuit is under load.
- Contact with electrically charged parts of the modules, such as terminals, can result in burns, sparks and lethal shock whether the panel is connected or disconnected..
- Do not touch the PV module unnecessarily during installation. The glass surface may be hot; there is a risk of burns and electric shock.
- Do not work in the rain, snow or in windy conditions.
- Cables shall be located so that they will not be exposed to direct sunlight in order to prevent degradation of cables.
- Keep children well away from the system while transporting and installing mechanical and electrical components.
- Completely cover the module with an opaque material during installation to keep electricity from being generated.
- Do not wear metallic rings, watchbands, earrings, nose rings, lip rings or other metallic objects while installing or troubleshooting photovoltaic systems.
- Use only insulated tools that are approved for working on electrical installations.
- Abide with the safety regulations for all other components used in the system, including wiring and cables, connectors, charging regulators, inverters, storage batteries and rechargeable batteries, etc.

Installation safety

- Under normal outdoor conditions the module will produce current and voltages that are different than those listed in the data sheet. Data sheet values are values expected at standard test conditions. Accordingly, during system design, values of short-circuit current and open-circuit voltage should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacity, fuse ratings and size of controls connected to the modules or system output.

Fire Safety

- Refer to your local authority for guidelines and requirements for building or structural fire safety.
- The roof construction and installation may affect the fire safety of a building; improper installation may contribute to hazards in the event of fire.
- It may be necessary to use components such as earth ground fault circuit breakers, fuses and circuit breakers.
- Do not use panels near equipment or locations where flammable gases can be generated or can collect.
- The modules are rated fire Class C, and are suitable for mounting over a class A roof. Do not install modules on a roof or building during strong winds in case of accidents.

Product identification

Each module has three labels on its rear side providing the following information:

1. Nameplate: describes the product type; rated power, rated current, rated voltage, open circuit voltage, short circuit current, all as measured under standard test conditions; weight, dimensions etc.; the maximum system voltage 1000 volts DC and is shown on the nameplate. Maximum fuse rating is also shown.

2. "Pass": describe inspection date and security class.

3. Bar code: each individual module has a unique serial number. The serial number has 18 digits. The 15th and the 16th digit are the week code, and the 17th and the 18th digit are the year code. For example, xxxxxxxxxxxx0106 means the module was made in the first week of 2006. There is only one bar code on module. It is permanently attached to the interior of the module visible when viewing from the front of the module. This bar code is inserted at the beginning of laminating.



Typical serial number barcode label

Do not remove any label. If the label is removed, the product warranty will no longer be honored by Suntech.

Mechanical Installation

Selecting the location

- Select a suitable location for installing the modules.
- The modules should be facing south in northern latitudes and north in southern latitudes.
- SUNTECH recommend that the minimum installation angle is 10 degree because dust can be washed by rain or dew for better effective light intensity and better ventilation as hot air on and under the module can flow along a direction and the module has higher performance at lower temperature
- For detailed information on the best elevation tilt angle for the installation, refer to standard solar photovoltaic installation guides or a reputable solar installer or systems integrator.
- The module should not be shaded at any time of the day.
- Do not use module near equipment or in locations where flammable gases can be generated or collected.

General Installation

- The support module mounting structure must be made of durable, corrosion-resistant and UV-resistant material.
- Select the height of the mounting system to prevent the lowest edge of the module from being covered by snow for a long time in winter in areas that experience heavy snowfalls. In addition, assure the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by sand and stone driven by wind.
- When installing a module on a roof or building, ensure that it is securely fastened and cannot fall as a result of wind or snow loads.
- Provide adequate ventilation under a module for cooling (10cm minimum air space between module and mounting surface).

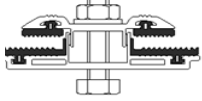
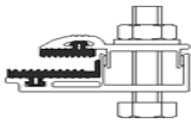

Mechanical Installation



- Always observe the instructions and safety precautions included with the support frames to be used with the modules.
- Do not attempt to drill holes in the glass surface of the modules. To do so will void the warranty.
- Modules must be securely attached to the mounting structure.
- When installing module on a roof, ensure that the roof construction is suitable. In addition, any roof penetration required to mount the module must be properly sealed to prevent leaks.
- When installing a module on a pole, choose a pole and module mounting structure that will withstand anticipated winds for the area.
- Care must be taken to avoid low tilt angles which may cause dirt to build-up on the glass against the frame edge.
- Dirt build-up on the surface of the panel can cause active solar cells to be shaded and electrical performance to be impaired.
- Observe the linear thermal expansion of the module (the recommended distance between 2 modules is 2 cm).
- Ensure panels are not subjected to wind or snow loads in excess of the maximum permissible loads and are not subject to excessive forces due to the thermal expansion of the support structure, see the following paragraph for more detailed information.

Installation method

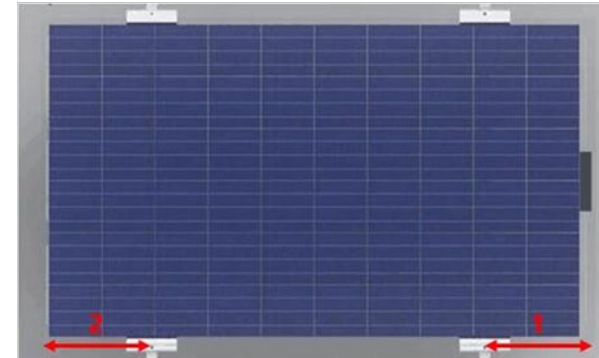
Main Parts and functionality

Tab1: introduction of clamps&parts

NO.	Items	Pic	Description
1	Middle Clamp		Middle module installation
2	Edge Clamp		Edge installation
3	EPDM Rubber Strip		To protect Modules

4	Purlin		Used to install clamp
5	Screw		Fasten Module with clamps

Installation parameters



Tab2: Double glass installation parameters

Module Dimension(mm)	1634×986×6	1662×990×5	1980×990×5
Thickness of Glass (mm)	2.5 mm	2.0 mm	2.0 mm
Installation Distance 1(mm)	275~370	280~380	410~450
Installation Distance 2(mm)	275~370	280~380	410~450
Distance between two purlins(mm)	894-1084	902-1102	1080-1160
The torque(N*M)	15-18	15-18	15-18

Note: The side that junction box exists is rear side.

Installation method

Tab3: Installation method

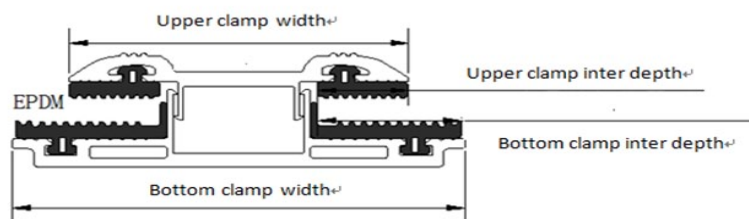
Module Dimension(mm)	Thickness of Glass (mm)	Load Capacity	Clamp Length	Qty of Purlins & Clamps
1634×986×6mm	2.5 mm	+2400Pa/-2400Pa	150mm	2 purlins & 4 clamps
1662×990×5mm	2.0 mm	+2400Pa/-2400Pa	150mm	2 purlins & 4 clamps
1980×990×5mm	2.0 mm	+2400Pa/-2400Pa	200mm	2 purlins & 4 clamps

Note: Design load is 1600Pa with the safety factor $\gamma=1.5$

Clamp details

The reasonable structure of cross section and dimension can improve mechanical load capacity when using clamps. Please check the picture of "cross section of clamp" below and dimension references that in Tab 4. EPDM used in the clamps protecting module from damages should not react chemically with other materials.

Cross section of Clamp



Sectional dimension of Clamps

Tab4: Sectional dimension of Clamps

NO.	Items	Standards
1	Upper clamp inter depth	$\geq 15\text{mm}$
2	Bottom clamp inter depth	$\geq 25\text{mm}$
3	Clamp Thickness	$\geq 2\text{mm}$
4	EPDM Thickness	$\geq 3\text{mm}$

Electrical Installation

General installation

- Do not use modules of different configurations in the same system.
- The max. number (connected in series) of module (N) = $V_{\text{max system}} / [V_{\text{oc}}(\text{at STC})]$.
- The max. number (connected in parallel) of module is not limited, which is determined by system design such as current, power output.
- Several modules are connected in series and then in parallel to form a PV array, especially for application with a high operation voltage. If modules are connected in series, the total voltage is equal to the sum of individual voltages.
- For applications requiring high currents, several photovoltaic modules can be connected in parallel; the total current is equal to the sum of individual currents.
- Module is supplied with connectors to use for system electrical connections.
- Consult rated local wiring regulations to determine system wire size, type, and temperature.
- The cross section area of cable and the capacity of connector must be selected to suit the maximum system short circuit current (Recommended cross section area of cable is 4mm^2 for a single module and rated current of a connector is larger than 10A), otherwise the cable and connector will be overheated under large current. Please note that the upper limit temperature of cable is $\geq 85^\circ\text{C}$,and the connector is $\geq 105^\circ\text{C}$.
- The DC electrical energy generated by photovoltaic systems may also be converted to AC and connected to a utility grid system. As local utilities' policies on connecting renewable energy systems to their grids vary from region to region. Consult a qualified system designer or integrator to design such a system. Permits are normally required for installing such a system and the utility must formally approve and inspect such a system before it can be accepted.

Maintenance

Suntech recommends the following maintenance in order to ensure optimum performance of the module:

- Clean the glass surface of the module as necessary. Always use water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent can be used to remove stubborn dirt.
- Check the electrical and mechanical connections every six months to verify that they are clean, secure and undamaged.
- If any problem arises, have them investigated by a competent specialist.
- Attention, observe the maintenance instructions for all components used in the system, such as support frames, charging regulators, inverters, batteries etc.

Disclaimer of liability

- Because the use of this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic (PV) product are beyond Suntech's control, Suntech does not accept responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance.
- No responsibility is assumed by Suntech for any infringement of patents or other rights of third parties, which may result from use of the PV product. No license is granted by implication or otherwise under any patent or patent rights.
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