Installation Manual for Photovoltaic Module

Contents

1. General Information

1.1. Overview

Thanks for choosing PV modules (hereafter referred to as “modules”) from SANY Silicon Energy (Zhuzhou) Co., Ltd. In order to ensure that the PV modules are installed correctly, please read the following instructions carefully before installing and using the modules.

Please remember that PV modules generate electricity and that certain safety measures must be taken to avoid danger.

The application class of modules: Class II (IEC61730:2016); Class A (IEC61730:2004).

1.2. Warnings

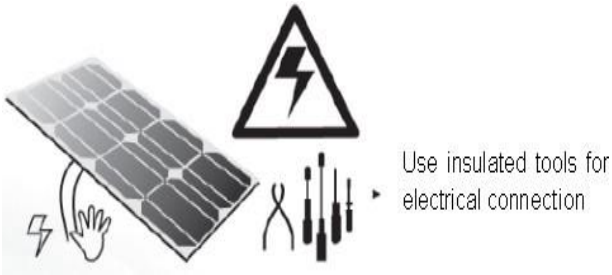
Precautions:

- Modules generate DC electrical energy when exposed to sunlight or other light sources. Improperly contact with live parts of the module such as terminals can result in burns, sparks, and lethal shock.
- Front glass is used for module protection. If the glass is damaged, the module may cause electrical safety hazard (electric shock or fire). Such modules cannot be repaired and must be removed and replaced immediately;
- Breakage of the rear glass (in the case of bifacial PV modules) can also lead to the issue of electrical safety. As in the case of monofacial modules, this cannot be repaired and the modules must be disconnected and replaced immediately.
- The table of specifications is measured under standard test conditions (Irradiance 1000W/m^2, module cell temperature 25℃, air mass=1.5). The current and voltage generated by modules in different environments are different from those listed in the specification table. Therefore, when determining the specifications of the rated voltage, cable capacity, fuse capacity, controller capacity, and other output power related specifications, take the values of 1.25 times the short-circuit current and open-circuit voltage marked on the module as reference, and consult with your inverter/controller supplier for the system configuration design.
- During all deliveries, ensure that the modules are not subject to big shocks during transportation, which may damage the assembly or cause cracks in the cell of modules.
- When the electrical load is working, do not disconnect modules without authorization; if disconnecting the connector is needed, the DC and AC inverters must be turned off first or the main switch of the converter must be cut off.
- When the battery storage system is connected with the PV system, the battery must be installed correctly, so as to protect the operation of the system and ensure the user safety; Follow the battery manufacturer's instructions for installation, operation, and maintenance.

Prohibitions:

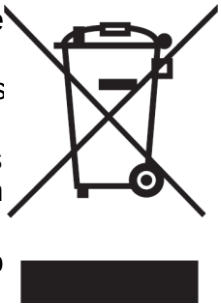
- Do not apply excessive force or objects on the surface of the module, do not impact, and do not twist the frame of the module, which may damage the cells or cause the cells to crack.
- Do not use the module to replace or partly replace roofs and walls of buildings.
- Do not remove any part installed by Sany or disassemble the module.
- Do not lift up the modules using the attached cables or the junction box.
- Modules (glass, junction boxes, connectors, etc.) shall be protected from long-term exposure to environments containing sulfur, acid, alkaline, etc., which may pose a risk of corrosion to the product, and organic solvents which can destroy anti-reflection (AR) coating on the front glass or have a negative impact on the polymers as junction boxes and back sheet.
- The junction box must meet IP68 (IEC60529) requirement, however it must be protected from direct sunlight and water immersion. The interconnection of female-male connectors shall meet the IP68 (IEC60529) requirements. However, it is not allowed to use the connector under water for a long time.
- The junction box and the connector shall not be in contact with oily substances, organic solvents and other corrosive materials that may cause functional failure, i.e., alcohol, gasoline, lubricants, rust inhibitors, herbicides, to avoid damage to the junction box and the connector. If the junction box and connector are contaminated, they are forbidden to use.
- Do not stand or step on the module like shown in the below pictures. This is prohibited and there is a risk of damaging the module and injuring the user.

- Do not touch live terminals with bare hands. Use insulated tools for electrical connections.
- Artificially concentrated sunlight shall not be directed onto the module. Do not expose the back of the monofacial module directly to sunlight.



Others:

- The maximum altitude of module installation is 2000m;
- The minimum distance from the seashore is 50m (for more info, please refer to 2.2.2).
- When looking at PV modules with anti-reflection (AR) coating technology, it will be normal to see module with a slight color difference at different angles, as the modules are used
- Before the installation of modules, the modules shall be kept under rainproof facility to avoid direct exposure to rain and sunlight.
- Meaning of crossed–out wheeled dustbin:
  Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
  Contact your local government for information regarding the collection systems available.
  If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
  When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.



For more, please contact Sany or refer to the operation and maintenance guideline

2. Installation

2.1 Installation Safety

- Always wear safety helmet, insulated gloves, insulated rubber shoes, and other protective measures during installation.
- When installing or maintaining the PV system, please do not wear metal rings, watches and other metal products, so as not to cause electric shock danger and damage the modules.
- Keep the module packed until installation. Once the modules are removed from the pallet, they shall be installed and connected to the inverter. If they are not installed immediately, protective measures (such as adding rubber joint cover, etc.) shall be taken on the connection head.
- Do not touch the PV module with bare hands during installation unless necessary. The glass surface and the frame may be hot. There is a risk of burns and electric shock. Use the standard safety tools and equipment when installing the modules.
- 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 module are wet.
- Use insulated tools and do not use wet tools.
- Only the modules of the same size and the specifications within same range can be connected in series.

- Connect the male and female connectors correctly, check the wiring condition, all wires shall not be detached from the modules, and secure the wires with cable ties so that the wires do not scratch or squeeze the back sheet of the modules.
- Do not touch the junction box or the connectors with bare hands during installation or under sunlight, regardless of the module is connected to or disconnected from the system.
- Do not drill holes in the frame without authorization from Sany, which may cause corrosion or other negative effects to the module.
- Thermal expansion and cold contraction effect occur on the modules. During installation, the interval between two adjacent modules must be ≥ 10mm. If there are special requirements, please confirm with Sany before installation;
- During installation, as for module removal, maintenance and any other related processes, it is recommended that the force applied between the cable and the connector, and the cable and the junction box to be no more than 60N.
- Do not install the modules anywhere close to open flames or exposed flammable and explosive gases.

2.2 Installation Condition

2.2.1 Climate Condition

The recommended weather conditions for installing modules are:

a) Humidity: < 85% RH
b) Ambient air temperature range: -40°C to + 40°C
c) Limit working ambient temperature range: -40°C to + 40°C
d) The Module(T98)max: 70 °C

2.2.2 Site Selection

In most applications, Sany PV modules should be installed in a location where they can 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 due South (or due North) will lose approximately 10 to 15 percent of their power output. If the module faces 60 degrees away from due South (or due North), the power loss will be 20 to 30 percent. Refer to the longitude and latitude of the location to determine the optimal azimuth of the module.

When choosing a site, avoid trees, buildings or obstructions that could create shadows on the modules. Shading causes loss of power output, even though bypass diodes have been installed for the module, shading will affect the optimum performance and safety issue of the PV modules. Operation in permanent shading conditions is not recommended.

Do not install the PV module near open flame or flammable materials.

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.

PV modules can be installed at a distance of 50m away from the seashore. In the case when the modules are installed within 50m to 500m distance from the seashore, the connectors shall be protected, i.e., adding dust plugs. After removing the dust plugs, connect the connectors immediately and take other anti-rust measures to prevent rust.

For roof-top installations, the roof must be covered with at least one layer of fireproof material suitable for the fireproof class of the PV modules. To facilitate ventilation and heat dissipation of the module, the minimum distance between modules and roof must be ≥ 10 cm. Walkways should be reserved for cleaning, repair and maintenance. For roof-top PV systems, please follow the safety principles of "from top to bottom" and "from left to right". Please use appropriate module components to comply with local laws and regulations, as well as the building fire safety requirements before installation, such as fuses, circuit breakers and grounding connectors, etc...

2.2.3 Tilt Angle Selection

During the installation, Sany suggests the module tilt angle maintained at more than 10° to allow the rain to wash away the dust, while the module with too small tilt angle requires more frequent cleaning, which will affect the appearance and performance of the modules.

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

For standalone systems, the tilt angle of the modules should be selected to optimize the performance based on the season and sunlight. In general, if the module output is adequate when the irradiance is low (i.e., winter), the angle chosen should be adequate during the rest of the year.

For grid-connected systems, modules should be tilted at the angle that the energy production from the modules will be maximized on an annual basis. The Fire Class Rating of a module for roof mounted system shall meet local code requirements in order to achieve the specified System Fire Class Rating for a non-BIPV module.

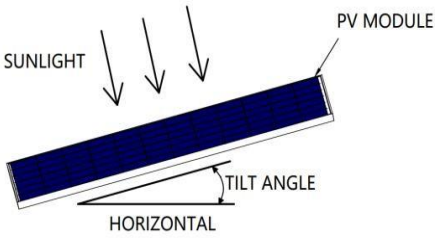


Fig. 1 PV module tilt angle

All PV systems have limitations of inclination required to maintain a specific System Fire Class Rating.

2.3 Mechanical Installation

Modules can usually be mounted by using the following methods: fixed installation-mounting with bolts.

※Note:

1) All installation methods herein are only for reference, and are based on the test results from third-party tests and Sany internal tests;

2) Sany will not provide related mounting accessories, the system installer or trained professional personnel must be responsible for the PV system's design, installation, and mechanical load calculation and system security.

3) Before installation, the following items shall be addressed:

a) Visually check the module for any damage. Clean the module if any dirt or residue remains;

b) Check if module serial number stickers match.

4) The maximum loads that different types of modules can withstand on the front side and back side are dependent on installation methods, which can be referred to Table 2. If there is heavy snow and strong wind on the module installation site, take special protection to meet the actual requirements.

5)The module must be mounted on the bracket according to the following installation. If there are other installation, please consult Sany group and obtain approval, otherwise the warranty will be invalid.

Note: Maximum Test Load = 1.5 (Safety factor) x Design load

2.3.1 Fixed installation-mounting with bolts

Install the module on the rack using anti-corrosion bolts, elastic washers and flat washers with sufficient torque to allow the module to be properly secured. The reference value of tightening torque for M8 bolt is 16-20 N*M, and for M6 bolt is 9-12 N*M. If special mounting system or special installation method is required, please reconfirm with the supplier for regarding the torque value. See Figure 2 for detailed installation information.

See Figure 3 for the module models with corresponding installation positions for bolt installation (using 4 inner holes), Table 1 lists different sizes of bolts for different mounting holes.

Mounting hole (mm)	Recommended bolt size
14x9	M8
10x7	M6

Table 1 Bolts for different mounting holes

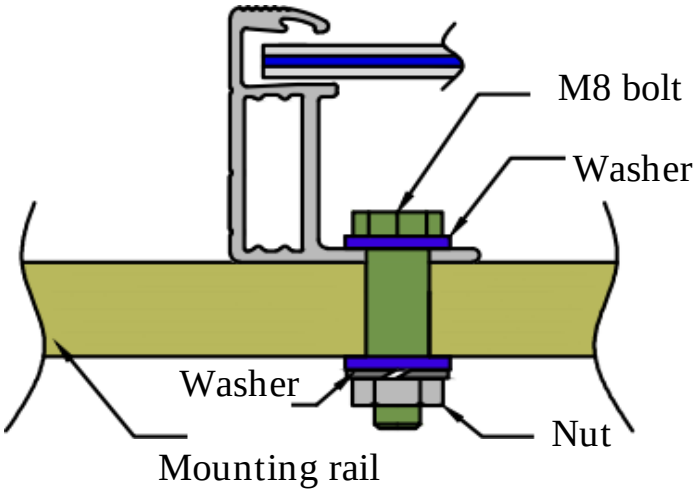


Fig. 2 Mounting with bolts

2.3.1.1 Bolt mounting method

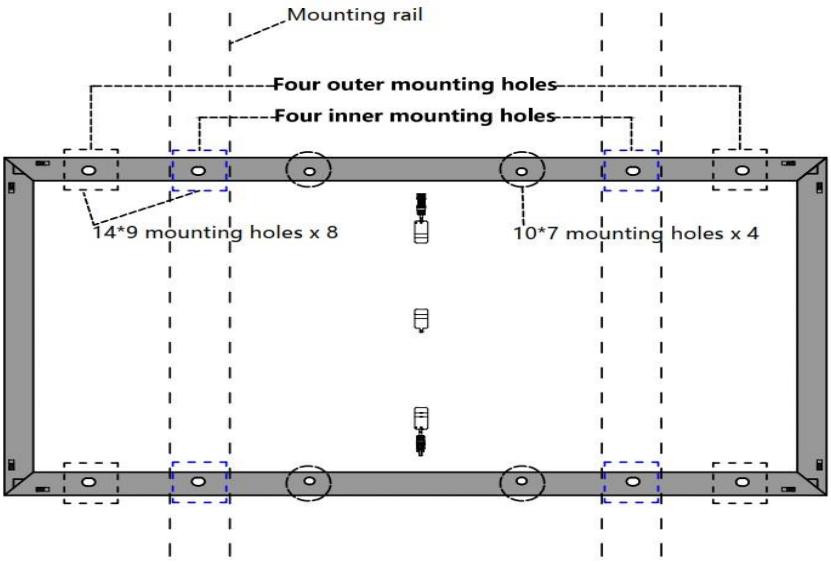


Fig. 3 Installation with bolt（Four inner mounting holes）

Module type	Four inner mounting holes bolt installation Test load	Four outer mounting holes bolt installation Test load
SYMN156TBD SYMN108TBDB SYMN108TBDBF	+5400Pa(Front), -2400Pa(Back)	+3600Pa(Front), -1800Pa(Back)
SYMN144TBD	+3600Pa(Front), -1800Pa(Back)	+5400Pa(Front), -2400Pa(Back)

Table 2 Test loads under four inner and outer bolt installation methods for different module types

(Note: Other installation methods and load capacity not listed inTable 2,

please contact Sany Silicon for more details)

2.3.1.2 Fixed installation-mounting with clamps

The clamps must not be installed in contact with the front glass of the module and must not deform the module frame. Recommended clamp schematic shown as followed (see Figure 4). Ensure that the clamps do not create a shadow on the module. Under no circumstances may the frame be altered. When choosing the mounting method for the clamps, make sure that there are at least four clamps on each module. Different mounting positions of the clamps determine the maximum load capacity of the module. Table 5-6 as followed show the different mounting methods and the positions of the clamps for the different mounting methods. The distance between the installation position of the longside clamp and the edge is represented by L in Table 5-6. The distance between the installation position of the short side clamp and the edge is represented by S in Table 5-6. Depending on the local wind and snow loads, if there is a possibility of excessive load combinations:

a) Additional clamps could be required to ensure that the module has enough load carrying capacity.

Clamp dimensions, contact area and torque must follow minimum values shown in Table 3.

b) Longer and/or stronger profiles/rails could be required to ensure that the module has enough load carrying capacity.

c) Oversized modules (size over 2.2m*1.3m) are recommended to be mounted with the camber clamps shown in Fig. 4 d), which enables the clamps to fit better with the frame and provide more stable performance under extreme environmental conditions. The torque value applied during installation of the clamps should be high enough to securely hold the module. Please always consult the installer or bracket supplier for exact torque value.

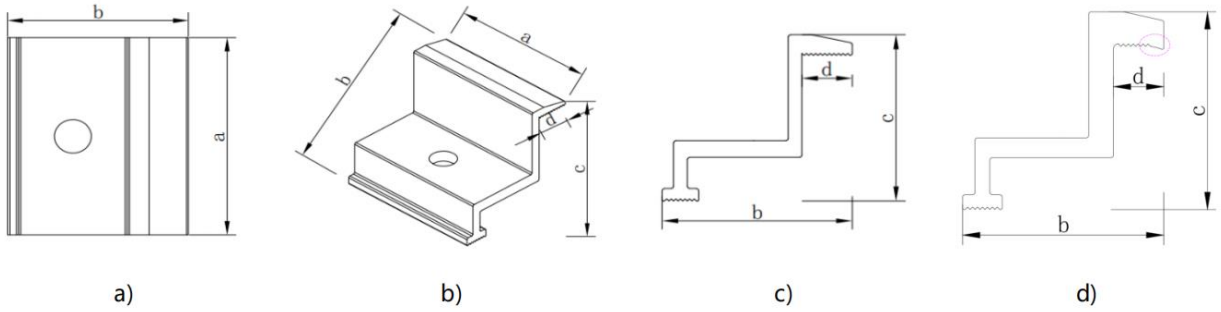


Fig. 4 Recommended clamp schematic

Length of the clamp (a)	≥50 mm
Width of the clamp (b)	≥30 mm
Height of the clamp (c)	≥30 mm
Thickness	≥3 mm
Overlap of the frame of the module (d)	10-11 mm
Torque	16-20 Nm (M8 bolt)

Table 3 Minimum values for clamp dimensions, contact area and torque

The minimum dimensions of clamps specified in this installation manual have been tested and verified through the installation process and serve as a baseline for proper installation. However, it is important to note that these minimum values may not guarantee compatibility with all variations of clamps that may exist in the market. Using clamps with dimensions lower than the recommended minimums may result in insufficient clamping force and compromise the integrity of the installation. It is important to ensure that any alternative clamps used in the installation meet the necessary performance standards and do not compromise the safety and integrity of the system.

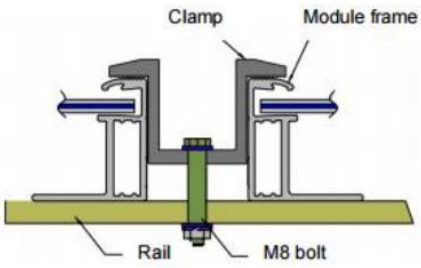
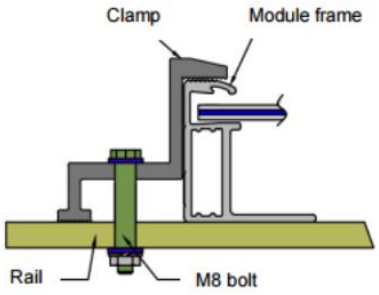
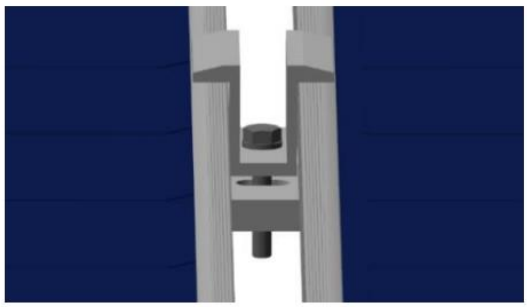
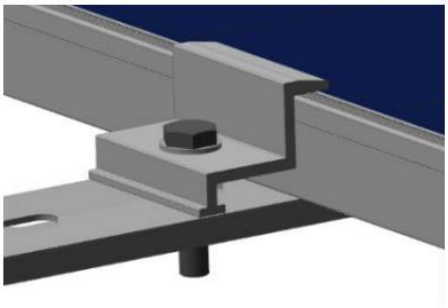
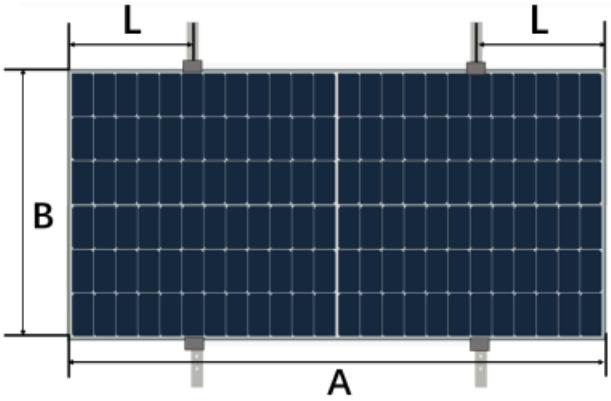
	
	
Middle clamp module installation	**End clamp module installation**

Table 4 PV module installed at the side with Clamp mounting

Please thoroughly review the maximum test load specified for each module type, contingent on the chosen installation method.

Long side clamping with rails



Long side clamping (4pcs.), rails (2pcs) parallel to short side.

Module Type	Maximum test load (Pa)	Mounting Range
SYMN156TBD	+5400 /-2400	L=A/4±40mm
SYMN144TBD	+5400 /-2400	L=A/4±40mm
SYMN108TBDB	+5400 /-2400	L=A/4±40mm
SYMN108TBDBF	+5400 /-2400	L=A/4±40mm

Table5 Maximum test load values for different modules with long side clamps mounted with rail

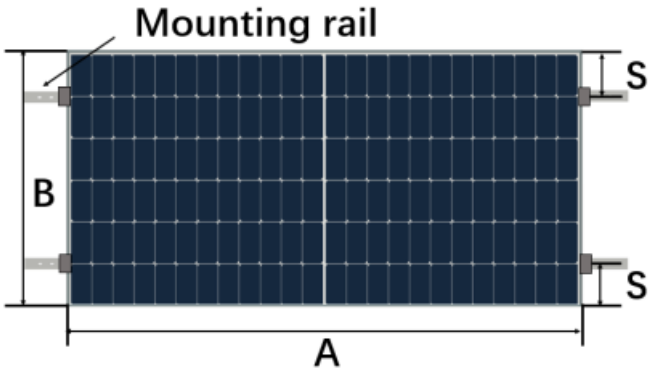
Short-side clamping with rails		
 Short side clamping (4pcs.), rails (2pcs) parallel to long side.		
Module Type	Maximum test load (Pa)	Mounting Range
SYMN108TBDB	+1600 /-1600	S=100-240mm
SYMN108TBDBF	+1600 /-1600	S=100-240mm
SYMN156TBD	/	/
SYMN144TBD	/	/

Table 6 Maximum test load values for different modules with short clamps mounted with rails

3.Wiring and Connection

In order to ensure the normal operation of the system, when connecting the module or loads (such as inverters, batteries, etc.), observe to ensure that the polarity of the cable is connected correctly. If modules are not connected correctly, the bypass diode could be damaged. PV modules can be connected in series to increase the voltage and connected in parallel to increase the current, as shown in Figure 5.

Before connecting the module, please make sure using the connector approved by Sany. Otherwise, Sany does not responsible for any potential problem.

When conducting electrical connection of the modules, please use diagonal pliers to cut the cable tie. When cutting the tie, be careful not to scratch the cable and backsheet. According to the electrical requirements. The positive and negative connectors should be connected in turn, and confirm that you hear a "click" to indicate that the connection is successful. Otherwise, during the operation of the modules, this could lead to electric arc due to poor connections and can burn the connectors.

Before the commissioning and operation of the power station, please check the electrical connection of modules and strings, making sure all connection polarity is correct and the open circuit voltage meets the requirements of the acceptance criteria.

The number of modules in series and in parallel shall be designed reasonably according to the system configuration.

All the above instructions must be followed to meet Sany warranty conditions..

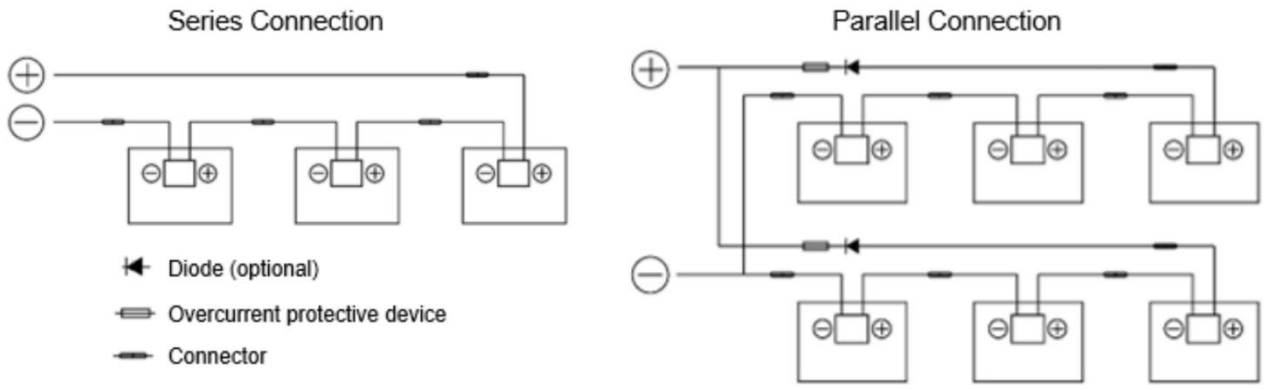


Fig. 5. Series and parallel connection circuit diagram.

Sany recommends the following two wiring methods for portrait and landscape installations with short and long cable lengths, respectively.

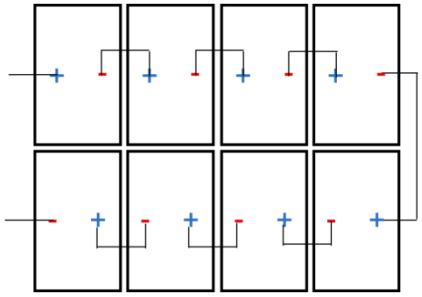


Fig. 6.Dual-row module wiring schematic

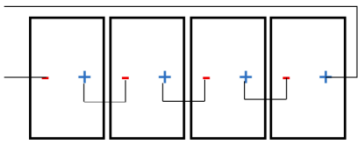


Fig. 7.Single-row module wiring schematic

(Note: the exact number of series connections will be determined according to the actual design)

※Note:

a) When installing and connecting modules, the foam tube must be removed first, Sany will not guarantee the safety of products and the consistency of technical parameters if the connecting heads and tools used are not officially specified by Sany or are not installed according to the official requirements.

b) PV modules connected in series shall have similar current, (please contact Sany if there is any concern), and modules must not be connected together to create a voltage higher than the permitted system voltage. The maximum number of modules in series depends on system design and the rating of the inverter used.

c) The maximum fuse rating value in an array string can be found on product label or product datasheet. The fuse rating value is also corresponding to the maximum reverse current that a module can withstand, for example, when one string is in shade then the other parallel strings of modules will be loaded by the shaded string and the current will pass through to create a current circuit. Based on the maximum series fuse rating of module and local electrical codes and standards, make sure the modules strings in parallel are protected with the appropriate in-line string fuse.

d) Open the combiner box of the control system and connect the conductor from the PV arrays to the combiner box in accordance with the design and local codes and standards. The cross-sectional area and cable connector capacity must meet the maximum short-circuit current requirement of the PV system (for a single module, it is recommended that the cross-sectional area of cables be 4mm^2 and the rated current of connectors be more than 10A), otherwise cables and connectors will become overheating for large current. Please pay attention that the temperature limit of cables is 90℃.

e) The module frame must be grounded, and the grounding design should be in accordance with local national, regional or international regulations, laws and standards, and the grounding connection should be carried out by qualified electricians.

f) The grounding device must penetrate the anodic oxide film of the component frame and make full contact with the interior of the aluminum alloy, and the grounding conductor must be connected to earth ground through a suitable grounding electrode.

g) There are grounding holes with a diameter of 4mm on the long side of the back frame of the module by the edge part, the hole can only be used for grounding, can not be used for the installation of the module, and the frame of the module shall not be punched with additional holes.

h) Grounding devices and materials shall be provided by qualified manufacturers. Bolts, nuts and washers shall be of a size to match the grounding hole and made of stainless steel, and grounding wires shall be made of copper core wires with a size of AWG 6-12 (4-14mm^2) and shall comply with the requirements of the relevant local national, regional or international regulations, laws and standards.

i) Sany recommends grounding mode: bolted grounding, shown in Figure 8. The bolts should be tightened when grounding is installed and no damage should be done to the module frame or the grounding wire. The torque of the screw is 4-5 N.M.

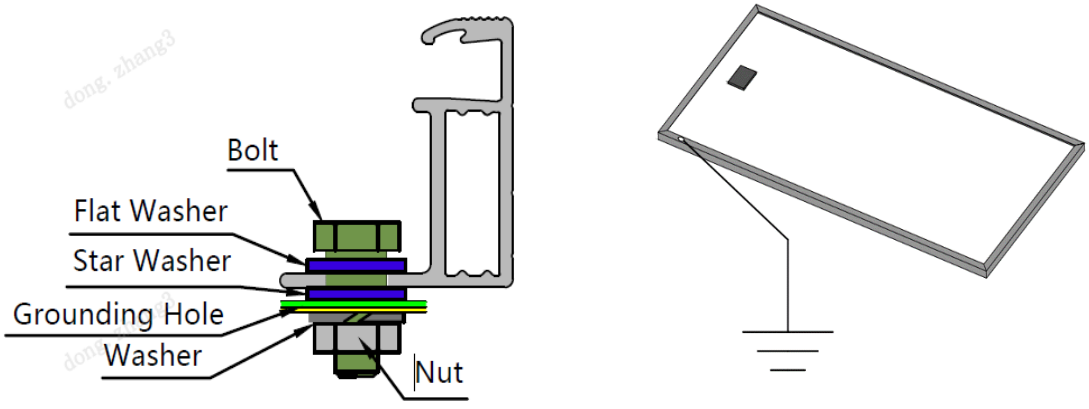


Fig. 8 Grounding of PV modules

j) Follow the requirements of applicable local and national electrical codes.

k) Modules contain factory-installed bypass diodes. If modules are incorrectly connected to each other, the bypass diodes, cable or junction boxes may be damaged.

l) The length of the junction box shall be determined according to the component specifications and the customer's design proposal. As shown in Figure 9 below, consider the length of the lead wire before

designing the wiring.

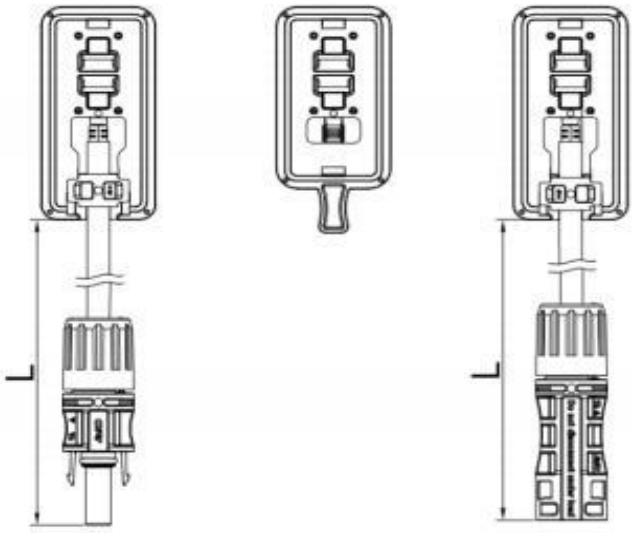


Fig. 9 The half–cut cell module/ split junction box

m) -If modules are connected in series, the total voltage is equal to the sum of individual voltages. The recommended system voltage is as below,

System voltage ≥ N*Voc [1+TCVoc* (Tmin-25)]

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

Where:

N	module numbers in series
Voc	Open circuit voltage (refer to product label or data sheet)
TCVoc	Temperature coefficient of open circuit voltage (refer to product label or data sheet)
Tmin	Minimum ambient temperature

n) For floating projects, please contact local technical support.

o) Connectors and bybass diodes from different manufacturers should not be mated together. If such replacement is needed, please contact Sany Silicon Energy.

4.Maintenance and Care

It is required to perform regular inspection and maintenance of the modules, especially during the warranty period. To ensure optimum module performance, Sany recommends the following maintenance measures:

4.1 Visual Inspection

Inspect the modules visually to find if there are any visual defects, if there are, the following items should be evaluated:

a) If the modules are observed having slight module color differences at different angles, this is a normal phenomenon for modules with anti-reflection coating technology. If the colors are within the cell, please consult Sany for further analysis.

b) Whether the glass is broken.

c) No sharp objects are in contact with the PV module surfaces.

d) The PV modules are not shaded by unwanted obstacles or foreign material.

e) Corrosion along the cells' busbar. The corrosion is caused by moisture intrusion thought the module back sheet. Check the back sheet for damage.

f) Check whether the back sheet is burnt.

g) Check if screws and mounting accessories are tight, adjust and tighten as necessary.

4.2 Cleaning

a) A buildup of dust or dirt on the module front face will result in a decreased energy output. Clean the module preferably once per annum, more frequently in dusty conditions, using soft cloth dry or damp. Water with high mineral content may leave deposits on the glass surface and is not recommended. It is recommended to use neutral water of the PH value ranging from 6.5 to 8.5 to clean the glass, so as not to cause damage to the glass coating layer;

b) Never use abrasive material under any circumstances;

c) In order to reduce the potential for electrical and thermal shock, Sany recommends to clean PV modules during early morning or late afternoon hours when solar irradiation is low and the modules are cooler, especially in regions with hot temperatures;

d) Never attempt to clean PV module with broken glass or other signs of exposed wiring, as this presents a shock hazard;

e) Never use chemicals when cleaning modules as this may affect the module warranty and energy yield. For the environment with extreme climate, please contact Sany after-sales department for specific requirement if needed;

f) For single-side module, back sheet cleaning is not necessary; for dual-glass module, cleaning the module backside regularly when necessary, and follow the requirements in 4.2 a) – e). Please wear insulated gloves and pay special attention to the cables and electrical connections during the backside cleaning.

4.3 Inspection of Connector and Cable

It's recommended to implement the following preventive maintenance every 6 months:

a) Check the sealing gels of the junction box for any damage.
b) Examine the modules for signs of deterioration. Check all wiring for possible rodent damage, weathering and that all connections are tight and corrosion free. Check the electrical grounding.

5. Electrical Specification

5.1 Electrical property

For the electrical design, please find the main electrical parameters shown in the datasheet and product label.

- Modules must be installed and connected with the foam tube removed first. Sany does not guarantee the safety of the product or the consistency of the technical parameters if the connectors and tools used are not officially designated by Sany or are not installed according to specifications.

- Modules can be connected both in series or in parallel，reasonable design is required according to the system configuration. In any case, string size (quantity of modules that can be connected together, in series/parallel) must be calculated taking into consideration local regulations, chosen inverter and project location (environmental conditions, which may vary from STC). This must be done by qualified professionals.

- When modules are in series, the string voltage is the sum of each module individual voltage. Modules with different electrical parameters must not be connected in series. String voltage must not be higher than the maximum permitted system voltage, as well as inverter’s maximum input voltage and other electrical devices that may be installed in the system. To assure this, we recommend calculating the open circuit voltage of the array at the lowest
expected ambient temperature of the project location, by using the following formula:

$$Max.\,system\ voltage \geq N \cdot V_{oc} \cdot [1 + TC_{VOC} \cdot (T_{min} - 25)]$$

Where：

N = Number of modules in series.

Voc = Open circuit voltage (refer to product label or datasheet).

TCvoc = Temperature coefficient of open circuit voltage (refer to product label or datasheet).

Tmin = Minimum ambient temperature.

- When modules are connected in parallel, the string current is the sum of each module individual current. In this case, the maximum recommended number of parallel connections is:

$$N \leq （Fuse\ Rating\ / I_{sc}） + 1$$

Where：

N = Number of maximum parallel connections.

Fuse Rating = Maximum fuse rating value in an array string (refer to product label or datasheet).

Isc = Short circuit current (refer to product label or datasheet)

-PV modules connected in series shall have similar current, (please contact Sany if there is any concern), and modules must not be connected together to create a voltage higher than the permitted system voltage stated in the label of the module. The maximum number of modules in series depends on system design and the rating of the 17 inverter used.

- The maximum current rating of the module array is identified on the product nameplate or in the product specification, and the current rating also relates to the maximum reverse current that can be applied to a single module. For example, when a module is shaded, other modules connected to it will form a load causing a current loop. Depending on the maximum fuse current rating of the modules and the local electrical installation standards, the connection of parallel strings of modules needs to be fitted with suitable fuse protection for circuit protection reasons.
- Open the combiner box of the control system and connect the conductor from the PV arrays to the combiner box in accordance with the design and local codes and standards. The cross-sectional area and cable connector capacity must satisfy the maximum short-circuit of the PV system (for a single module, it is recommended that the crosssectional area of cables be 4mm^2 and certified to IEC 62930 type 131), otherwise cables and connectors will become overheating for large current. Please pay attention that the temperature limit of cables is 90℃.
- Sany modules junction boxes contain factory-installed bypass diodes. These diodes are connected in parallel with each cell string to allow the current flow to the next cell array in case there are hot spots or partial shadows in any of the other cells' string. This will avoid performance and heating losses.
- If modules are incorrectly connected to each other, the bypass diodes, cables or junction boxes may be damaged.
- Keep in mind that bypass diode is not an over-current protection.
- Please do not try to open module junction boxes by yourself.
- Bypass diodes from different manufacturers should not be mated together. If such a replacement is needed, please contact Sany.
- For floating projects, please contact local technical support.

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 the control of Sany, Sany 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 Sany for any infringement of patents or other rights of third parties, which may result from use of the PV product. NO license is granted by implication or otherwise under any patent or patent rights.

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7. Annex of model types

Module type	Power

SYMN156TBD625	625W
SYMN156TBD630	630W
SYMN156TBD635	635W
SYMN156TBD640	640W
SYMN156TBD645	645W
SYMN144TBD575	575W
SYMN144TBD580	580W
SYMN144TBD585	585W
SYMN144TBD590	590W
SYMN144TBD595	595W
SYMN108TBDB425	425W
SYMN108TBDB430	430W
SYMN108TBDB435	435W
SYMN108TBDB440	440W
SYMN108TBDB445	445W
SYMN108TBDFB425	425W
SYMN108TBDFB430	430W
SYMN108TBDFB435	435W
SYMN108TBDFB440	440W
SYMN108TBDFB445	445W

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