INSTALLATION INSTRUCTION FOR SLPXXX-12V SERIES SOLAR MODULE

SOLARLAND®
AUSTRALIA

Contents

SLPXXX-24V (where XXX is directly related to module's rated power) series solar modules are made of 72pcs 156×78mm mono crystalline solar cell in series with high efficiency, high transmission rate, low iron tempered glass, anti-aging EVA, high flame resistant TPT laminate, and anodized aluminium alloy frames. Wuxi Tianran Photovoltaic Co., Ltd. (SOLARLAND) modules have long life, easy installation, high wind and hail impact resistance and many other advantages.
SOLARLAND modules are made according to international standards and have passed several third party test centre's examination for certification.
SLPXXX-24V series solar modules mainly include 120Watt, 125Watt, 130Watt, 135Watt, 140Watt.

1. Electrical Performance Parameters

Value Parameters	SLP010-12V	SLP015-12V	SLP020-12V	SLP025-12V	SLP030-12V
Max Power (Pmax)	10W	15W	20W	25W	30 W
Operating Voltage (Vmp)	17.0V	17.2V	17.2V	17.2V	17.2 V
Operating Current (Imp)	0.58A	0.87A	1.16A	1.45A	1.75 A
Open-Circuit Voltage (Voc)	21.6V	21.6V	21.6V	21.6V	21.2 V
Short-Circuit Current (Isc)	0.68A	0.96A	1.31A	1.60A	1.90A
Maximum System Voltage	±3%	±3%	±3%	±3%	±3%
Output Tolerance	1000V	1000V	1000V	1000V	1000V
Maximum Series Fuse Rating	1 A	2 A	2 A	2 A	3A

Value Parameters	SLP035-12V	SLP040-12V	SLP045-12V	SLP050-12V
Max Power (Pmax)	35 W	40 W	45 W	50 W
Operating Voltage (Vmp)	18.1 V	17.2 V	18.0 V	17.4 V
Operating Current (Imp)	1.94 A	2.33 A	2.50 A	2.88 A
Open-Circuit Voltage (Voc)	21.9 V	21.6 V	21.8 V	21.2 V
Short-Circuit Current (Isc)	2.09 A	2.55 A	2.73 A	3.15 A
Maximum System Voltage	±3%	±3%	±3%	±3%
Output Tolerance	1000V	1000V	1000V	1000V
Maximum Series Fuse Rating	3A	4 A	4 A	5A

Value Parameters	SLP055-12V	SLP060-12V	SLP065-12V	SLP070-12V
Max Power (Pmax)	55 W	60 W	65 W	70 W
Operating Voltage (Vmp)	17.9 V	17.2 V	17.7 V	18.1 V
Operating Current (Imp)	3.08 A	3.49 A	3.68 A	3.87A
Open-Circuit Voltage (Voc)	21.7V	21.2 V	21.6 V	21.9 V
Short-Circuit Current (Isc)	3.38 A	3.81 A	4.01 A	4.18 A
Maximum System Voltage	±3%	±3%	±3%	±3%
Output Tolerance	1000V	1000V	1000V	1000V
Maximum Series Fuse Rating	5A	6 A	6 A	6 A

NOTE: All technical data at standard test condition (E=1000W/m² TC=25°C Am=1.5)

Value Parameters	SLP075-12V	SLP080-12V	SLP085-12V	SLP120-12V
Max Power (Pmax)	75 W	80 W	85 W	120 W
Operating Voltage (Vmp)	17.2 V	17.8V	18.2 V	17.2 V
Operating Current (Imp)	4.36 A	4.50 A	4.67A	6.98A
Open-Circuit Voltage (Voc)	21.3 V	21.6 V	22.0 V	21.2 V
Short-Circuit Current (Isc)	4.75 A	4.91 A	5.07 A	7.62 A
Maximum System Voltage	±3%	±3%	±3%	±3%
Output Tolerance	1000V	1000V	1000V	1000V
Maximum Series Fuse Rating	7 A	7 A	7 A	15 A

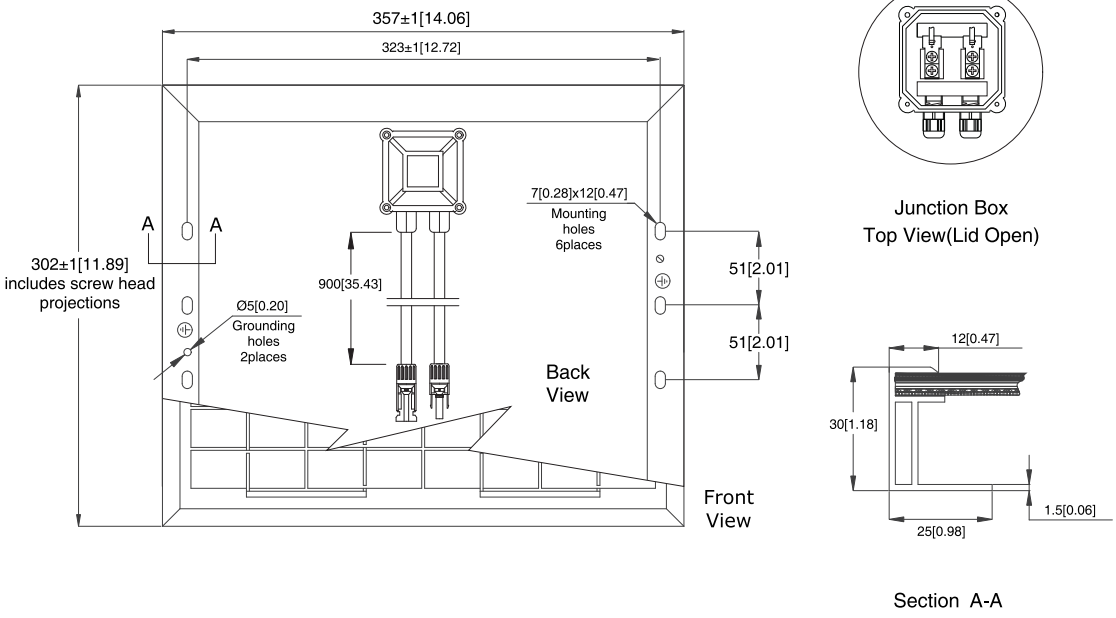
Value Parameters	SLP125-12V	SLP130-12V	SLP135-12V	SLP140-12V
Max Power (Pmax)	125 W	130 W	135 W	140 W
Operating Voltage (Vmp)	17.4 V	17.7 V	18.0 V	18.1 V
Operating Current (Imp)	7.19 A	7.35 A	7.50 A	7.74 A
Open-Circuit Voltage (Voc)	21.4 V	21.6 V	21.8 V	21.9 V
Short-Circuit Current (Isc)	7.85 A	8.02 A	8.18 A	8.36 A
Maximum System Voltage	±3%	±3%	±3%	±3%
Output Tolerance	1000V	1000V	1000V	1000V
Maximum Series Fuse Rating	15A	15 A	15 A	15 A

NOTE: All technical data at standard test condition (E=1000W/m² TC=25°C Am=1.5)

2. Mechanical Parameters

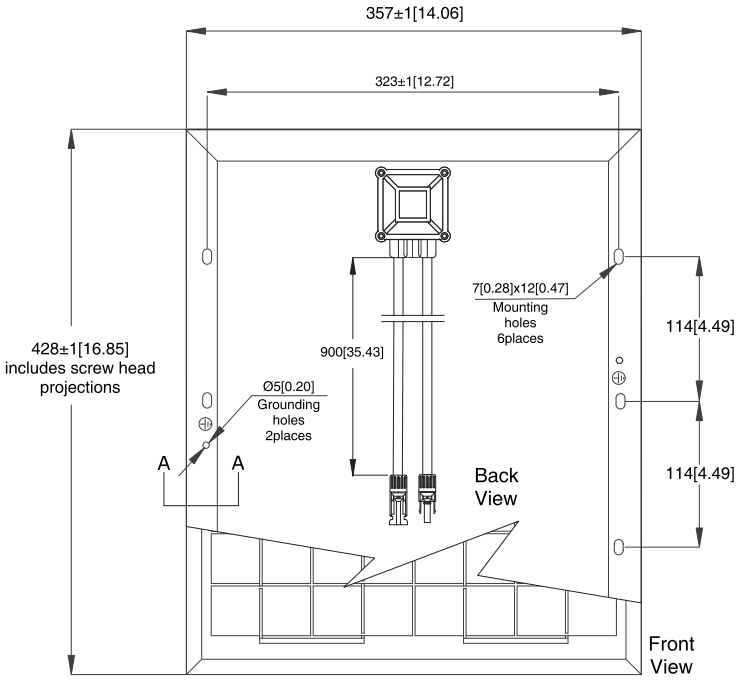
SLP010-12V		
No.	**Item**	**Description**
1	Dimension	Length: 302mm Width: 357mm Height: 30mm
2	Weight	1.60Kg
3	Solar cell	36 pieces (78mm × 26mm) polycrystalline silicon cells, 4×9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

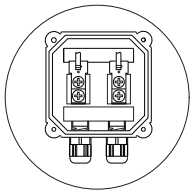
Unit: mm [in.]



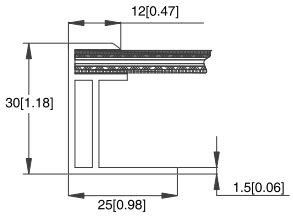
SLP015-12V		
No.	**Item**	**Description**
1	Dimension	Length: 428mm Width: 357mm Height: 30mm
2	Weight	2.2Kg
3	Solar cell	36 pieces (78mm × 39mm) polycrystalline silicon cells, 4×9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





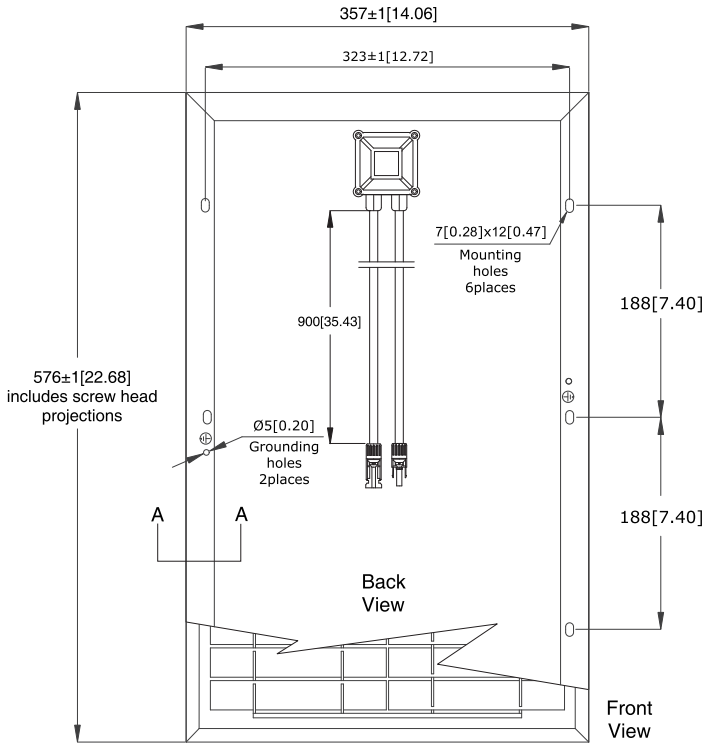
Junction Box
Top View(Lid Open)

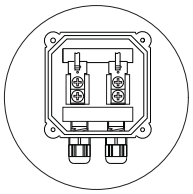


Section A-A

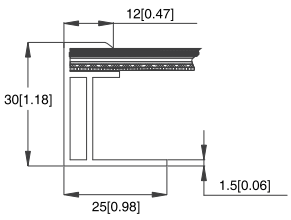
SLP020-12V		
No.	**Item**	**Description**
1	Dimension	Length: 675mm Width: 357mm Height: 30mm
2	Weight	3.3Kg
3	Solar cell	36 pieces (156mm × 32mm) polycrystalline silicon cells, 2x18 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





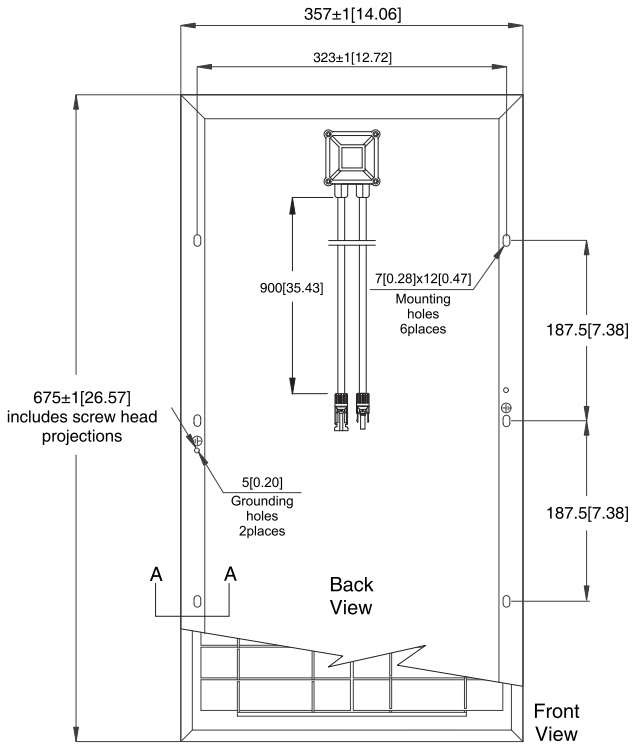
Junction Box
Top View(Lid Open)

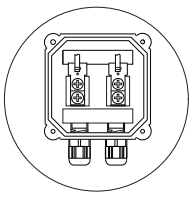


Section A-A

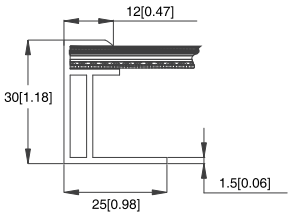
SLP025-12V		
No.	**Item**	**Description**
1	Dimension	Length: 428mm Width: 357mm Height: 30mm
2	Weight	2.2Kg
3	Solar cell	36 pieces (78mm × 39mm) polycrystalline silicon cells, 4×9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





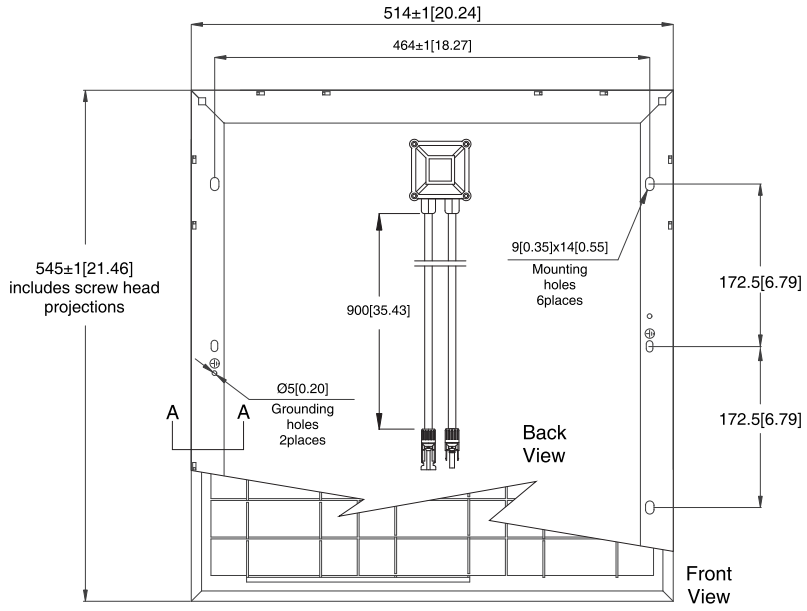
Junction Box
Top View(Lid Open)

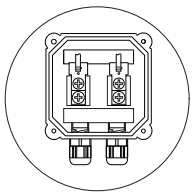


Section A-A

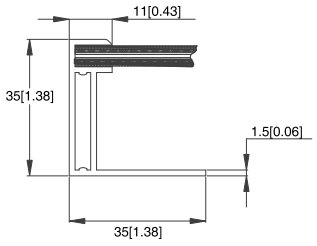
SLP030-12V/SLP035-12V		
No.	**Item**	**Description**
1	Dimension	Length: 545mm Width: 514mm Height: 35mm
2	Weight	3.79Kg
3	Solar cell	36 pieces(156mm x 39mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





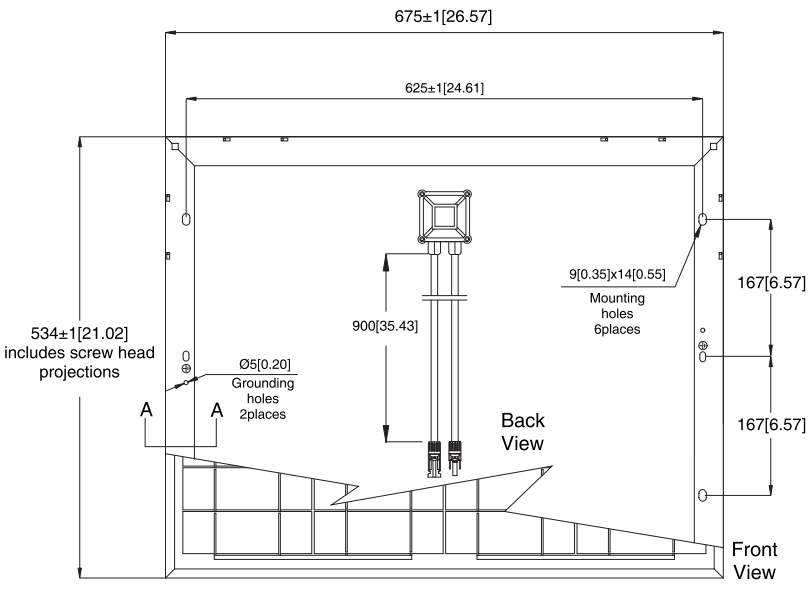
Junction Box
Top View（Lid Open）

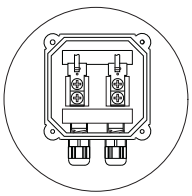


Section A-A

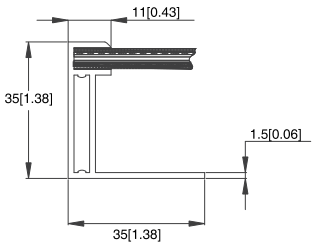
SLP040-12V/SLP045-12V		
No.	**Item**	**Description**
1	Dimension	Length: 534mm Width: 675mm Height: 35mm
2	Weight	4.69Kg
3	Solar cell	36 pieces(156mm x 52mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





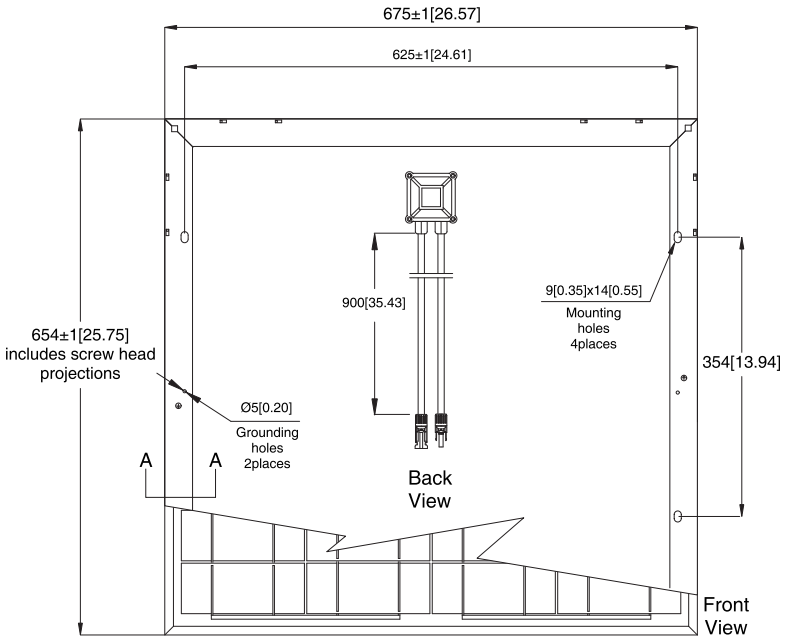
Junction Box
Top View (Lid Open)

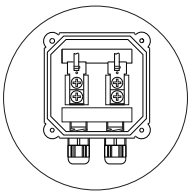


Section A-A

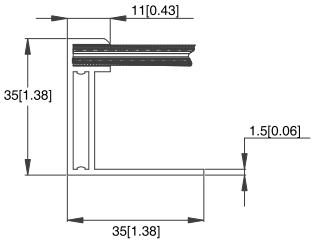
SLP050-12V/SLP055-12V		
No.	**Item**	**Description**
1	Dimension	Length: 654mm Width: 675mm Height: 35mm
2	Weight	5.66Kg
3	Solar cell	36 pieces(156mm x 64mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB030; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





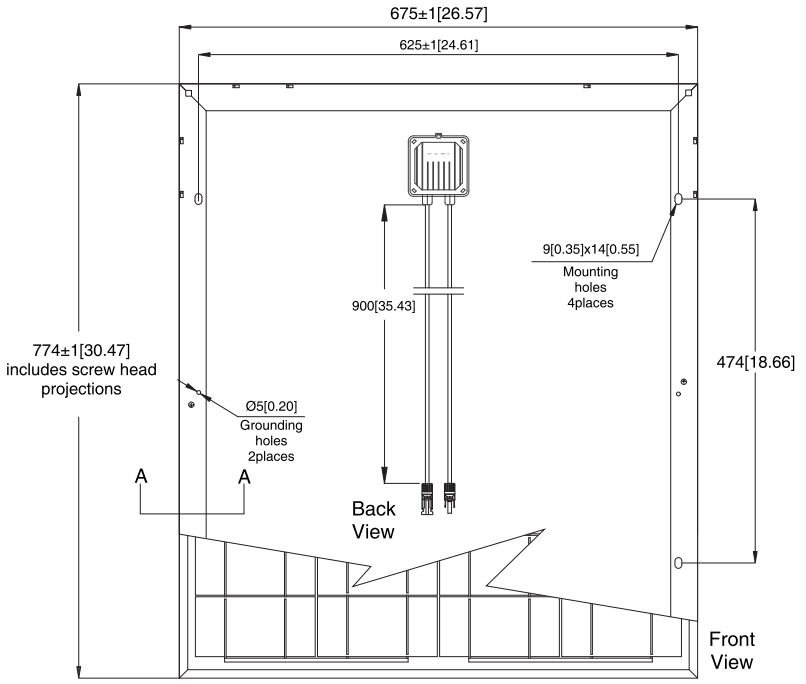
Junction Box
Top View(Lid Open)

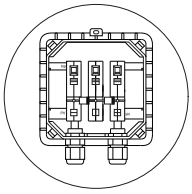


Section A-A

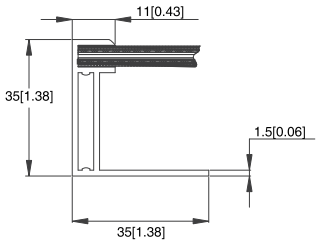
SLP060-12V/SLP065-12V/SLP070-12V		
No.	**Item**	**Description**
1	Dimension	Length: 774mm Width: 675mm Height: 35mm
2	Weight	6.69Kg
3	Solar cell	36 pieces(156mm x 78mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB001; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





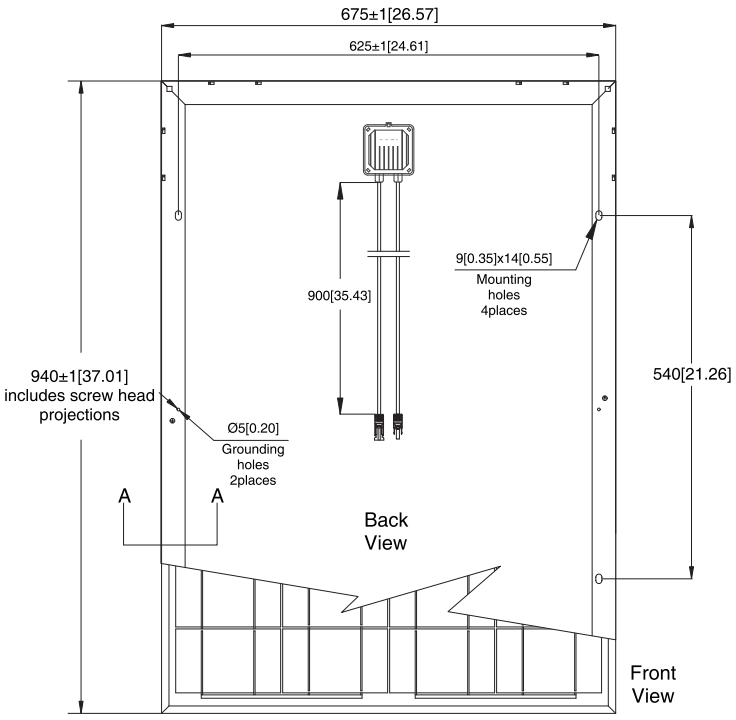
Junction Box
Top View（Lid Open）

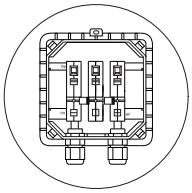


Section A-A

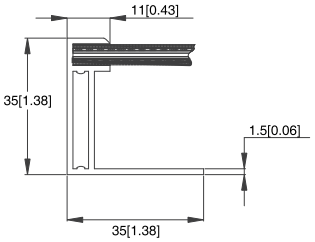
SLP075-12V/SLP080-12V/SLP085-12V		
No.	**Item**	**Description**
1	Dimension	Length: 940mm Width: 675mm Height: 35mm
2	Weight	7.94Kg
3	Solar cell	36 pieces(156mm x 95mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB001; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





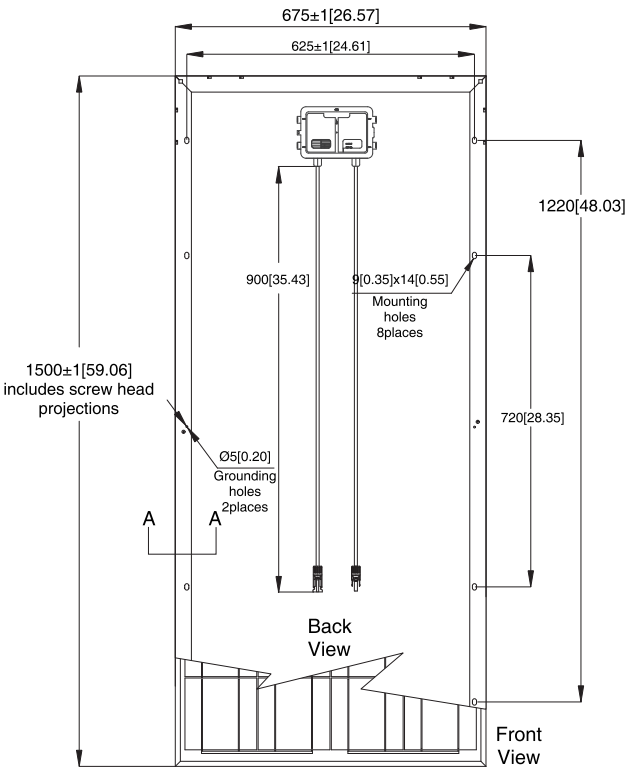
Junction Box
Top View (Lid Open)

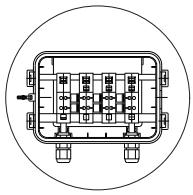


Section A-A

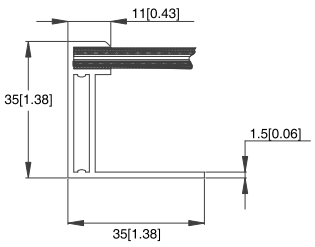
SLP120-12V/SLP125-12V/SLP130-12V/SLP135-12V/SLP140-12V		
No.	**Item**	**Description**
1	Dimension	Length: 1500mm Width: 675mm Height: 35mm
2	Weight	12.12Kg
3	Solar cell	36 pieces(156mm x 156mm)polycrystalline silicon cells,4x9 in series.
4	Output cable	PV1-F 1×4.0mm2, Wuxi Xinhongye Wire & Cable Co., Ltd.
5	Junction box / connector	PV-JB003A; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. PV-ST01; Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.
6	Bypass diode	10SQ050, Yangzhou Yangjie Electronic Co., Ltd.
7	Construction	Front: high transmission rate and low iron tempered glass 3.2mm(1/8 inch)
8	Frame	Back:TPT Encapsulation material: EVA With anodized aluminum alloy frame color: argent
9	Insulation	50MΩ

Unit: mm [in.]





Junction Box
Top View(Lid Open)



Section A-A

Please carefully read the following installation and safety instructions. Non-compliance with these instructions may void the module warranty.

3. Purpose of this guide

This guide contains information regarding the installation and safe handling of SOLARLAND 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 SOLARLAND 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.

4. General

- 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 a permanently attached junction box and #12 AWG (4 mm2) wire terminated in PV connectors. Your dealer can provide additional extension cables to simplify module wiring.
- Exercise caution when wiring or handling modules exposed to sunlight.
- Do not disconnect wires connected to a photovoltaic module when it 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.
- 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 attempt to disassemble the module, and do not remove any attached nameplates or components. Doing so will void the warranty.**
- Do not apply paint or adhesive to the module.
- **Do not use mirrors or other hardware to artificially concentrate sunlight on the module.**
- When installing modules observe all applicable local, regional and national codes & regulations. Obtain a building and/or electrical permit where required.

A. Safety precautions for installing a solar photovoltaic system

- Solar modules produce electrical energy when exposed to sunlight.
- 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.
- Only connect modules or series combinations of modules with the same voltage in parallel. If modules are connected in parallel, the total current is equal to the sum of individual module or series combination currents.
- 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 than those listed in the data sheet. Data sheet values are applicable at standard test data.
- 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.

B. General installation notes

- Drainage holes must not be covered with parts of the mounting system. 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 the module's junction box or electrical leads
- Do not stand or step on module.
- Do not drop the module or allow objects to fall on the module.
- Do not place any heavy objects on the module.
- Inappropriate transport and installation may damage the module glass or frame.

5. Mechanical Installation

A. Selecting the location

- 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.
- The module should not be shaded at any time of the day.
- Do not install the module near equipment or in locations where flammable gases can be generated or collected.

B. Selecting the proper mounting structure and hardware

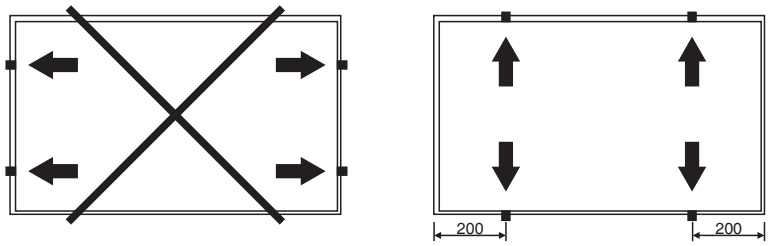
- Observe all instructions and safety precautions included with the mounting system to be used with the module.
- Do not drill holes in the glass surface of the module. Doing so will void the warranty.
- Do not drill additional mounting holes in the module frame. Doing so will void the warranty.
- Modules must be securely attached to the mounting structure using four mounting points for normal installation. If heavy wind or snow loads are anticipated, additional mounting points 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, corrosion- and UV-resistant material.
- The modules have been evaluated by TUV for mounting using the 8 provided mounting holes in the frame.
- Each module (or series string of modules so connected) shall be provided with the maximum series fuse as specified.

C. Mounting methods

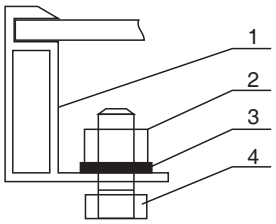
- The module mounting structure must be made of durable, corrosion-resistant and UV- resistant material.
- In regions with heavy snowfall in winter, select the height of the mounting system so that the lowest edge of the module is not covered by snow for any length of time. In addition, ensure that the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by flying sand.
- Modules must be securely attached to the mounting structure.
- Provide adequate ventilation under the modules in conformity to your local regulations. A minimum distance of 10 cm between the roof plane and the frame of the module is generally recommended.
- Always observe the instructions and safety precautions included with the module support frames.
- Do not attempt to drill holes in the glass surface of the modules as this will void the warranty.
- Do not drill additional mounting holes in the module frames of the modules as this will void the warranty.
- Before installing modules on a roof, ensure that the roof construction is suitable. In addition, any roof penetration required to mount the module must be properly sealed to prevent leaks.
- When installing a module on a pole, choose a pole and module mounting structure that will withstand the anticipated winds for the area.
- Dust building up on the surface of the module can impair with the module performance. SOLARLAND recommends installing the modules with a tilt angle of at least 10 degrees, making it easier for dust to be washed off by rain.
- Observe the linear thermal expansion of the module frames (the recommended minimum distance between two modules is 1 cm).
- Always keep the backsheet of the panel free from foreign objects or structural elements, which could come into contact with the panel, especially when the panel is under mechanical load.
- Ensure panels are not subjected 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: See the following section for more detailed information.

D. Installation

- The module must be attached and supported by at least four bolts through the indicated mounting holes.
- Depending on the local wind and snow loads, additional mounting points may be required.
- The modules have been evaluated by TUV for a maximum positive or negative design loading of 30 lbs/ft2.
- Each PV module should installed tightly at minimum of 4 points, if fixed mounting then points should be installed with M8 bolts in the frame on the long side of the panel and not the short side, as shown below:

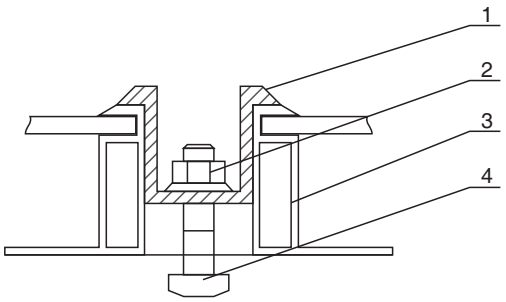


- When mounting the panel with the provided mounting holes, mounting must comply with the minimum requirements shown below:



1. Solar Panel,
2. Stainless steel nuts M8,
3. 2mm EPDM washer,
4. Stainless steel bolt

- When mounting the panel with third party mounting brackets, mounting must comply with the minimum requirements shown below:



1. Al-plate folder
2. Stainless steel flange nuts M8
3. Solar panel
4. Stainless steel of T bolt

- When using the provided mounting holes, fasten the M8 stainless steel bolts and nuts with 15-20N•m of torque. When using third party mounting system, please refer to the supplier's installation instructions for required clamping torque.

Recommended Tilt Angle for a Fixed System	
Site Latitude in Degrees	Fixed Tilt Angle
0° to 15°	15°
15° to 25°	Same As Latitude
25° to 30°	Latitude +5°
30° to 35°	Latitude +10°
35° to 40°	Latitude +15°
40° +	Latitude +20°

WARNING!

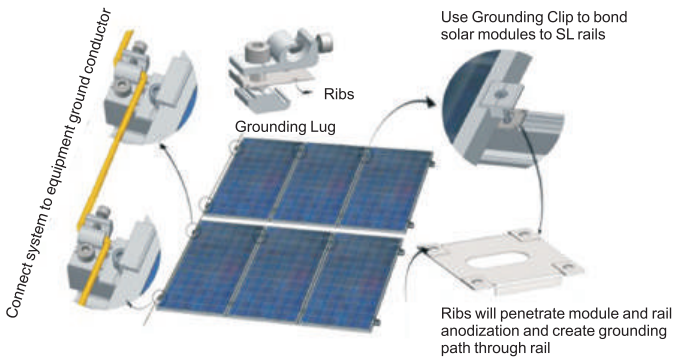
Electrical shock hazard! Do not touch bare conductors or other potentially energized parts.

E. Electrical installation

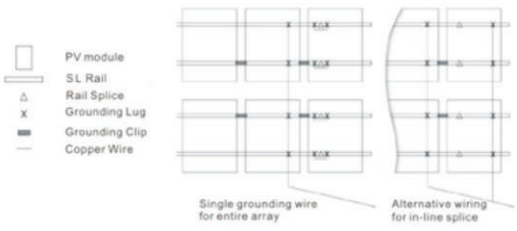
- Any hardware used must be compatible with the mounting structure material to avoid galvanic corrosion.
- It is not recommended to use modules with different configurations (grounding, wiring) in the same system.
- For applications requiring a high operating voltage several modules can be connected in series to form a string of modules; the system voltage is then equal to the sum of the voltage of each module.
- For applications requiring high operating currents several strings of modules can be connected in parallel; the system current is then equal to the sum of the current of each string of modules.
- Our modules are supplied with connectors to be used for system electrical connections, allowing both parallel and series connections.
- The maximum number of series connected modules depends on system design, the type of inverter used and environmental conditions.
- The maximum system voltage is 600 volts DC according to UL standards. However products are rated for use up to 1000V where UL standards do not apply.
- There is no limitation on the number of modules that can be connected in parallel; the number of modules is determined by system design parameters such as current or power output.
- Please refer to local regulations to determine the system wires size, type and temperature.
- To prevent the cables and the connectors from overheating, the cross section of the cables and the capacity of the connectors must be selected to suit the maximum system short circuit current (The recommended cable is PV wire with a cross section of at least 4mm2 and the recommended connector is Multi Contact MC4 or equivalent).
- 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 their grids vary from region to region. A qualified system designer or integrator should always be consulted to maintain validity of the module warranty. Building permits, inspections and approvals by the local utility are generally required.

F. Grounding

- For grounding and bonding requirements, please refer to regional and national safety and electricity standards. If grounding is required, use a recommended connector type for the grounding wire.
- If grounding is required, the grounding wire must be properly fastened to the module frame to assure adequate electrical connection.
- SOLARLAND recommends the lay-in lug and plates when grounding. Please refer to relevant connector specifications for instructions.
- For grounding lug, assemble the grounding lug to the aluminium frame using stainless steel M5 screw and hardware as shown below. The star washer is fitted directly under the grounding lug and makes electrical contact by penetrating the anodized coating of the aluminium frame. Recommended M5 screw assembly torque is 1.5 N•m. Next, insert the ground wire (10-12AWG exposed copper wire is recommended) to the feet of the lug, and screw down the slotted screw. Be careful not to damage the wire core.



Planning Layout



6. Maintenance

To ensure optimum module performance, SOLARLAND recommends the following maintenance measures:

- Clean the glass surface of the module when required. Always use clean water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent may be used to remove stubborn dirt.
- Check the electrical, grounding and mechanical connections every six months to verify that they are clean, secure, undamaged and free of corrosion.
- If any problem arises, consult a professional for suggestions.
- Caution: observe the maintenance instructions for all components used in the system, such as support frames, charging regulators, inverters, batteries etc.

7. Shutting down the system

- Completely cover system modules with an opaque material to prevent electricity from being generated while disconnecting conductors.
- Disconnect system from all power sources in accordance with instructions for all other components used in the system.
- The system should now be out of operation and can be dismantled. In doing so, observe all the safety instructions as applicable to installation.

8. 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 SOLARLAND's control; SOLARLAND 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 SOLARLAND 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 SOLARLAND's knowledge and experience and is believed to be reliable, but such information including product specification (without limitations) and suggestions does not constitute a warranty, expressed or implied. SOLARLAND reserves the right to change the manual, the product, the specifications, or product information sheets without prior notice.

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Please consult your distributor or the manufacturer concerning the warranty of your modules. If you have any further questions, your dealer will gladly assist you. Subject to technical modifications without notice.