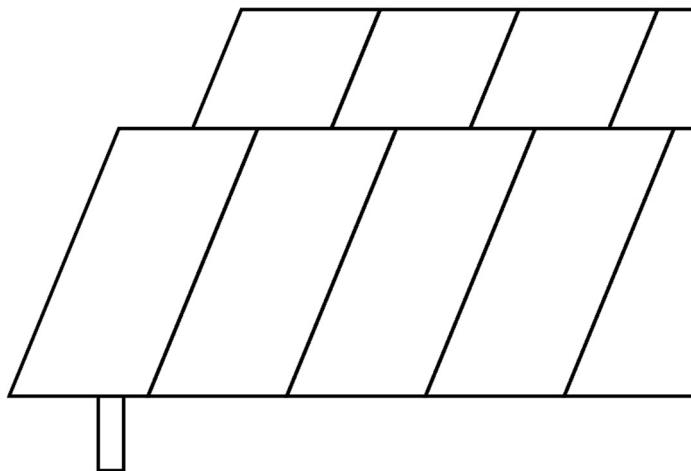


INSTALLATION

MANUAL

Installation | Safety instructions | Maintenance



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WARNING!

The photovoltaic module produces electricity when exposed to the sun or other light sources. For your safety and the safety of others, please read the entire installation and assembly instruction manual carefully prior to installation. Please carefully read the following installation and safety instructions. Non-compliance with these instructions may void the module warranty.

1 Introduction

This guide contains information regarding the installation and safe handling of EliTe Solar photovoltaic modules (hereafter referred to as "modules"). All instructions should be read and understood before attempting installation. If there are any questions, please contact your dealer or EliTe Solar for further information. The installer should conform to all safety precautions in the guide when installing modules. Before installing a solar photovoltaic system, the installer should become familiar with the mechanical and electrical requirements for photovoltaic systems. Keep this guide in a safe place for future reference. If not otherwise specified, it is recommended that the requirements of the U.S. National Electrical Code (NEC) or respective European Code and other countries Code be followed.

Non-compliance with this installation instruction may result in property damage and/or physical injury. EliTe Solar will not be liable for compensation of any loss or injury caused by this type of non-compliance.

2 Codes and regulations

The mechanical and electrical installation of PV systems should be performed in accordance with all applicable codes, including electrical codes, building codes and electric utility interconnection requirements. Such requirement may vary for mounting location. Requirements may also vary with system voltage, and for DC or AC application. Contact local authorities for governing regulations.

3 General information

Be careful when unpacking, transporting, and storing the modules. They are subject to breakage if they are not handled and installed properly. It is recommended not to take them out of the packaging until the moment of the installation. During installation, please use soft materials to protect the modules from contacting directly with the ground, concrete or tiles. Otherwise scratches or glass breakages may occur.

- ✓ Installing solar photovoltaic systems requires specialized skills and knowledge. The installer assumes all risk of injury, including risk of electric shock. Module installation should be performed only by qualified persons.
- ✓ All modules come with permanently attached junction box and 4 mm² (#12 AWG) wire terminated in PV connectors. Your dealer can provide additional extension cables to simplify module wiring.
- ✓ Each individual module can generate DC voltages greater than 30 volts (V) when exposed to direct sunlight. Contact with a DC voltage of 30 V or more is potentially hazardous. Exercise caution when wiring or handling modules exposed to sunlight.
- ✓ When disconnecting wires connected to a photovoltaic module that is exposed to sunlight, an electric arc may occur. Arcs can cause burns, start fires or otherwise create safety problems. Exercise caution when disconnecting wiring on modules exposed to sunlight.
- ✓ Photovoltaic solar modules convert light energy to direct-current electrical energy, and are designed for outdoor use. Proper design of support structures is the responsibility of the system designer and installer.
- ✓ Modules may be ground mounted, pole mounted, or mounted on rooftops.
- ✓ Do not apply paint or adhesive to the module.
- ✓ When installing modules, observe all applicable local, regional and national codes and regulations. Obtain a building and/or electrical permit where required.
- ✓ Modules should operate at environmental temperature of between -40 to +85°C. If modules are to be installed in areas where the temperature may go outside the above range, please consult with EliTe Solar before installation.
- ✓ The irradiance reflected on the rear of the bifacial solar modules shall not exceed 300W/m².



Do not attempt to disassemble the module, and do not remove any attached nameplates or components. Doing so will void the warranty.



Do not use mirrors or other hardware to artificially concentrate sunlight on the module.

3.1 Safety precautions for installing a solar photovoltaic system

Regular safety: EliTe Solar Modules are designed to meet the requirement of IEC 61215 and IEC61730, application class A. Modules rated for use in this application class may be used in system operating at greater than 50VDC or 240W, where general contact access is anticipated. Modules qualified for safety through IEC61730-1,61730-2 and within this application class are considered to meet the requirement for protection

class II equipment.

- ✓ Solar modules produce electrical energy when exposed to sunlight. DC voltages may exceed 30V on a single exposed module.
- ✓ Only connect modules with the same rated output current in series. If modules are connected in series, the total voltage is equal to the sum of the individual module voltages. The maximum system voltage for module type is 1500V(IEC/UL), for roof use, the maximum system voltage must not exceed 1000V according to National Electrical Code.
- ✓ Bypass diodes are preassembled in each module. Do not remove these diodes.
- ✓ Keep children well away from the system while transporting and installing mechanical and electrical components.
- ✓ Completely cover all modules with an opaque material during installation to prevent electricity from being generated.



Do not wear metallic rings, watchbands, ear, nose, or lip rings or other metallic devices while installing or troubleshooting photovoltaic systems.



Use appropriate safety equipment (insulated tools, insulating gloves, etc.) approved for use on electrical installations.

- ✓ Observe the instructions and safety precautions for all other components used in the system, including wiring and cables, connectors, DC-breakers, mounting hardware, inverters, etc.
- ✓ Use only equipment, connectors, wiring and mounting hardware suitable for use in a photovoltaic system.
- ✓ Always use the same type of module within a particular photovoltaic system.
- ✓ Under normal operating conditions, PV modules will produce currents and voltages that are different from those listed in the data sheets. The values in the module data sheets are collected under very specific circumstances known as Standard Test Conditions.
- ✓ Short-circuit current and open-circuit voltages should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacity, fuse sizes and size of controls connected to the module or system output. An additional multiplying factor of 125 percent (80 percent de-rating) may be applicable.

3.2 General installation notes

- ✓ The junction box has a breather port which must be mounted facing downward and cannot be exposed to the rain. The junction box should be on the higher side of the module when it is mounted in order to orient the breather port correctly.
- ✓ Do not lift the module by grasping module's junction box or electrical leads.

- ✓ Do not stand or step on the module.
- ✓ Do not drop the module or allow objects to fall on the module.
- ✓ Do not place any heavy objects on the module.
- ✓ Do not scratch the glass surface.
- ✓ Prior to installation, do not store modules outdoors or in a damp environment.
- ✓ Inappropriate transport and installation may damage the module glass.
- ✓ Connect the male and female connectors correctly, check the wiring condition, all wires shall not be detached from the modules, and secure the wires with cable ties so that the wires do not scratch or squeeze the backsheet of the modules.
- ✓ Do not pull, scratch or bend the output cables with force. Otherwise, the insulation part of the output cables will be damaged, leading to current leakage or electric shock.
- ✓ During the installation, as for module removal, maintenance and any other related processes, it is recommended that the force applied between the cable and the connector, and the cable and the junction box to be no more than 60N
- ✓ Do not scratch the anodized coating of the frame (except for grounding connection). This may cause corrosion of the frame or compromise the frame strength.
- ✓ Do not drill holes in the frame. This may compromise the frame strength and cause corrosion of the frame.
- ✓ Do not remove the corner guard from the modules before installation;
- ✓ Before connecters connection, please use scissors to cut the binding band of the fixed wire to avoid the connector hitting the back and damaging the modules; Do not pull the nylon ties directly when disassembling the cables.

3.3 Fire rating

- ✓ The fire rating for this module is only valid when the product is installed as specified in the mechanical mounting instructions in this document.
- ✓ For system fire rating, it should be evaluated among with the roof cover and mounting. Consult your local authority for guidelines and requirements for building or structural fire safety. Roof constructions and installations may affect the fire safety of a building; improper installation may create hazards in the event of a fire.
- ✓ Use components or accessories required by local authority. Do not use panels near equipment or in places where flammable gases may be generated.
- ✓ EliTe Solar double modules have been rated type 29/Class C(type 1/Class C for backsheet module) for fire performance according IEC61730/UL61730.

- ✓ Confirm mounting slope less than 5 in/ft (127mm/305mm) to maintain a fire class rating.

3.4 Safe transportation and storage

- ✓ Open modules outer Package when installation.
- ✓ EliTe solar does not recommend transshipment, please contact EliTe solar if it is required;
- ✓ During the transportation at the project site, the Modules shall not be stacked, but only allowing for one layer in transportation.
- ✓ Storage environment requirements in the project site warehouse: humidity < 70%, temperature -10°C~+40°C, statically stacked for ≤ 2 trays;
- ✓ When temporarily storing pallets and boxes at the project site, please keep the outer packing intact. The storage area should be protected pallets and boxes from moisture and direct sunlight, waterproof(rain) measures should also be taken.
- ✓ The storage area of modules should be kept dry and flat, with the floor and horizontal Angle less than 10°;
- ✓ The modules should be placed neatly and kept at a safe distance of more than 30cm between the boxes;
- ✓ Please do not stack other items on the modules or boxes;

4 Mechanical Installation

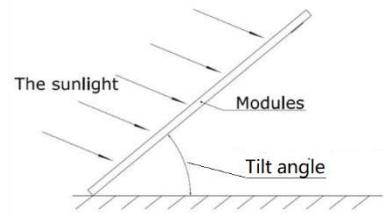
4.1 Installation requirement

EliTe Solar bears NO responsibility for any damage caused by the use of unsuitable or inappropriate mounting / fixing systems. Before starting with the mounting process, the strength of mounting / fixing structure on the panel field must meet the local loading condition, e.g. wind, snow, earthquake, and so on.

4.1.1 Selecting the location& Tilt Angle

- ✓ Select a suitable location for installation of the module.
- ✓ For optimum performance, the module must be facing true south in northern latitudes and true north in southern latitudes.
- ✓ For detailed information on optimal module orientation, refer to standard solar photovoltaic installation guides or a reputable solar installer or systems integrator.

- ✓ Shading on the module will reduce electricity production.
- ✓ Do not install the module near equipment or in locations where flammable gases can be generated or collected.
- ✓ A minimum angle of 10° is recommended in order to make it easier for dust to be washed off by rain.



4.1.2 Selecting the proper mounting structure and hardware

- ✓ Observe all instructions and safety precautions applicable to the mounting system to be used with the module.
- ✓ Do not drill holes in the glass surface of the module. Doing so will void the warranty.
- ✓ Modules must be securely attached to the mounting structure. If heavy wind or snow loads are anticipated, additional mounting measures should also be used.
- ✓ Load calculations are the responsibility of the system designer or installer.
- ✓ The mounting structure and hardware must be made of durable, anti-corrosion and UV-resistant material.

4.2 Mounting methods

4.2.1 Mounting with bolts

- ✓ 4 or 8 pre-drilled mounting holes, located on the aluminum alloy frame, are provided for ease of installation. They are designed to be used with metric M8 stainless steel screws. We recommend to use a tighten torque of 16~20N.m
- ✓ The module must be attached and supported by at least four bolts through the indicated mounting holes.
- ✓ Most installations will use the four inner mounting holes on the module frame.
- ✓ Depending on the local wind and snow loads, additional mounting points may be required.
- ✓ The frame of each module has 8 mounting holes used to secure the modules to support structure, the module frame must be attached to a mounting rail using M8 corrosion-proof bolts together with spring washers and flat washers in eight symmetrical locations on the pv module. The applied torque value should be big enough to fix the modules steadily. Please find detailed mounting information in the below, figure A,1,2.

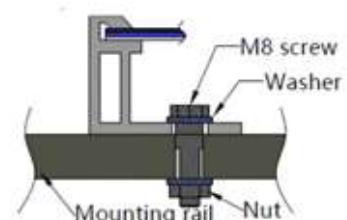


Figure A

4.2.2 Mounting with clamping hardware

- ✓ When choosing clamp mounting method, please be sure to use at least four clamps on each module, two clamps should be attached on each long sides of the module. Depending on the local wind and snow loads, if excessive pressure load is expected, additional clamps or support would be required to ensure the module can bear the load. The applied torque value should be big enough to fix the modules steadily (we recommend the torque range of screw tightening is between 16 to 18N.m for M8 bolt, 9N.m for M6 bolt. please consult with the clamp or support' s supplier for the specific torque value). Please find details mounting information in the below, figure B,3.

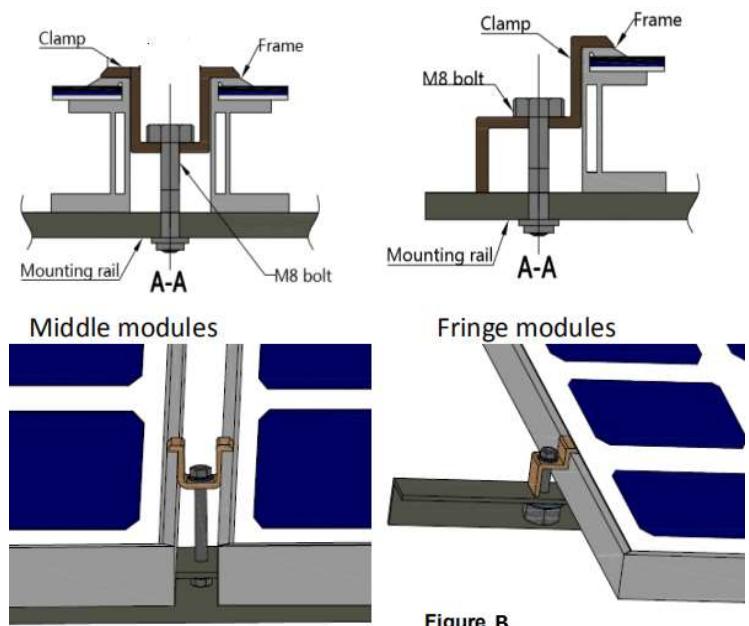
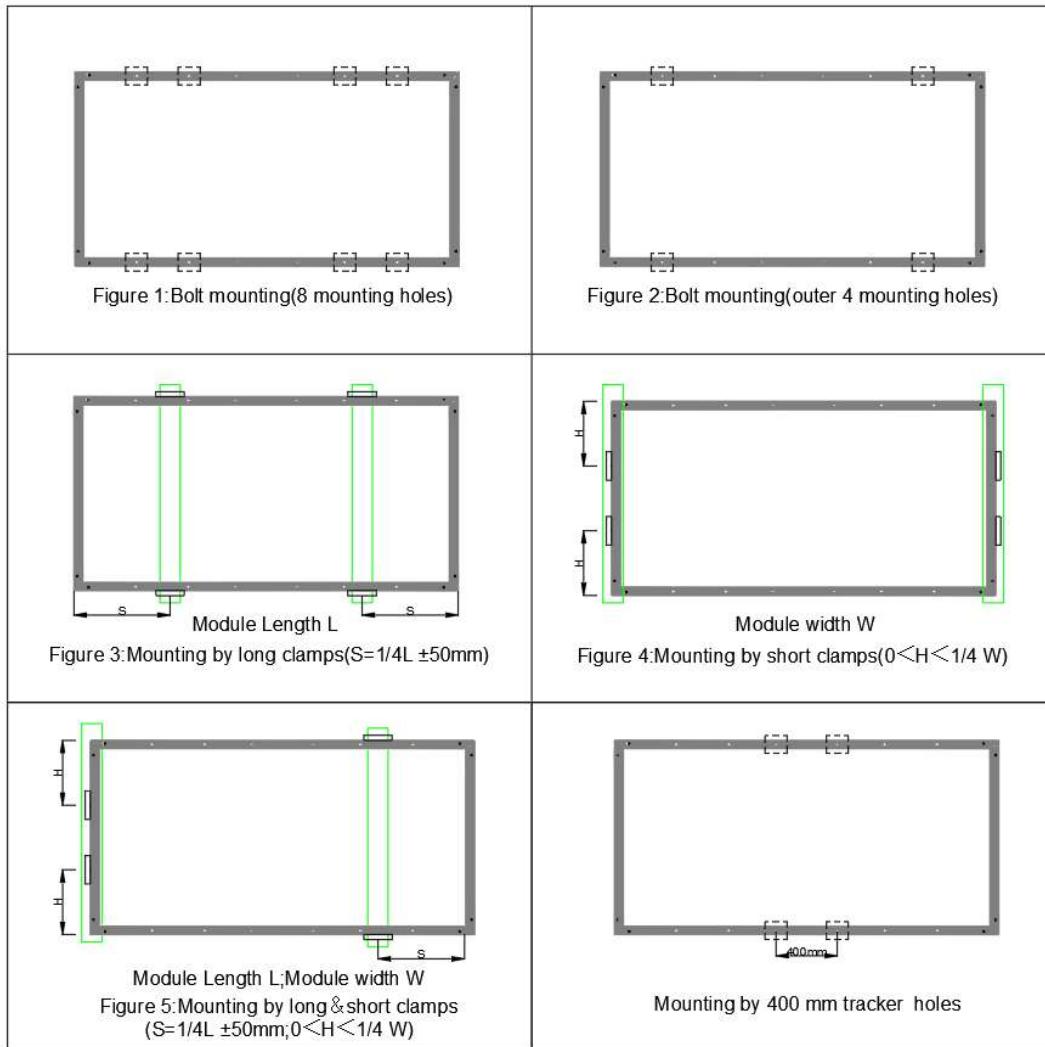


Figure B

4.2.3 Installation position and static loads

Maximum Static load(test load) of the PV module by: front 5400pa and back 2400pa, these values can vary depending on installation method of the modules (please refer to the following installation methods)

Installation Methods and corresponding max pressure relation									
Module Type	Installation methods	Mounting with bolts(8 mounting holes) Figure 1	Mounting with bolts(4 mounting holes) Figure 2	Clamp mounting on long side of the frame Figure 3	Clamp mounting on short side of the frame Figure 4	Clamp mounting on long&short sides Figure 5	Mounting with bolts(tracker 4 mounting holes) Figure 6	Clamp length	Bolt/nut/washer type
ET-M672BHxxxGL 2045*1008*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M660BHxxxGL 1704*1008*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M672BHxxxWW/WB/BB 2008*1002*40;2008*1002*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M660BHxxxWW/WB/BB 1684*1002*40;1684*1002*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M672BHxxxTW/TB 2008*1002*40;2008*1002*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M660BHxxxTW/TB 1684*1002*40;1684*1002*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M672BHxxxWW/WB/BB 2115*1052*35;2094*1038*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M660BHxxxWW/WB/BB 1776*1052*35;1755*1038*35 1776*1052*30;1755*1038*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M672BHxxxTW/TB 2115*1052*35;2094*1038*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M660BHxxxTW/TB 1776*1052*35;1755*1038*35 1776*1052*30;1755*1038*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M778BHxxxWW/B/TW/TB 2465x1134x35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	/	/	+ 1400/-1400	+ 1400/-1400	≥50mm	M8,Stainless steel
ET-M772BHxxxWW/B/B/TW/TB 2279*1134*33	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1400/-1400	+ 1400/-1400	≥50mm	M8,Stainless steel
ET-M766BHxxxWW/B/B/TW/TB 2094*1134*33	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M760BHxxxWW/B/B/TW/TB 1908*1134*33	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M754BHxxxWW/B/B/TW/TB 1722*1134*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-M778BHxxxGL 2465x1134x35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	/	/	+ 1400/-1400	+ 1400/-1400	≥50mm	M8,Stainless steel
ET-M772BHxxxGL 2278x1134x35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M766BHxxxGL 2094X1134X35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M760BHxxxGL 1908*1134*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-M754BHxxxGL 1722*1134*35	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel
ET-N778TBHxxxGL/GB 2465x1134x30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	/	/	+ 1400/-1400	+ 1400/-1400	≥50mm	M8,Stainless steel
ET-N772TBHxxxGL/GB 2278x1134x30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-N766TBHxxxGL/GB 2094X1134X30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-N760TBHxxxGL/GB 1908*1134*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	≥50mm	M8,Stainless steel
ET-N754TBHxxxGL/GB 1722*1134*30	+ 5400/-2400	+ 5400/-2400	+ 5400/-2400	+ 1600/-1600	+ 1600/-1600	+ 1600/-1600	/	≥50mm	M8,Stainless steel

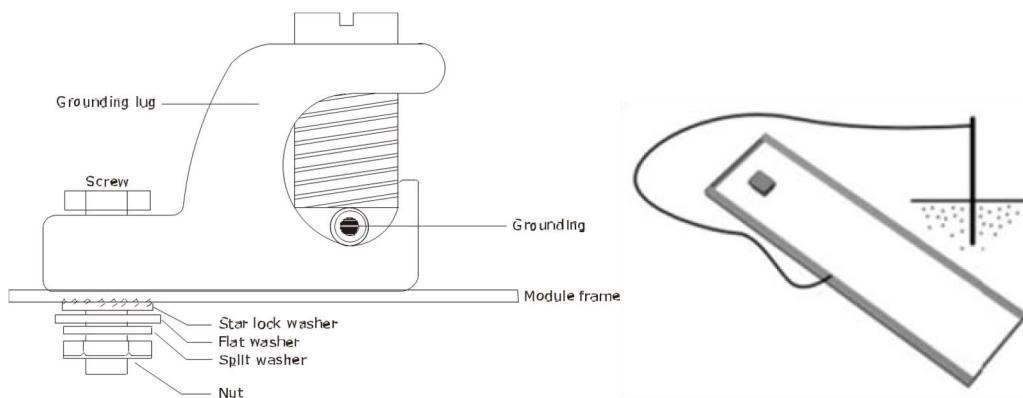


5.Electrical Installation

5.1 Grounding

- ✓ All module frames must be properly grounded.
- ✓ Observe all local electric codes and regulations.
- ✓ A bonding or toothed washer is required to make proper and reliable electrical grounding connection with the anodized aluminum frame.
- ✓ Devices listed and identified for grounding metallic frames of PV modules are permitted to ground the exposed metallic frames of the module to grounded mounting structures.
- ✓ Consider using a lay-in lug, rated for outdoor use, if the module grounding conductor is to be larger than #10 AWG.
- ✓ When using lay-in lugs, the grounding conductor should be inserted into the opening indicated in the figure, and secured using the set screw.

- ✓ Expect for equipment grounding, EliTe Solar recommends the negative pole of PV module array is connected to earth during all PV system installations. That will keep optimal performance of PV Power Plants, which are located in a hot, high humidity climate and high Maximum System Voltage.
- ✓ The grounding method should not result in the direct contact of dissimilar metals with the aluminum frame of the Modules that will result in galvanic corrosion, IEC 60950-1 standard recommends metal combinations not exceed an electrochemical potential difference of 0.6 Volts.
- ✓ The frame rails have pre-drilled holes marked with a grounding sign. These holes should be used for grounding purposes and should not be used for mounting the Modules.



Grounding installation of PV module

5.2 Wire

- ✓ The junction boxes on each PV module has two wires that terminate in a male and a female connector. When the modules are to be connected in series, the male connector should be plugged into the female connector of the neighboring module while the female connector should be plugged into the male connector of the other neighboring module.
- ✓ When connecting parallel modules strings to the distribution box, use proper third-party PV system connectors with suitable cable which are qualified for EN50618(or IEC62852) All field wiring cables must have large enough cross-sectional areas approved for use at the maximum short-circuit current of the PV module. EliTe Solar recommends that installers use only sunlight resistant cables for direct current (DC) wiring in PV systems. The recommended minimum wire size should be 4 mm²(12AWG) and must be subject to the local national codes and regulations.

- ✓ The connecting cables must not cross each other and must be kept away from direct sunlight, heat source and water immersion of the cables. The cables should be secured by the modules mounting structure and should maintain a distance of at least 25 mm from one another with no possibility of coming into contact.
- ✓ Cables should be fixed to the mounting structure in such a way that mechanical damage of the cable and/or the Modules is avoided. Do not apply stress to the cables. The minimum cables bending radius should be 38.4mm(4mm²). Any cable damage caused by bending too much or cable management system is not covered under EliTe Solar's warranty. For fixing, use appropriate means, such as sunlight resistant cable ties and/or wire management clips specifically designed to attach to the Module frame.
- ✓ Cable arrangement must comply with local laws and regulations

5.3 Connectors

- ✓ The connectors should be kept dry and clean. Do not attempt to make electrical connections between wet, soiled, or otherwise faulty connectors. Faulty connections can result in electrical shocks and arcs.
- ✓ Only compatible connectors can be mated. from the same vendor and model, shall be used;(if you need to use different types of connectors, please consult customer service of EliTe Solar);
- ✓ It is recommended to check the connectors, torque of bolts, and the general condition of wiring at least once a year. Also, check that mounting hardware is fastened in place. Loose connections will result in damage to the array.
- ✓ 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. Connector interconnect must reach the corresponding IP protection level, so as to achieve the electrical security.

5.4 Bypass Diodes

EliTe Solar module junction boxes contain bypass diode which is parallel connection with the PV cell strings. if hot spot occurred, the diode will come into operation to stop the main current from flowing through the hot spot cells in order to prevent module over-heated and performance loss. Notice, bypass diode is not the

overcurrent protection device. If the diode is suspected to be defective, the installer or system providers shall contact EliTe Solar. Please do not try to open the junction box by yourself.

5.5 General electrical installation

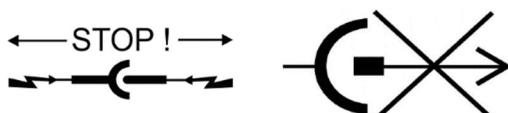
- ✓ Do not use modules of different configurations in the same system.
- ✓ This module is supplied with connectors for electrical connections.
- ✓ Refer to local code to determine appropriate types and temperature ratings of conductors. Wiring should be 4 mm²(minimum), and must be temperature rated at 90 °C (minimum).
- ✓ Completely cover system modules with an opaque material to prevent electricity from being generated while disconnecting conductors.
- ✓ Refer to local code to determine over current, conductor ampacity and size requirements.
- ✓ Installation shall be in accordance with local code.
- ✓ For best performance, ensure that positive and negative DC wires run closely together to avoid loops.



WARNING!

Electrical shock hazard!

Do not touch bare conductors or other potentially energized parts.



Do not disconnect under load!

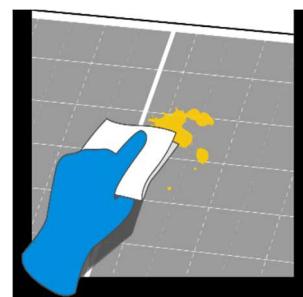
6 Operation and Maintenance

It is required to perform regular inspection and maintenance of the modules, especially during the period of warranty. inform the supplier within 2 weeks when modules are found to be defective.

EliTe Solar recommends the following maintenance items to ensure optimal performance of the module.

6.1 Cleaning

- ✓ This manual covers the requirements for the cleaning procedures of EliTe Solar PV modules. Professional installers should read these guidelines carefully and strictly follow these instructions. Failure to follow these instructions may result in death, injury, or property damage. Damages induced by inappropriate cleaning procedures will void EliTe Solar warranty.
- ✓ The amount of electricity generated by a solar module is proportional to the amount of light captured. A module with shaded cells generate less energy, and therefore, it is essential to keep PV modules clean. The dirt such as bird droppings, leaves, dust is usually need to be cleaned.
- ✓ When cleaning the modules, make sure that the temperature difference between the water and the module is in the range of -5°C-10°C.
- ✓ Use a dry or wet, soft and clean cloth, sponge, or soft bristled brush to wipe the photovoltaic module. Please make sure that the cleaning tools do not wear out glass, EPDM, silicon, aluminum alloys or steel.
- ✓ If there is greasy dirt or other substances which are difficult to clean, conventional household glass cleaning agents can be used. Pay attention not to use alkaline and strong acidic solvents, including hydrofluoric acid, alkali, acetone.
- ✓ For modules that are installed horizontally (0° tilt angle), they should be cleaned more frequently, as they do not have "self-cleaning" function as those installed at 10° or larger tilt angles.
- ✓ The back surface of the monofacial module usually does not need to be cleaned. When cleaning the back of the bifacial module, avoid any sharp objects that may cause damage or penetrate the base material.



The other cleaning requirements are the same as the front-side.

- ✓ 
- ✓ Cleaning activities create risk of damaging the modules and array components, as well as increasing the potential electric shock hazard.
- ✓ Do not clean the modules during the hottest time of the day to avoid thermal stress

on the modules.

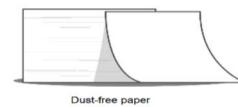
- ✓ Cracked or broken modules represent an electric shock hazard due to leakage currents, and the risk of shock is increased when modules are wet. Before cleaning, thoroughly inspect modules for cracks, damage, and loose connections.
- ✓ During the daylight, the voltage and current present in the array are sufficient to cause a fatal electric shock.
- ✓ Please make sure that the array has been disconnected from other active components before starting the cleaning.
- ✓ Wear suitable protective clothing (clothes, insulating gloves, etc.) when cleaning the modules.
- ✓ Do not immerse the module, partially or totally, in water or any other cleaning solution.
- ✓ Do not use such as lubricants and organic solvents to clean the connectors.
- ✓ Do not clean modules under the weather conditions of wind more than 4 class (in Beaufort scale), heavy rain or heavy snow.
- ✓ When cleaning the modules, it is forbidden to step on the modules, forbidden the injection of water to the backside of the modules or cables. Please ensure that the connectors are clean and dry to prevent electric shock and fire hazards.
- ✓ Do not use steam cleaner.

For detailed requirements regarding cleaning, please refer to Manual for PV Module Operation and Maintenance.

CLEANING METHODS

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 $\mu\text{s}/\text{cm}$
- ✓ Total dissolved solids (TDS): $\leq 1000 \text{ mg/L}$
- ✓ 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)



Method B: Compressed Air

- ✓ EliTe Solar recommends using this method to clean the soft dirt (like dust) on modules. This technique can be applied as long as the method is efficient enough to clean the modules considering the on-site conditions.

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.
- ✓ Please make sure that any brushes or agitating tools are constructed with non-conductive materials to minimize risk of electric shock and that they are not abrasive to the glass or the aluminum frame.
- ✓ If grease is present, an environmentally friendly cleaning agent may be used with caution.

Method D: Cleaning robot

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

TROUBLE SHOOTING

- ✓ If your PV system does not work normally after installation, please inform your installer immediately. It is recommended to perform preventive inspections every six months, and do not change the components of the modules without authorization. If electrical or mechanical performance inspection or maintenance is required, they should be operated by qualified professionals to avoid any electric shock or personal injury.

6.2 The visual inspection of the modules

Inspect the modules visually to find if there are appearance defects, especially:

- ✓ whether the module glass is broken.
- ✓ If there is burning vestige on the backsheet.

- ✓ Corrosion along the cells' bus-bar. The corrosion is caused by the dampness infiltrated into the modules when the surface encapsulation material is damaged during the installation or transportation.
- ✓ Check if any obstacles shading the PV modules

6.3 Inspection of the connector and cable

It is suggested to carry out the following preventive inspection every 6 months.

- ✓ Check the encapsulation of the connector with the cable
- ✓ Check the sealing gel of the junction box to ensure it is not cracked or creviced.

7 Disclaimer of liability

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

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Appendix 1: Electrical ratings of EliTe Solar modules

ET-N778TBH610GL/GB	2465x1134x30	55.69	13.54	47.77	12.77	610	1500	30
ET-N778TBH615GL/GB	2465x1134x30	55.89	13.59	47.94	12.83	615	1500	30
ET-N778TBH620GL/GB	2465x1134x30	56.09	13.64	48.12	12.89	620	1500	30
ET-N778TBH625GL/GB	2465x1134x30	56.29	13.69	48.27	12.95	625	1500	30
ET-N778TBH630GL/GB	2465x1134x30	56.49	13.74	48.43	13.01	630	1500	30
ET-N778TBH635GL/GB	2465x1134x30	56.69	13.79	48.59	13.07	635	1500	30
ET-N778TBH640GL/GB	2465x1134x30	56.89	13.84	48.75	13.13	640	1500	30
ET-N778TBH645GL/GB	2465x1134x30	57.09	13.89	48.91	13.19	645	1500	30
ET-N772TBH560GL/GB	2278x1134x30	51.28	13.52	44.03	12.72	560	1500	30
ET-N772TBH565GL/GB	2278x1134x30	51.48	13.57	44.21	12.78	565	1500	30
ET-N772TBH570GL/GB	2278x1134x30	51.68	13.62	44.38	12.85	570	1500	30
ET-N772TBH575GL/GB	2278x1134x30	51.88	13.67	44.55	12.91	575	1500	30
ET-N772TBH580GL/GB	2278x1134x30	52.08	13.72	44.72	12.97	580	1500	30
ET-N772TBH585GL/GB	2278x1134x30	52.28	13.76	44.9	13.03	585	1500	30
ET-N772TBH590GL/GB	2278x1134x30	52.48	13.81	45.08	13.09	590	1500	30
ET-N772TBH595GL/GB	2278x1134x30	52.68	13.86	45.25	13.15	595	1500	30
ET-N766TBH510GL/GB	2094x1134x30	46.97	13.45	38.79	13.15	510	1500	30
ET-N766TBH515GL/GB	2094x1134x30	47.17	13.51	38.96	13.22	515	1500	30
ET-N766TBH520GL/GB	2094x1134x30	47.37	13.56	39.13	13.29	520	1500	30
ET-N766TBH525GL/GB	2094x1134x30	47.57	13.62	39.3	13.36	525	1500	30
ET-N766TBH530GL/GB	2094x1134x30	47.77	13.67	39.47	13.43	530	1500	30
ET-N766TBH535GL/GB	2094x1134x30	47.97	13.72	39.63	13.5	535	1500	30
ET-N766TBH540GL/GB	2094x1134x30	48.17	13.77	39.8	13.57	540	1500	30
ET-N766TBH545GL/GB	2094x1134x30	48.37	13.83	39.96	13.64	545	1500	30
ET-N760TBH465GL/GB	1908x1134x30	42.67	13.49	36.65	12.69	465	1500	30
ET-N760TBH470GL/GB	1908x1134x30	42.87	13.56	36.81	12.77	470	1500	30
ET-N760TBH475GL/GB	1908x1134x30	43.07	13.62	36.97	12.85	475	1500	30
ET-N760TBH480GL/GB	1908x1134x30	43.27	13.67	37.13	12.93	480	1500	30
ET-N760TBH485GL/GB	1908x1134x30	43.47	13.73	37.28	13.01	485	1500	30
ET-N760TBH490GL/GB	1908x1134x30	43.67	13.79	37.44	13.09	490	1500	30
ET-N760TBH495GL/GB	1908x1134x30	43.87	13.85	37.59	13.17	495	1500	30
ET-N754TBH415GL/GB	1908x1134x30	38.26	13.45	32.83	12.64	415	1500	30
ET-N754TBH420GL/GB	1908x1134x30	38.46	13.52	33.02	12.72	420	1500	30
ET-N754TBH425GL/GB	1908x1134x30	38.66	13.58	33.2	12.8	425	1500	30
ET-N754TBH430GL/GB	1908x1134x30	38.86	13.65	33.39	12.88	430	1500	30
ET-N754TBH435GL/GB	1908x1134x30	39.06	13.72	33.55	12.97	435	1500	30
ET-N754TBH440GL/GB	1908x1134x30	39.26	13.78	33.73	13.05	440	1500	30
ET-N754TBH445GL/GB	1908x1134x30	39.46	13.84	33.9	13.13	445	1500	30



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