

SOLUXTEC

made in Germany.

USER GUIDE

SOLUXTEC
SOLAR PRODUCTS



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1 INTRODUCTION

Thank you for electing SOLUXTEC GmbH PV modules. The following user guide covers important instructions to be read and understood before installation of SOLUXTEC products. This document does not have any relation to quality warranties and only acts as a user guide for electrical, mechanical and general handling safety of SOLUXTEC products.

In case PV installation is not respecting below mentioned points, the quality warranty of SOLUXTEC products will become invalid.

This document belongs to SOLUXTEC and all content is SOLUXTEC intellectual property. SOLUXTEC reserves the right to modify this document without prior notice.

- Please read this document carefully before installation
- Please make sure that this document is always available for installers and operators to handle SOLUXTEC products.
- Please give a copy of this document to the installation owner.
- If any questions are not well answered in this document, please contact SOLUXTEC support prior installation.

2 SAFETY

- ⚠ The installation of photovoltaic modules must respect the current standards from the place of installation. It is imperative to refer to the standards of each local authority in case specific rules are imposed.
- ⚠ Installation of photovoltaic modules must be operated by qualified people with sufficient knowledge of all regulations and compliance requirements specific to the country of installation.
- ⚠ Solar modules create DC electricity and are even energized under a slight illumination level. Several modules connected together may occur an accumulation of voltage and intensity. Please respect all personal security to avoid a risk of electrocution.
- ⚠ Please respect the data given from the elected module's data sheet to respect all module's limits and comply with other materials that will be needed to operate the photovoltaic generator.
- ⚠
 - Never open the junction box on the back of the photovoltaic module
 - Make sure that connectors are clean and not dirty or wet before connection.
 - Never disconnect the photovoltaic connector under load. Always turn off the DC breaker prior to any photovoltaic connector disconnection.
 - Tools must be dedicated for solar installation and supporting DC current.
 - The final photovoltaic generator must follow all needed standards and requirements in compliance with the installation country (PV, inverter, cable, grounding and other accessories from the PV generator).
 - Never disassemble any part of the module.

3 REGULATION











All modules presented in this document are covered by the following standards:

- IEC 61215
- IEC 61730
- IEC 62804 (PID)
- IEC 61701 (SALT MIST)
- IEC 62716 (AMMONIA)
- EMC and Low Voltage regulation

NOTE: SOLUXTEC is always improving its products. Please contact customer service if a standard is missing for your project from the above list.

4 TRANSPORTATION AND HANDLING

During transportation and interim storage, following points have to be respected:

-  Transportation of the modules needs to be done only with SOLUXTEC original packaging.
-  Never exceed the maximum number of pallets to be stacked. Only original SOLUXTEC packaging is allowed for pallet stacking.
-  When unpacking modules, please wear soft and clean gloves. It is forbidden to use suction cup to carry the module as it will damage the onto reflective coating for the solar glass.
-  It is forbidden to carry/lift the modules from the solar cables or from the junction box or any conductive elements.
-  Do not drop module directly on module.
-  While handling modules be cautious, especially on the corners to not shock them.
-  While handling the modules never scratch the anodised coating of the frame. Corrosion may occur and cause mechanical resistance diminution.
-  It is forbidden to drill holes in the aluminium frames.
-  It is forbidden to paint the modules or to apply any adhesive on the module's surface.
-  Never walk on the module.

5 PRODUCTS DETAILS

This document is valid for all products below:

FRAMED	DAS MODUL MONO VI / XSC	DMMVI / DMMXSC	Single glass	White / Black
	DAS MODUL MONO	DMM	Single glass	White/ Black
	DAS MODUL POLY	DMP	Single glass	White / Black
	DAS MODUL MONO PURE GLASS VI / XSC	DMMVIPG / DMMXSCPG	Glass glass	Transparent / black
	DAS MODUL MONO VI GEMINI	DMMVI_GEMINI	Single glass Bifacial	Transparent
FRAMELESS	POWERSLATE MONO VI	PSMVI	Single glass	Black/White/Transparent
	POWERSLATE MONO VI PG	PSMVIPG	Glass glass	Black/White/Transparent

Label explanation:

SOLUXTEC Werner-von-Siemens-Str. 25
D-54634 Bitburg

DAS MODUL MONO VI Serie 370 Wp
DMMVI370

Pmax (0, + 4,99 Wp)	370 Wp
Isc	11,41 A
Impp	10,81 A
Voc	41,06 V
Vmpp	34,25 V
Max. System Voltage	1500 V
Protection Class	II
Max. Series Fuse	25 A

All values measured under STC (1000 W/m², 25°C, AM 1,5).
Power measurement tolerance: Pmax ±3%, Isc ±3%, Uoc ±3%
Pflash>Pmpp

MADE IN GERMANY

All Modules from SOLUXTEC have their own label on back.

This label summarizes the module data sheet as follows:

- Place of production
- Commercial name
- STC (standard test condition) data:
 - Pmpp : Power in watt at maximum power point
 - Isc : Short circuit Intensity in ampere
 - Impp : Intensity in ampere at power point
 - Voc : Voltage in volt in open circuit
 - Vmpp : Voltage in volt at power point

For more details about mechanical or electrical module behaviour, please refer to dedicated data sheet.

Serial number codification:

S T U V WW XX YYY ZZZZ, where:

- S = D for DAS MODUL
P for POWERSLATE
- T = F for foil module
G for Glass Glass module
- U = A for solar cell mono M6
B for solar cell mono M10
C for solar cell mono M3
D for solar cell poly 157 mm²
E for solar cell mono M6 Bifacial
F for solar cell mono M10 Bifacial
G for solar cell mono M3 bifacial
H for solar cell mono M10 half cut
- V = 1 for production in FAB 1 Bitburg
2 for production in FAB 2 Trier
- W = month of production
- X = year of production
- Y = Production order number
- Z = Module number from above Production Order number.

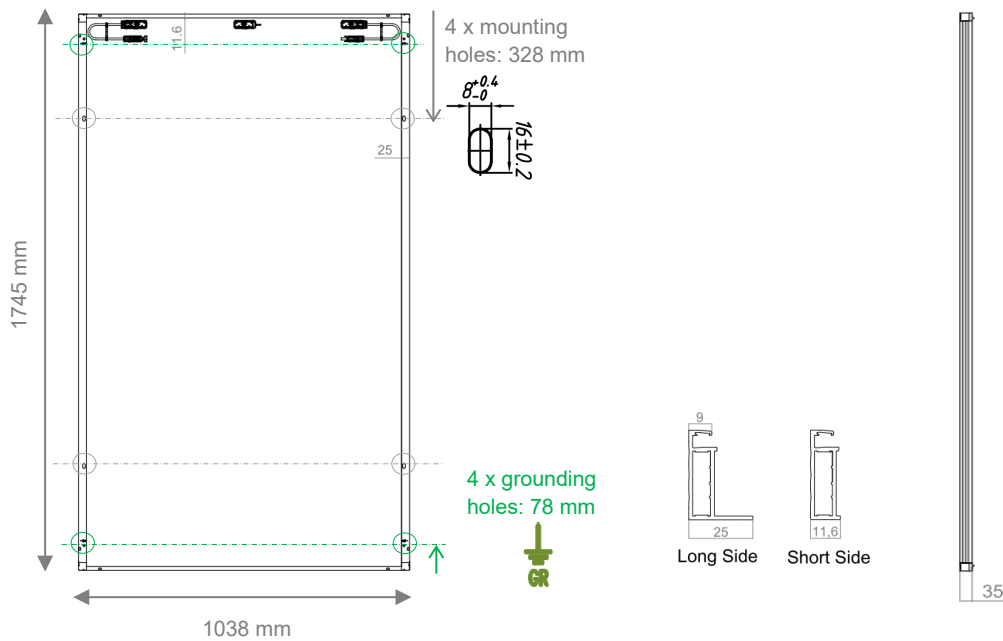
6 INSTALLATION ON SITE

When installing SOLUXTEC PV modules the following guidelines need to be respected on site.

MODULE DESIGN PRESENTATION

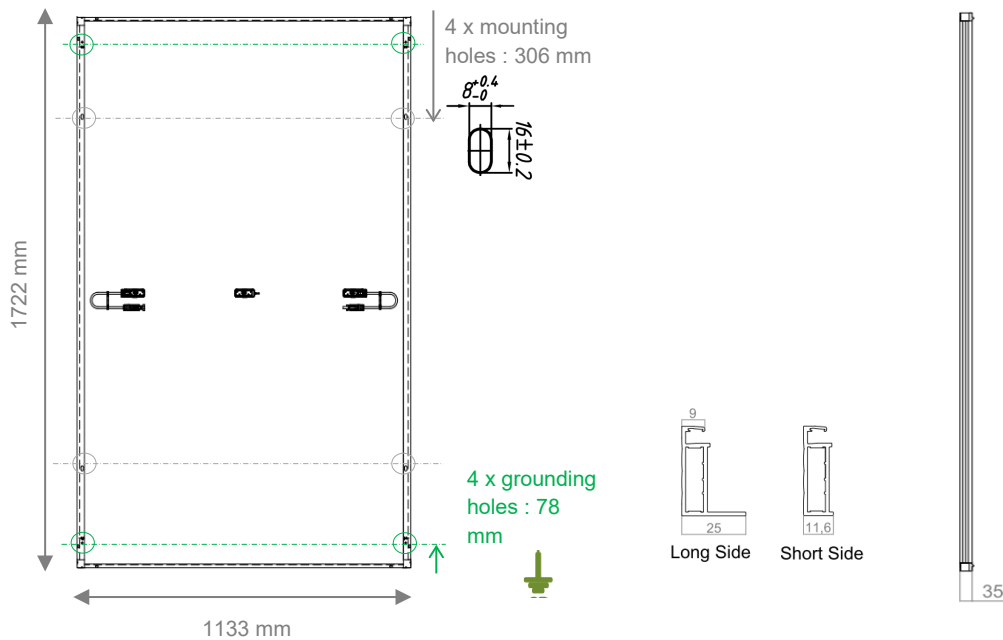
- Frame design for M6 solar cells modules:

- DMMVI
- DMMVI_GEMINI
- DMMVIPG



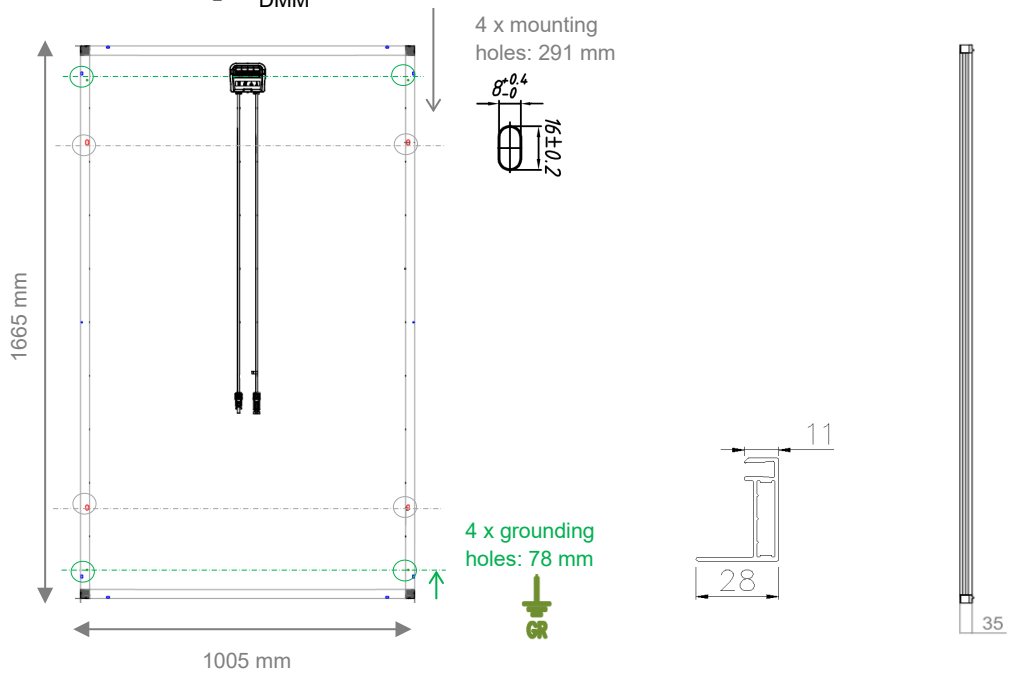
- Frame design for M10 solar cells modules:

- DMMXSC
- DMMXSCPG



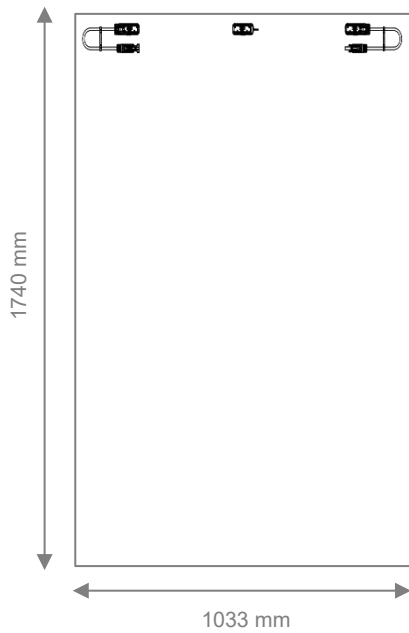
- Frame design for Poly and Mono M10 solar cells modules:

- DMP
- DMM



- Frameless Design for M6 solar cells Module Glass + Foil & Glass + Glass:

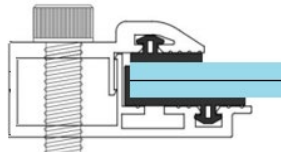
- PSMVI (total thickness of 5,5 mm)
- PSMVIPG (total thickness of 6,5 mm)



PRECAUTION:

- Operate Solar PV modules in a safe environment. Suitable and exempt of any risks.
 - Maximum height to operate the modules is 4000 m above the sea level
 - Please do not use any abrasive or chemical solution on the modules. Neither on glass nor on aluminium frames.
 - Avoid direct contact with salt water.
 - Solar PV modules are not to be considered as a roofing substitute. Solar PV modules alone cannot grant waterproofing for the roof.
Roof waterproofing can be obtained considering the addition of a PV module and a BIPV* solution.
**building integrated photovoltaic.*
 - Operating temperature from -40°C to 85°C.
-
- The best efficiency will be obtained by optimising the angle of inclination and facing the sun.
 - When electing final position of the PV modules it is recommended to avoid any potential shadowing that could result from building, chimney, trees and so on as it could result in a significant energy loss.
-
- SOLUXTEC's PV modules can be installed only with mounting structures.
 - Mounting structures need to comply with any applicable laws specific to the country of installation.
 - Modules need to be installed on mounting structure following producer user guide.
 - Respect a sufficient ventilation for the PV modules.
 - Respect mounting structure dilatation to avoid any extra mechanical stress on PV modules.
 - Make sure to use a mounting structure material that won't present any chemical reaction on PV module frame (corrosion phenomena)
-
- Clamp's election is important and need to fulfill the minimum standards:

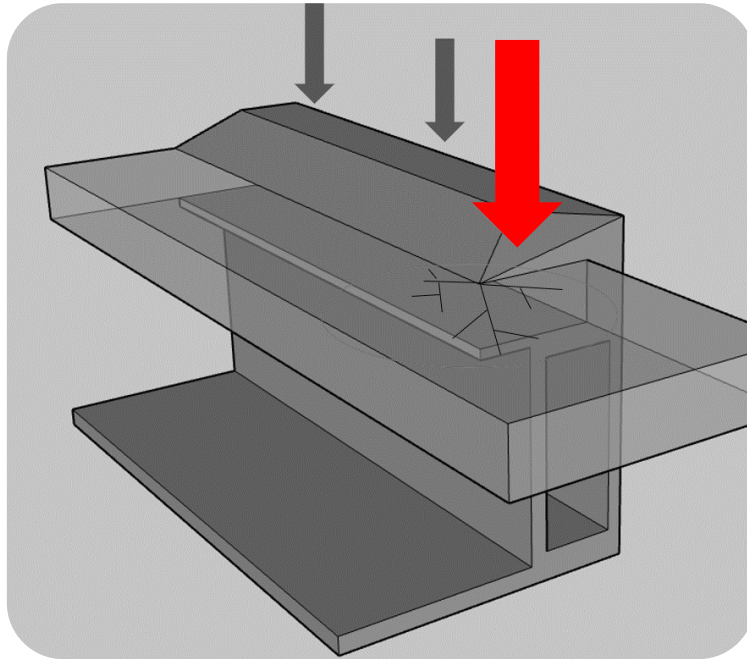
- Frameless module clamps need an EPDM protection to tighten on glass.



For each type of Frameless modules, a minimal length of 120 mm is mandatory.

- For each type of framed modules, a minimal length of 80 mm clamps is mandatory.
- Clamps are not in contact with front glass, or clamps for frameless modules are not shadowing solar cells.
- A minimum of 4 clamps/module is mandatory.
- Tightening force in Newton must follow recommendation of the clamp producer.

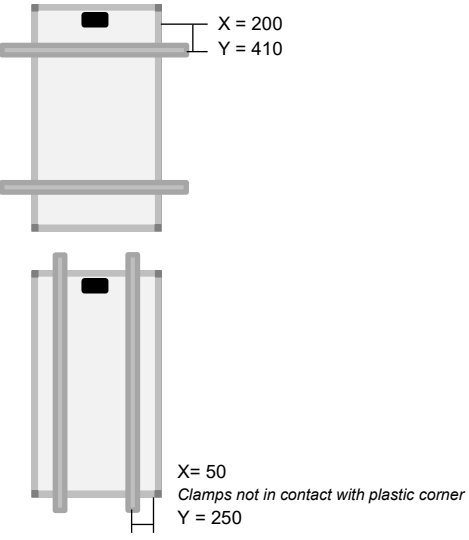
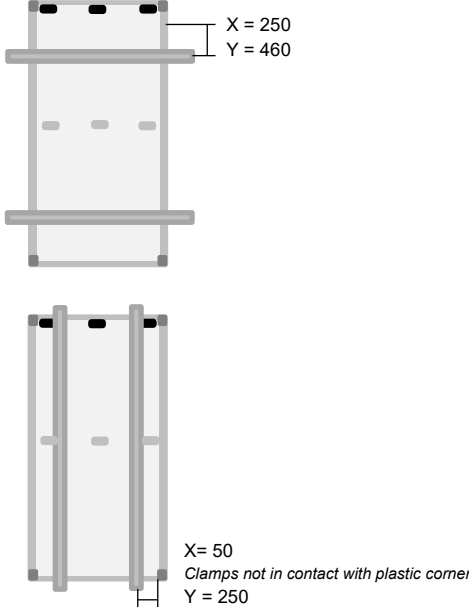
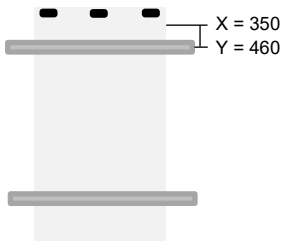
- When tightened, it is forbidden that clamps show a module frame deformation.

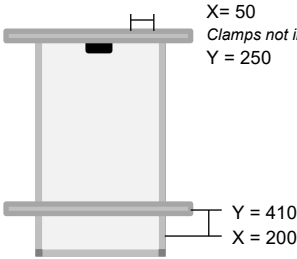
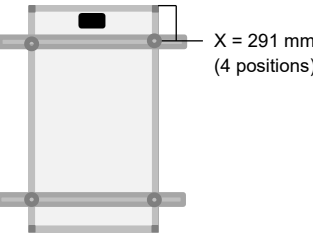
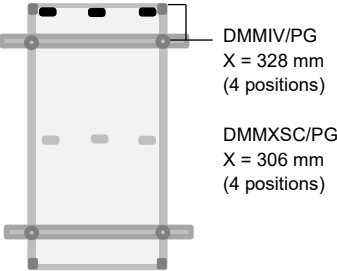
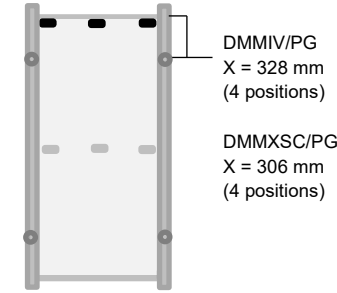


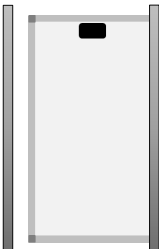
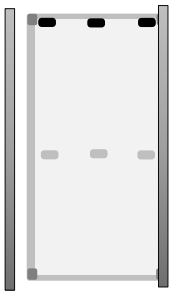
When clamping, please make sure that force is homogenously shared on aluminium part. Force cannot deform top frame flange. For module series equipped with a water drain corner, clamp must not be applied directly on.

- ➔ Please refer to the table on next page showing the different installation options from SOLUXTEC's module range. Please note as well that the mechanical behaviour from our product will vary depending on the option elected.
- ➔ Any solutions not shown in this table need to get an official validation from the technical department prior installation.

INSTALLATION OPTION

Installation method	Module	Mounting system position (in mm) Between X and Y	Mechanical load test in Pa (safety factor of 1,5)
With Clamps	DMP DMM	 <p>X = 200 Y = 410</p> <p>X = 50 Clamps not in contact with plastic corner Y = 250</p>	<p>Test: +8100/-2400 Design: +5400/-1600</p> <p>Test: +2400/-2400 Design: +1600/-1600</p>
	DMMIV DMMXSC & DMMIVPG DMMXSCPG	 <p>X = 250 Y = 460</p> <p>X = 50 Clamps not in contact with plastic corner Y = 250</p>	<p>Test: +8100/-2400 Design: +5400/-1600</p> <p>Test: +2400/-2400 Design: +1600/-1600</p>
	PSMVI & PSMVIPG	 <p>X = 350 Y = 460</p>	<p>Test: +2400/-2400 Design: +1600/-1600</p>

<p>With mix clamping</p>	<p>DMP DMM</p>	 <p>X= 50 Clamps not in contact with plastic corner Y = 250</p> <p>Y = 410 X = 200</p>	<p>Test: +2400/-2400 Design: +1600/-1600</p>
<p>With Mounting Holes</p>	<p>DMP DMM</p>	 <p>X = 291 mm (4 positions)</p>	<p>Test: +8100/-2400 Design: +5400/-1600</p>
<p>DMMIV DMMXSC & DMMIVPG DMMXSCPG</p>	<p>DMMIV DMMXSC & DMMIVPG DMMXSCPG</p>	 <p>DMMIV/PG X = 328 mm (4 positions)</p> <p>DMMXSC/PG X = 306 mm (4 positions)</p>	<p>Test: +8100/-2400 Design: +5400/-1600</p>
<p>DMMIV DMMXSC & DMMIVPG DMMXSCPG & GEMINI</p>	<p>DMMIV DMMXSC & DMMIVPG DMMXSCPG & GEMINI</p>	 <p>DMMIV/PG X = 328 mm (4 positions)</p> <p>DMMXSC/PG X = 306 mm (4 positions)</p>	<p>Test: +2400/-2400 Design: +1600/-1600</p>

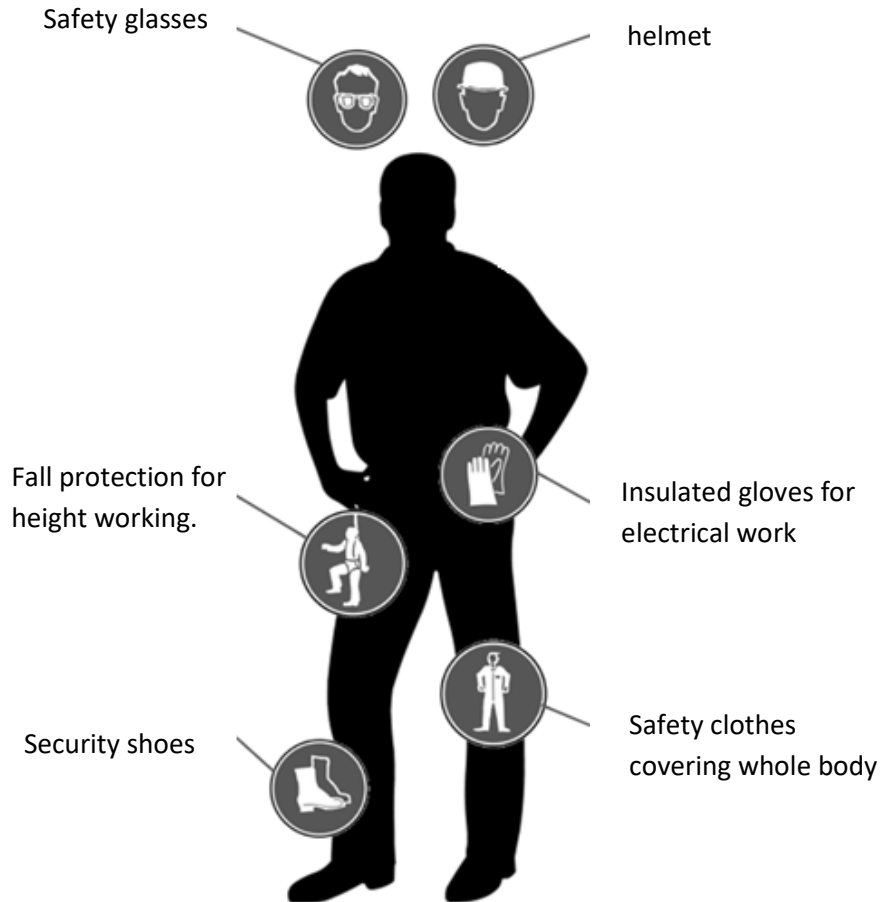
With insertion Profile	DMP DMM		For plotless module frame	Test: +2400/-2400 Design: +1600/-1600
	DMMIV DMMXSC & DMMIVPG DMMXSCPG & GEMINI		For plotless module frame	Test: +2400/-2400 Design: +1600/-1600

- ➔ All the data mentioned above is given based on module resistance. It is on the installer to elect a mounting instruction having at least same behaviour as the module. The whole solution needs to be evaluated by the solution supplier for the set “PV module + mounting system + clamp system”.
- ➔ All accessories such as bolt, screws and other metal parts are corrosion-proof and exempt of any chemical reaction with the frame of the solar module.
- ➔ Make sure that the module’s junction boxes are not in contact with any metal part belonging to the mounting structure.
- ➔ Make sure that module cables are not damaged and not in mechanical stress.
- ➔ Make sure that the mounting system or any sharp component is not in contact with the surface of the modules nor the foil or glass backside.

7 ELECTRICAL INSTALLATION

PRECAUTION for individual protection

Please make sure to wear your individual protection equipment.

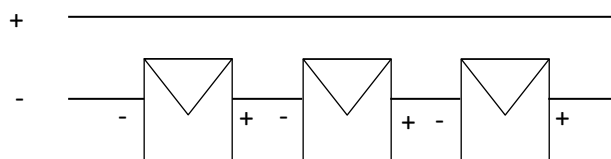


WIRING AND PLANNING

- Before starting with modules wiring, a visual inspection is recommended to make sure that all module components are in a good shape.
- The final wiring conception is determined in relation to the final project on site. Modules deployed for a given project should present the same technical characteristics to prevent any mismatching.
- PV modules can be connected in serial or in parallel.

- In serial:

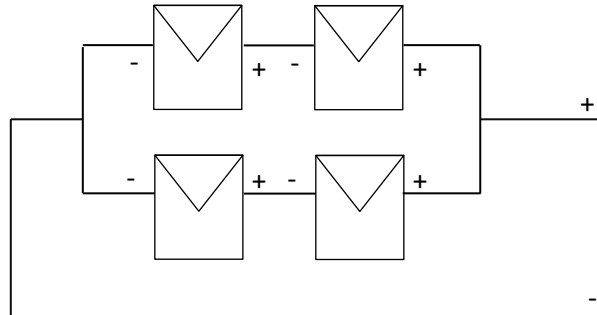
total voltage is the sum of each module voltage
(in serial we add voltage, we do not add intensities)



- In parallel:

total intensity is the sum of the serial lines in parallel (in parallel we add the intensities)

total voltage is the sum of each module voltage in from 1 line (in parallel we do not add the voltage)



Note: When a project is wired with modules in parallel, it is important to check the fuse rating of the module. This value is available on the module's label as well as on the dedicated data sheet. Indeed, in case of 1 line shadowing, the line that is still producing energy will "load" the other. This is why an appropriate line fuse protection must be applied and follow appropriate standards.

- The maximal overall voltage of a PV generator needs to take into consideration the worst-case scenario. It means that we need to consider the voltage open circuit and the minimal temperature on site. You can calculate it with the following formula:

$$\text{Max system voltage} = N \times U_{oc} [1 + TcU_{oc} \times (T_{min} - 25^\circ)]$$

Where:

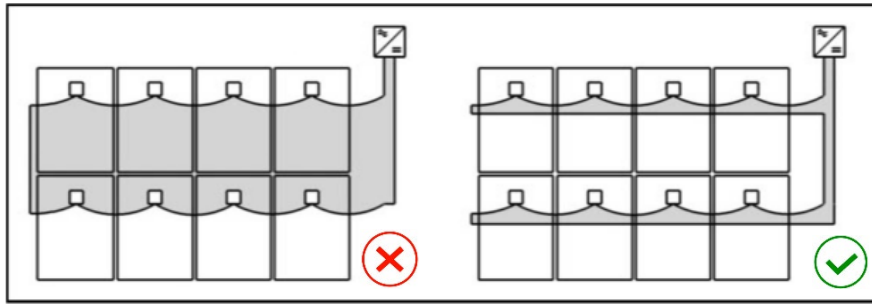
N=number of modules in serial

Uoc = Open circuit voltage of a module

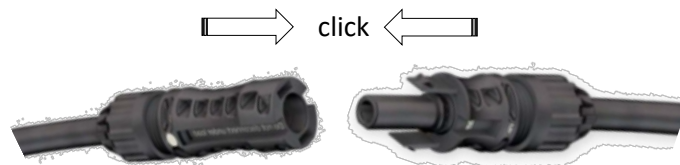
TcUoc = Temperature coefficient at open circuit voltage

Tmin = Minimal temperature on project site

- The cables section from our products is always given at 4mm², cables are always UV resistant and qualified for direct current (DC). This section is enough for a single component. However, and depending on the configuration of the pv generator, it is recommended to check at the maximal short circuit current from the whole project in order to elect the right cables cross section in respect to the local standards.
- The planning for the wiring of the PV system should consider a tight loop wiring of the plus and minus line. The area enclosed by the conductors should be kept as small as possible (here in grey). This reduces the risk of inductive coupling caused by lightning strokes.

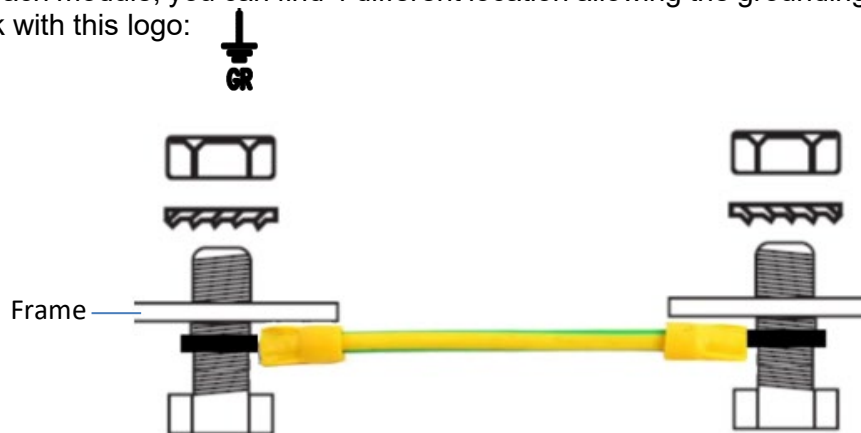


- Connectors need to be kept dry and clean. When wiring connectors together, make sure that both are from same manufacturer and same reference. When well connected, you must listen a “click” confirming the right connection.



A bad connection may result into arcs and electrical shock. Arcs may also be the origin of a fire departure. This point is extremely important.

- All framed modules need to be connected together with a grounding solution to the main equipotential bonding of the project location. On each module, you can find 4 different location allowing the grounding bonding and mark with this logo:



It is recommended to use a 10 mm² bonding connector to realize the grounding between each module. The recommended section to the main equipotential bonding is 16 mm².

The legal standard from the installation place might be different and need to be follow in priority.

8 MAINTENANCE AND CLEANING:

SOLUXTEC PV modules come with a long-lasting operating life coupled with low level of maintenance.

SOLUXTEC recommends a yearly inspection from a qualified company (ideally from the company having realised the installation) in order to control the efficiency of the complete generator.

Dust or pollution from the environment may gather on the surface of PV modules. Hence, it is recommended to clean the surface of the modules only with a soft broom and water. An alcohol based cleaner solution is also allowed.

For any issues with SOLUXTEC's products you can contact us via our email address - info@soluxtec.de
SOLUXTEC'S technical service will support you.

S LUXTEC

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