

# SoliTek PV Modules INSTALLATION MANUAL

Version: 15 11 26

According to: IEC 61215 IEC 61730

**For:**  
**72 cells model**  
**60 cells model**  
**36 cells model**

Thank you for choosing SoliTek panels. Please read this guide in its entirety before the installation. Failure of follow instructions in this guide may damage system components, endanger personnel, damage property, or invalidate the panel warranty.

The purpose of this document is to provide minimum requirements and recommendations for safe and successful installation of SoliTek PV modules. This document also contains requirements necessary to retain SoliTek PV module compliance with IEC 61215 and IEC 61730 standards.

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## Safety

### General

You must understand and follow all applicable local, state, and federal regulations and standards for building construction, electrical design, fire, and safety, and must check with local authorities to determine applicable permitting requirements before attempting to install or maintain PV modules.

Rooftop PV systems should only be installed on dwellings that have been formally analyzed for structural integrity, and confirmed to be capable of handling the additional weighted load of PV system components, including PV modules, by a certified building specialist or engineer.

For your safety, do not attempt to work on a rooftop until safety precautions have been identified and taken, including without limitation fall protection measures, ladders or stairways, and personal protective equipment (PPE).

For your safety, do not install or handle PV modules under adverse conditions, including without limitation strong or gusty winds, and wet or frosted roof surfaces.

The flat-plate PV module construction consists of a laminated assembly of solar cells encapsulated within an insulating material within two glass sheets.

### Electrical

PV modules can produce current and voltage when exposed to light of any intensity. Electrical current increases with higher light intensity. DC voltage of 30 Volts or higher is potentially lethal. Contacting the live circuitry of a PV system operating under light can result in lethal electric shock.

De-energize PV modules by removing them entirely from light or by covering their front surface with an opaque material. Regard the safety regulations for live electrical equipment when working with modules that are exposed to any light. Use insulated tools and do not wear metallic jewelry while working with PV modules.

In order to avoid arcing and electrical shock, do not disconnect electrical connections under load. Faulty connections can also result in arcing and electrical shock. Keep connectors dry and clean, and ensure that they are in proper working condition. Never insert metallic objects into the connectors, or modify them in any way in order to secure an electrical connection.

Do not touch or handle PV modules with broken glass unless the PV modules are first disconnected and you are wearing proper PPE. Avoid handling PV modules when they are wet unless cleaning the PV modules as

directed in this manual. Never touch electrical connections that are wet without protecting yourself with insulated gloves.

## Handling

SoliTek PV modules must be transported in the supplied packaging only and kept in the packaging until they are ready to be installed. Protect pallets against movement and exposure to damage during transportation. Secure pallets from falling over. Do not exceed the maximum height of pallets to be stacked, as indicated on the pallet packaging. Store pallets in a cool and dry location until the PV modules are ready to be unpackaged.

SoliTek PV modules are heavy, and should be handled with care. Never use the junction box or cables as a grip. Do not exert mechanical stress on the cables. Never step on PV modules or drop or place heavy objects on them. Be careful when placing PV modules on hard surfaces, and secure them from falling. Broken glass can result in personal injury. PV modules with broken glass cannot be repaired and must not be used. Broken or damaged PV modules must be handled carefully and disposed of properly.

## Specifications

	Model A	Model B	Model C
Dimensions	1960x986x7.1 mm (+/- 2mm)	1645x986x7.1 mm (+/- 2mm)	1486x669x7.1 mm (+/- 2mm)
Weight	32 kg	27 kg	16,5 kg
Construction	Frameless glass/glass laminate 3 mm tempered solar glass front & back		
Solar cells	72 cells (poly/mono) 156x156 mm	60 cells (poly/mono) 156x156 mm	36 cells (poly/mono) 156x156 mm
Output cables	900 mm		
Electrical connectors	TE connectivity (TE) – BREEZE4GBR3SA, 0.9M		
Mounting system	4 clamps (100mm) for 2400 Pa load – 2 rail system 4 clamps (200mm) for 5400 Pa snow loads - 2 rail system		

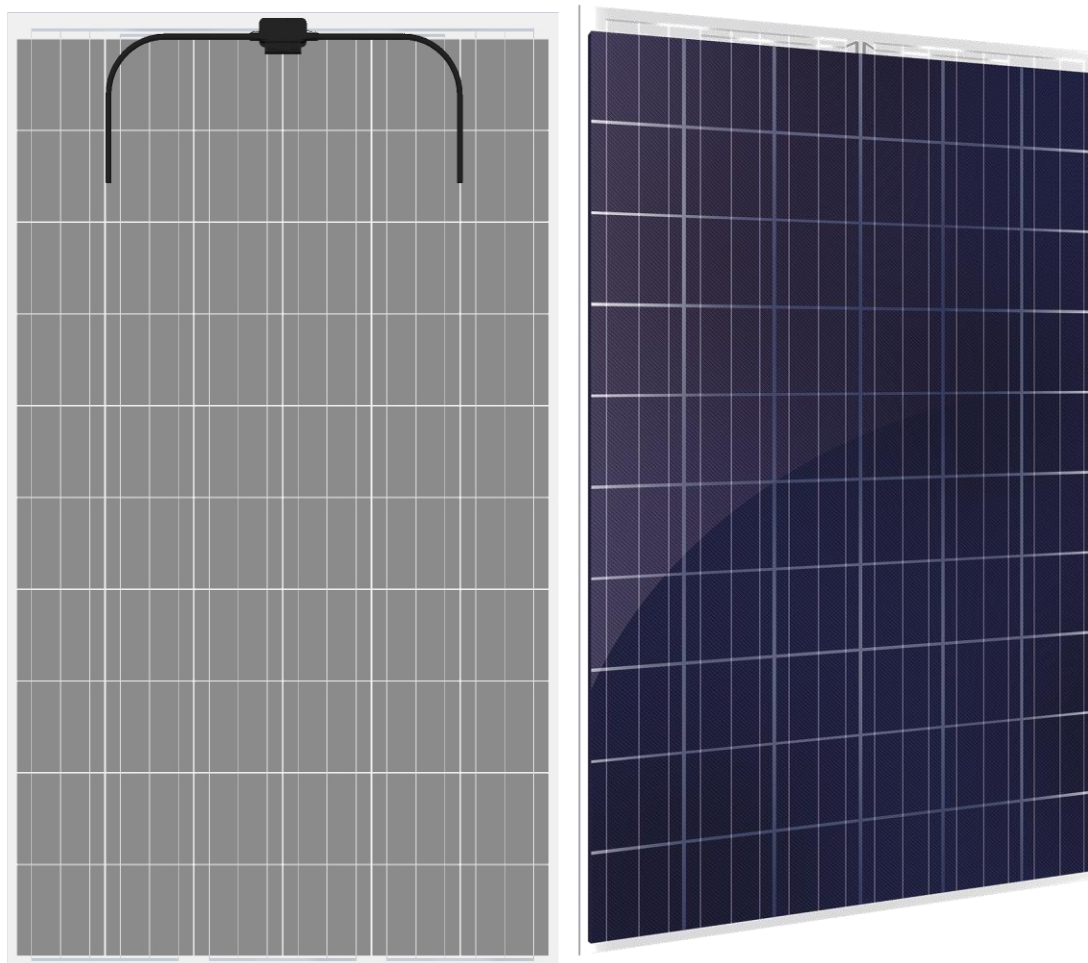


Figure 1 Glass-Glass pv module visualization of front and back sides

## Application

### Restrictions

Soli Tek PV modules must be mounted on appropriate mounting structures positioned on suitable buildings, the ground, or other structures suitable for PV modules (e.g. carports, building facades or PV trackers). PV modules must not be mounted on moving vehicles of any kind. Modules must not be installed in locations where they could be submerged in water.

Artificially concentrated light must not be directed on SoliTek PV modules.

### Recommendations

SoliTek recommends that PV modules be mounted at a minimum tilt angle of 10 degrees to allow for proper self-cleaning from rain.

Partial or complete shading of a PV module or modules can significantly reduce system performance. SoliTek recommends minimizing the amount of shade throughout the year to increase the amount of energy produced by the PV modules.

High system voltages could be induced in the event of an indirect lightning strike, which could cause damage to PV system components. The open area of wire loops should be minimized; in order to reduce the risk of lightning induced voltage surges.

## Electrical installation

### Configuration

Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at Standard Test Conditions (STC: 1000 W/m<sup>2</sup>, AM 1.5, and 25° cell temperature). The short-circuit current (ISC) should be multiplied by a factor of 1.25 and the open-circuit voltage (VOC) should be multiplied by a factor of up to 1.25 based on the lowest ambient temperature recorded for the installation location when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.

Voltages are additive when PV modules are connected directly in series, and module currents are additive when PV modules are connected directly in parallel. PV modules with different electrical characteristics must not be connected directly in series. The use of suitable third-party electronic devices connected to PV modules may enable different electrical connections and must be installed according to the manufacturer's specified instructions.

The maximum number of PV modules that can be connected in a series string must be calculated in accordance with applicable regulations in such a way that the specified maximum system voltage of the PV module and all other electrical DC components will not be exceeded in open-circuit operation at the lowest temperature expected at the PV system location.

An appropriately rated overcurrent protection device must be used when the reverse current could exceed the value of the maximum fuse rating of the module. An overcurrent protection device is required for each series string if more than two series strings are connected in parallel.

## **Cable & wiring**

SoliTek PV modules are provided with two standard, sunlight resistant output cables that are terminated with PV connectors ready for most installations. The positive (+) terminal has a male connector while the negative (-) terminal has a female connector. The module wiring is intended for series connections [i.e. male (+) to female (-) interconnections], but can also be used to connect suitable third-party electrical devices that may have alternative wiring configurations so long as the manufacturer's instructions are followed.

Use field wiring with suitable cross-sectional areas that are approved for use at the maximum short-circuit current of the PV module. SoliTek recommends installers use only sunlight resistant cables qualified for direct current (DC) wiring in PV systems. The minimum wire size should be 4 mm<sup>2</sup>.

Cables should be fixed to the mounting structure in such a way that mechanical damage of the cable and/or the module is avoided. Do not apply stress to the cables. For fixing, use appropriate means, such as sunlight resistant cable ties and/or wire management clips.

While the cables are sunlight resistant and waterproof, where possible, avoid direct sunlight exposure and water immersion of the cables.

## **Connectors**

Keep connectors dry and clean, and ensure that connector caps are hand tight before connecting the modules. Do not attempt making an electrical connection with wet, soiled, or otherwise faulty connectors. Avoid sunlight exposure and water immersion of the connectors. Avoid connectors resting on the ground or roof surface.

Faulty connections can result in arcs and electrical shock. Check that all electrical connections are securely fastened. Make sure that all locking connectors are fully engaged and locked.

## Bypass diodes

The junction box used with SoliTek PV modules contains bypass diodes wired in parallel with the PV cell strings. In the case of partial shading, the diodes bypass the current generated by the non-shaded cells, thereby limiting module heating and performance losses.

Bypass diodes are not overcurrent protection devices. Bypass diodes divert current from the cell strings in the event of partial shading.





## Mounting instructions

### Mounting rails

Please observe the safety regulations and installation instructions included with the mounting rail. If necessary please contact the supplier directly for further information.

The modules must be safely set onto the mounting rail. The whole rail supporting the photovoltaic system must be strong enough to resist potential mechanical pressures caused either by wind or snow, in accordance with local, regional and state safety (and other associated) standards.

Make sure that the mounting rail will not deform or affect the modules when it expands as a result of thermal expansion.

The mounting rail must be made of durable, anti-corrosive and UV-resistant materials.

### Mounting with clamps

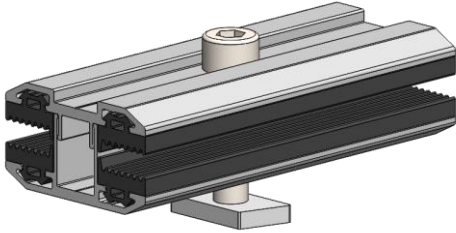
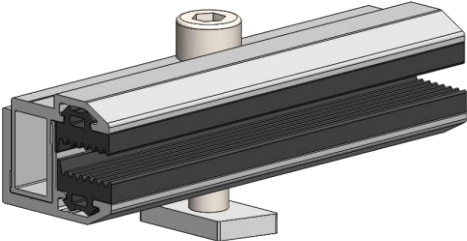
SoliTek has tested its modules with Alumero laminated CLICK 6.8 clamps. Use at minimum 4 clamps to fix modules on the mounting rails. Modules clamps metal parts should not come into contact with the front or back glass. When choosing this type of clamp-mounting method, use at least four clamps on each module; two clamps should be attached on each long side. Depending on local wind and snow loads, additional clamps may be required to ensure that modules can bear the load.

To withstand 5400Pa (snow) load pv module should be mounted using 4 clamps (2 on each long side) and over 2 transversal metal bars, which have to be mounted just behind the module attached to the back glass with no separation to prevent the module from bending. Clamps selection and fixation points are given in the mounting schemes.

Applied torque should refer to mechanical design standard according to the bolt customer is using. It is recommended to use only certificated equipment for the PV plant installation.

## Clamp technical data

Table 1. Laminated, CLICK 6.8 type, clamp details

Product	Visualisation	Length options:	Material / surface
Laminate middle clamp CLICK 6.8		<ol style="list-style-type: none"> <li>100mm</li> <li>200mm</li> </ol>	EN AW 6063/T66; EPDM; mill finish / black
Laminate end clamp CLICK 6.8		<ol style="list-style-type: none"> <li>100mm</li> <li>200mm</li> </ol>	EN AW 6063/T66; EPDM; mill finish / black

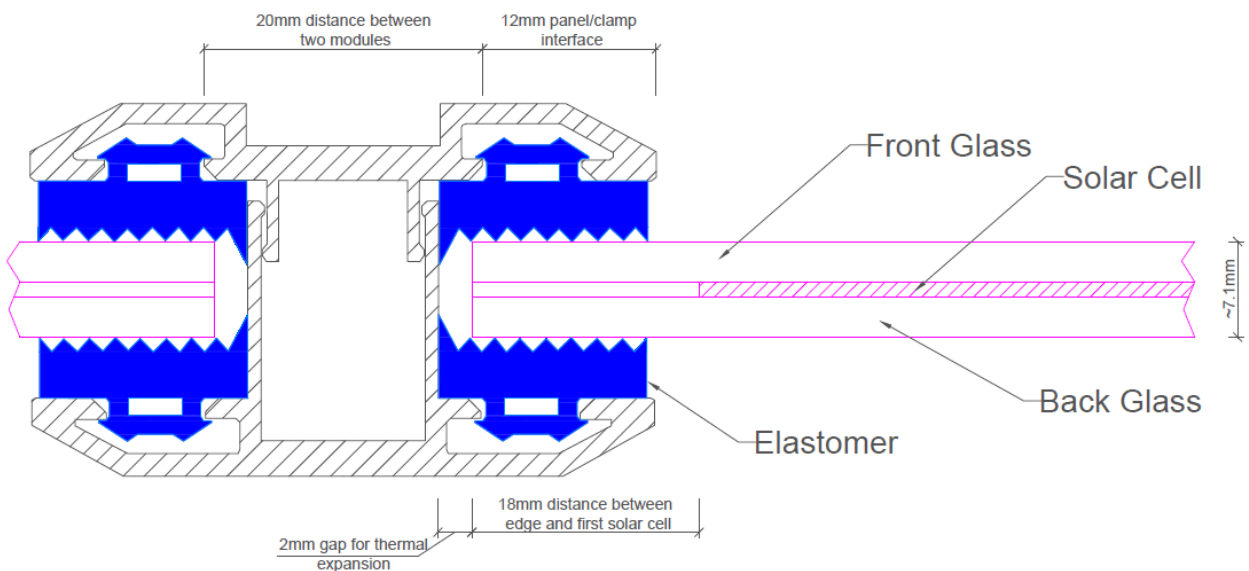


Figure 2. Recommended clamp dimensions for the SoliTek PV Glass-Glass modules

## Module mounting schemes

Table 2. Glass-Glass module (300W) mounting details

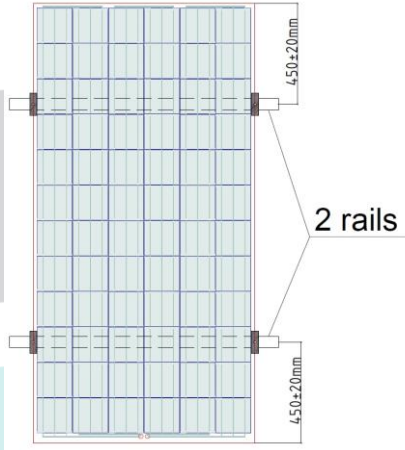
<b>Glass-Glass PV module: 72 cell (300W)</b>			
Mechanical loading	Clamp length	Quantity	
+2400Pa/-2400Pa 2 rails	100mm	4	
+5400Pa/-2400Pa 2 rails	200mm	4	

Table 3. Glass-Glass module (250-260W) mounting details

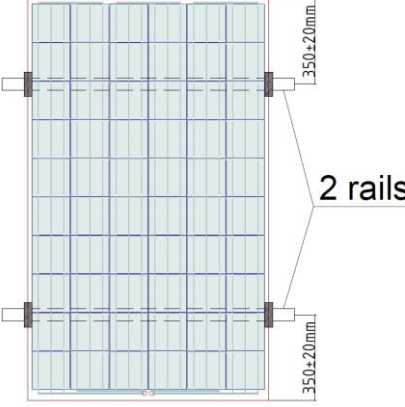
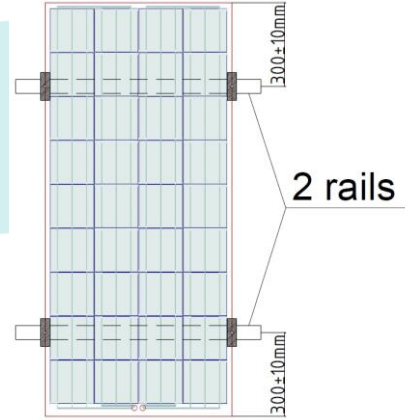
<b>Glass-Glass PV module: 60 cell (250-260W)</b>			
Mechanical loading	Clamp length	Quantity	
+2400Pa/-2400Pa 2 rails	100mm	4	
+5400Pa/-2400Pa 2 rails	200mm	4	

Table 4. Glass-Glass module (150W) mounting details

<b>Glass-Glass PV module: 36 cell (150W)</b>			
Mechanical loading	Clamp length	Quantity	
+2400Pa/-2400Pa 2 rails	100mm	4	
+5400Pa/-2400Pa 2 rails	200mm	4	

## Maintenance

In order to ensure optimum module performance, SoliTek recommends the following: If necessary, the glass front of the module can be cleaned with water and a soft sponge or cloth. A mild, non-abrasive detergent can be used to remove more stubborn stains.

Check the electrical and mechanical connections periodically and make sure they are clean, safe, complete and secure.

In the event of a problem, consult with a licensed/qualified person.

## Disclaimer of liability

Since it is impossible for SoliTek to control installation, operation, application and maintenance of the photovoltaic system according to this instruction. SoliTek does not accept responsibility and expressly disclaims liability for any loss, damage or expense arising out of or in any way connected with such installation, operation, use or maintenance.

SoliTek will not take any responsibilities for any possible violation of patent rights and third party rights that are related to application of the solar energy system. No permission of patents is given through implication.

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