

INSTALLATION MANUAL

DUAL GLASS SOLAR PV MODULES



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1. Overview: -

This guide contains information regarding the installation and safe handling of Saatvik Green Energy Ltd.'s photovoltaic module (hereinafter referred to as "module Saatvik Green Energy Ltd is referred to as "Saatvik". Installers must read and understand this guide prior to installation. For any questions, please contact Saatvik Team & Customer Support department or our local representatives for more detailed information. Installers must follow all safety precautions as described in this guide as well as local requirements and regulations by law or authorized organizations. / *Les installateurs doivent suivre toutes les précautions de sécurité décrites dans ce guide ainsi que les exigences et réglementations locales par la loi ou les organisations autorisées.*

Before installing a solar photovoltaic system, installers should familiarize themselves with its mechanical and electrical requirements. Keep this guide in a safe place for future reference (care and maintenance) and in case of sale or disposal of the modules. Saatvik's modules are tested and certified for installation worldwide. Different regions may have different regulations for solar PV installations. In this guide, hereinafter "IEC Only" is used to refer to regions where IEC standards apply, e.g. Europe, Middle East, most of the Asia Pacific countries; "UL Only" is used to refer to regions where UL standards apply, e.g. United States, Canada; all other references are global.

Information contained in this instruction manual is based on Saatvik information and expertise. If the customer fails to install modules as per requirements that are stipulated in this manual, the limited warranty provided to the customer will be invalid.

1.1. Warnings: -

- PV modules generate DC electrical energy when exposed to sunlight or other light sources. Active parts of the modules such as terminals can result in burns, sparks, and lethal sparks.
- Artificially concentrated sunlight shall not be directed on the module or panel.
- Front or rear protective glass is utilized on the module. Broken solar module glass is an electrical safety hazard (may cause electric shock or fire). These modules cannot be repaired and should be replaced immediately / *Le module est équipé d'une vitre de protection avant ou arrière. Un verre brisé présente un risque électrique (risque de choc électrique ou d'incendie). Ces modules ne sont pas réparables et doivent être remplacés immédiatement.*
- To reduce the risk of electrical shocks or burns, modules may be covered with an opaque material (a material that blocks sunlight) during installation to avoid injury.
- The installation work of the PV array can only be done under the protection of sun-sheltering covers or sunshades, and only qualified person can install or perform maintenance work on this module.
- Follow the battery manufacturer's recommendations if batteries are used with modules.
- Do not use this module to replace or partly replace roofs and walls of living buildings. Do not install modules where flammable gas may be present.
- Do not remove any part installed by Saatvik or disassemble the module.
- All instructions should be read and understood before attempting to install, wire, operate and maintain the module.
- All PV systems must be grounded to earth. If there is no special regulation, please follow the National Electrical Code or other national code
- 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 value of I_{sc} and V_{oc} marked on the module should be multiplied by 1.25 when determining PV system component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.
- Once the PV module has been shipped to the installation site, all the parts should be unpacked properly with care.
- Do not stand or step on the PV module as shown in figure 8. This is prohibited and there is a risk of damage to the module and cause injury to you.
- Only PV modules with the same cell size should be connected in series.
- During module transportation, please attempt to minimize shock or vibration to the module, as this may damage the module or lead to cell microcracks.
- During all transportation situations, never drop the module from a vehicle, house, or hands. This will damage the module.
- Modules including glass, junction boxes, connectors, etc.) shall be protected from long-term exposure to environments containing Sulphur, strong acid, strong alkaline, etc., which may pose a risk of corrosion to the product.

- Do not clean the glass with chemicals. Only use tap water. Make sure the module surface temperature is cool to the touch. Cleaning modules with cool water when module surface temp is high may result in glass breakage. Do not brush paint or corrosive substances on the surface of the modules.
- Do not disconnect any of the modules when under load. If you need to disconnect the connector, you must first close the DC and AC converter or disconnect the junction box master switch.
- When looking at PV modules with anti-reflection (AR) coating technology, it will be normal to see some cells with a slight color difference at different angles.
- The junction box connector should not be in contact with oily substances, organic solvents and other corrosive materials to avoid damage to the connector. For example, alcohol, gasoline, lubricants, rust inhibitors, herbicides and so on. If the connector is polluted, you need to replace the connector with a new one, after consulting with Saatvik support team.
- Before the installation of modules, it is recommended to add rainproof facilities in the project site to avoid direct open- air placement.
- The maximum altitude of the PV module is designed for $\leq 2000\text{m}$.
- The maximum irradiance is $1300\text{W}/\text{m}^2$ for module with transparent rear.
- Do not treat back sheet and front surface of the module with paint and adhesives, such cases will void Warranty.
- Do not use the junction box to hold or transport the module
- In a system using a battery, blocking diodes are typically placed between the battery and the PV module output to prevent battery discharge at night.
- Saatvik Solar PV modules are equipped with bypass diodes in the junction box. This minimizes module heating and current losses. Do not try to open the junction box to change the diodes even if they malfunction.
- While performing any type of electrical maintenance, all the systems should be isolated / shutdown and maintenance should be performed by well trained professionals only. Any failure to follow instruction may result in lethal electric shocks, burns, other injuries and sometimes may cause death also. Saatvik solar is not responsible for any type of accident occurring in Power plant using Saatvik panels. The documentation includes a statement advising that external or otherwise artificially concentrated sunlight shall not be directed onto the front or back face of the PV module (if not qualified for).

1.2. Meaning of crossed – out wheeled dustbin: -



Figure 1

- Do not dispose of electrical appliances as unsorted municipal waste; use separate collection facilities.
- Contact your local government for information regarding the collection systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
- When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposal at least free of charge.

2. Module Unloading: -

Upon arrival of the modules, please check that the packaging box is in good condition, and check whether the module type and quantity on the outer packaging are consistent with the delivery order, if anything is wrong, please contact Saatvik Logistics / Customer Support department and sales staff immediately.

2.1. Container Unloading: -
2.1.1. Crane unloading: -

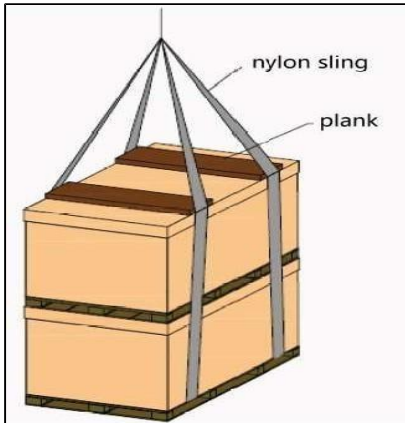


Figure 2

Note: Crane unloading is not allowed without a plank.

- When a crane is used to unload the modules, please choose and use specialized tooling according to the weight and size of the module. Please adjust the position of the sling to keep the modules steady. To ensure the safety of the module, wooden sticks, boards or other fixtures of the same width as the outer packing cases should be used on the upper part of the box to prevent the sling from squeezing the pallet and damaging the modules. When placing the modules, do not lower the packing box too quickly and put it on a flat ground/ *Pour assurer la sécurité du module, des bâtons en bois, des planches ou d'autres fixations de la même largeur que les caisses d'emballage extérieures doivent être utilisés sur la partie supérieure de la boîte pour empêcher l'élingue de pincer la palette et d'endommager les modules. Lors de la mise en place des modules, ne pas baisser trop rapidement le carton d'emballage et le poser sur un sol plat.*
- For vertically landscape packages, do not lift more than two pallets of modules at once; for vertically portrait packages, do not lift more than ONE pallet of modules at once.
- Do not unload modules under the weather conditions of wind above class 6 (on the Beaufort scale), heavy rain or heavy snow.

2.1.2. Forklift unloading: -



Figure 3

- Please choose a suitable forklift according to the weight.
- The fork should go into the pallet at least 3/4 of the pallet depth during unloading.
- Drive slowly and do not allow forks to hit the cartons or pallets.
- It is recommended to operate the forklift from the aluminium frame side of the module and not to touch the glass side. If the operation must be carried out on the glass side, please place buffer protection material in advance to prevent the inside modules from being damaged due to the external force.
- It is recommended to extend the height or width of the forklift backrest so that the force is distributed on the modules' aluminum frame.

H2: Height of the module packing box
H1: Height of the container door

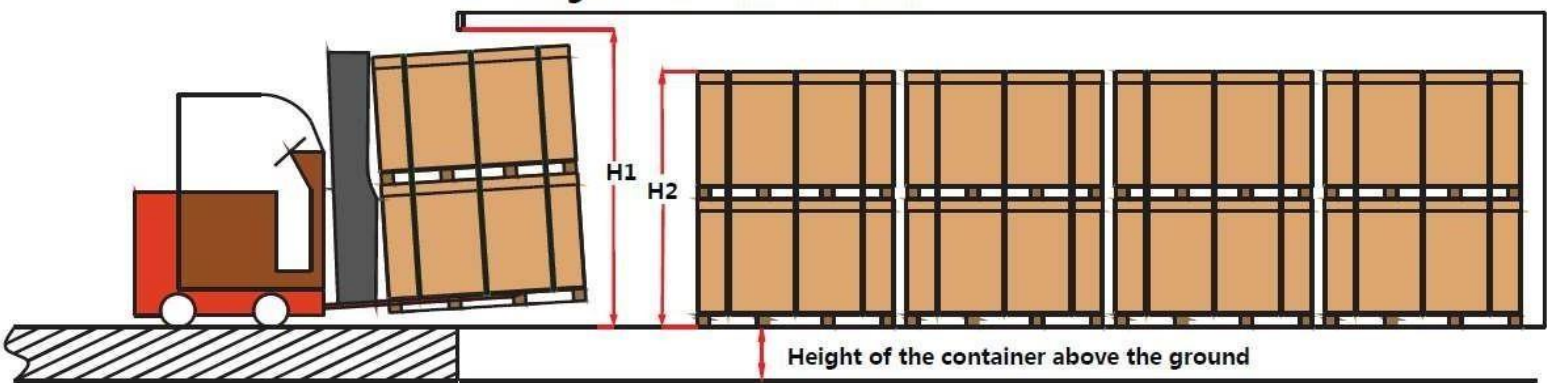


Figure 4

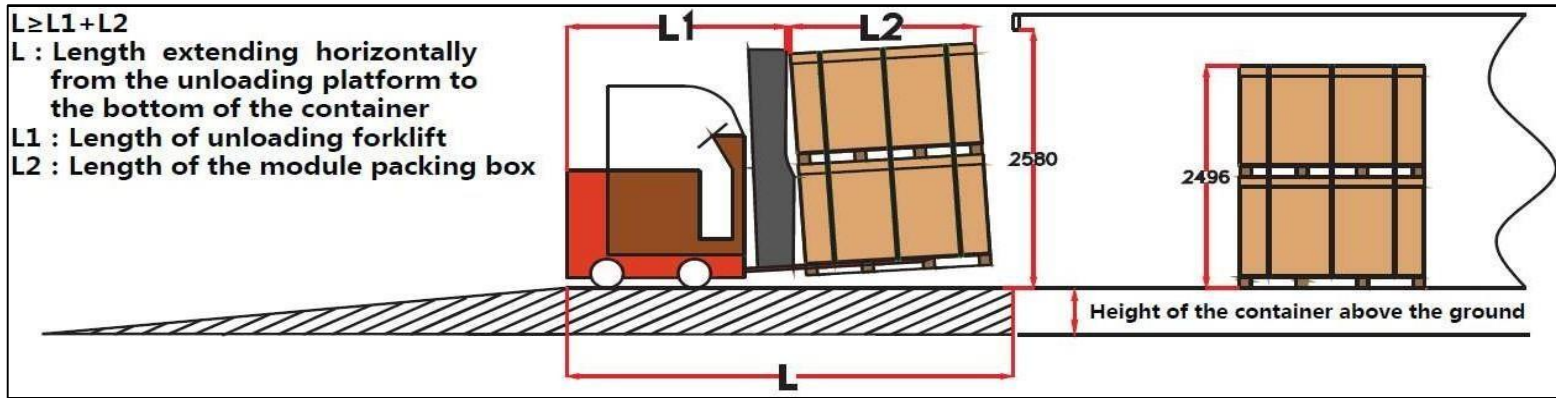


Figure 5

2.2. Storage Location Guidelines: -



Figure 6

- Do not store pallets on an uneven surface.
- Do not remove the original packaging and keep the wrapping film and carton box in good condition, if the modules require long-distance transport or long-term storage.
- Do not stack more than 2Nos pallets on the project site
- In rainy weather, please fully cover the modules and pallets with rain protection and take moisture-proof measures on pallets and cartons to prevent collapse and moisture ingress.
- Do not allow unauthorized persons to access the module storage area.
- Do not leave modules unsupported or unsecured.
- Do not stack modules on the project site.

2.3. module Unboxing instruction: -

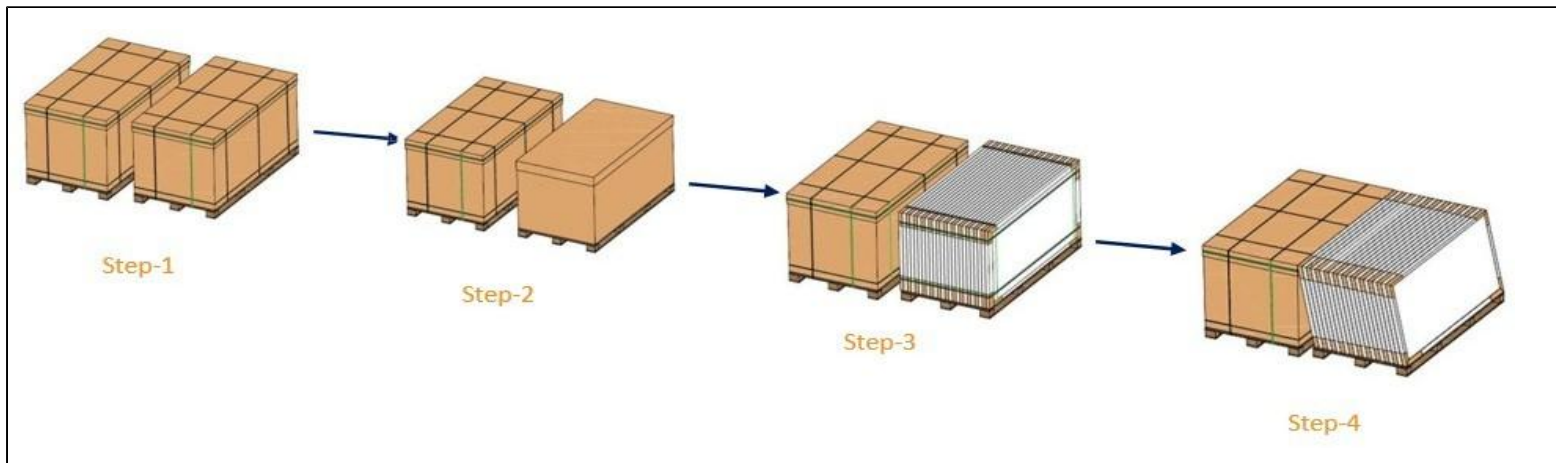
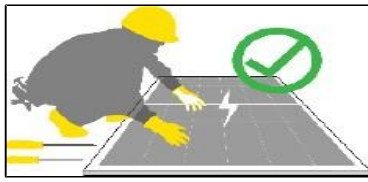


Figure 7

- Step-1:** Position at least two pallets adjacent to each other, ensuring a proper gap to allow the modules on one pallet to rest against the other for support during unpacking.
- Note:** If only one pallet is available, place it securely next to a solid, immovable object such as a concrete wall that can safely support the full weight of the modules while cutting the straps.
- Step-2:** Carefully remove the outer wrapping film and any external packing belts from the pallet.
- Step-3:** Remove the protective packaging box covering the modules.
- Step-4:** Start by cutting either the vertical or the horizontal strapping belts first. Once initial belts are removed, gently incline the pallet toward the supporting object (another pallet or concrete wall) to stabilize it. then proceed to cut the remaining straps. Once all straps are removed and the modules are stable, begin unloading the modules one by one, ensuring proper handling and adherence to all safety precautions.

3. Installation: -

3.1. Installation Safety: -



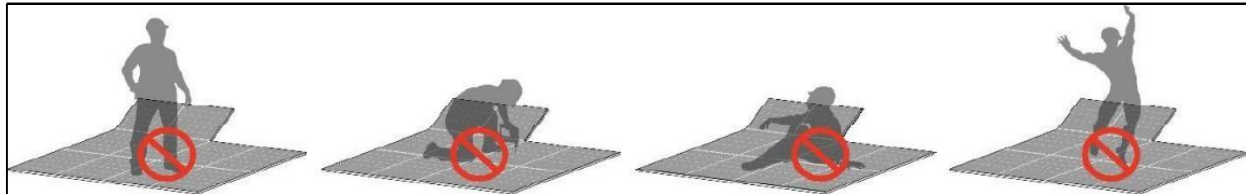
Step1



Step 2



Step 3

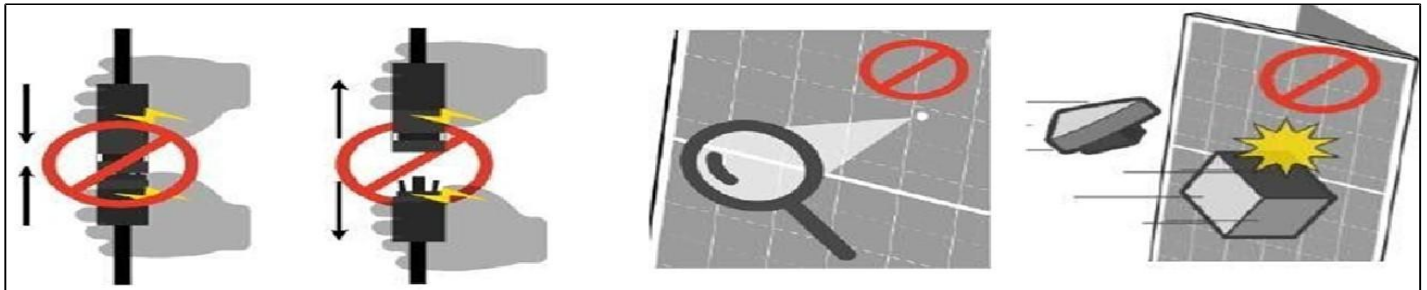


Step4

Figure 8

- Do not stand/walk on PV modules under any circumstances. Applying body weight can create uneven pressure, potentially leading to micro-cracks or internal damage to the solar cells, which may not be immediately visible. Any such mishandling will invalidate the product warranty if it is discovered that anyone has stood on the modules.
- Do not transport the module without proper authorization or protective packaging, as improper handling may cause damage and void the product warranty.
- Always wear protective headgear, insulating gloves and safety shoes (with rubber soles) and other protective measures during installation.
- When installing or maintaining the photovoltaic system, please do not wear metal rings, watches and other metal products, so as not to cause electric shock danger and damage to the modules.
- Keep the PV module packed in the carton until installation. Once the modules are removed from the packing box, they should be installed and connected to the string monitoring box in promptly. If they are not installed immediately, protective measures (such as adding rubber joint cover, etc.) should be taken on the connection head.
- Do not touch the PV module unnecessarily during installation. The glass surface and the frame may be hot. There is a risk of burns and electric shock.
- Do not work in rain, snow, or windy conditions.
- Due to the risk of electrical shock, do not perform any work if the terminals of the PV module are wet.
- Use insulated tools and do not use wet tools.
- When installing PV modules, do not drop any objects (e.g., PV modules or tools).
- Make sure flammable gases are not generated or present near the installation site.
- Insert module connectors fully and correctly. An audible "click" sound should be heard. This sound confirms the connectors are fully seated. Check all connections
- Connect the male and female connectors correctly, check the wiring condition, all wires shall not be separated from the modules, and secure the wires with cable ties so that the wires do not scratch or squeeze the back sheet of the modules.
- The protection class for this module types are "Class II" per IEC 61730/UL61730. modules are designed for 1500 Volts Maximum System Voltage.
- PV modules operate at high voltages (up to 1500VDCDC), which can cause electric shock, arcing, or fire if handled improperly.
- Only trained personnel should handle solar modules, module arrays, and DC combiner boxes.
- Saatvik is not responsible for any on-site hazards or incidents involving trained personnel.
- When disconnecting the array, always use a properly rated isolator or DC switch
- Even after disconnection, DC power may still be active for a short time — only trained individuals should proceed.
- Saatvik Solar is not liable for any accidents that occur in plants using their modules.
- PV systems are at risk of lightning strikes; EPCs and customers should assess this risk per IEC 62305-2 or NEC/UL 61730 standards.
- Install lightning arrestors and surge protection devices (SPDs) to protect the system from lightning and voltage surges.
- Ensure a complete lightning protection setup: air termination, earth termination, equipotential bonding, and SPDs as per IEC 61643-11 and NEC/UL 61730.

- Proper and consistent surge protection improves the safety and performance of the entire PV power plant.



- Do not touch the junction box and the end of the interconnect cables (connectors) with bare hands during installation or under sunlight, regardless of whether the PV module is connected to or disconnected from the system.
- The junction box must be protected from direct sunlight and water. The connector must meet the IP68 water-tight standard after being connected. However, it is not recommended to use the connector under water for a long time
- Do not expose the PV module to excessive loads on the surface of the PV module or twist the frame.
- Do not hit or put excessive load on the glass or back sheet, this may break the cells or cause microcracks.
- During the installation or operation, don't use sharp tools to wipe the back sheet and glass. Scratches can appear on the module.
- Do not drill holes in the frame. It may cause corrosion of the frame.
- When installing modules on roof mounted structures, please try to follow the "from top to bottom" and/or "from left to right" principle, and don't step on the module. This will damage the module and would be dangerous for personal safety.
- modules will have thermal expansion and thermal contraction effect. When installing, the interval between two adjacent conventional modules is recommended > 10mm. If there are special requirements subject to Saatvik approvals.
- Sufficient clearance (at least 10 cm) between the module frame and the mounting surface is required to allow cooling air to circulate around the back of the module. This also enables condensation or moisture to dissipate.
- We recommend maintaining a minimum gap of 10mm between two modules to accommodate the linear thermal expansion of the module frames
- Saatvik modules contain factory installed bypass diodes. If the modules are incorrectly connected to each other, the bypass diodes, cables, or junction box may be damaged.
- When the reverse currents exceed the value of the maximum protective fuse, a properly rated and certified overcurrent device (fuse or circuit breaker) must be connected in series with each module or string of modules.
- Match the polarities of cables and terminals when making the connections; failure to do so may result in damage to the module.
- Connecting modules in reverse polarity to a high current source, such as a battery, will destroy the bypass diodes and render the module inoperative. Bypass diodes are not user replaceable.
- The junction box, cable and connectors shall not be altered in any case. modules with a suspected electrical problem should be returned to Saatvik for inspection and possible repair or replacement according to Saatvik warranty policy.

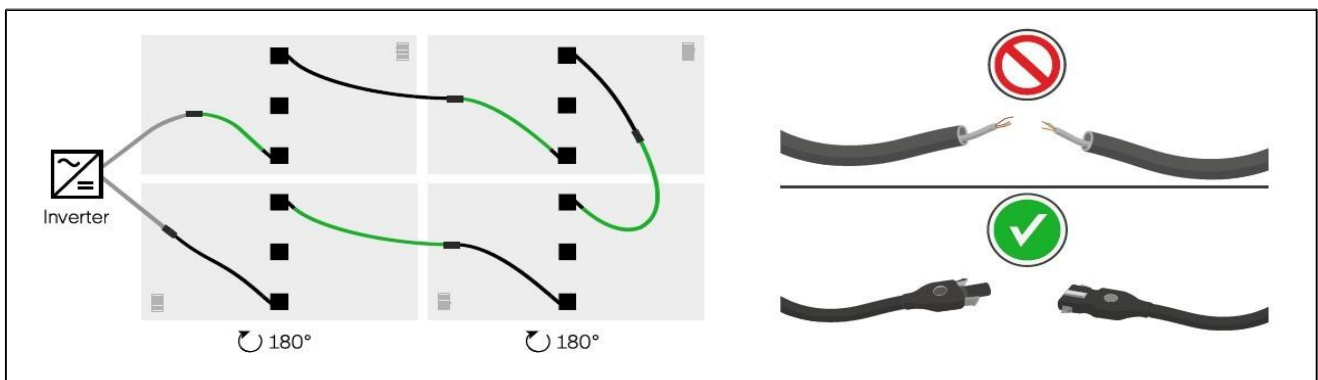


Figure 10

3.2. Installation Condition: -

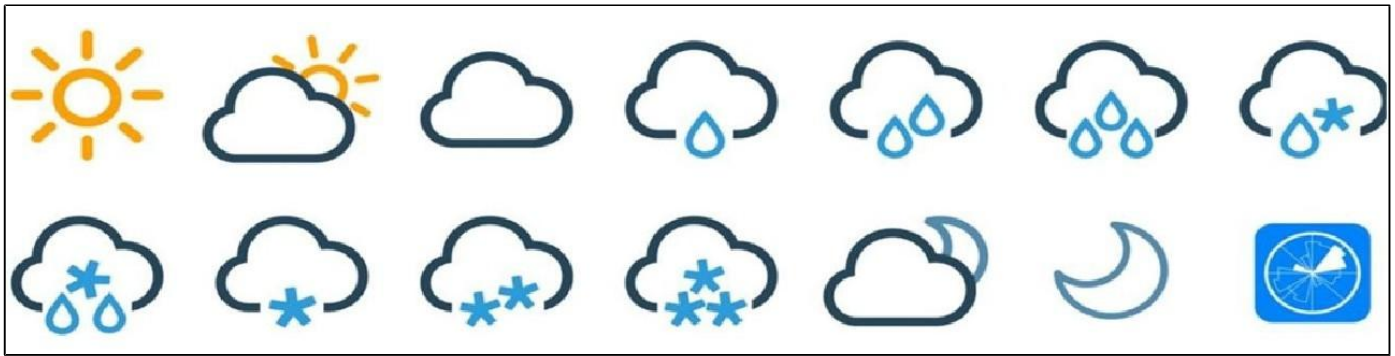


Figure 11

3.2.1. Climate Conditions: -

- Operating temperature: Module [T98]max [°C]: 70 °C
- Humidity: < 85RH%

Note: The mechanical load bearing capacity (including wind and snow loads) of the module is based on the approved mounting methods. The professional system installer is responsible for mechanical load calculations in accordance with the system design.

3.2.2. Site Selection: -



- In most applications, Saatvik PV modules should be installed in a location where they will receive maximum sunlight throughout the year. In the Northern Hemisphere, modules should typically face south, and in the Southern Hemisphere, modules should typically face north.
- modules facing 30 degrees away from true South (or North) will lose approximately 10 to 15 percent of their power output. If the module faces 60 degrees away from true South (or North), the power loss will be 20 to 30 percent.
- When choosing a site, avoid trees, buildings or obstructions, which could cast shadows on the solar photovoltaic modules, especially during the winter months when the arc of the sun is lowest over the horizon. Shading causes loss of output, even though the factory-fitted bypass diodes in the PV module will minimize such losses.
- When choosing a site, avoid trees, buildings or obstructions, which could cast shadows on the solar photovoltaic modules, especially during the winter months when the arc of the sun is lowest over the horizon. Shading causes loss of output, even though the factory-fitted bypass diodes in the PV module will minimize such losses.
- Do not install the PV module near open flame or flammable materials.
- When solar modules are used to charge batteries, the battery must be installed in a manner, that protects the performance of the system and the safety of its users. Follow the battery manufacturer’s guidelines concerning installation, operation and maintenance recommendations. In general, the battery (or battery bank) should be away from the main flow of people and animal traffic. Select a battery site that is protected from sunlight, rain, snow, debris, and is well ventilated. Most batteries generate hydrogen gas when charging, which can be explosive. Do not light matches or create sparks near the battery bank.
- When a battery is installed outdoors, it should be placed in an insulated and ventilated battery case specifically designed for the purpose.
- Do not install the PV module in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain etc.
- The PV module can be installed at a distance of 50m to 500m from the seashore. However, when installing modules in offshore areas, protect the connectors or add dust plugs. After removing the dust plugs, connect the connectors immediately and take other anti-rust measures to prevent rust

3.2.3. Tilt Angle Section: -

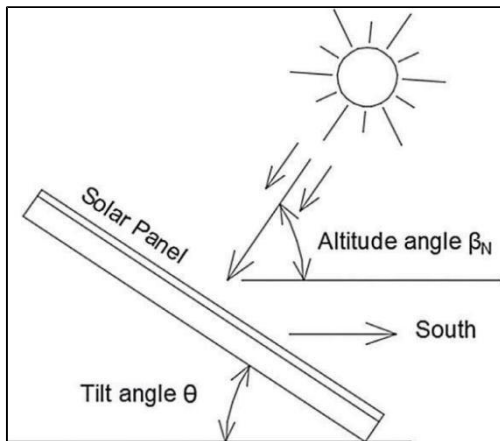


Figure 12

- The tilt angle of the PV module is measured between the surface of the PV module and a horizontal ground surface. The PV module generates maximum output power when it faces the sun directly
- For standalone systems with batteries where the PV modules are attached to a permanent structure, the tilt angle of the PV modules should be selected to optimize the performance based on seasonal load and sunlight. In general, if the PV output is adequate when irradiance is low (e.g., winter), then the angle chosen should be adequate during the rest of the year.
- For grid-connected installations where the PV modules are attached to a permanent structure, PV modules should be tilted so that the energy production from the PV modules will be maximized on an annual basis.

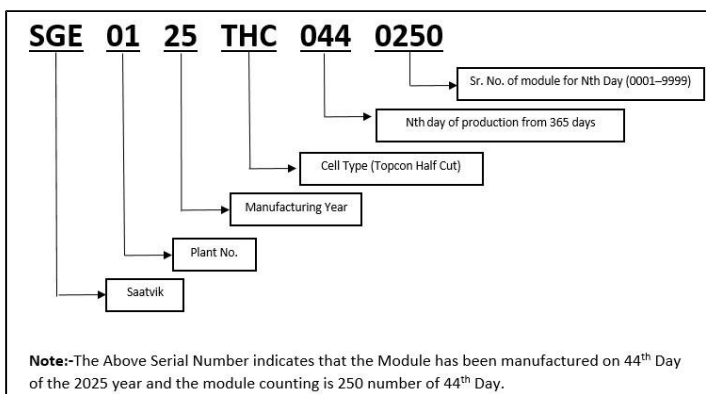
3.3. Mechanical Installation Guidelines: -

Solar PV modules usually can be mounted by using the following methods: bolts and clamps.

Note:

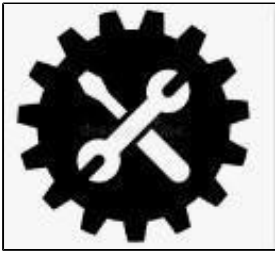
- All installation methods herein are for reference only. Saatvik does not provide related mounting components., the system installer or trained professional personnel must be responsible for the PV system’s design, installation, and mechanical load calculation and system security.
- Before installation, the following items should be addressed:
 - 1 Visually inspect the module for any damage.
 - 2 Clean the module if any dirt or residue remains from shipping.
 - 3 Check if module serial number stickers match the installation documentation and specifications.

Identification Serial Number



Saatvik modules are designed to meet a maximum positive (or downward) pressure of 3600Pa (Only refer to the mentioned module type in this manual) and negative (or upward) pressure of 1600Pa. This design load was then tested with a safety factor of 1.5 times. Therefore, Saatvik modules are tested under a maximum downward pressure of 5400Pa and upward pressure of 2400Pa. When mounting modules in snow-prone or high-wind environments, special care should be taken to mount the modules in a manner that provides sufficient design strength while meeting local code requirements.

3.3.1. Mounting with Bolts



The frame of each module has 8 mounting holes (Length*Width: 14mm*9mm) used to secure the modules to support structure. Always use all eight mounting holes to secure the modules. The module frame must be attached to a mounting rail using M8 corrosion-resistant bolts together with spring washers and flat washers in eight symmetrical locations on the PV module. The applied torque value should be sufficient to fix the modules steadily.

The reference value for M8 bolt is 16-20N*m. As to special support system or special installation requirements, please reconfirm with the support supplier for the torque value. Please find detailed mounting information in the below illustration as Figure

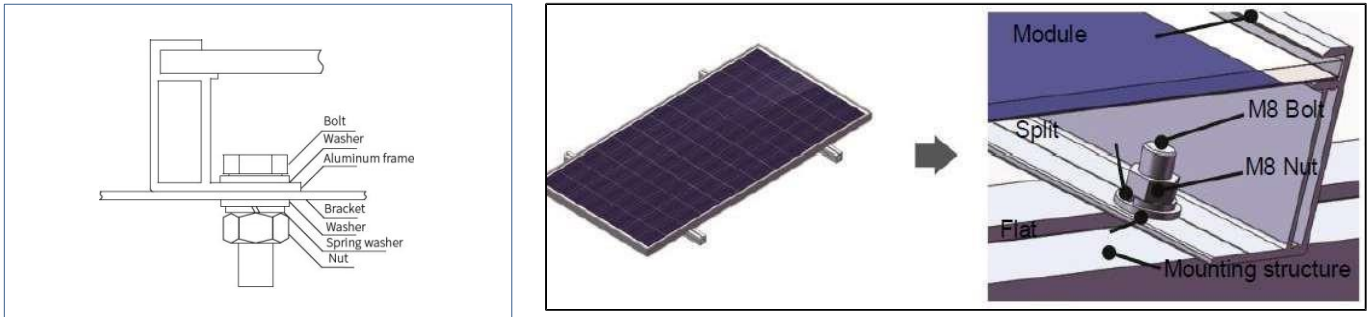
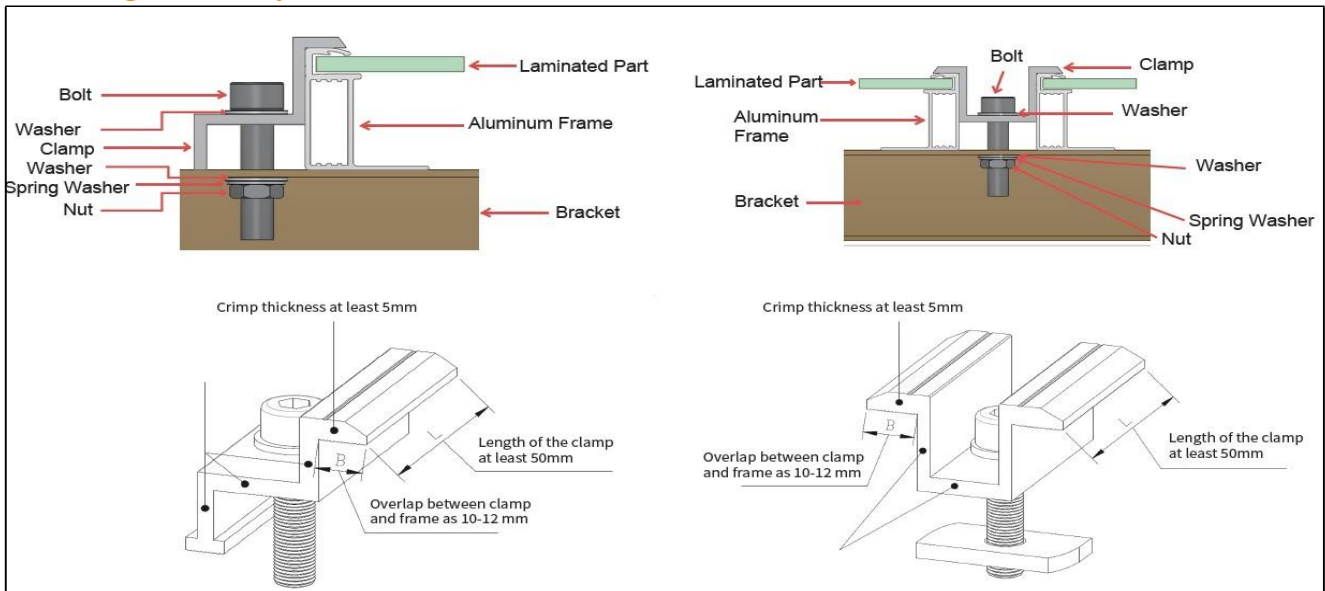


Figure 13

“The module is considered to be in compliance with this standard only when the module is mounted in the manner specified by the mounting instructions. A module with exposed conductive parts is considered to be in compliance with this standard only when it is electrically grounded in accordance with the manufacturer's instructions and the requirements of the National Electrical Code (NEC), local electrical codes, and applicable IEC standards.

3.3.2. Mounting with Clamps



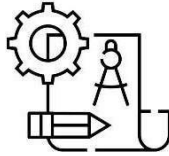
*****The required length for each clamp is minimum 50 mm, and wall thickness of its upper part is no less than 5mm***

Figure 14

Note: The modules must be properly secured to their support so that they can withstand live load conditions, including positive and negative load, to the pressure they have been certified for. It is the installer's responsibility to ensure that the clamps used to secure the modules are strong enough. Make sure that there is no shadow caused by clamps. The drain holes of the module cannot be blocked by clamps. module Mechanical Drawing details are given in Section 3.2.3

* The Clamping method is not covered under IEC Certification & Testing.

3.3.3. Mechanical drawing of PV module



Model No: SGE XXX-156TGG – (615-625Wp)

- Module Size: 2464 x 1134 x 30mm

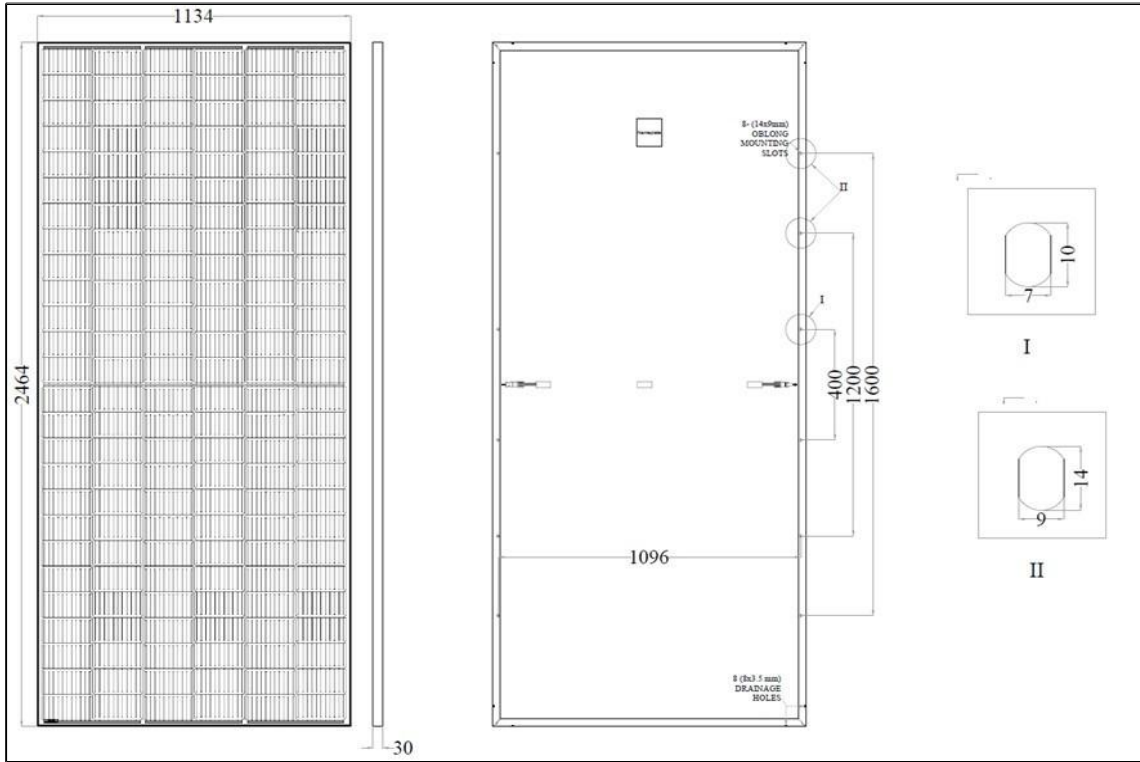


Figure 15

- Module Size: 2464 x 1134 x 35mm

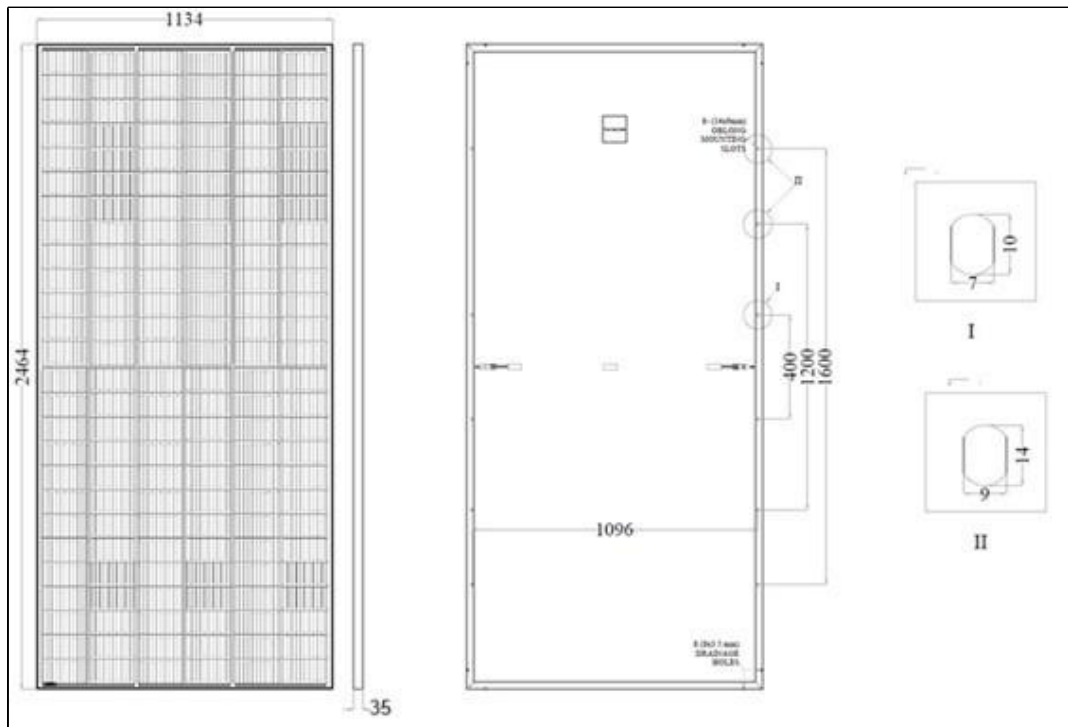


Figure 16

Model No: SGEXXX-144TGG (560-600Wp)

- Module Size: 2278 x 1134 x 30mm

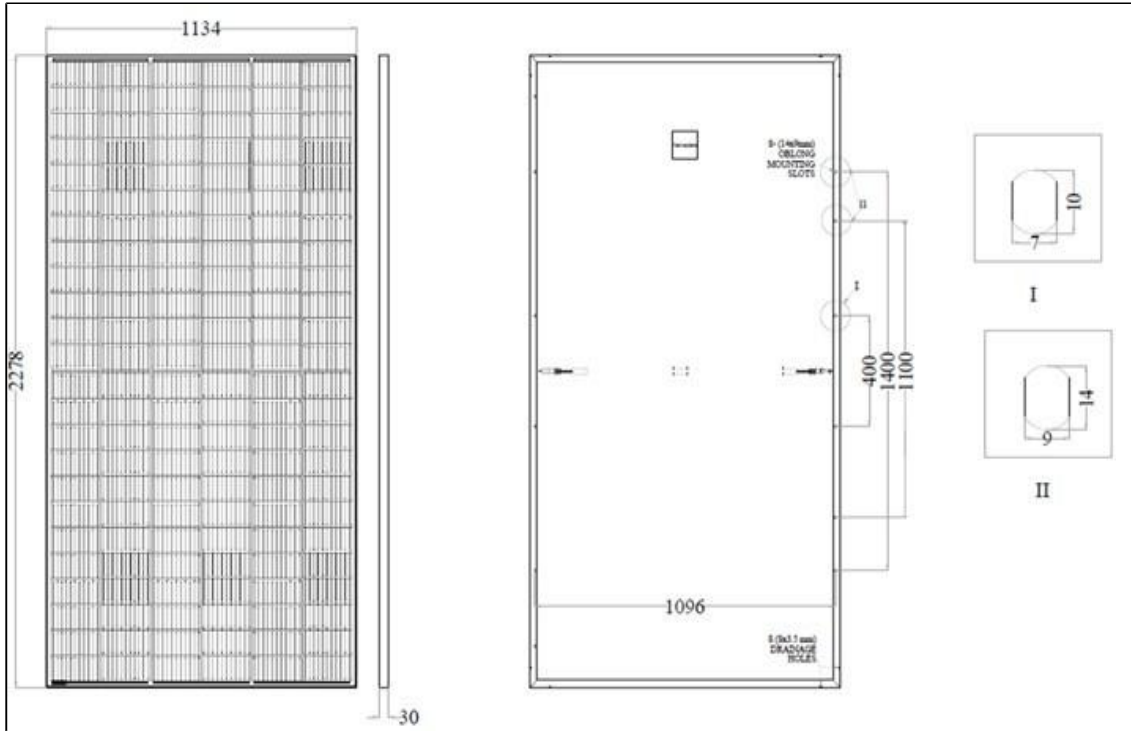


Figure 17

- Module Size: 2278 x 1134 x 35mm

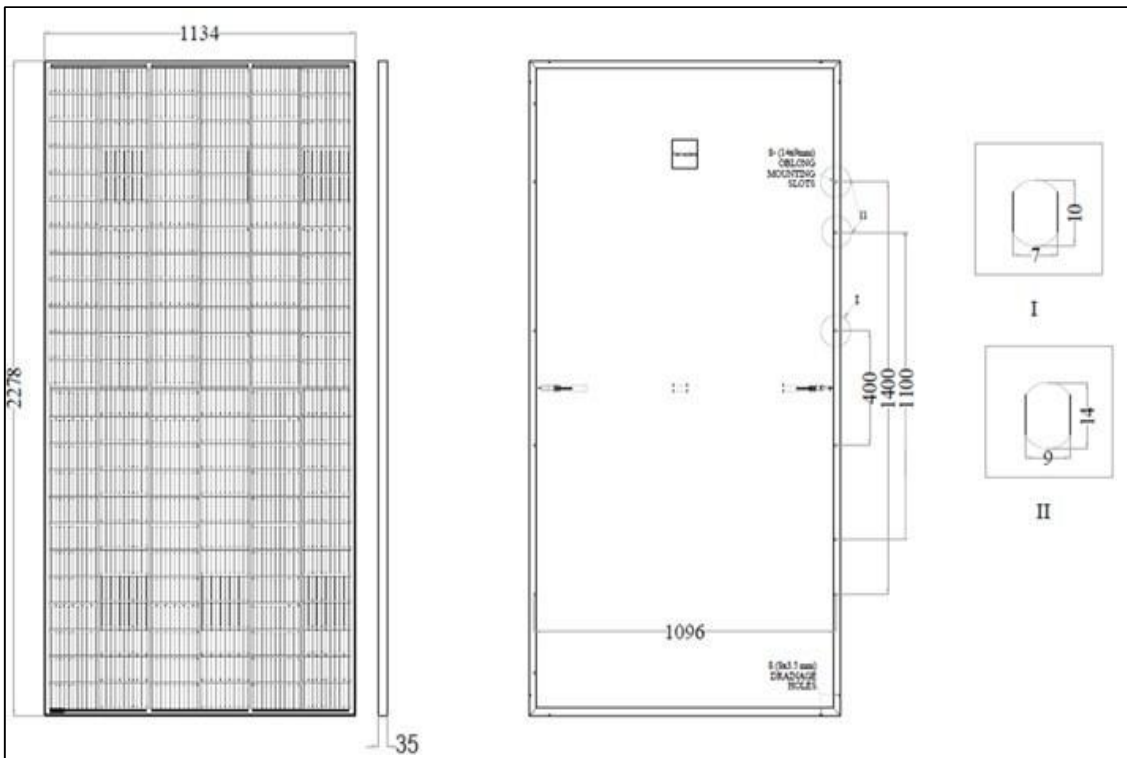


Figure 18

Model No: SGEXXX-132TGG (600-625Wp)

- Module Size: 2382 x 1134 x 30mm

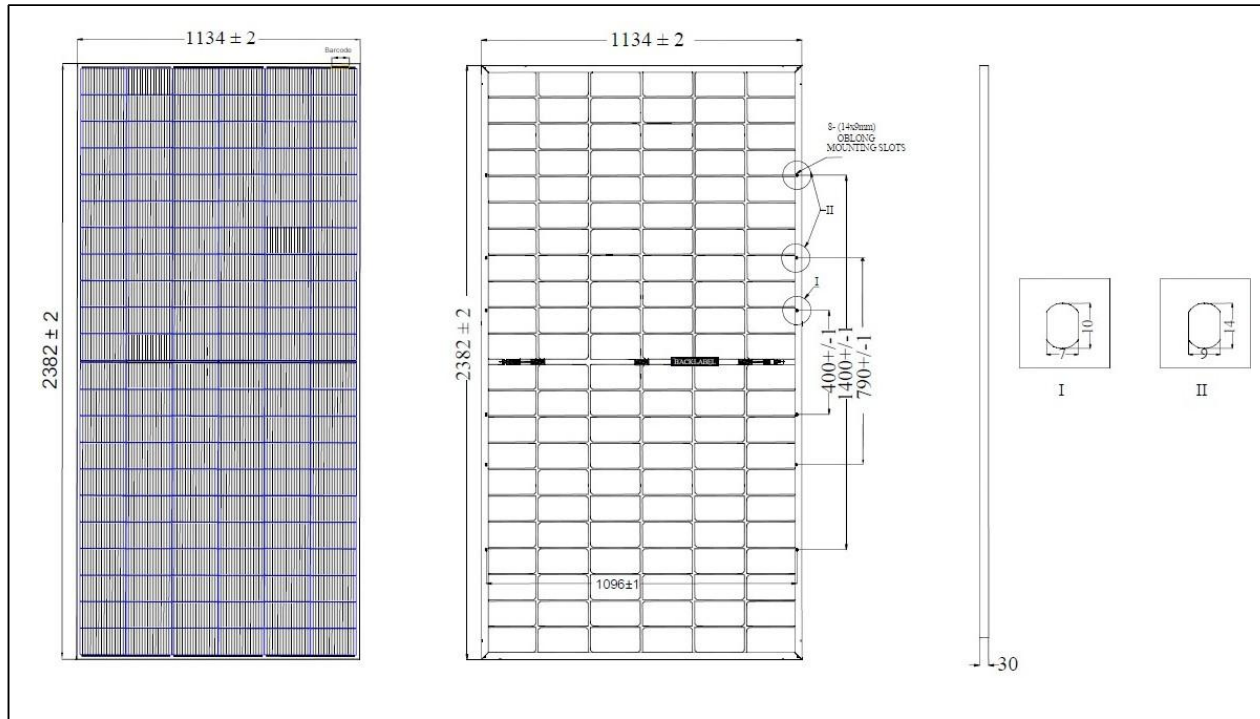


Figure 19

- Module Size: 2382 x 1134 x 35mm

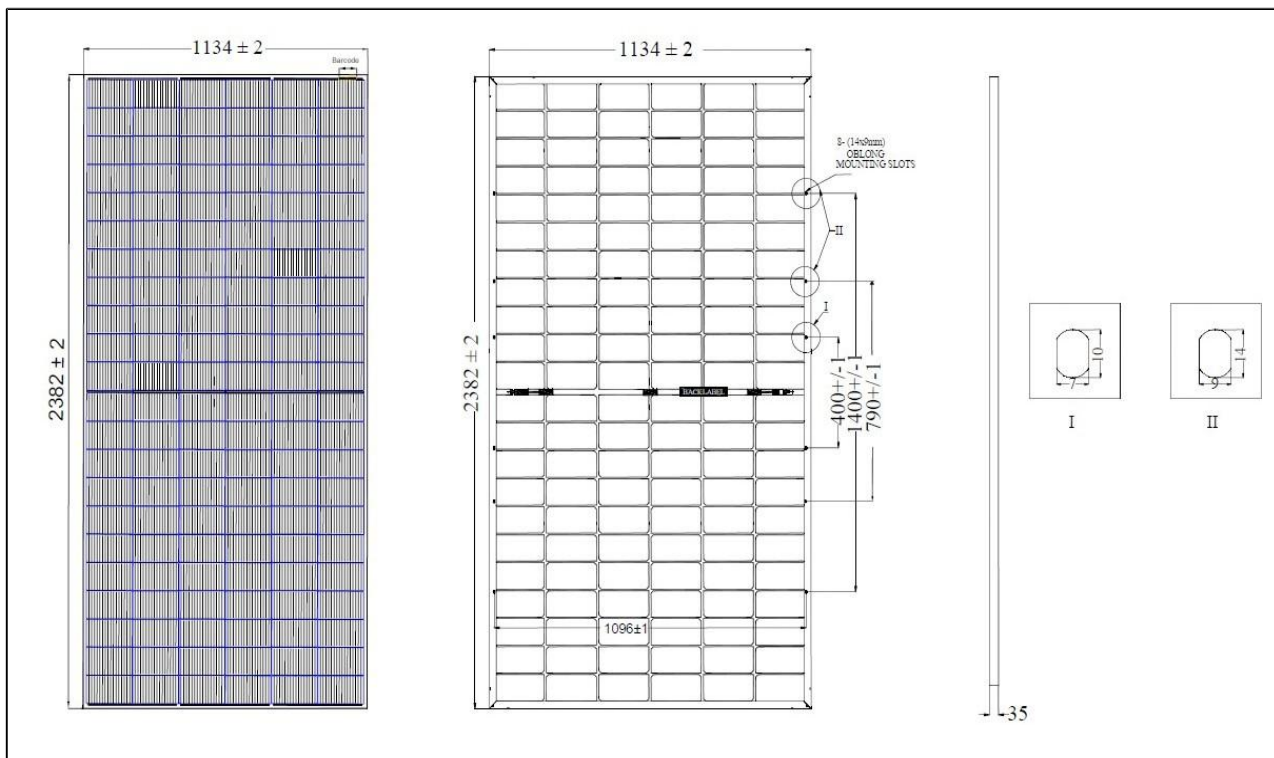


Figure 20

3.3.4. Technical Specification of modules

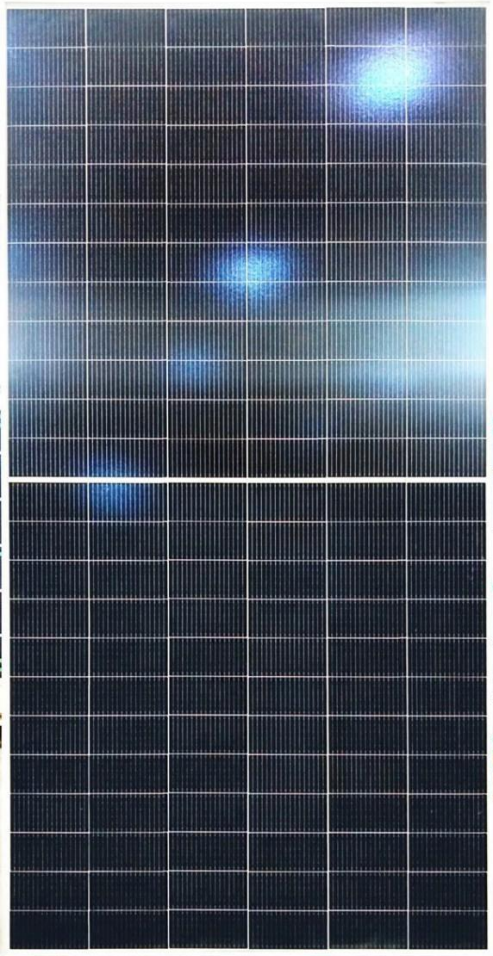
*Please refer to the certificate

Models	SGE XXX-156 TGG (XXX : 615 -625)	SGE XXX-144 TGG (XXX : 560 -600)	SGE XXX-132 TGG (XXX : 600 -625)
Product Type	TOPCon	TOPCon	TOPCon
module Length (mm)	2464	2278	2382
module Width (mm)	1134	1134	1134
Frame Height (mm)	30/35	30/35	30/35
Weight (Kgs)	35 / 35.5	32 / 32.5	33.5 / 34
Max. Voltage (VDC)	1500	1500	1500
Max Fuse Rating (A)	30	30	35
Permissible Temp (°C)	[T98]max [°C]: 70 °C	[T98]max [°C]: 70 °C	[T98]max [°C]: 70 °C
JB Protection (IP Rating)	IP 68	IP 68	IP 68
Connector Protection (IP Rating)	IP68	IP68	IP68
JB Cable length (mm)	350	350	350
Fire Rating	Type 38	Type 38	Type 38
Snow Load (Pa)	3600 Pa	3600 Pa	3600 Pa
Wind Load (Pa)	1600 Pa	1600 Pa	1600 Pa
Safety Factor	1.5	1.5	1.5

Table 1

*Cable length can vary as per customer requirement

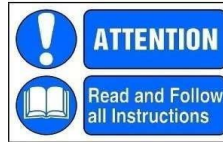
Front-Side Picture of Product

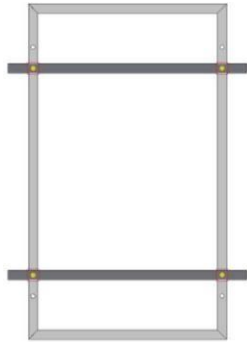
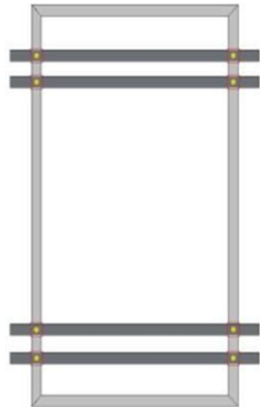
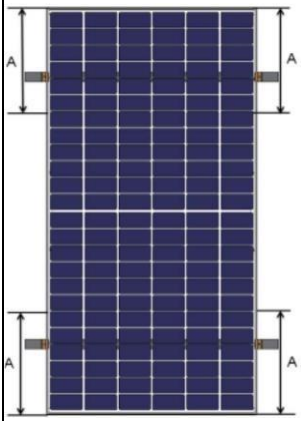


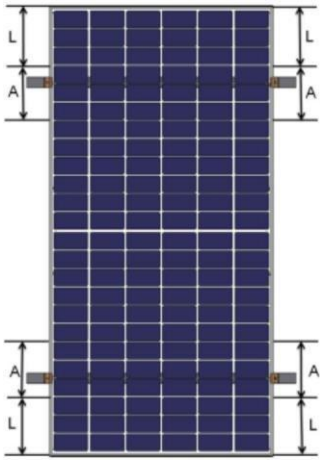

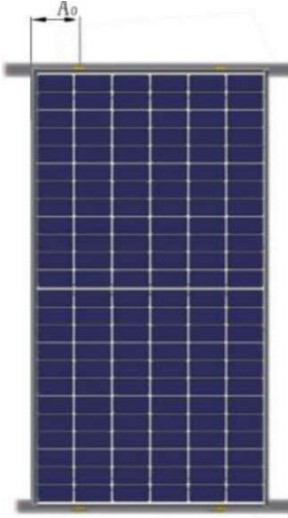
Back-Side Picture of Product

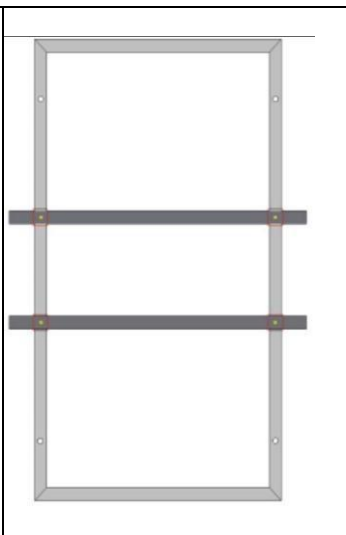


3.3.5. Recommendations of Mounting Methods



Mounting Method	Mechanical Load	Installation Location	Applicable for Models
Installation with 4 outer holes and beams underneath	Test load: Positive 1600Pa Negative 1600Pa Safety Factor 1.5		SGE XXX-156/144/132TGG
Installation 04 outer and 04 inner holes beams underneath (Excepting the tracking mounting hole)	Test load: Positive 3600Pa Negative 1600Pa Safety Factor 1.5		SGE XXX-156/144/132TGG
Installation with Clamps into 4 outer holes, Beams perpendicular to long sides	Test load: Positive 1600Pa Negative 1600Pa Safety Factor 1.5		SGE XXX-156/144/132TGG

<p>Installation with Clamps into 4 inner holes, Beams perpendicular to short sides</p>	<p>Test load: Positive 1600Pa Negative 1600Pa Safety Factor 1.5</p>	 <p>The diagram shows a solar panel with four clamps, one on each of the short sides. Dimension lines indicate the distance from the top and bottom edges to the clamps as 'L', and the distance between the clamps as 'A'.</p>	<p>SGEXXX156/144/132TGG</p>
<p>Four clamps short end mounting with beams parallel with long frame</p>	<p>Test load: Positive 1600Pa Negative 1600Pa Safety Factor 1.5</p>	 <p>The diagram shows a solar panel with four clamps, one on each of the short ends. A dimension line 'A0' indicates the distance from the top edge to the top clamps.</p>	<p>SGE XXX-156/144/132TGG</p>
<p>Four clamps short end mounting with beams underneath the short frame</p>	<p>Test Load Positive 1600Pa Negative 1600Pa Safety Factor 1.5</p>	 <p>The diagram shows a solar panel with four clamps, one on each of the short ends, and beams underneath the short frame. A dimension line 'A0' indicates the distance from the top edge to the top clamps.</p> <p>A0=1/4 short frame length±50mm</p>	<p>SGE XXX-156/144/132TGG</p>

<p>Four Bolt tracker Mounting</p>	<p>Test Load Positive 1600Pa Negative 1600Pa</p>		<p>SGE XXX-156/144/132TGG</p>
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Note: The module clamps must not come into contact with the front glass or deform the frame in any way. Avoid shading effects caused by clamps or insertion systems. Drainage holes in the module frame must not be closed or obscured by the clamps.

The mounting holes are reserved for tracker mounting system with special accessories. If the length of module is over 2 meters, its mechanical load value for tracker needs to be confirmed by module supplier.

4. Electrical Installation

Module under standard testing conditions of: irradiance of 1000W /m², cell temperature of 25 °C and air mass of AM1.5. 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 I_{sc} and V_{oc} marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes, and size of controls connected to the PV output.

Voltages are additive when modules are connected in series, and modules currents are additive when modules are connected in parallel, as illustrated in Figure 1.

Modules with different electrical characteristics must not be connected directly in series.

The reported performance measurements are subject to +5% uncertainty at STC/BSTC (1000W/m² Irradiance, a cell temperature of 25° and an AM1.5 spectrum) for voltage, current and +3% power, where standard test conditions (1000 W/m², (25 +_ 2) °C, AM 1.5 according to IEC 60904-3) and BSTC (AM 1.5, T = 25 °C, Irradiance = 1000W/m² + #•135W/m²)

Maximum allowable system voltage for Saatvik PV modules is 1500VDC, Class for protection against electrical shock, in accordance with Clause 4 of IEC 61730-1:2016 is CLASS II. When modules are connected in series, the string voltage is the sum of individual modules in one string.

When modules are connected in parallel, the current is sum of individual string current. modules with different electric performance models cannot be connected in one string.

4.1. Series Wiring / Parallel Wiring

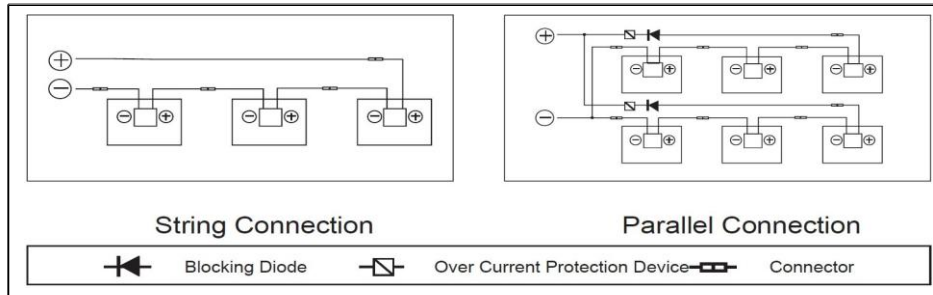


Figure 21: Electrical diagrams of series and parallel wiring.

- The maximum number of modules that can be connected in series within a string must be calculated in accordance with applicable regulations in a way that the specified maximum system voltage (The maximum system voltage of bifacial module is DC 1500VDC) of the modules and all other electrical DC components will not exceed in open-circuit operation at the lowest temperature expected at the PV system location.
- Correction factor for the open-circuit voltage can be calculated based on the following formula:

$$CVoc=[1-\alpha(25- T)]\%$$

- T is the lowest expected ambient temperature at the system location.
- α (%/°C) is the temperature coefficient of the selected module Voc (Refer to corresponding datasheet).
- The maximum allowed quantity of modules in string connection shall be calculated according to relative regulations. The open circuit voltage value under the expected lowest temperature shall not exceed the maximum system voltage value allowed by modules and other values required by DC electric components.
 - If modules are connected in series, the total voltage is equal to the sum of individual voltages. The recommended system voltage calculation is as below,

$$\text{System Voltage} = N \times Voc [1 + TcVoc \times (Tmin - 25)]$$

Where: N - module numbers in series

Voc - Open circuit voltage (refer to product data sheet)

TcVoc - Temperature coefficient of open circuit voltage (refer to product data sheet)

Tmin - Minimum ambient temperature

Under certain conditions, a module may produce more current or voltage than under its Standard Test Conditions rated power. As a result, the module short-circuit current under STC should be multiplied by 1.25. Depending on your local regulations, an additional 1.25 multiplier for the short-circuit current (giving a total multiplier of 1.56) may be applicable when sizing conductors and fuses.

- If the modules are connected in parallel, the recommended number of modules in parallel is maximum series fuse rating/Isc+1.

If there is reverse current exceeding the maximum fuse current flowing through the module, use an overcurrent protection device with the same specifications to protect the module; if parallel connection is more than 2 strings, there must be an overcurrent protection device on each string of module The table below indicates the advisable maximum overcurrent rating for different model: -

Model No.	module Type	Maximum Overcurrent Protection Rating
SGE XXX- 156TGG (615-625Wp)	Bifacial	30A
SGE XXX- 144TGG (560-600Wp)	Bifacial	30A
SGE XXX- 132TGG (600-625Wp)	Bifacial	35A

Table 2

The module is considered to be in compliance with this standard only when the module is mounted in the manner specified by the mounting instructions. A module with exposed conductive parts is considered to be in compliance with this standard only when it is electrically grounded in accordance with the manufacturer's instructions and the requirements of National Electrical Code, ANSI/NFPA 70 (2014-2017).

Recommended installation method of full cell solar module:

The modules in PV array are recommended for portrait connecting, and cable length is not less than 0.7 m.

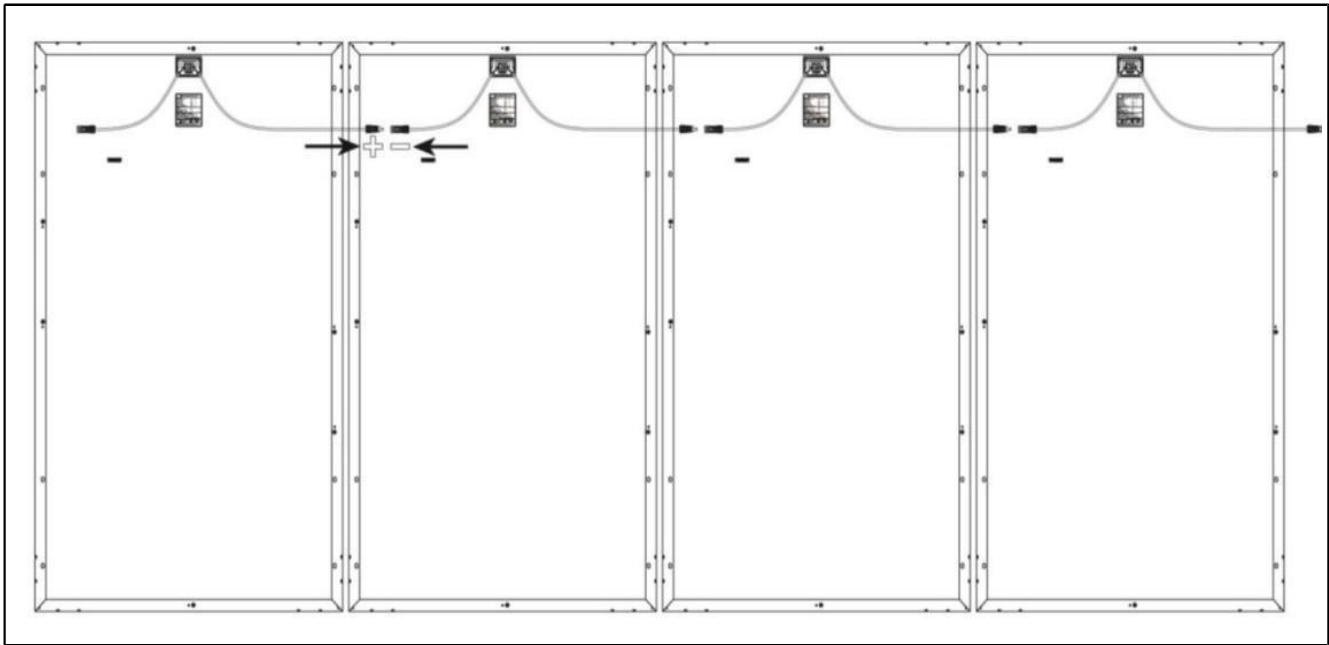


Figure 22

Recommended mounting method of half-cell solar module:

The head and tail of the modules in PV array are placed in a cross layout, and cable length as mentioned on Technical Datasheet sheet.

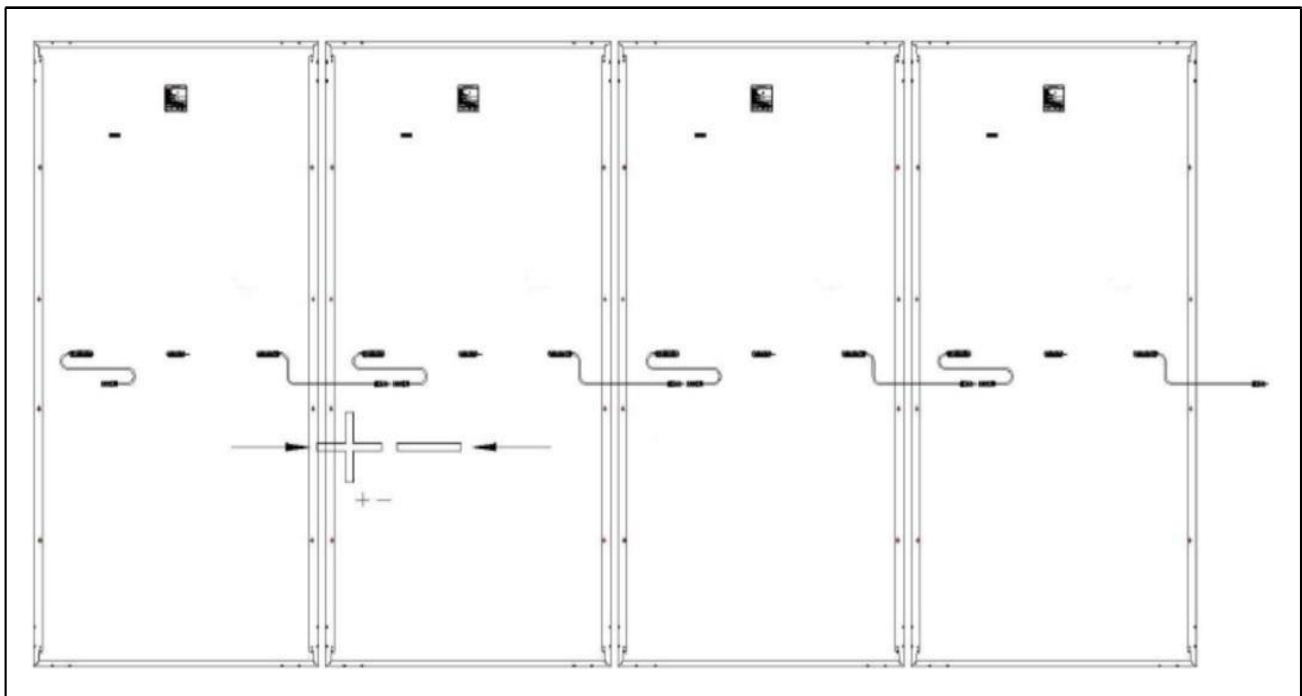
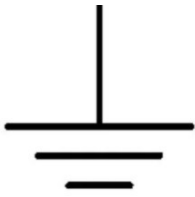


Figure 23

Type name or model no.	SGExxx-156TGG (xxx= 615-625wp in step of1)	SGExxx-144TGG (xxx= 560-600wp in step of 1)	SGExxx-132TGG (xxx= 600-625wp in step of 1)
Nominal maximum output power at STC [W]	615-625 In steps of 1	560-600 In steps of 1	600-625 In steps of 1
Nominal short-circuit current at STC [A]	14.02 – 14.18	13.88 – 14.51	15.85 – 16.10
Nominal open-circuit voltage at STC [V]	54.99 – 55.35	50.68 – 52.13	47.98 – 48.98
Tolerance of rating at STC (Pmpp / Isc / Voc) [%]	0~+3%/±5/±5	0~+3%/±5/±5	0~+3%/±5/±5
Nominal maximum output power at BNPI [W]	675-685	615-640	600-625
Nominal short-circuit current at BNPI [A]	15.39-15.53	15.23-15.96	17.28-17.50
Nominal open-circuit voltage at BNPI [V]	54.99-55.35	50.68-52.13	47.98 – 48.98
Tolerance of rating at BNPI (Pmpp / Isc / Voc) [%]	0~+3%/±10/±10	0~+3%/±10/±10	0~+3%/±10/±10
Bifaciality coefficient	80± 5%	80± 5%	80± 5%
Dimensions (L x W x H) [mm]	2464x1124x30/35	2278x1134x30/35	2382x1134x30/35
Module area [m ²]	2.79	2.58	2.70
Class (IEC 61730-1:2016)	Class II	Class II	Class II
Maximum system voltage [VDC]	1500	1500	1500
Pollution degree	PD1	PD1	PD1
Qualified as cemented joint design	No	No	No
Over-current protection rating [A]	30	25	35
Defined min. creepage distance [mm]	13	13	13
Defined min. clearance distance [mm]	13	13	13
Max. operational altitude [masl]	≤2000	≤2000	≤2000
Design load – downwards [Pa]	3600	3600	3600
Design load – upwards [Pa]	1600	1600	1600
Safety factor for mechanical load	1.5	1.5	1.5
Number of solar cells	156	144	132
Connection of cells (S, SP, PS)	SP	SP	SP
Number of diodes	3	3	3
Cells per diode	52	48	44

Table 3

5. Grounding



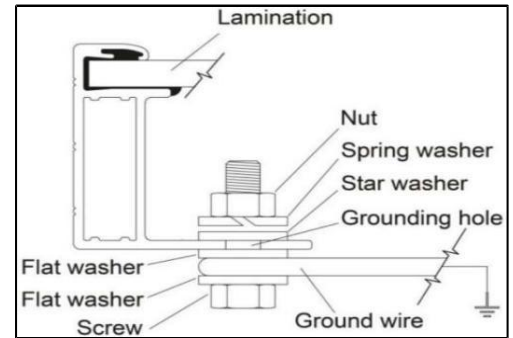
For grounding and bonding requirements, please refer to regional and national safety and electrical standards. If grounding is required, use a recommended connector type for the grounding wire. This guide refers to module frame grounding. If grounding is required, ensure that module frames (metal exposed to touch) are always grounded. All modules must be electrically grounded as per the National Electrical Code (USA) or any applicable local code.

Saatvik always recommends referring to local state and national code requirements for PV module grounding. Saatvik highly recommends negative grounding if it is allowed by local authorities.

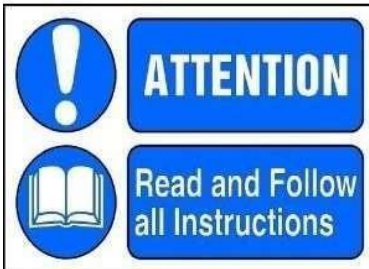
When attaching the frame grounding hardware and wire to the frame it must be placed corresponding to the ground symbol stamped location to ensure proper electrical connection.

Saatvik recommends one of the following parts for grounding:

- Use M5/M6 bolt and washer to bond the ground wire and aluminum frame through the grounding hole (as shown below). The tightening torque is 3-7Nm. All nuts and washers should be made of stainless steel. 4-14 mm²
- (AWG 6-12) exposed copper wire recommended as ground wire.
- Grounding part is tested to UL467.



6. Important Instructions for Installations: -



- Any hardware used must be compatible with any other used material to avoid galvanic corrosion. Defects caused by corrosions void the warranty.
- It is not recommended to use modules with different configurations (grounding, wiring) in the same system.
- Excessive cables must be organized and fixed in an adequate way, for example attached to the mounting structure by using non-metallic cable ties. Solar cables, connectors, and junction boxes should not be exposed to water, snow, rain, or water submersion for a long period of time (IP65/67/68).
- For applications requiring high operating voltage, several modules can be connected in series to form a string of modules; the system voltage is then equal to the sum of the voltage of each module.
- For applications requiring high operating current, several strings of modules can be connected in parallel; the system current is then equal to the sum of the current of each string of modules.
- The maximum system voltage is 600 volts, 1000 volts, or 1500 volts depending on the product family (DC), according to standards. The maximum number of series connected modules depends on system design, the type of inverter used, and environmental conditions.
- Based on the maximum series fuse rating of the module and local electrical installation codes, always make sure that Saatvik's PV modules are assembled with the appropriate string fuse for circuit protection.
- Connect the fuse to the non-grounded pole of the solar array. Maximum fuse rating connected in series can be 25A, 30A, or 35A. Actual fuse rating is mentioned in the PV module specification sheet and on the PV module back label. Fuse rating value also indicates the maximum reverse current that can flow from the module, i.e. when one string is in shade, then the other parallel strings of modules will be loaded by the shaded string, and the current will pass through to create a circuit. Based on the maximum series fuse rating of the module and local electrical codes and standards, make sure the modules string in parallel are protected with the appropriate in-line string fusing.

- There is no specific limitation on the number of modules that can be connected in parallel, the number of modules is determined by system design parameters such as current or power output.
- To prevent the cables and the connectors from overheating, the cross section of the cables and the capacity of the connectors must be selected to suit the maximum system short circuit current. The recommended cable is PV wire with a cross section of at least 4mm².
- **Caution:** Do not secure the cables too tightly. Any cable damage caused by cable management system is not covered under Saatvik's warranty.
- Always refer to the cable manufacturer's bending radius, which includes the radius just behind the connectors.
- Saatvik's modules are supplied with connectors used for system electrical connections. Recommended to use same connectors during installation of module on site.
- Saatvik strongly recommends using the genuine connector type specified by Saatvik's product data sheet. Any choice of a different connector types other than specified may void the warranty of the module.
- To ensure reliable electrical connection and to prevent possible intrusion of humidity, two connectors must be mated and locked together until a click can be heard.
- Long-term exposure to wet environments may cause connector's poor connectivity, resulting in current leakage and poor conductivity, which voids the warranty. Saatvik recommends proper connector/cable/wire management to prevent moisture intrusion. Depending on the amount of humidity, Saatvik recommends periodic inspections of the installation system to maintain optimal module performance.
- The DC current generated by photovoltaic systems can be converted into AC and fed into a public grid. As local utilities' policies on connecting renewable energy systems to the grid vary from region to region. Always seek the advice from a qualified system designer or integrator. Building permits, inspections and approvals by the local utility are generally required.
- Especially for larger installations Saatvik recommends lightning protection following the local requirements and regulations.
- When the installation is finished and after connecting to the grid, please do a professional hand over to the owner, including an installation protocol is required. Provide clear documentation of the system to the owner consisting of the following minimum data such as user guide, system layout, data sheets, performance expectations, and electrical system data.

7. Module Cleaning

- Accumulated contaminants on module surface glass will reduce the power output and lead to local hot spots, such as dust, industrial wastewater and birds' droppings. The severity of influence is determined by the transparency of waste. Small amounts of dust will affect the intensity and evenness of the received solar irradiation but are not dangerous and power will not be reduced remarkably in general.
- During operation of modules, there shall be no environmental factors that shade modules fully or partially. These environmental factors include other modules, the module mounting system, birds dwelling, dust, soil, or plants. These will significantly reduce output power. Saatvik suggests that the module surface should not be shadowed in any case.
- The Frequency of cleaning depends on dirt accumulation speed. Under normal conditions, rainwater will clean the module surface and reduce the cleaning frequency. It is suggested that you use a sponge dipped in clean water or soft cloth to wipe the glass surface.
- Do not use acid and alkaline detergents to clean modules. Do not use tools with rough surfaces to clean in any case.
- To avoid the potential risk of electrical shock or burn, Saatvik suggests cleaning the modules during early morning or evening with low irradiance and low modules temperature, especially in areas with high average temperatures.
- To avoid the potential risk of electrical shock, do not try to clean the modules with glass damage or exposed wires.
- Don't: Artificially concentrated sunlight shall not be directed onto module or panel.
- 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 ampacities, fuse sizes, and the size of controls connected to the PV output.
- For safety Standard for Electrical Installations, please refer to national building codes and safety requirements.

7.1 Method A: - Compressed Water

Requirement for water quality:

- PH: 5 ~7;
- Chloride and Salinity : 0 - 3,000 mg/L
- Turbidity : 0-30 NTU
- Conductivity: 1500~3000 μ s/cm
- Total dissolved solids (TDS): \leq 1000 mg/L
- Water hardness (calcium and magnesium ions): 0-40 mg/L
- Non-alkaline water must be used; demineralized water shall be used when conditions are available
- The maximum water pressure recommended is 4 MPa (40 bar)

7.2 Method B: - Compressed Air

- We recommend using this method to remove the soft dirt (like dust) on modules. This technique can be applied whenever it efficiently cleans the modules under the given site conditions.

7.3 Method C: - Wet Cleaning

- If excessive soiling is present on the module surface, a non-conductive brush, sponge, or other mild agitating method may be used with caution.
- Ensure that any brushes or agitating tools are made of non-conductive materials to minimize risk of electric shock and that they are non-abrasive to the glass or the aluminum frame.
- If grease is present, an environmentally friendly cleaning agent may be used with caution.

7.4 Method D: - Robot Cleaning

- If a cleaning robot is used for dry cleaning, the brush material is must soft plastic material, ensuring that the glass surface and aluminum alloy frame of the module will not be scratched during the cleaning process or after cleaning.
- The weight of the cleaning robot should not be too large. If the cleaning robot is improperly used, any resulting module damage and power attenuation are not covered by Saatvik's warranty.

8. Release and Execution

- This manual document is implemented and managed by product management department. Product management department reserves the right to modify and revise in any time

9. Fire Safety

- Please follow all local laws and regulations regarding fire protection and PV module installation.
- Saatvik mono-facial modules are certified with a fire rating of UL Type 1 or 2 or IEC Class C, while bifacial modules are UL Type 29 or IEC Class C
- The roof should be coated with fireproof materials suitable for the intended fire protection rating; ventilation between the back sheet and mounting surface must be maintained.
- Maintain a minimum clearance of 10 cm between the module frame and the roof surface to ensure proper ventilation and fire safety.
- Avoid installing modules near flammable gases, liquids, or other hazardous materials.
- Ensure all electrical connection with no gaps, as loose contacts can cause arcing and pose a fire risk.
- Use certified accessories such as fuses, circuit breakers, and grounding connectors in accordance with local electrical codes.
- In the event of fire, immediately disconnect the inverter to reduce the risk of fire spread.
- Never use water to extinguish electrical fires; use only Class C extinguishing agents such as dry powder or CO₂, as recommended by NFPA (USA), NSCI (India), or other competent authorities.
- Trained personnel should wear insulating boots and gloves and use a photovoltaic connector wrench to safely disconnect affected modules.
- Notify all personnel to evacuate immediately and call the fire department.
- Be aware that PV modules may continue generating hazardous voltage or current even after disconnection or damage; avoid contact until the system is declared safe.
- The fire rating valid only when modules are mounted according to the manufacturer's instructions.

10. General Handling & Use

Photovoltaic modules generate electricity when exposed to light, even when they are not connected in a circuit. Direct contact with the module output leads can cause electric shock or burns. Under normal conditions, a photo voltaic module is likely to experience conditions that produce more current and/ or voltage than reported at standard test conditions. Accordingly, the values of I_{sc} and V_{oc} marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacities, fuse sizes, and size of controls connected to the PV output. These hazards are increased when multiple modules are inter- connected to increase array output current or voltage.

Les modules photovoltaïques génèrent de l'électricité lorsqu'ils sont exposés à la lumière, même lorsqu'ils ne sont pas connectés à un circuit. Des CHOCS et des BRÛLURES peuvent se produire en cas de contact direct avec les fils de sortie du module. Dans des conditions normales, un module photovoltaïque est susceptible de connaître des conditions qui produisent plus de courant et/ou de tension que celles rapportées dans des conditions de test standard. En conséquence, les valeurs d'I_{sc} et de V_{oc} indiquées sur ce module doivent être multipliées par un facteur de 1,25 lors de la détermination des tensions nominales des composants, des intensités des conducteurs, des tailles de fusibles et de la taille des commandes connectées à la sortie PV. Ces risques sont accrus lorsque plusieurs modules sont interconnectés pour augmenter le courant ou la tension de sortie du réseau.

11. Installation Safety / Sécurité d'installation

- *Portez toujours un casque de protection, des gants isolants et des chaussures de sécurité (avec des semelles en caoutchouc) et d'autres mesures de protection lors de l'installation.*
- *Lors de l'installation ou de l'entretien du système photovoltaïque, veuillez ne pas porter de bagues métalliques, de montres et d'autres produits métalliques, afin de ne pas provoquer de danger d'électrocution et d'endommager les modules.*
- *Gardez le module PV emballé dans le carton jusqu'à l'installation. Une fois les modules retirés de la boîte d'emballage, ils doivent être installés et connectés à la boîte de bus à temps. S'ils ne sont pas installés immédiatement, des mesures de protection (telles que l'ajout de couvre-joint en caoutchouc, etc.) doivent être prises sur la tête de raccordement*

- *Ne touchez pas inutilement le module PV pendant l'installation. La surface en verre et le cadre peuvent être chauds. Il existe un risque de brûlures et d'électrocution*
- *Ne travaillez pas sous la pluie, la neige ou le vent*
- *En raison du risque de choc électrique, n'effectuez aucun travail si les bornes du module PV sont mouillées*
- *Utilisez des outils isolés et n'utilisez pas d'outils humides*
- *Lors de l'installation des modules PV, ne laissez tomber aucun objet (par exemple, des modules PV ou des outils).*
- *Assurez-vous que des gaz inflammables ne sont pas générés ou présents à proximité du site d'installation.*
- *Insérez complètement et correctement les connecteurs du module. Un son "clic" audible doit être entendu. Ce son confirme que les connecteurs sont bien en place. Vérifiez toutes les connexions*
- *Connectez correctement les connecteurs mâles et femelles, vérifiez l'état du câblage, tous les fils ne doivent pas être séparés des modules et fixez les fils avec des attaches de câble afin que les fils ne rayent pas ou ne compriment pas la feuille arrière des modules.*
- *La classe de protection pour ce type de module est « Classe II » selon CEI 61730/UL61730. Les modules sont conçus pour une tension maximale du système de 1500 volts.*
- *Dans la plupart des applications, les modules PV de Saatvik doivent être installés dans un endroit où ils recevront le maximum d'ensoleillement tout au long de l'année. Dans l'hémisphère nord, le module doit généralement faire face au sud, et dans l'hémisphère sud, les modules doivent généralement faire face au nord.*
- *Les modules orientés à 30 degrés du vrai sud (ou nord) perdront environ 10 à 15 % de leur puissance de sortie. Si le module fait face à 60 degrés du vrai sud (ou nord), la perte de puissance sera de 20 à 30 %.*
- *Ne touchez pas la boîte de jonction et l'extrémité des câbles d'interconnexion (connecteurs) à mains nues pendant l'installation ou sous la lumière du soleil, que le module PV soit connecté ou déconnecté du système.*
- *La boîte de jonction doit être protégée de la lumière directe du soleil et de l'eau. Le connecteur doit répondre à la norme d'étanchéité IP68 après avoir été connecté. Cependant, il n'est pas recommandé d'utiliser le connecteur sous l'eau pendant une longue période*
- *N'exposez pas le module PV à des charges excessives sur la surface du module PV ou ne tordez pas le cadre.*
- *Ne frappez pas ou ne mettez pas de charge excessive sur le verre ou la feuille arrière, cela pourrait casser les cellules ou provoquer des micro-fissures.*
- *Pendant l'installation ou le fonctionnement, n'utilisez pas d'outils pointus pour essuyer la feuille arrière et le verre. Des rayures peuvent apparaître sur le module.*
- *Ne percez pas de trous dans le cadre. Cela peut provoquer la corrosion du cadre.*
- *Lors de l'installation de modules sur des structures montées sur le toit, veuillez essayer de suivre le principe « de haut en bas » et/ou « de gauche à droite », et ne marchez pas sur le module. Cela endommagerait le module et serait dangereux pour la sécurité personnelle.*
- *Les modules auront un effet de dilatation thermique et de contraction à froid. Lors de l'installation, l'intervalle entre deux modules conventionnels adjacents est recommandé > 10 mm. En cas d'exigences particulières soumises aux approbations Saatvik.*

12. Attention

- *Les modules PV génèrent de l'énergie électrique CC lorsqu'ils sont exposés à la lumière du soleil ou à d'autres sources lumineuses. Les parties actives du module telles que les bornes peuvent provoquer des brûlures, des étincelles et des chocs mortels. La lumière du soleil artificiellement concentrée ne doit pas être dirigée sur le module ou le panneau.*
- *Une vitre de protection avant est utilisée sur le module. Le verre brisé du module solaire constitue un danger pour la sécurité électrique (peut provoquer un choc électrique ou un incendie). Ces modules ne peuvent pas être réparés et doivent être remplacés immédiatement.*
- *Pour réduire le risque d'électrocution ou de brûlure, les modules peuvent être recouverts d'un matériau opaque lors de l'installation pour éviter les blessures.*

- *Les travaux d'installation du générateur photovoltaïque ne peuvent être effectués que sous la protection de couvertures ou de pare-soleil abritant le soleil et seule une personne qualifiée peut installer ou effectuer des travaux de maintenance sur ce module.*
- *Suivez les recommandations du fabricant de la batterie si des batteries sont utilisées avec des modules. N'utilisez pas ce module pour remplacer ou remplacer partiellement les toits et les murs de bâtiments d'habitation. N'installez pas de modules où des gaz inflammables peuvent être présents.*
- *Ne retirez aucune pièce installée par Saatvik et ne démontez pas le module.*
- *Toutes les instructions doivent être lues et comprises avant de tenter d'installer, de câbler, d'utiliser et d'entretenir le module.*
- *Tous les systèmes PV doivent être mis à la terre. S'il n'y a pas de réglementation spéciale, veuillez suivre le Code national de l'électricité ou tout autre code national*
- *Dans des conditions normales, un module photovoltaïque est susceptible de connaître des conditions qui produisent plus de courant et/ou de tension que celles signalées dans les conditions de test standard. En conséquence, la valeur de Isc et Voc indiquée sur le module doit être multipliée par 1,25 lors de la détermination des tensions nominales des composants du système PV, des courants nominaux des conducteurs, des tailles de fusibles et de la taille des commandes connectées à la sortie PV.*
- *Une fois que le module PV a été expédié sur le site d'installation, toutes les pièces doivent être déballées correctement avec soin.*
- *Ne vous tenez pas debout ou ne marchez pas sur le module PV comme le montrent les images ci-dessous. Ceci est interdit et il y a un risque d'endommager le module et de vous blesser.*
- *Seuls les modules PV avec la même taille de cellule doivent être connectés en série.*
- *Pendant le transport des modules, essayez de minimiser les chocs ou les vibrations sur le module, car cela pourrait endommager le module ou entraîner des microfissures de cellule.*
- *Dans toutes les situations de transport, ne laissez jamais tomber le module d'un véhicule, d'une maison ou des mains. Cela endommagera le module.*
- *Les modules (verre, boîtes de jonction, connecteurs, etc.) doivent être protégés d'une exposition prolongée à des environnements contenant du soufre, des acides forts, des alcalins forts, etc., qui peuvent présenter un risque de corrosion pour le produit.*
- *Les travaux d'installation du générateur photovoltaïque ne peuvent être effectués que sous la protection de couvertures ou de pare-soleil abritant le soleil et seule une personne qualifiée peut installer ou effectuer des travaux de maintenance sur ce module.*
- *Suivez les recommandations du fabricant de la batterie si des batteries sont utilisées avec des modules.*
- *N'utilisez pas ce module pour remplacer ou remplacer partiellement les toits et les murs de bâtiments d'habitation. N'installez pas de modules où des gaz inflammables peuvent être présents.*
- *Ne retirez aucune pièce installée par Saatvik et ne démontez pas le module.*
- *Toutes les instructions doivent être lues et comprises avant de tenter d'installer, de câbler, d'utiliser et d'entretenir le module.*
- *Tous les systèmes PV doivent être mis à la terre. S'il n'y a pas de réglementation spéciale, veuillez suivre le Code national de l'électricité ou tout autre code national*
- *Ne nettoyez pas la vitre avec des produits chimiques. N'utilisez que de l'eau du robinet. Assurez-vous que la température de surface du module est froide au toucher. Le nettoyage des modules avec de l'eau froide lorsque la température de surface du module est élevée peut entraîner des bris de verre. Ne pas brosser de peinture ou de substances corrosives sur la surface des modules.*
- *Ne débranchez aucun des modules lorsqu'ils sont sous charge. Si vous devez débrancher le connecteur, vous devez d'abord fermer le convertisseur CC et CA ou débrancher l'interrupteur principal de la boîte de jonction.*
- *Lorsque vous regardez des modules PV dotés de la technologie de revêtement anti-reflet (AR), il sera normal de voir certaines cellules avec une légère différence de couleur sous différents angles.*
- *Le connecteur de la boîte de jonction ne doit pas être en contact avec des substances huileuses, des solvants organiques et d'autres matériaux corrosifs pour éviter d'endommager le connecteur. Par exemple, l'alcool, l'essence, les lubrifiants, les inhibiteurs de rouille, les herbicides, etc. Si le connecteur est pollué, il faut remplacer le nouveau connecteur pour l'utiliser à nouveau.*
- *Avant l'installation des modules, il est recommandé d'ajouter des installations anti-pluie sur le site du projet pour éviter un placement direct à l'air libre.*
- *L'altitude maximale pour laquelle le module PV est conçu ≤ 2000 m.*

- L'irradiance maximum est de 1300W/m2 pour le module avec arriere transparent Lors de l'exécution de tout type de maintenance électrique, tout le système doit être isolé / arrêté et la maintenance doit être effectuée uniquement par des professionnels bien formés. Tout non-respect des instructions peut entraîner des décharges électriques mortelles, des brûlures, d'autres blessures et parfois la mort également. Saatvik solar n'est pas responsable de tout type d'accident survenant dans une centrale électrique utilisant des panneaux Saatvik. La documentation comprend une déclaration indiquant que la lumière solaire nominale externe ou artificielle ne doit pas être dirigée sur la face avant ou arriere du module PV (si elle n'est pas qualifiée).

13. Contact Details: -

Email us at: - info@saatvikgroup.com

Contact us at: - 1800-547-1151



Please scan above QR code for electronic copy of Installation Manual

Corporate Address: -

Plant Address: -

Tower A, IFFCO Complex, Plot No. 3 Institutional Area,
Sector 32, Gurugram, Haryana 122001

Plant-01:

Saatvik Green Energy Limited Village Dubli, Chadiala-
Kesri Road, Tehsil:, Barara, Haryana 133101

Plant-02:

Saatvik Solar Industries Private Limited Hadbast
No. 222, Village Dubli, Sub, Tehsil Saha, Distt.
Ambala, Haryana-133101

Plant-03:-

Saatvik Solar Industries Private Limited
Village Mohri, Tehsil Shahbad Markanda,
Ambala Road, District Kurukshetra, Haryana-
136135



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Appendix 1 : Connector Specifications

Manufacturer	Type/Model	Specification
Shanxi Zhongke Anrui Energy Technology Co., Ltd.	PV-ZKC2	Max. Voltage = 1500VDCDC Max. Current =35A Max Temp = 100°C
DhaSh PV Technologies Private Limited	DS01	Max. Voltage = 1500VDCDC Max. Current =35A Max Temp = 100°C
Ningbo Guangzhixing Photovoltaic Technology Co., Ltd.	PV-GZX1500	Max. Voltage = 1500VDC Max. Current =30A Max Temp = 100°C
Stäubli Electrical Connectors AG	PVKST4-EVO2/xy UR PVKBT4-EVO2/xy UR	Max. Voltage = 1500VDCDC Max. Current =45A Max Temp = 100°C
GENEX PV India Private limited	GXSB-01E (E=3)	Max. Voltage = 1500V Max Current = 35A Max Temp = 110°C