eArc™ PV System

Installation Manual

Contents

Purpose of this guide

- This guide contains information regarding the installation and safe handling of Sunman (Zhenjiang) Company Limited eArc PV system. Sunman (Zhenjiang) Company Limited referred to as “SUNMAN”.
- Installers must read and understand this guide prior to installation. For any questions, please contact SUNMAN’s Customer Service Department “or our local representatives” for more detailed information. Installers should follow all safety precautions described in this guide as well as local codes when installing eArc.
- 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 eArc.
- SUNMAN’s eArc are tested and certified for installations worldwide. Different regions may have different regulations for solar PV installations.

Features & Benefits

• Flexible layouts

• eArc™ PV system can be installed at any shape roofs, which has integrated appearance with buildings.

• Maximization installation quantity of eArc at any kinds of roof.

• Quick installation

• Ultra-thin and light-weight to save installation labor by a large margin.

Notices

This manual contains important installation instructions for the core hardware components required for eArc™ PV System PV arrays.

Copyright and Trademark Information

Warranty Warnings

"WARRANTY VOID IF NON-SUNMAN-CERTIFIED HARDWARE IS ATTACHED TO eArc™ PV System."

For Further Information

For additional technical support documentation, please visit the Support page of the SUNMAN website at www.sunman-energy.com

General safety

- eArc that fall under this application class may be used in system operation at more than 50V DC or 240W, where general contact access is anticipated. eArc are qualified for safety under IEC 61730-2 and within this application class are considered to meet the requirements for Safety Class II.
- eArc are qualified for Application Class A(IEC 61730-1).
- Installing solar photovoltaic systems requires specialized skills and knowledge. Installation should only be performed by qualified personnel.
- Installers should assume all risks of injury that might occur during installation, including, but not limited to, the risk of electric shock.
- One single eArc may generate more than 30V DC when exposed to direct sunlight. Contact with a DC voltage of 30V or more is potentially hazardous.
- Do not disconnect during load connection.
- Photovoltaic solar eArc convert light energy to direct current electrical energy. They are designed for outdoor use. eArc can be ground mounted, mounted on rooftops, vehicles or boats. The proper design of support structures lies within the responsibility of the system designers and installers.
- Do not use mirrors or other magnifiers to concentrate sunlight onto eArc.
- When installing the system, abide to all local, regional and national statutory regulations. Obtain a building permit if necessary.
- eArc electrical characteristics are within ±5% of the indicated values of Isc, Voc and Pmax under standard test conditions (Irradiance of 1000W/m^2, AM 1.5 spectrum, a cell temperature of 25℃（77°F）).
- Only use equipment, connectors, wiring and support frames suitable for solar electrical systems.
- “Always use fall protection equipment when working from heights of 6 feet （183cm）or above”. Follow Occupational Safety and Health Act (OSHA) or local governing safety regulations regarding fall protection. (UL only)

Handling safety

- Do not lift eArc by grasping eArc’ junction box or electrical leads.
- Do not stand, step or walk on any side of eArc.
- Do not drop eArc or allow objects to fall on eArc.
- Do not place any heavy objects on eArc.
- Be cautious when placing eArc down onto a surface, particularly when placing it in a corner.
- Inappropriate transport and installation may break eArc and void the warranty.
- Do not attempt to disassemble eArc, and do not remove any attached nameplates or components from

eArc.

- Do not apply paint or adhesive to eArc' top surface.
- To avoid damage to the front cover and backsheet, do not scratch, "dent" or hit the front cover and backsheet.
- A panel with broken front plate or torn back sheet cannot be repaired and must not be used since contact with any panel surface or the ribs can cause an electric shock.
- Work only under dry conditions, and use only dry tools. Do not handle panels under wet conditions unless wearing appropriate protective equipment.
- When storing uninstalled panels outdoors for any period of time, always cover the panels and ensure that the front cover faces down "on a soft flat surface" to prevent water from collecting inside the panel and causing damage to exposed connectors.

Installation safety

- Never open electrical connections or unplug connectors while the circuit is under load.
- Contact with electrically charged parts of the panels, such as terminals, can result in burns, sparks and lethal shock whether or not the panel is connected.
- Do not touch eArc unnecessarily during installation. The front surface and the ribs may be hot; there is a risk of burns and electric shock.
- Do not work in the rain, snow or in windy conditions.
- Avoid exposing cables to direct sunlight in order to prevent insulation degradation.
- Keep children well away from the system while transporting and installing mechanical and electrical components.
- Completely cover eArc with an opaque material during installation to prevent electricity from being generated.
- Do not wear metallic rings, watchbands, earrings, nose rings, lip rings or other metallic objects while installing or troubleshooting photovoltaic systems.
- Use only insulated tools that are approved for working on electrical installation.
- Follow the safety regulations for all other system components, including wires and cables, connectors, charging regulators, inverters, storage batteries, rechargeable batteries, etc.
- Under normal conditions, a photovoltaic eArc 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 eArc 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.
- Only use same or connectable connectors to connect eArc to form a string, or connect to another device. Removing the connectors will void the warranty.

Fire safety

- 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 such as ground fault circuit breakers and fuses as required by local authority.
- Do not use panels near equipment or in places where flammable gases may be generated.
- eArc have been rated Fire Class C, and are suitable for mounting on to a Class A roof.

Production Identification

Each eArc has two labels providing the following information:

- Nameplate: describes the product type; rated power, rated current, rated voltage, open circuit voltage, short circuit current, all as measured under standard test conditions; weight, dimensions etc.; the maximum system voltage is 1500 volts.
- Barcode: each individual eArc has a unique serial number. The serial number has 21 digits. The 1th to 4th digits are the module type for internal use, and 5th to 8th digits are the year code, and the 9th and 10th digits are the month code, and the 11th and the 12th digits are the week code, and the 13th and 14th digits are the month code, and the 15th to 17th digits are order number, and the 18th to 21th digits are the sequence codes. For example, xxxx20210415xxxxxxxxx means the module was made in the 15th week of 2021. Each module has only one bar code. It is permanently attached to the interior of eArc and is visible from the top front of eArc. This bar code is inserted prior to lamination.

Installation

Selecting the location

- Select a suitable location for installing eArc.
- The altitude of the installation location shall be less than or equal to 2000 meters.
- eArc should face south in northern latitudes and north in southern latitudes.
- For detailed information on the best installation angle, refer to standard solar photovoltaic installation guides or consult a reputable solar installer or systems integrator.
- eArc should not be shaded at any time. If an eArc is shaded or even partially shaded, it will fail to perform at ideal conditions and result in lower power output.
- Do not use eArc near equipment or in locations where flammable gases may be generated or collected.

General installation

- eArc mounting structure must be made of durable, corrosion-resistant and UV-resistant material.
- Always observe the instructions and safety precautions included with eArc support frames.
- Do not drill additional mounting holes in the PV panel's ribs as this will void the warranty.
- Before installing eArc on a roof, always ensure the roof construction is suitable. In addition, any roof penetration required to mount eArc must be properly sealed to prevent leaks.
- Dust building up on the surface of eArc can impair with eArc performance. SUNMAN recommends installing eArc with a tilt angle of at least 10 degrees, making it easier for dust to be washed off by rain.
- Always keep the back sheet of the panel free from foreign objects, "plants and vegetation", or structural elements, which could come into contact with the panel, especially when the panel is under mechanical load.
- Ensure panels are not subject to wind or snow loads exceeding the maximum permissible loads, and are not subject to excessive forces due to the thermal expansion of the support structures: Refer to the following installation methods for more detailed information.
- The module is considered to be in compliance with this standard only when the module is either mounted in the manner specified by the mounting instructions, or when the mounting means has been evaluated with this PV module to UL 2703. A module with exposed conductive parts is considered to be in compliance with this standard only when it is either electrically grounded in accordance with the manufacturer's instructions and the requirements of the National Electrical Code, ANSI/NFPA 70 (2014-2017),or when the bonding means has been evaluated with this PV module to UL 2703.

eArc environmental condition

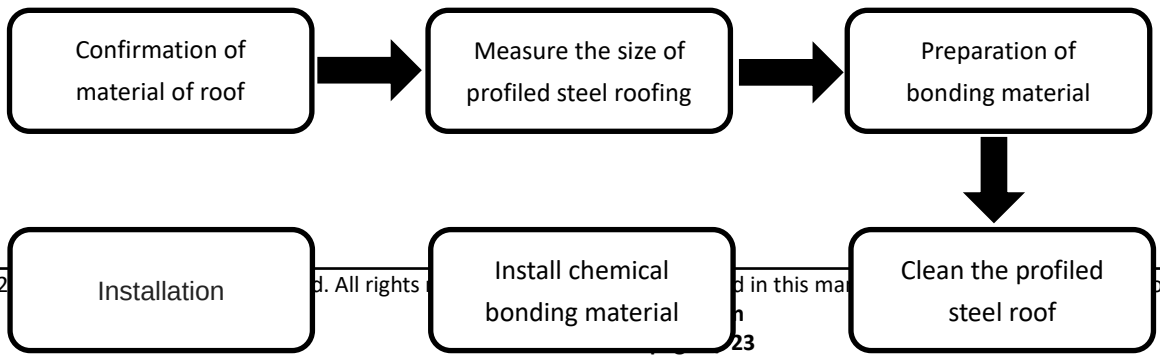
- All eArc modules are suitable for ambient temperatures of -40°C to +40°C. Satisfy wind/snow loads of 1600 Pa with a safety factor of 1.5 according to the following installation.

Quick-bonding Installation

▸Overview

- The SMF/SMH Series use quick and easy installation methods which called "Quick-bonding" is very suitable for profiled steel roof.

SMF series:

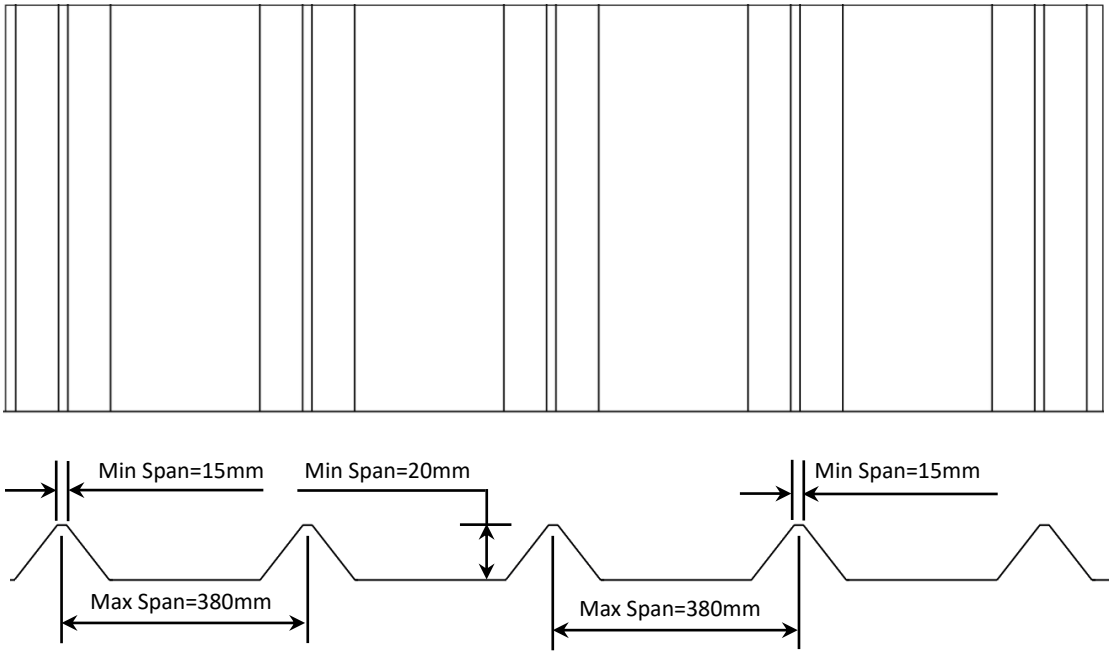


Step 1： Confirmation of material of profiled steel roof

◆ SMF Series to be bonded with bonding material on the zinc aluminum plate.

Step 2: Confirm profiled steel plate

◆ Size of profiled steel roof:



Step 3: Preparation of bonding material

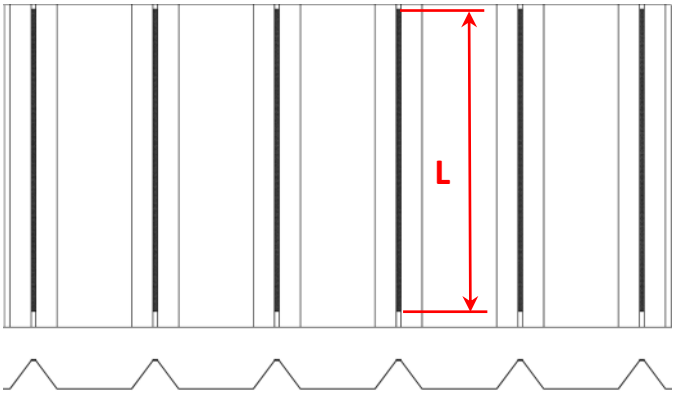
◆ The applicable adhesive material is 1527 type from Tonsan Adhesive Inc.

Step 4: Clean the profiled steel roof

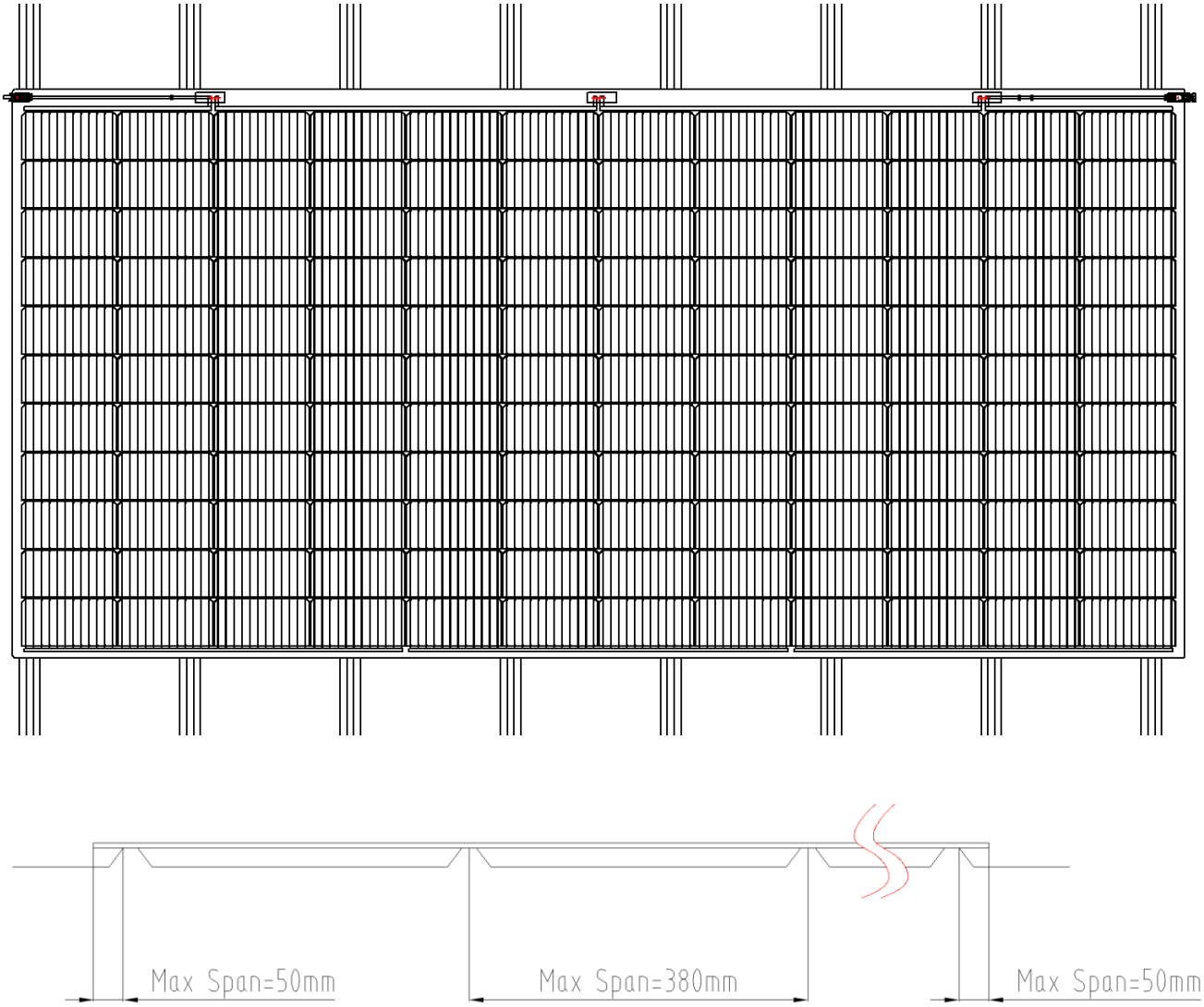
◆ Always keep the backsheet of eArc and rooftop clean before install.

Step 5: Install chemical bonding material

◆ The thickness of chemical bonding material should not less than 4 mm, width is not less than 10 mm. The length of the chemical bonding material shall not be less than the width of eArc.



◆ Installation structure:



SMH series：

Step 1: Bonding HP plate

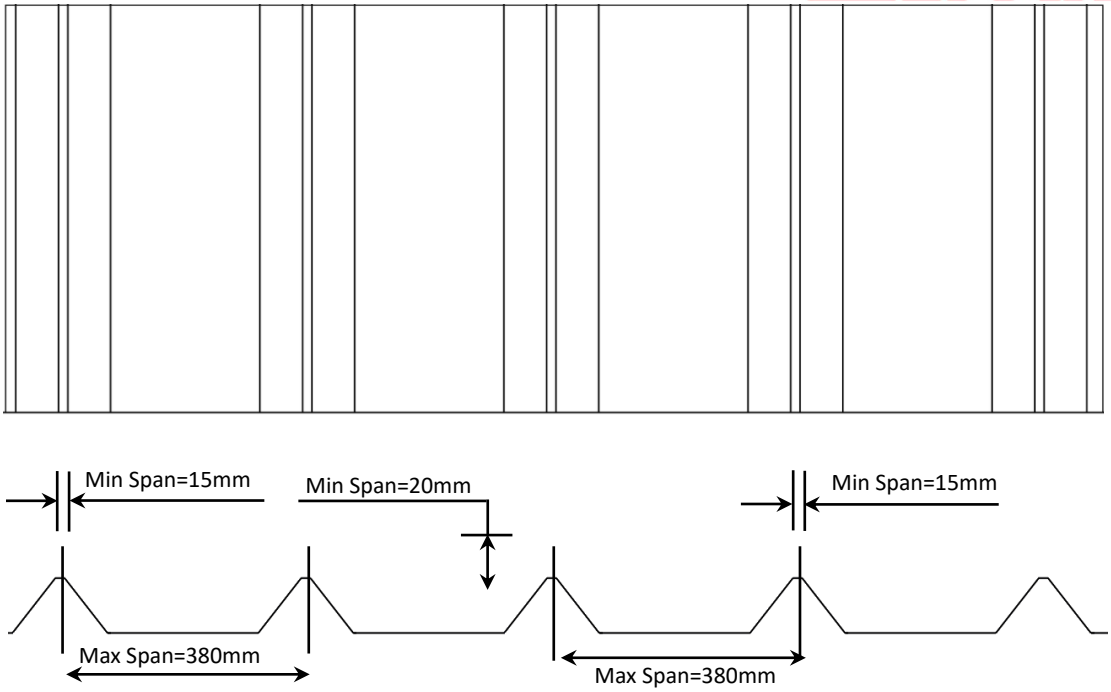
◆ Apply adhesive material on the backsheet of the PV module, make sure that all the backsheet with sufficient adhesive material. Affix the HP plate to the backsheet, the exterior outline of PV module and the HP plate should align.

◆ The applicable adhesive material is 1527 type from Tonsan Adhesive Inc.

◆ The HP plate is HP-PP010-80gsm type from Guangzhou Kingfa Carbon Fiber Materials Development Co., Ltd. The HP material is made of polypropylene honeycomb core material and continuous glass fibers reinforced polypropylene UD tapes.

Step 2: Confirm profiled steel plate

◆ Size of profiled steel roof:

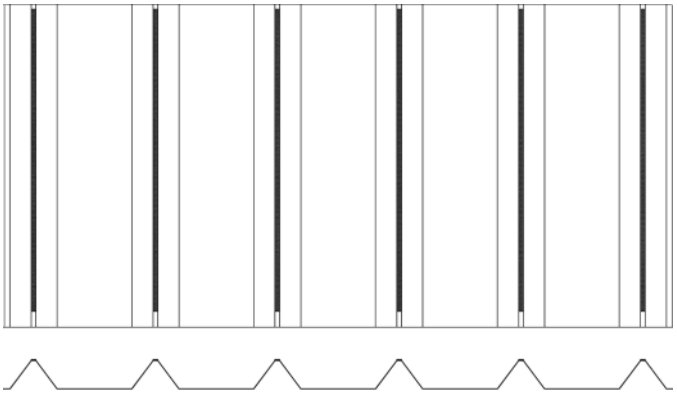


- The coating of zinc aluminum profiled steel plate is polyurethane baking varnish. The thickness of the profiled steel roof is not less than 0.4mm.

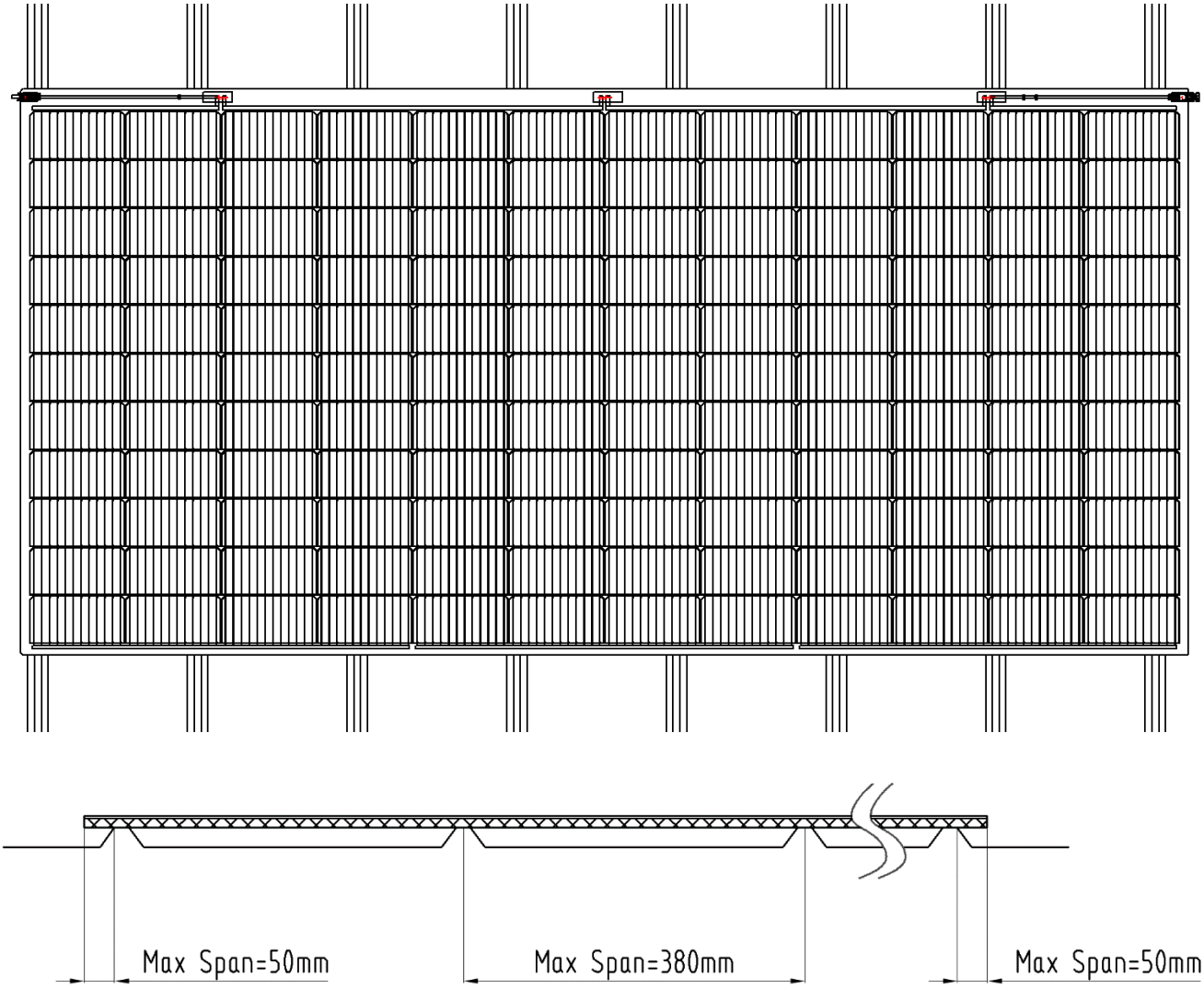
Step 3: bonding profiled steel plate

- Measure the size of profiled steel plate.
- Always keep the backsheet of PV module and the profiled steel plate clean before install.

Apply adhesive material on the profiled steel plate, make sure that all the profiled steel plate with sufficient adhesive material. The thickness of bonding material should not be less than 4 mm, the width of bonding material should not be less than 10 mm. The length of the chemical bonding material shall not be less than the width of PV module.



- The applicable adhesive material is 1527 type from Tonsan Adhesive Inc.
- Installation structure:



▸Note:

- The direction of module installation is that the short edge of the module is parallel to the ribs of the profiled steel roof (in the same direction as shown in the structure layout diagram).
- Please contact the local distributors if you are not sure whether your roof is suit for SMF/SMH Series or have any question about this installation method.
- Please contact the local distributors if you want to remove SMF/SMH Series from your roof.

Electrical installation

- Any hardware used must be compatible with the mounting structure material to avoid galvanic corrosion.
- It is not recommended to use eArc wi1.th different configurations in the same system.
- Excessive cables must be organized or fixed in an adequate way, e.g. attached to the mounting structure by using non-metallic cable ties.
- For applications requiring high operating voltage several eArc can be connected in series to form a string

of eArc; the system voltage is then equal to the sum of the voltage of each eArc.

- For applications requiring high operating currents several strings of eArc can be connected in parallel; the system current is then equal to the sum of the current of each string of eArc.
- The maximum system voltage is 1500 volts DC.
- Please make sure no more than two strings in parallel if eArc without any fuse or blocking diode to be connected according to the maximum series fuse rating of eArc and local electrical installation code.
- There is no limitation on the number of eArc that can be connected in parallel (fuse for each string should be considered), the number of eArc 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(temperature rating is 90℃) with a cross section of at least 2.5mm².
- Please refer to local regulations to determine the system wires size, type and temperature.
- eArc are supplied with connectors to be used for system electrical connections.
- To ensure reliable electric connection and to prevent possible intrusion of humidity, connectors must be mated and locked together until a click can be heard.
- Long-term exposure to wet environments may cause connectors' poor connectivity, resulting in current leakage and poor conductivity. SUNMAN recommend proper connector/cable/wire management to prevent moisture intrusion. Depending on the amount of humidity, SUNMAN recommends periodic inspections of the installation system to maintain optimal eArc' 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 Grids 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 to be expected.
- About bypass diode in the junction box, recommend bypass diode model is XT4550M-B or XT4050M-B.

Disclaimer of liability

- As the adherence to this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic (PV) products are beyond SUNMAN's control, SUNMAN does not accept responsibility and expressly disclaims liability for any loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance.
- No responsibility is assumed by SUNMAN for any infringement of patents or other rights of third parties, which may result from the 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 SUNMAN's best knowledge and experience and is believed to be reliable; But such information including product specification (without limitations) and suggestions do not constitute a warranty, express or implied. SUNMAN reserves the right to change the manual, eArc, the specifications, or product information sheets without prior notice.

Products Data

Model Series:

SMFXXXF-6X24UW (XXX = 415 W to 445 W),
SMFXXXF-12X12UW (XXX = 410 W to 450 W),
SMHXXXF-12X12UW (XXX = 410 W to 450 W),
SMHXXXF-12X12DW (XXX = 410 W to 450 W),
SMHXXXF-12X12UB (XXX = 410 W to 450 W),
SMHXXXF-12X12DB (XXX = 410 W to 450 W),
SMFXXXJ-5X24UW (XXX = 415 W to 455 W),
SMFXXXJ-6X20UW (XXX = 415 W to 455 W),
SMFXXXJ-6X24UW (XXX = 500 W to 540 W),
SMFXXXJ-10X12UW (XXX = 415 W to 455 W),
SMFXXXJ-12X08UW-e (XXX = 330 W to 360 W),
SMFXXXJ-12X10UW (XXX = 415 W to 455 W),
SMFXXXJ-12X11UW (XXX = 455 W to 495 W),
SMFXXXJ-12X12UW (XXX = 500 W to 540 W),
SMHXXXJ-12X12UW (XXX = 500 W to 540 W),
SMHXXXJ-12X11UW (XXX = 455 W to 495 W),
SMHXXXJ-12X10UW (XXX = 415 W to 455 W),

SMHXXXJ-12X12DW (XXX = 500 W to 540 W),
SMHXXXJ-12X12UB (XXX = 500 W to 540 W),
SMHXXXJ-12X12DB (XXX = 500 W to 540 W),
SMFXXXL-8X10UW (XXX = 365 W to 395 W),
SMFXXXL-8X11UW (XXX = 400 W to 440 W),
SMFXXXL-10X08UW (XXX = 365 W to 395 W),
SMFXXXL-10X09UW (XXX = 405 W to 445 W),
SMFXXXL-10X11UW (XXX = 500 W to 540 W),
SMFXXXL-12X07UW-e (XXX = 380 W to 420 W),
SMFXXXL-12X09UW (XXX = 490 W to 540 W),
SMFXXXL-12X10UW (XXX = 545 W to 595 W),
SMFXXXL-12X11UW (XXX = 595 W to 655 W),
SMHXXXL-12X11UW (XXX = 595 W to 655 W),
SMHXXXL-12X11DW (XXX = 595 W to 655 W),
SMHXXXL-12X11UB (XXX = 595 W to 655 W),
SMHXXXL-12X11DB (XXX = 595 W to 655 W),
SMMXXXL-12X11UW (XXX = 595 W to 655 W).

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMF415F-6X24UW	1500	49.20	41.13	10.59	10.09	415	20
SMF420F-6X24UW	1500	49.40	41.44	10.64	10.14	420	20
SMF425F-6X24UW	1500	49.60	41.71	10.69	10.19	425	20
SMF430F-6X24UW	1500	49.80	42.00	10.74	10.24	430	20
SMF435F-6X24UW	1500	50.00	42.29	10.79	10.29	435	20
SMF440F-6X24UW	1500	50.20	42.58	10.84	10.34	440	20
SMF445F-6X24UW	1500	50.40	42.87	10.89	10.39	445	20
SMF410F-12X12UW	1500	49.00	40.84	10.54	10.04	410	20
SMF415F-12X12UW	1500	49.20	41.13	10.59	10.09	415	20
SMF420F-12X12UW	1500	49.40	41.44	10.64	10.14	420	20
SMF425F-12X12UW	1500	49.60	41.71	10.69	10.19	425	20
SMF430F-12X12UW	1500	49.80	42.00	10.74	10.24	430	20
SMF435F-12X12UW	1500	50.00	42.29	10.79	10.29	435	20
SMF440F-12X12UW	1500	50.20	42.58	10.84	10.34	440	20
SMF445F-12X12UW	1500	50.40	42.87	10.89	10.39	445	20
SMF450F-12X12UW	1500	50.60	43.16	10.94	10.44	450	20
SMF415J-5X24UW	1500	40.48	34.18	13.36	12.16	415	25
SMF420J-5X24UW	1500	40.68	34.44	13.41	12.21	420	25
SMF425J-5X24UW	1500	40.88	34.70	13.46	12.26	425	25
SMF430J-5X24UW	1500	41.08	34.96	13.51	12.31	430	25
SMF435J-5X24UW	1500	41.28	35.22	13.56	12.36	435	25
SMF440J-5X24UW	1500	41.48	35.48	13.61	12.41	440	25
SMF445J-5X24UW	1500	41.68	35.74	13.66	12.46	445	25
SMF450J-5X24UW	1500	41.88	36.00	13.71	12.51	450	25
SMF455J-5X24UW	1500	42.08	36.26	13.76	12.56	455	25
SMF415J-6X20UW	1500	40.48	34.16	13.36	12.16	415	25
SMF420J-6X20UW	1500	40.68	34.41	13.41	12.21	420	25
SMF425J-6X20UW	1500	40.88	34.68	13.46	12.26	425	25
SMF430J-6X20UW	1500	41.08	34.95	13.51	12.31	430	25
SMF435J-6X20UW	1500	41.28	35.22	13.56	12.36	435	25
SMF440J-6X20UW	1500	41.48	35.49	13.61	12.41	440	25
SMF445J-6X20UW	1500	41.68	35.76	13.66	12.46	445	25
SMF450J-6X20UW	1500	41.88	36.03	13.71	12.51	450	25
SMF455J-6X20UW	1500	42.08	36.28	13.76	12.56	455	25
SMF500J-6X24UW	1500	48.74	41.33	13.36	12.11	500	25
SMF505J-6X24UW	1500	48.94	41.55	13.41	12.16	505	25
SMF510J-6X24UW	1500	49.14	41.79	13.46	12.21	510	25
SMF515J-6X24UW	1500	49.34	42.02	13.51	12.26	515	25

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMF520J-6X24UW	1500	49.54	42.264	13.56	12.31	520	25
SMF525J-6X24UW	1500	49.74	42.51	13.61	12.36	525	25
SMF530J-6X24UW	1500	49.94	42.73	13.66	12.41	530	25
SMF535J-6X24UW	1500	50.14	42.96	13.71	12.46	535	25
SMF540J-6X24UW	1500	50.34	43.18	13.76	12.51	540	25
SMF415J-10X12UW	1500	40.48	34.16	13.36	12.16	415	25
SMF420J-10X12UW	1500	40.68	34.43	13.41	12.21	420	25
SMF425J-10X12UW	1500	40.88	34.69	13.46	12.26	425	25
SMF430J-10X12UW	1500	41.08	34.96	13.51	12.31	430	25
SMF435J-10X12UW	1500	41.28	35.22	13.56	12.36	435	25
SMF440J-10X12UW	1500	41.48	35.48	13.61	12.41	440	25
SMF445J-10X12UW	1500	41.68	35.74	13.66	12.46	445	25
SMF450J-10X12UW	1500	41.88	36.01	13.71	12.51	450	25
SMF455J-10X12UW	1500	42.08	36.25	13.76	12.56	455	25
SMF330J-12X08UW-e	1500	32.42	27.31	13.41	12.10	330	25
SMF335J-12X08UW-e	1500	32.62	27.61	13.46	12.15	335	25
SMF340J-12X08UW-e	1500	32.82	27.91	13.51	12.20	340	25
SMF345J-12X08UW-e	1500	33.02	28.17	13.56	12.25	345	25
SMF350J-12X08UW-e	1500	33.22	28.49	13.61	12.30	350	25
SMF355J-12X08UW-e	1500	33.42	28.79	13.66	12.35	355	25
SMF360J-12X08UW-e	1500	33.62	29.04	13.71	12.40	360	25
SMF415J-12X10UW	1500	40.48	34.15	13.36	12.16	415	25
SMF420J-12X10UW	1500	40.68	34.41	13.41	12.21	420	25
SMF425J-12X10UW	1500	40.88	34.71	13.46	12.26	425	25
SMF430J-12X10UW	1500	41.08	34.97	13.51	12.31	430	25
SMF435J-12X10UW	1500	41.28	35.22	13.56	12.36	435	25
SMF440J-12X10UW	1500	41.48	35.51	13.61	12.41	440	25
SMF445J-12X10UW	1500	41.68	35.76	13.66	12.46	445	25
SMF450J-12X10UW	1500	41.88	36.02	13.71	12.51	450	25
SMF455J-12X10UW	1500	42.08	36.26	13.76	12.56	455	25
SMF455J-12X11UW	1500	44.61	37.75	13.36	12.07	455	25
SMF460J-12X11UW	1500	44.81	38.01	13.41	12.12	460	25
SMF465J-12X11UW	1500	45.01	38.25	13.46	12.17	465	25
SMF470J-12X11UW	1500	45.21	38.51	13.51	12.22	470	25
SMF475J-12X11UW	1500	45.41	38.74	13.56	12.27	475	25
SMF480J-12X11UW	1500	45.61	38.99	13.61	12.32	480	25
SMF485J-12X11UW	1500	45.81	39.25	13.66	12.37	485	25
SMF490J-12X11UW	1500	46.01	39.51	13.71	12.42	490	25

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMF495J-12X11UW	1500	46.21	39.75	13.76	12.47	495	25
SMF500J-12X12UW	1500	48.74	41.35	13.36	12.11	500	25
SMF505J-12X12UW	1500	48.94	41.58	13.41	12.16	505	25
SMF510J-12X12UW	1500	49.14	41.81	13.46	12.21	510	25
SMF515J-12X12UW	1500	49.34	42.06	13.51	12.26	515	25
SMF520J-12X12UW	1500	49.54	42.26	13.56	12.31	520	25
SMF525J-12X12UW	1500	49.74	42.54	13.61	12.36	525	25
SMF530J-12X12UW	1500	49.94	42.76	13.66	12.41	530	25
SMF535J-12X12UW	1500	50.14	42.98	13.71	12.46	535	25
SMF540J-12X12UW	1500	50.34	43.21	13.76	12.51	540	25
SMF365L-8X10UW	1500	26.88	23.18	17.98	15.77	365	30
SMF370L-8X10UW	1500	27.08	23.27	18.03	15.92	370	30
SMF375L-8X10UW	1500	27.28	23.36	18.08	16.07	375	30
SMF380L-8X10UW	1500	27.48	23.44	18.13	16.22	380	30
SMF385L-8X10UW	1500	27.68	23.54	18.18	16.37	385	30
SMF390L-8X10UW	1500	27.88	23.64	18.23	16.52	390	30
SMF395L-8X10UW	1500	28.08	23.72	18.28	16.67	395	30
SMF400L-8X11UW	1500	29.43	24.89	17.93	16.09	400	30
SMF405L-8X11UW	1500	29.63	25.13	17.98	16.14	405	30
SMF410L-8X11UW	1500	29.83	25.36	18.03	16.19	410	30
SMF415L-8X11UW	1500	30.03	25.58	18.08	16.24	415	30
SMF420L-8X11UW	1500	30.23	25.79	18.13	16.29	420	30
SMF425L-8X11UW	1500	30.43	26.04	18.18	16.34	425	30
SMF430L-8X11UW	1500	30.63	26.26	18.23	16.39	430	30
SMF435L-8X11UW	1500	30.83	26.49	18.28	16.44	435	30
SMF440L-8X11UW	1500	31.03	26.71	18.33	16.49	440	30
SMF365L-10X08UW	1500	26.88	22.75	17.98	16.07	365	30
SMF370L-10X08UW	1500	27.08	22.99	18.03	16.12	370	30
SMF375L-10X08UW	1500	27.28	23.22	18.08	16.17	375	30
SMF380L-10X08UW	1500	27.48	23.44	18.13	16.22	380	30
SMF385L-10X08UW	1500	27.68	23.69	18.18	16.27	385	30
SMF390L-10X08UW	1500	27.88	23.93	18.23	16.32	390	30
SMF395L-10X08UW	1500	28.08	24.16	18.28	16.37	395	30
SMF405L-10X09UW	1500	30.12	25.47	17.93	15.92	405	30
SMF410L-10X09UW	1500	30.32	25.71	17.98	15.97	410	30
SMF415L-10X09UW	1500	30.52	25.93	18.03	16.02	415	30
SMF420L-10X09UW	1500	30.72	26.17	18.08	16.07	420	30
SMF425L-10X09UW	1500	30.92	26.37	18.13	16.12	425	30

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMF430L-10X09UW	1500	31.12	26.61	18.18	16.17	430	30
SMF435L-10X09UW	1500	31.32	26.84	18.23	16.22	435	30
SMF440L-10X09UW	1500	31.52	27.06	18.28	16.27	440	30
SMF445L-10X09UW	1500	31.72	27.30	18.33	16.32	445	30
SMF500L-10X11UW	1500	36.99	31.38	17.93	15.95	500	30
SMF505L-10X11UW	1500	37.19	31.59	17.98	16.00	505	30
SMF510L-10X11UW	1500	37.39	31.81	18.03	16.05	510	30
SMF515L-10X11UW	1500	37.59	32.03	18.08	16.10	515	30
SMF520L-10X11UW	1500	37.79	32.23	18.13	16.15	520	30
SMF525L-10X11UW	1500	37.99	32.43	18.18	16.20	525	30
SMF530L-10X11UW	1500	38.19	32.63	18.23	16.25	530	30
SMF535L-10X11UW	1500	38.39	32.83	18.28	16.30	535	30
SMF540L-10X11UW	1500	38.59	33.03	18.33	16.35	540	30
SMF380L-12X07UW-e	1500	28.05	23.67	17.93	16.06	380	30
SMF385L-12X07UW-e	1500	28.25	23.91	17.98	16.11	385	30
SMF390L-12X07UW-e	1500	28.45	24.14	18.03	16.16	390	30
SMF395L-12X07UW-e	1500	28.65	24.39	18.08	16.21	395	30
SMF400L-12X07UW-e	1500	28.85	24.61	18.13	16.26	400	30
SMF405L-12X07UW-e	1500	29.05	24.85	18.18	16.31	405	30
SMF410L-12X07UW-e	1500	29.25	25.09	18.23	16.36	410	30
SMF415L-12X07UW-e	1500	29.45	25.31	18.28	16.41	415	30
SMF420L-12X07UW-e	1500	29.65	25.53	18.33	16.46	420	30
SMF490L-12X09UW	1500	36.10	30.61	17.88	16.03	490	30
SMF495L-12X09UW	1500	36.30	30.83	17.93	16.08	495	30
SMF500L-12X09UW	1500	36.50	31.04	17.98	16.13	500	30
SMF505L-12X09UW	1500	36.70	31.24	18.03	16.18	505	30
SMF510L-12X09UW	1500	36.90	31.44	18.08	16.23	510	30
SMF515L-12X09UW	1500	37.10	31.64	18.13	16.28	515	30
SMF520L-12X09UW	1500	37.30	31.84	18.18	16.33	520	30
SMF525L-12X09UW	1500	37.50	32.08	18.23	16.38	525	30
SMF530L-12X09UW	1500	37.70	32.27	18.28	16.43	530	30
SMF535L-12X09UW	1500	37.90	32.47	18.33	16.48	535	30
SMF540L-12X09UW	1500	38.10	32.67	18.38	16.53	540	30
SMF545L-12X10UW	1500	40.22	34.16	17.88	15.97	545	30
SMF550L-12X10UW	1500	40.42	34.36	17.93	16.02	550	30
SMF555L-12X10UW	1500	40.62	34.56	17.98	16.07	555	30
SMF560L-12X10UW	1500	40.82	34.76	18.03	16.12	560	30
SMF565L-12X10UW	1500	41.02	34.96	18.08	16.17	565	30

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMF570L-12X10UW	1500	41.22	35.16	18.13	16.22	570	30
SMF575L-12X10UW	1500	41.42	35.36	18.18	16.27	575	30
SMF580L-12X10UW	1500	41.62	35.56	18.23	16.32	580	30
SMF585L-12X10UW	1500	41.82	35.76	18.28	16.37	585	30
SMF590L-12X10UW	1500	42.02	35.96	18.33	16.42	590	30
SMF595L-12X10UW	1500	42.22	36.16	18.38	16.47	595	30
SMF595L-12X11UW	1500	45.29	37.49	17.77	15.88	595	30
SMF600L-12X11UW	1500	45.24	37.72	17.88	15.91	600	30
SMF605L-12X11UW	1500	45.26	37.93	17.93	15.96	605	30
SMF610L-12X11UW	1500	45.28	38.11	17.98	16.01	610	30
SMF615L-12X11UW	1500	45.30	38.31	18.03	16.06	615	30
SMF620L-12X11UW	1500	45.32	38.51	18.08	16.11	620	30
SMF625L-12X11UW	1500	45.34	38.69	18.13	16.16	625	30
SMF630L-12X11UW	1500	45.36	38.88	18.18	16.21	630	30
SMF635L-12X11UW	1500	45.38	39.07	18.23	16.26	635	30
SMF640L-12X11UW	1500	45.40	39.24	18.28	16.31	640	30
SMF645L-12X11UW	1500	45.42	39.44	18.33	16.36	645	30
SMF650L-12X11UW	1500	45.44	39.61	18.38	16.41	650	30
SMF655L-12X11UW	1500	45.46	39.81	18.43	16.46	655	30
SMH595L-12X11UW	1500	44.14	37.48	17.77	15.85	595	30
SMH600L-12X11UW	1500	44.34	37.68	17.83	15.91	600	30
SMH605L-12X11UW	1500	44.54	37.88	17.89	15.97	605	30
SMH610L-12X11UW	1500	44.74	38.08	17.95	16.03	610	30
SMH615L-12X11UW	1500	44.94	38.28	18.01	16.09	615	30
SMH620L-12X11UW	1500	45.14	38.48	18.07	16.15	620	30
SMH625L-12X11UW	1500	45.34	38.69	18.13	16.16	625	30
SMH630L-12X11UW	1500	45.54	38.88	18.19	16.27	630	30
SMH635L-12X11UW	1500	45.74	39.08	18.25	16.33	635	30
SMH640L-12X11UW	1500	45.94	39.28	18.31	16.39	640	30
SMH645L-12X11UW	1500	46.14	39.48	18.37	16.40	645	30
SMH650L-12X11UW	1500	46.34	39.68	18.43	16.45	650	30
SMH655L-12X11UW	1500	46.54	39.88	18.49	16.49	655	30
SMH595L-12X11DW	1500	44.14	37.48	17.77	15.85	595	30
SMH600L-12X11DW	1500	44.34	37.68	17.83	15.91	600	30
SMH605L-12X11DW	1500	44.54	37.88	17.89	15.97	605	30
SMH610L-12X11DW	1500	44.74	38.08	17.95	16.03	610	30
SMH615L-12X11DW	1500	44.94	38.28	18.01	16.09	615	30
SMH620L-12X11DW	1500	45.14	38.48	18.07	16.15	620	30

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMH625L-12X11DW	1500	45.34	38.69	18.13	16.16	625	30
SMH630L-12X11DW	1500	45.54	38.88	18.19	16.27	630	30
SMH635L-12X11DW	1500	45.74	39.08	18.25	16.33	635	30
SMH640L-12X11DW	1500	45.94	39.28	18.31	16.39	640	30
SMH645L-12X11DW	1500	46.14	39.48	18.37	16.40	645	30
SMH650L-12X11DW	1500	46.34	39.68	18.43	16.45	650	30
SMH655L-12X11DW	1500	46.54	39.88	18.49	16.49	655	30
SMH595L-12X11UB	1500	44.14	37.48	17.77	15.85	595	30
SMH600L-12X11UB	1500	44.34	37.68	17.83	15.91	600	30
SMH605L-12X11UB	1500	44.54	37.88	17.89	15.97	605	30
SMH610L-12X11UB	1500	44.74	38.08	17.95	16.03	610	30
SMH615L-12X11UB	1500	44.94	38.28	18.01	16.09	615	30
SMH620L-12X11UB	1500	45.14	38.48	18.07	16.15	620	30
SMH625L-12X11UB	1500	45.34	38.69	18.13	16.16	625	30
SMH630L-12X11UB	1500	45.54	38.88	18.19	16.27	630	30
SMH635L-12X11UB	1500	45.74	39.08	18.25	16.33	635	30
SMH640L-12X11UB	1500	45.94	39.28	18.31	16.39	640	30
SMH645L-12X11UB	1500	46.14	39.48	18.37	16.40	645	30
SMH650L-12X11UB	1500	46.34	39.68	18.43	16.45	650	30
SMH655L-12X11UB	1500	46.54	39.88	18.49	16.49	655	30
SMH595L-12X11DB	1500	44.14	37.48	17.77	15.85	595	30
SMH600L-12X11DB	1500	44.34	37.68	17.83	15.91	600	30
SMH605L-12X11DB	1500	44.54	37.88	17.89	15.97	605	30
SMH610L-12X11DB	1500	44.74	38.08	17.95	16.03	610	30
SMH615L-12X11DB	1500	44.94	38.28	18.01	16.09	615	30
SMH620L-12X11DB	1500	45.14	38.48	18.07	16.15	620	30
SMH625L-12X11DB	1500	45.34	38.69	18.13	16.16	625	30
SMH630L-12X11DB	1500	45.54	38.88	18.19	16.27	630	30
SMH635L-12X11DB	1500	45.74	39.08	18.25	16.33	635	30
SMH640L-12X11DB	1500	45.94	39.28	18.31	16.39	640	30
SMH645L-12X11DB	1500	46.14	39.48	18.37	16.40	645	30
SMH650L-12X11DB	1500	46.34	39.68	18.43	16.45	650	30
SMH655L-12X11DB	1500	46.54	39.88	18.49	16.49	655	30
SMM595L-12X11UW	1500	44.14	37.48	17.77	15.85	595	30
SMM600L-12X11UW	1500	44.34	37.68	17.83	15.91	600	30
SMM605L-12X11UW	1500	44.54	37.88	17.89	15.97	605	30
SMM610L-12X11UW	1500	44.74	38.08	17.95	16.03	610	30
SMM615L-12X11UW	1500	44.94	38.28	18.01	16.09	615	30

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMM620L-12X11UW	1500	45.14	38.48	18.07	16.15	620	30
SMM625L-12X11UW	1500	45.34	38.69	18.13	16.16	625	30
SMM630L-12X11UW	1500	45.54	38.88	18.19	16.27	630	30
SMM635L-12X11UW	1500	45.74	39.08	18.25	16.33	635	30
SMM640L-12X11UW	1500	45.94	39.28	18.31	16.39	640	30
SMM645L-12X11UW	1500	46.14	39.48	18.37	16.40	645	30
SMM650L-12X11UW	1500	46.34	39.68	18.43	16.45	650	30
SMM655L-12X11UW	1500	46.54	39.88	18.49	16.49	655	30
SMH500J-12X12UW	1500	48.70	41.30	13.32	12.07	500	25
SMH505J-12X12UW	1500	48.90	41.54	13.38	12.13	505	25
SMH510J-12X12UW	1500	49.10	41.78	13.44	12.19	510	25
SMH515J-12X12UW	1500	49.30	42.02	13.5	12.25	515	25
SMH520J-12X12UW	1500	49.54	42.26	13.56	12.31	520	25
SMH525J-12X12UW	1500	49.70	42.50	13.62	12.37	525	25
SMH530J-12X12UW	1500	49.86	42.74	13.68	12.43	530	25
SMH535J-12X12UW	1500	50.10	42.98	13.74	12.49	535	25
SMH540J-12X12UW	1500	50.30	43.22	13.80	12.55	540	25
SMH455J-12X11UW	1500	44.61	37.75	13.36	12.07	455	25
SMH460J-12X11UW	1500	44.81	38.01	13.41	12.12	460	25
SMH465J-12X11UW	1500	45.01	38.25	13.46	12.17	465	25
SMH470J-12X11UW	1500	45.21	38.51	13.51	12.22	470	25
SMH475J-12X11UW	1500	45.41	38.74	13.56	12.27	475	25
SMH480J-12X11UW	1500	45.61	38.99	13.61	12.32	480	25
SMH485J-12X11UW	1500	45.81	39.25	13.66	12.37	485	25
SMH490J-12X11UW	1500	46.01	39.51	13.71	12.42	490	25
SMH495J-12X11UW	1500	46.21	39.75	13.76	12.47	495	25
SMH415J-12X10UW	1500	40.48	34.15	13.36	12.16	415	25
SMH420J-12X10UW	1500	40.68	34.41	13.41	12.21	420	25
SMH425J-12X10UW	1500	40.88	34.71	13.46	12.26	425	25
SMH430J-12X10UW	1500	41.08	34.97	13.51	12.31	430	25
SMH435J-12X10UW	1500	41.28	35.22	13.56	12.36	435	25
SMH440J-12X10UW	1500	41.48	35.51	13.61	12.41	440	25
SMH445J-12X10UW	1500	41.68	35.76	13.66	12.46	445	25
SMH450J-12X10UW	1500	41.88	36.02	13.71	12.51	450	25
SMH455J-12X10UW	1500	42.08	36.26	13.76	12.56	455	25
SMH500J-12X12DW	1500	48.70	41.30	13.32	12.07	500	25
SMH505J-12X12DW	1500	48.90	41.54	13.38	12.13	505	25
SMH510J-12X12DW	1500	49.10	41.78	13.44	12.19	510	25

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMH515J-12X12DW	1500	49.30	42.02	13.50	12.25	515	25
SMH520J-12X12DW	1500	49.54	42.26	13.56	12.31	520	25
SMH525J-12X12DW	1500	49.70	42.50	13.62	12.37	525	25
SMH530J-12X12DW	1500	49.86	42.74	13.68	12.43	530	25
SMH535J-12X12DW	1500	50.10	42.98	13.74	12.49	535	25
SMH540J-12X12DW	1500	50.30	43.22	13.80	12.55	540	25
SMH500J-12X12UB	1500	48.70	41.30	13.32	12.07	500	25
SMH505J-12X12UB	1500	48.90	41.54	13.38	12.13	505	25
SMH510J-12X12UB	1500	49.10	41.78	13.44	12.19	510	25
SMH515J-12X12UB	1500	49.30	42.02	13.5	12.25	515	25
SMH520J-12X12UB	1500	49.54	42.26	13.56	12.31	520	25
SMH525J-12X12UB	1500	49.70	42.50	13.62	12.37	525	25
SMH530J-12X12UB	1500	49.86	42.74	13.68	12.43	530	25
SMH535J-12X12UB	1500	50.10	42.98	13.74	12.49	535	25
SMH540J-12X12UB	1500	50.30	43.22	13.80	12.55	540	25
SMH500J-12X12DB	1500	48.70	41.30	13.32	12.07	500	25
SMH505J-12X12DB	1500	48.90	41.54	13.38	12.13	505	25
SMH510J-12X12DB	1500	49.10	41.78	13.44	12.19	510	25
SMH515J-12X12DB	1500	49.30	42.02	13.50	12.25	515	25
SMH520J-12X12DB	1500	49.54	42.26	13.56	12.31	520	25
SMH525J-12X12DB	1500	49.70	42.50	13.62	12.37	525	25
SMH530J-12X12DB	1500	49.86	42.74	13.68	12.43	530	25
SMH535J-12X12DB	1500	50.10	42.98	13.74	12.49	535	25
SMH540J-12X12DB	1500	50.30	43.22	13.80	12.55	540	25
SMH410F-12X12UW	1500	49.00	41.20	10.54	10.03	410	20
SMH415F-12X12UW	1500	49.20	41.40	10.59	10.09	415	20
SMH420F-12X12UW	1500	49.40	41.60	10.64	10.16	420	20
SMH425F-12X12UW	1500	49.60	41.80	10.69	10.23	425	20
SMH430F-12X12UW	1500	49.80	42.00	10.74	10.24	430	20
SMH435F-12X12UW	1500	50.00	42.20	10.79	10.34	435	20
SMH440F-12X12UW	1500	50.20	42.40	10.84	10.39	440	20
SMH445F-12X12UW	1500	50.40	42.60	10.89	10.44	445	20
SMH450F-12X12UW	1500	50.60	42.80	10.94	10.49	450	20
SMH410F-12X12DW	1500	49.00	41.20	10.54	10.03	410	20
SMH415F-12X12DW	1500	49.20	41.40	10.59	10.09	415	20
SMH420F-12X12DW	1500	49.40	41.60	10.64	10.16	420	20
SMH425F-12X12DW	1500	49.60	41.80	10.69	10.23	425	20
SMH430F-12X12DW	1500	49.80	42.00	10.74	10.24	430	20

Model Type	Maximum DC System Voltage (V)	Open Circuit Voltage (V)	Maximum power voltage (V)	Short Circuit Current (A)	Maximum power current (A)	Maximum Power (Watts)	Maxium overcurrent protection rating (A)
SMH435F-12X12DW	1500	50.00	42.20	10.79	10.34	435	20
SMH440F-12X12DW	1500	50.20	42.40	10.84	10.39	440	20
SMH445F-12X12DW	1500	50.40	42.60	10.89	10.44	445	20
SMH450F-12X12DW	1500	50.60	42.80	10.94	10.49	450	20
SMH410F-12X12UB	1500	49.00	41.20	10.54	10.03	410	20
SMH415F-12X12UB	1500	49.20	41.40	10.59	10.09	415	20
SMH420F-12X12UB	1500	49.40	41.60	10.64	10.16	420	20
SMH425F-12X12UB	1500	49.60	41.80	10.69	10.23	425	20
SMH430F-12X12UB	1500	49.80	42.00	10.74	10.24	430	20
SMH435F-12X12UB	1500	50.00	42.20	10.79	10.34	435	20
SMH440F-12X12UB	1500	50.20	42.40	10.84	10.39	440	20
SMH445F-12X12UB	1500	50.40	42.60	10.89	10.44	445	20
SMH450F-12X12UB	1500	50.60	42.80	10.94	10.49	450	20
SMH410F-12X12DB	1500	49.00	41.20	10.54	10.03	410	20
SMH415F-12X12DB	1500	49.20	41.40	10.59	10.09	415	20
SMH420F-12X12DB	1500	49.40	41.60	10.64	10.16	420	20
SMH425F-12X12DB	1500	49.60	41.80	10.69	10.23	425	20
SMH430F-12X12DB	1500	49.80	42.00	10.74	10.24	430	20
SMH435F-12X12DB	1500	50.00	42.20	10.79	10.34	435	20
SMH440F-12X12DB	1500	50.20	42.40	10.84	10.39	440	20
SMH445F-12X12DB	1500	50.40	42.60	10.89	10.44	445	20
SMH450F-12X12DB	1500	50.60	42.80	10.94	10.49	450	20

Maintenance

To ensure optimal performance of modules and maximize system power generation, the following maintenance measures are recommended:

1 Module appearance inspection, focusing on the following points:

a) Whether the module is damaged.

b) Whether there is a sharp object touching the surface of the module.

c) Whether the modules are obstructed by obstacles and objects, avoiding new trees, new poles etc. to shielding the modules.

d) Check for corrosion near the busbar. This kind of corrosion is caused by the damage of the module surface during transportation, which causes moisture to penetrate into the interior of the module.

e) Check the adhesive between the module and the roof for looseness or damage and adjust or repair it in time.

2 Clean the modules. The accumulation of dust or dirt on the surface of the modules will reduce the power output. It should be cleaned regularly to keep the surface clean. Generally, it should be cleaned at least once a month, appropriately increase the frequency in the harsh natural environment. Pay attention when cleaning PV modules:

a) Rinse with water first, then dry the water with a soft cloth. Do not use corrosive solvents to clean or wipe the PV modules with hard objects.

b) The PV module should be cleaned at an irradiance of less than 200 W/m^2. It should be cleaned in the absence of sunlight or in the morning and evening.

c) It is strictly forbidden to clean PV modules under meteorological conditions where the wind is greater than grade 4, heavy rain or heavy snow.

Note: Do not walk, stand or sit on the module when cleaning.

3 Connector and cable inspection. It is recommended to conduct a preventive inspection every six months:

Check for signs of aging of PV modules, including possible rodent damage, weathering, and whether all connectors are tightly connected or corroded.