
SunSpark

Photovoltaic Module

User Manual



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1. General Information

1.1 Overview

Thanks for choosing SunSpark PV modules. In order to ensure the PV modules to be installed correctly, please read the following operation instructions carefully before modules installed and used.

Please remember that the products would generate electricity and certain safety measures need to be taken to avoid danger.

1.2 Applicable Products

This document is applicable to the series of solar module as listed below:

Make sure the array of modules installed with the Maximum permitted system voltage and the rating current and voltage of the sub-equipment such as regulators and inverters. The maximum permitted system voltage (DC) of the modules (UL 1500V series) sold in America and Canada is 1500 V.

This module has a Class C Fire Rating and with the Module Fire performance type 2 (only in America) and must be installed over a roof which is with appropriate fire resistance. Before mounting the module, please consult your local building department to determine approved roofing materials.

The modules are qualified for application class A, and modules qualified for safety through UL1703 within this application class are considered to meet the requirements of Safety Class II


1.3 Warnings

PV modules generate DC electrical energy when exposed to sunlight or other light sources. Active parts of module such as terminals can result in burns, sparks, and lethal shock

- Artificially concentrated sunlight shall not be directed on the module or panel.



- Front protective glass is utilized on module. Broken solar module glass is an electrical safety hazard (electric shock and fire). These modules cannot be repaired and should be replaced immediately.

 Warning	<ul style="list-style-type: none"> ◆ Electric Shock and Burn Hazard ↵ ◆ This photovoltaic module produces Electricity when exposed to the sun
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- To reduce the risk of electrical shocks or burns, modules may be covered with an opaque material during installation to avoid shocks or burns.
- The fire rating of this module is valid only when mounted in the manner specified in the mechanical mounting instructions.
- The module is considered to be in compliance with UL 1730 only when the module is mounted in the manner specified by the mounting instructions below.
- All installations must be performed in compliance with the National Electrical Code (NEC)
- A module with exposed conductive parts is considered to be in compliance with UL 1703 only when it is electrically grounded in accordance with the instructions presented below and the requirements of the National Electrical Code.
- Any module without a frame (laminated) shall not be considered to comply with the requirements of UL 1730 unless the module is mounted with hardware that has been tested and evaluated with the module under this standard or by a field Inspection certifying that the installed module complies with the requirements of UL 1730.
- 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 manufacture's recommendations if batteries are used with module
- 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 touch live terminals with bare hands. Use insulated tools for electrical connections.



- Do not remove any part installed by SunSpark or disassemble the module.
- All instructions should be read and understood before attempting to install, wire, operate and maintain the module.
- Please don't lift PV modules using the attached cables or the junction box.
- All PV systems must be earthed. If there is no special regulation, please follow the National Electrical Code or other national code.
- Common hardware items such as nuts, bolts, star washers, lock washers and the like have not been evaluated for electrical conductivity or for use as grounding devices and should be used only for maintaining mechanical connections and holding electrical grounding devices in the position for electrical conductivity. Such devices, where supplied with the module and evaluated through the requirements in UL 1730, may be used for grounding connections in accordance with the instructions provided with the module.
- Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. The requirements of the National Electrical Code (NEC) in Article 690 shall be followed to address these increased outputs. In installations not under the requirements of the NEC, the value 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, overcurrent device ratings, and size of controls connected to the PV output.

- Once the PV module has been shipped to the installation site, all of the parts should be unpacked properly with care.
- Do not stand or step on the PV module like below pictures show, this is prohibited and there is a risk of damage the module and cause injury for you.
- The fire rating of this module is valid only when mounted in the manner specified in the mechanical mounting instructions.
- If instructions are provided allowing modules to be installed in parallel electrically the installation instructions shall specify that each module (for series string of modules so connected) shall be provides with the maximum series fuse as specified.
- Only PV modules with the same cell size should be connected in series.
- During all transportation situations, please make sure no huge shock for the vehicle or the modules, as this may damage the module or lead the cell to be crack.
- During all transportation situation, never let the module fall down from the vehicle, house or hands. This will break the cells of the modules.
- Do not clean the glass with chemicals.
- Do not disconnect any of the modules when it is under load.

2 Installation

2.1 Installation safety

- Always wear protective head gear, insulating gloves and safety shoes (with rubber soles).
- Keep the PV module packed in the carton until installation.
- 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 gasses are not generated or present near the installation site.

- Insert interconnect connectors fully and correctly. Check all connections.
- The interconnect cable should be securely fastened to the module frame, Cable support should be done in a way to avoid the connector from scratching or impacting the back sheet of the module.
- Do not touch the terminal 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 disconnect from the system.
- 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 micro crack.
- During the operation, don't use sharp tools to wipe the back sheet and glass, it would leave scratch on the module.
- Do not drill holes on the frame, it may cause corrosion of the frame.
- For roof mounting structure, when install the modules, please try to follow the 'from top to bottom' and/or 'from left to right' principle, and don't step on the module, that will damage the module and would be dangerous for personal safety.
- The recommended standoff height is 115 mm. If other mounting means are employed this may affect the UL Listing.
- The modules when used with a Listed mounting system that has been rated as a Class C System when installed with type 2 modules, is suitable to maintain the System Class C Fire Rating
- The fire rating of the module is valid only when mounted in the manner specified in the mechanical mounting instructions.

2.2 Installation Condition

2.2.1 Climate condition

Please install the modules in the following conditions:

- a) Operating temperature: within -40°C (-4°F) to 85°C (185°F)
- b) Relative humidity: within 10% to 95%.
- c) Do not install modules above 2000m altitude above sea level.

* Note: The mechanical load bearing (include wind and snow loads) of the module is based on the mounting methods. The professional system installer must be responsible for mechanical load calculation according to the system.

2.2.2 Site selection

In most applications, SunSpark PV modules should be installed in a location where they will receive maximum sunlight throughout the year. In the Northern Hemisphere, the module should typically face south, and in the Southern Hemisphere, the 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 of the PV module will minimize any such loss. Do not install the PV module near naked flame or flammable materials.

When solar modules are used to charge batteries, the battery must be installed in a manner, which will protect 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.

2.2.3 Tilt angle selection

The tilt angle of the PV module is measured between the surface of the PV module and a horizontal ground surface (Figure 1). The PV module generates maximum output power when it faces the sun directly.

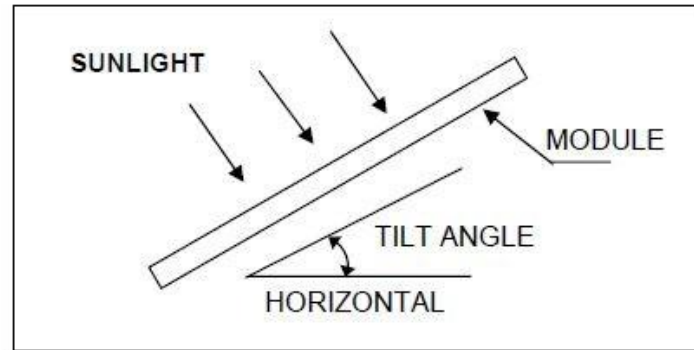


Figure1: PV module title angle

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. Only for UL listed products.

The System Fire Class Rating of the module or panel in a mounting system in combination with a roof covering complete with requirements to achieve the specified System Fire Class Rating for a non-BIPV module or panel.

Any module or panel mounting system limitations on inclination required to maintain a specific System Fire Class Rating.

The recommended standoff height is 115 mm. If other mounting means are employed this may affect the UL Listing.

2.3 Mechanical Installation introduction

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

*** Note:**

- 1) All installation methods herein are only for reference, and SunSpark will 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 security of the system.
- 2) Before installing, you should confirm below important things:
 - a) Visual check before installation, to make sure there is no bug in the packing and junction box as well as the surface of module, if have, remove and clean it.
 - b) Check the series number is right or not.
 - c) Our modules are designed to meet a maximum positive design loading of 3600 Pa and negative design loading of 2400 Pa with frame dimension 1979*996*40mm and 1657*996*40mm.
 - d) Where common grounding hardware (nuts, bolts, star washers, spilt-ring lock washers, flat washers and the like) is used to attach a listed grounding/bonding device, the attachment must be made in conformance with the grounding device manufacturer's instructions. Common hardware items such as nuts, bolts, star washers, lock washers and the like have not been evaluated for electrical conductivity or for use as grounding devices and should be used only for maintaining mechanical connections and holding electrical grounding devices in the proper position for electrical conductivity. Such devices, where supplied with the module and evaluated through the requirements in UL 1703, may be used for grounding connections in accordance with the instructions provided with the module.
 - e) Refer to Section 690-8 of the National Electric Code for an additional multiplying factor of 1.25 which may be applicable.
 - f) Indicating that this module has been evaluated to operate in an ambient air temperature range of -40°C to + 40°C and to a positive design loading of 3600 Pa and negative design loading of 2400 Pa with frame dimension 1979*996*40mm and 1657*996*40mm.

2.3.1 Fixation with clamps

- The applicable products only allow using clamps at long side of frames.
- The module clamps should not come into contact with the front glass and must not deform the frame. Be sure to avoid shadowing effects from the module clamps.
- The module frame is not to be modified under any circumstances. When choosing this type of clamp-mounting method, please be sure to use at least four clamps on each module, two clamps should be attached on each long side of the module.
- The applied torque should be big enough to fix it steadily (18N.m to 24N.m), for safety, you'd better follow the clamps manufacture's recommendation. Please find detailed mounting information in the below illustration, the installation dimensions are recommended as shown below:

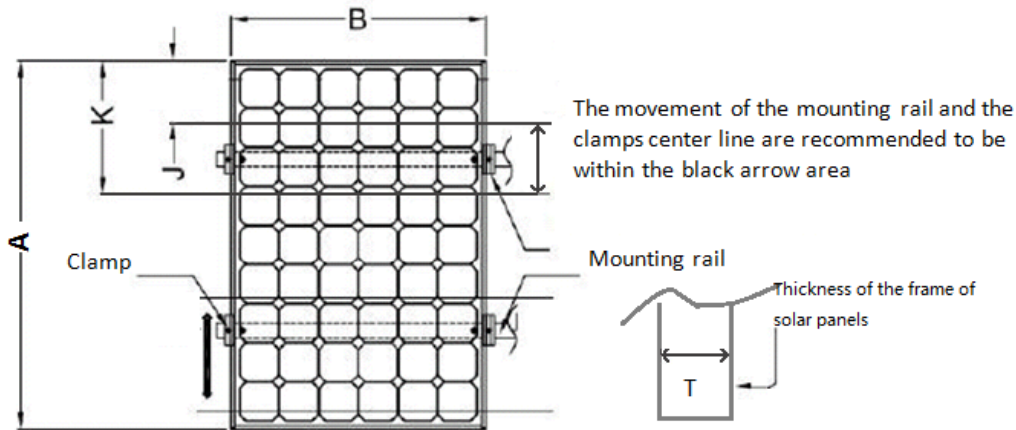
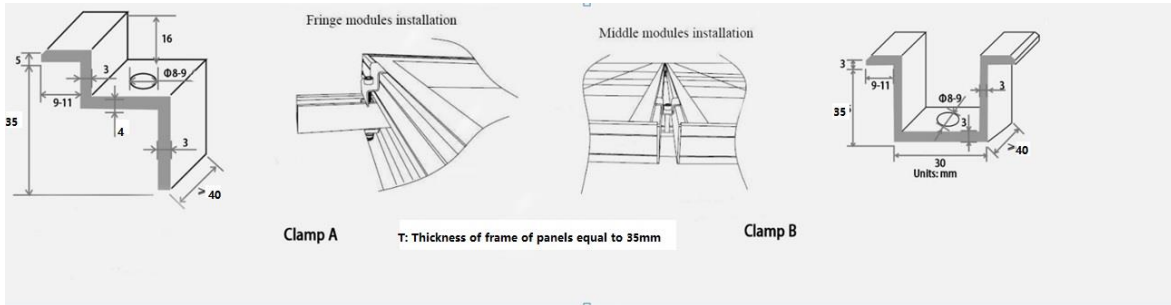
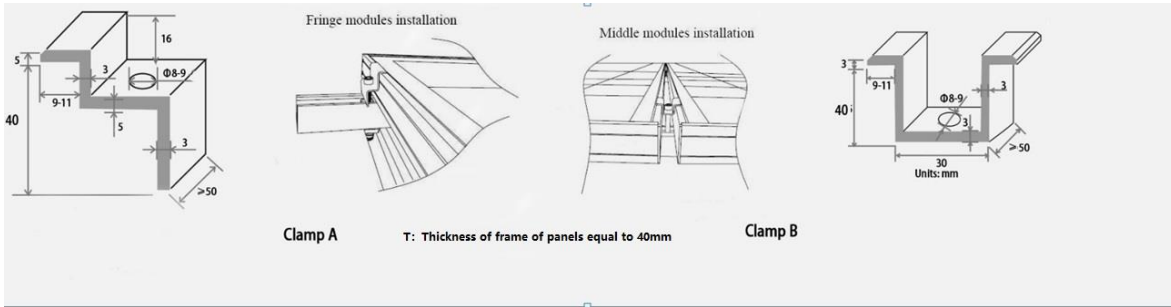


Figure2 above: PV module installed at long side with Clamp fitting method

Module type	Cell type	Cell quantity	Dimension(mm)			
			A*B	T	J	K
SST-XXXM3-60 SST-XXXM3B-60 XXX=310-335	Mono	6*10	1657*997	40	400	420
SST-XXXM3-72 XXX=375-400 And SST-375M3B-72	Mono	6*12	1979*996	40	400	480

Table 1 above: Mechanical dimensions when modules installed at long side with Clamp



● **Fitting dimensions and recommended mounting torque**

Accessories	Material	Type and Manufacturer	Size and Length
Bolt	Stainless Steel 304	type:M8	M8*40mm
Washer	Stainless Steel 304	type: M8	24*2mm
Middle Clamp	Aluminum Alloy 6005-T5	Type: AL40-50-8-M Manufacturer: Suzhou Alston Precision Electronics Co.Ltd	40*50mm
End Clamp	Aluminium alloy 6005-T5	Type: AL40-50-8-S Manufacturer:Suzhou Alston Precision Electronics Co.Ltd	40*50mm
Middle Clamp	Aluminum Alloy 6005-T5	Type: AL35-40-8-M Manufacturer: Suzhou Alston Precision Electronics Co.Ltd	35*40mm
End Clamp	Aluminium alloy 6005-T5	Type: AL35-40-8-S Manufacturer:Suzhou Alston Precision Electronics Co.Ltd	35*40mm

Recommended torque is between 18N.m to 24N.m
Clamp thickness: No less than 3mm;

2.3.2 Grounding

PV modules use an anodic oxidized aluminum frame to resist corrosion. So the frame of Modules should be connected to the equipment grounding conductor to prevent thunder and electrical shock.

The grounding device should fully contact with the inside of the aluminum alloy, and should penetrate the surface of the frame oxidation film.

Please don't drill any additional grounding hole on the frame of the Modules, otherwise SunSpark expressly disclaim liability for in validness of the warranty.

For optimal performance, SunSpark recommend the DC cathode of the Modules array is connected to ground. Failure to comply with this requirement may reduce the performance of the system.

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. An addendum to UL Standard 1703 "Flat Plate Photovoltaic Modules and Panels" 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. The following grounding methods are available.

Use Grounded Clamp

There is a grounding hole with 4.2 mm diameter on the edge side closer to the middle of the back frame of the Modules. The middle line of the grounding mark is overlapped with the grounding hole, and the direction is same as the longer frame. The grounding between Modules must be approved by qualified electrician. And the grounding device should produce by qualified electrical manufacture. The recommended twist torque value is 2.3 N-m. A copper core in size of 12 AWG can be used as grounding clamp. The copper wire should not be compressed during the installation.

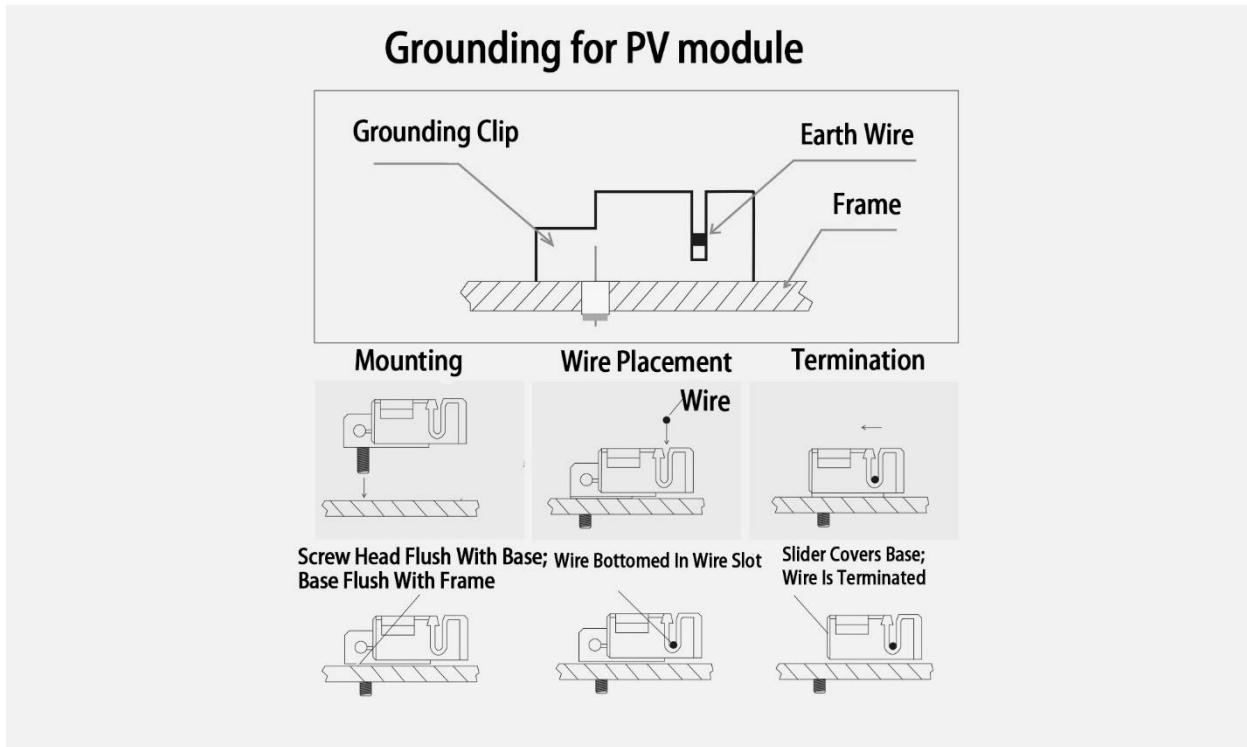


Figure 3: Installation Methods

Note: The figure above is using TYCO. 1954381-2 (recommended)

3 Wiring and connection

- a) Before this procedure, please read the operation instructions of the PV system carefully. Make wiring by Multi-connecting cables between the PV modules in series or parallel connection, which is determined by user's configuration requirement for system power, current and voltage.
- b) PV module connected in series should have similar current. Modules must not be connected together to create a voltage higher than the permitted system voltage (1500 VDC), Recommended maximum series/parallel module configurations: $(\text{Max system voltage} / (1.25 * V_{oc})) / (\text{fuse rating} / I_{sc} + 1)$.Any more please always take into consideration the variation of the voltage under different temperatures, the V_{oc} of the modules will be rise when the temperature drops.
- c) PV module connect in parallel should have similar voltage. As reference the maximum number of modules in parallel (M) can be easily calculated by dividing the maximum rated current (indicated in the electrical specification below) by I_{sc} value of the module, and then plus 1. Any more please always take into consideration the variation of the current under different temperatures, the I_{sc} of the modules will be rise when the temperature goes up.
- d) Open the connection box of the control system and connect the cabled from the PV arrays to the connection box in accordance with the installation indication of the PV control systems. The cross-sectional area and cable connector capacity must satisfy the maximum short-circuit of PV system (For a single component, we recommended the cross-sectional area of cables is 4mm² and the rated current of connectors is more than 10A), otherwise cables and connectors will become overheating for large current. Please pay attention: the temperature limit of cables is 85°C and the temperature limit of connector 105°C.
- e) All module frames and mounting racks must be properly grounded in accordance with local and national electrical codes. SunSpark modules can be grounded using third party ground washers or clip devices as long as the products are approved for grounding metallic frames of PV modules. Alternate grounding options built into the racking system are acceptable so long as they have been UL approved.
- f) Follow the requirements of applicable local and national electrical codes.
- g) These modules contain factory installed bypass diode. if these modules are incorrectly connected to each other, the bypass diodes, cable or junction box may be damaged.
- h) The module shall wire in accordance with the NEC, the grounding method of the frame of

arrays shall comply with the NEC, article 250.

- i) It is recommended that the screw be tightened to a torque between 18N.m to 24N.m
- j) For SunSpark standard module, the length of cable is 1000mm; and for customized module, the cable length can be based on your condition, take the cable length into consideration before designing the wiring layout.
- k) Connector matching requirements

Manufactured by	Male	Female	Mating
QC SOLAR (SUZHOU) CORP	PV- QC4.10-a5c13d3e2	PV- QC4.10-a5c13d3e2	only the same manufacturer and model of connectors. See table below
STAUBLI ELECTRICAL CONNECTORS ESSEN GMBH	PV-KST4/6II-UR	PV-KBT4/6II-UR	
STAUBLI ELECTRICAL CONNECTORS ESSEN GMBH	PV-KST4-EVO2/6I-UR	PV-KBT4-EVO2/6I-UR	
STAUBLI ELECTRICAL CONNECTORS ESSEN GMBH (E343181)	PV-KST4-EVO2/6II-UR	PV-KBT4-EVO2/6II-UR	

- l) Contact information of connector manufacturer.:

Manufactured by	Contact Web
QC SOLAR (SUZHOU) CORP	www.quick-contact.com ,
STAUBLI ELECTRICAL CONNECTORS ESSEN GMBH	https://www.staubli.com/zh-cn/profile/company/

- m) Terminal box information

Type	Manufacturers	Model
Junction Box	QC SOLAR (SUZHOU) CORP	0816431-11z
diode	QC Solar	SB3050DY
cable	QC SOLAR (SUZHOU) CORP	UL PV-12AWG
connector	QC SOLAR (SUZHOU) CORP	PV- QC4.10-a5c13d3e2
	STAUBLI ELECTRICAL CONNECTORS ESSEN GMBH	PV-KST4/6II-UR/ PV-KBT4/6II-UR
		PV-KST4-EVO2/6I-UR/ PV-KBT4-EVO2/6I-UR
		PV-KST4-EVO2/6II-UR/ PV-KBT4-EVO2/6II-UR

4 Maintenance and care

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

- a) Check the electrical and mechanical connections every six months to verify that they are clean, secure and undamaged;
- b) Check that mounting hardware, terminal screws and grounding components are tightly secured with no corrosion;
- c) Check that modules are not shaded by vegetation or any unwanted obstacles;
- d) Do not touch live parts of cables and connectors;
- e) Use appropriate safety equipment (insulated tools, insulating gloves, etc.) when handling modules;
- f) If any problem with the system or individual module arises, have them investigated by a competent specialist;
- g) Replacement modules must be the same type of those to be replaced;
- h) Modules generate high voltage when exposed to sunlight. Please cover the front surface of modules with an opaque non- scratch material when repairing. Repairing works must be performed by specialized and properly trained personnel only;

NOTICE: Follow the maintenance instructions for all components used in the system, such as support frames, charge regulators, inverters, batteries etc.

4.1 Cleaning

Dirt and dust can accumulate on the glass surface of the PV module over time, particularly in low inclination installations. This can cause a general decrease of power output and also sedimentation on the lower edge of the modules due to dirt accumulation. SunSpark Technology recommends periodic cleaning of PV modules to ensure maximum power output, especially in regions with high quantity of dust in the air or low precipitations, as follows:

- a) Under most weather conditions, normal rainfall is enough to keep the PV module glass surface clean. Clean the glass surface of the module as necessary and consider that lower inclination requires more cleaning frequency;
- b) Always use water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent can be used to remove stubborn dirt. High mineral content water is not recommended, as it may leave

residual deposits on the module;

- c) SunSpark modules may be equipped with anti-reflective coated glass. This technology provides SunSpark modules with high transmittance and low reflectivity features, which improves the module power output, reduces the dust and dirt deposition and produces very low glare. To avoid any damage to this layer do not clean the modules with high pressure washers, steam or corrosive chemicals. Do not use abrasive sponges or aggressive tools that could scratch the module surface.
- d) To avoid a possible thermal shock, clean the modules during early morning, when the module is still cold. This is specially recommended in regions with hotter temperatures;
- e) In cold environments with snow do not try to remove the frozen snow or ice from the module scratching on the front glass. Only soft snow can be removed gently with a soft brush in order to improve the production;
- f) Do not clean modules having broken glass or exposed wiring. This could cause a general electrical failure of the module and/or electrical shock hazard.

5 Electrical specification

The module electrical rating are measured under Standard Test Conditions, which are 1000W/m², irradiance with AM 1.5 spectrum and 25 deg (77°F) ambient temperature. The module might produce more or less voltage or current than rating value in uncertainty condition. Accordingly, the values of I_{sc} and V_{oc} marked on the module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output. Tables below are electrical characteristics of PV products at STC and the tolerance of I_{sc}, V_{oc}, V_{mp} and I_{mp} is ±3%. STC condition "All electrical data shall be shown as relative to standard test conditions (1 000 W/m², (25 ± 2) °C, AM 1,5 according to IEC 60904-3).

Electrical specifications of 60 Cells SST-XXM3-60 and SST-XXM3B-60

Module Type	SST-310M3-60	SST-315M3-60	SST-320M3-60	SST-325M3-60	SST-330M3-60	SST-335M3-60
Maximum Power at STC(Pmax)	310W	315W	320W	325W	330W	335W
Maximum Power at Voltage (Vmp))	32.61	32.90	33.18	33.45	33.76	34.07
Maximum Power at Current (Imp)	9.52	9.58	9.65	9.72	9.78	9.85
Open-circuit Voltage (Voc) ±3%	40.30	40.53	40.78	41.04	41.30	41.59
Short-circuit Current (Isc) ±3%	10.04	10.11	10.18	10.25	10.32	10.39
Maximum system Voltage	1500V					
Temperature coefficients of Pmax	-0.37%/°C					
Temperature coefficients of Voc	-0.28%/°C					
Temperature coefficients of Isc	0.04%/°C					
Bypass Diodes	Manufacturer: QC solar Type: SB3050DY					
Dimensions	1657mm*996mm*40mm					
Maximum series overcurrent protective device rating(A)	20A					

Module Type	SST-310M3B-60	SST-315M3B-60	SST-320M3B-60	SST-325M3B-60	SST-330M3B-60	SST-335M3B-60
Maximum Power at STC(Pmax)	310W	315W	320W	325W	330W	335W
Maximum Power at Voltage (Vmp))	32.61	32.90	33.18	33.45	33.76	34.07
Maximum Power at Current (Imp)	9.52	9.58	9.65	9.72	9.78	9.85
Open-circuit Voltage (Voc) ±3%	40.30	40.53	40.78	41.04	41.30	41.59
Short-circuit Current (Isc) ±3%	10.04	10.11	10.18	10.25	10.32	10.39
Maximum system Voltage	1500V					
Temperature coefficients of Pmax	-0.37%/°C					
Temperature coefficients of Voc	-0.28%/°C					
Temperature coefficients of Isc	0.04%/°C					
Bypass Diodes	Manufacturer: QC solar Type: SB3050DY					
Dimensions	1657mm*996mm*40mm					
Maximum series overcurrent protective device rating(A)	20A					

Electrical specifications of 72 Cells SST-XXXM3-72/ SST-375M3B-72

Module Type	SST-375M3-72 SST-375M3B-72	SST-380M3-72	SST-385M3-72	SST-390M3-72	SST-395M3-72	SST-400M3-72
Maximum Power at STC(Pmax)	375W	380W	385W	390W	395W	400W
Maximum Power at Voltage (Vmp))	39.74V	40.02V	40.28V	40.60V	40.89V	41.18V
Maximum Power at Current (Imp)	9.45A	9.51A	9.57A	9.62A	9.67A	9.73A
Open-circuit Voltage (Voc) ±3%	48.44V	48.70V	48.97V	49.27V	49.56V	49.86V
Short-circuit Current (Isc) ±3%	9.99A	10.06A	10.12A	10.17A	10.23A	10.29A
Maximum system Voltage	1500V					
Temperature coefficients of Pmax	-0.37%/°C					
Temperature coefficients of Voc	-0.28%/°C					
Temperature coefficients of Isc	0.048%/°C					
Bypass Diodes	Manufacturer: QC solar Type: SB3050DY					
Dimensions	1979mm*996mm*40mm					
Maximum series overcurrent protective device rating(A)	20A					

6 Disclaimer of Liability

Because the use of the manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic (pv) product are beyond our control, SunSpark 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 us 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.

The information in this manual is based on our knowledge and experience and is believed to be reliable, but such information including product specification(without limitations)and suggestions do not constitute a warranty, expresses or implied .SunSpark reserve the right to change the manual, the PV produce, the specifications, or product information sheets without prior notice.

7 Contact us

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