云上新能源光伏组件
安装维护手册
Yoursun New Energy
Photovoltaic Modules
Installation and Maintenance Manual

本手册包含云上新能源光伏组件（以下简称“组件”）安装和维护的重要说明。安装和维护人员工作时，应遵循本手册说明的全部安全防范措施描述。安装光伏系统需要专门的技能和知识。安装只能由合格人员执行。在安装光伏系统之前，安装人员应熟悉其机械和电气要求。将本指南保存在安全的地方，以备将来在维护， 出售或处置组件时参考。如有任何疑问，请联系我们的全球技术支持部门以获取更多信息。

This manual contains important instructions for the installation and maintenance of Yoursun New Energy's (hereinafter referred to as "Yoursun") photovoltaic modules (hereinafter referred to as "modules"). Installation and maintenance personnel should follow all safety precautions described in this manual when working. Installing photovoltaic systems requires specialized skills and knowledge. Installation may only be performed by qualified personnel. Before installing a photovoltaic system, the installer should be familiar with its mechanical and electrical requirements. Keep this guide in a safe place for future reference when maintaining, selling, or disposing of the modules. If you have any questions, please contact our Global Technical Support department for more information.

1、介绍/Introduction

感谢您选择云上新能源光伏组件!

本手册包含电气和机械安装的基本信息，您在处理和安装云上新能源光伏组件之前必须了解这些信息。本手册还包含您需要熟悉的安全信息。本手册中描述的所有信息均为云上新能源的知识产权，并基于云上新能源已获得和积累的技术和经验。

本手册不构成任何明示或暗示的质保。对于因组件的安装、操作、使用或维护引起的或以任何方式与之相关的损失、损坏或费用，云上新能源不承担任何责任。云上新能源对因使用组件可能导致的任何侵犯第三方专利或其他权利的行为不承担任何责任。云上新能源保留更改产品、规格或安装维护手册的权利。

不遵守本手册中列出的要求将使云上新能源在向直接客户销售的同时提供的组件有限质保失效。请将本手册的副本提供给光伏系统所有者以供参考，并告知他们安全、操作和维护的所有相关方面信息。

Thank you for choosing Yoursun Photovoltaic Modules!

This manual contains basic information on electrical and mechanical installation that you must understand before handling and installing PV modules. This manual also contains safety information that you need to be familiar with. All information described in this manual is the intellectual property of Yoursun and is based on the technology and experience that Yoursun has acquired and accumulated.

This manual does not constitute any express or implied warranty. Yoursun shall not be liable for any loss, damage or expense arising out of or in any way related to the installation, operation, use or maintenance of the modules. Yoursun is not responsible for any infringement of third-party patents or other rights that may result from the use of modules. Yoursun reserves the right to change products, specifications or installation and maintenance manuals.

Failure to comply with the requirements listed in this manual will void the limited warranty on modules provided by Yoursun when sold to direct customers. Please provide a copy of this manual to photovoltaic system owners for their reference and to inform them of all relevant aspects of safety, operation and maintenance.

2、代码和法规/Codes and regulations

光伏系统的机械和电气安装应按照所有适用规范进行，包括电气规范、建筑规范和电力设施互连要求。这些要求可能因安装位置而异。要求也可能因系统电压或者直流和交流应用的差异而不同。联系当地监管机构以了解相应规定。

Mechanical and electrical installation of photovoltaic systems shall be performed in accordance with all applicable codes, including electrical codes, building codes and electrical utility interconnection requirements. These requirements may vary depending on the installation location. Requirements may also vary based on differences in system voltage or DC and AC applications. Contact your local regulatory agency to learn about regulations.

3、一般信息/General information

产品鉴别/Product identification

铭牌：铭牌描述了产品类型、峰值功率、最大功率电压、开路电压、短路电流，均在标准测试条件下测得；认证标志，最大系统电压等等。

Nameplate: The nameplate describes the product type, peak power, maximum power voltage, open circuit voltage, short circuit current, all measured under standard test conditions; certification mark, maximum system voltage, etc.

典型的铭牌标签/Typical nameplate label

条码：每个组件都有一个唯一的序列号。序列号有20位数字。第6、7位为年码，第8、9位为月码，第10、11位为数据码。例如，YS10123061000010001表示该组件是在 2023.6.10 组装和测试的。每个组件只有一个条码。它永久固定在组件内部。这个条码是在层压前放入组件的。
Barcode: Each module has a unique serial number. The serial number has 20 digits. The 6th and 7th digits are the year code, the 8th and 9th digits are the month code, and the 10th and 11th digits are the data code. For example, YS10123061000010001 indicates that the modules was assembled and tested on 2023.6.10. There is only one barcode for each modules. It is permanently fixed inside the modules. This barcode is put into the modules before lamination.

典型的序列号条形码标签/Typical serial number barcode label

4、常规安全要求/General safety requirements

云上新能源组件符合安全等级Ⅱ。该类组件可用于公众可能接触的、大于直流50V或240W以上的系统。

当组件安装在屋顶上时，屋顶必须有适合这种应用的防火材料盖层。屋顶光伏系统只能安装在能够承受光伏系统重量的屋顶上。一个合格的工程师需要对屋顶进行详细的结构分析。

为了您的安全，在确定并采取安全预防措施之前，请勿尝试在屋顶上工作，包括但不限于坠落保护措施、梯子或楼梯以及个人防护设备。

为了您的安全，请勿在不利条件下安装或处理组件，包括但不限于强风或阵风以及潮湿或结霜的屋顶表面。

Yoursun modules meet the security level II. This type of modules can be used in systems greater than DC 50V or 240W that may be exposed to the public.

When modules are installed on a roof, the roof must have a covering of fire-resistant material suitable for this application. Rooftop PV systems can only be installed on roofs that can support the weight of the PV system. A qualified engineer will need to perform a detailed structural analysis of the roof.

For your safety, do not attempt to work on the roof until safety precautions have been identified and implemented, including but not limited to fall protection, ladders or stairs, and personal protective equipment.

For your safety, do not install or handle modules under adverse conditions, including but not limited to strong or gusty winds and wet or frosty roof surfaces.

4.1 电气性能安全/Electrical performance safety

光伏组件在光照下可以产生直流电，因此可能产生电击。高于30V的直流电压是可能致命的。

组件未连接到电路或负载时也会产生电压。在阳光下使用组件时，请使用绝缘工具和佩戴合规的绝缘橡胶手套。

组件没有开关。只有将组件从阳光下移开，或者用布、纸板或其他完全不透明的材料将它们完全覆盖，才能使组件失效。

为避免电弧和电击，请勿在负载下断开电气连接。错误的连接也可能导致电弧和电击。因此请保持连接器干燥清洁，并确保它们处于正常工作状态。切勿将金属物体插入连接器，或改装它们。

另外，为避免沙子或水汽进入造成连接安全问题，组件从纸箱中取出后，需要安装并连接到汇流箱；安装过程中保持连接器干燥清洁，如果组件在一周内没有安装，应加装橡胶连接器盖作为保护措施。请注意，沙子、灰尘和水的污染会导致连接器产生电弧和电击。我们建议客户增加橡胶连接器盖作为保护方法，特别是在灰尘大的地区或盐度较高或污染严重的海边地区。

雪或水的反射可以增加阳光，从而增加电流和功率。此外，较冷的温度可以大大增加电压和功率。如果玻璃或其他材料损坏，请佩戴个人防护设备并将组件从电路断开。

只能在干燥的条件下工作，并且只能使用干燥的工具。除非穿戴适当的防护设备，否则不要在潮湿时处理组件。如果您需要清洁组件，请按照说明书中提到的清洁要求进行清洁。

安装必须在合格电工的指导下进行。

Modules can produce direct current when exposed to light, so electric shock may occur. DC voltages above 30V are potentially fatal.

Voltage can also be generated when a module is not connected to a circuit or load. When working with modules in the sun, use insulated tools and wear compliant insulating rubber gloves.

The module has no switch. Modules can only be rendered ineffective by removing them from sunlight or completely covering them with cloth, cardboard, or other completely opaque material.

To avoid arcing and electric shock, do not disconnect electrical connections under load. Incorrect connections can also cause arcing and electric shock. So keep connectors dry and clean, and make sure they are in proper working order. Never insert metal objects into connectors or modify them.

In addition, in order to avoid connection safety issues caused by the entry of sand or water vapor, the modules need to be installed and connected to the combiner box after being taken out of the carton; the connectors should be kept dry and clean during the installation process. If the modules are not installed within a week, a rubber connector cover should be installed as a protective measure. Please note that contamination from

sand, dust, and water can cause arcing and electric shock in the connectors. We recommend customers to add rubber connector covers as a method of protection, especially in dusty areas or seaside areas with high salinity or serious pollution.
Reflection from snow or water can increase sunlight, thereby increasing current and power. Additionally, cooler temperatures can greatly increase voltage and power. If glass or other materials are damaged, wear personal protective equipment and disconnect the module from the circuit.
Only work in dry conditions and use only dry tools. Do not handle modules when wet unless wearing appropriate protective equipment. If you need to clean modules, please follow the cleaning requirements mentioned in the instructions.
Installation must be carried out under the guidance of a qualified electrician.

4.2 操作安全/Operational safety

运输和存储时，请勿打开组件包装，直到安装前。

同时请保护包装免受暴露损坏。防止托盘翻倒。请勿超过托盘堆放的最大高度。将托盘存放在通风、防雨和干燥的地方，直到组件准备好拆包。

在任何情况下都不要通过抓住组件的接线盒或电线来提起组件。不要将组件掉落在另一个组件上。

请勿在组件上放置任何重物以避免玻璃破裂。

将组件放在表面上时要小心，尤其是在组件的角上。不适当的运输和安装可能会损坏组件。不要试图拆卸组件，也不要从组件上取下任何附加的铭牌或配件。

不要在组件的表面涂上油漆或粘合剂。

不要在边框上钻孔。这可能会损害框架强度并导致框架腐蚀。

请勿刮擦边框的阳极氧化涂层（接地连接除外）。它可能会导致腐蚀并影响其强度。不要尝试修复玻璃损坏的组件。

报废组件应由有资质的机构回收处置。

在干燥地区，组件在安装过程中容易受静电影响。安装人员应佩戴防静电装，确保设备和安装人员不受静电影响。

During transportation and storage, do not unpack modules until just before installation. Also protect the packaging from exposure damage. Prevents the pallet from tipping over. Do not exceed the maximum height for stacking pallets. Store the pallet in a ventilated, rain-proof and dry place until the modules are ready to be unpacked.
Do not under any circumstances lift a module by grasping its junction box or wires. Do not drop modules on top of another module.
Do not place any heavy objects on the module to avoid glass breakage.

Be careful when placing modules on surfaces, especially at the corners of modules. Improper transportation and installation may damage modules. Do not attempt to disassemble the module or remove any attached nameplates or accessories from the module.

Do not apply paint or adhesive to the surface of the module.

Do not drill holes in the frame. This can compromise frame strength and cause frame corrosion.

Do not scratch the anodized coating of the bezel (except for the ground connection). It can cause corrosion and affect its strength. Do not attempt to repair modules with damaged glass.

End-of-life modules should be recycled and disposed of by qualified institutions.

In dry areas, modules are susceptible to static electricity during installation. Installers should wear anti-static clothing to ensure that the equipment and installers are not affected by static electricity.

4.3 防火/Fire protection

有关建筑或结构防火安全的指南和要求，请咨询当地政府。云上新能源光伏组件的设计符合IEC 61730标准。对于屋顶安装，组件应安装在适合此应用的防火覆盖物上，组件背面和安装件之间应有足够的通风表面。屋顶结构和安装可能会影响建筑物的防火安全。安装不当可能会造成危害。

根据地方当局的要求，使用适当的组件，例如保险丝、断路器和接地连接器。不要在可能产生易燃气体的地方使用组件。

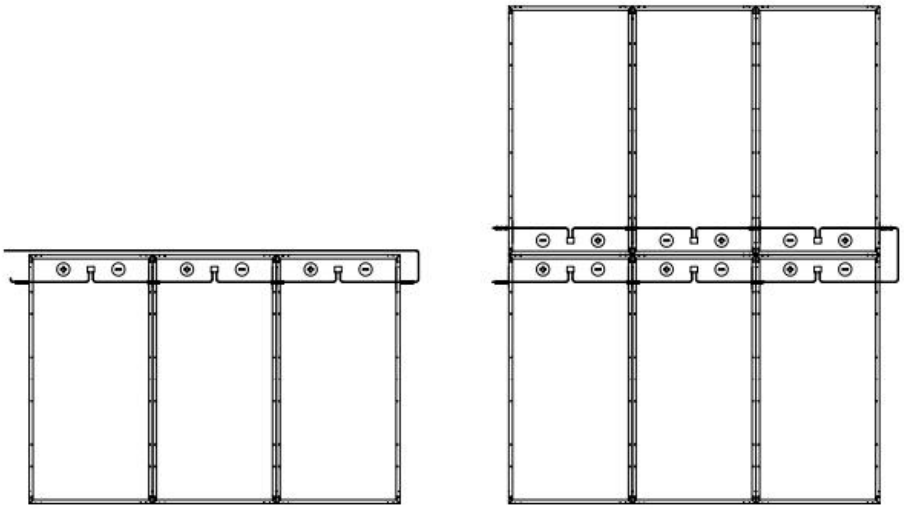
Consult your local government for guidance and requirements regarding fire safety in buildings or structures. The design of Yoursun modules complies with IEC 61730 standards. For rooftop installations, modules should be mounted over a fire-resistant covering suitable for the application, with adequate ventilation surfaces between the back of the module and the mounting. Roof construction and installation can affect a building's fire safety. Improper installation may cause hazards.

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...

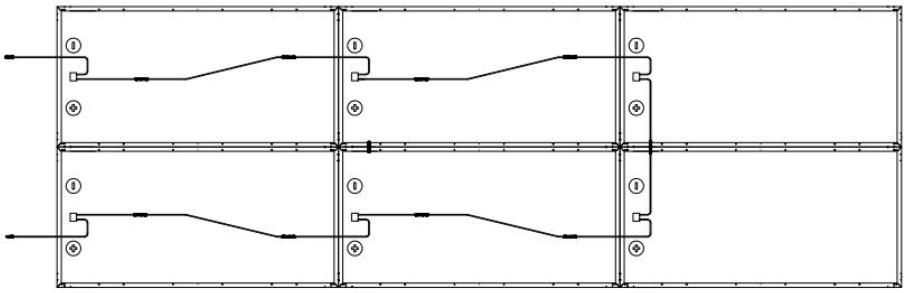
Use appropriate components such as fuses, circuit breakers and grounding connectors as required by local authorities. Do not use components where flammable gases may be generated.

4.4 接线方法/Wiring method

垂直安装



Vertical installation



横向安装/Horizontal installation

5、安装/Installation

组件的安装可以采取以下的方式：固定支架-螺栓安装，固定支架-压块安装和跟踪支架安装。

注意：

1）本手册中所列组件载荷值均为测试载荷，安装方法仅供参考，以第三方测试和云上新能源内部测试的测试结果为准。

2）云上新能源不提供相关的安装配件，系统安装人员或经过培训的专业人员必须负责光伏系统的设计、安装、机 械载荷计算和系统安全。

3）安装前，应注意以下事项：

a）检查组件外观是否有损坏。若残留任何污垢或残留物，请清洁组件；

b）检查组件的序列号是否正确。

4）不同型号组件正面和背面所能承受的最大载荷取决于安装方式。如果组件安装地环境为多雪和强风，在组件安装时应采取特殊的防护，来满足实际要求。

注：设计载荷=测试载荷÷1.5（安全系数）

5）组件必须按照以下的安装方式安装在支架上。如果有其他安装方式，请咨询云上新能源，并取得云上新能源同意，否则会导致质保失效。

6）在符合本手册规定的固定支架安装方式下，由于重力作用，组件会出现不同程度下凹的情况，这种情况属于正常物理现象，不影响组件正常的使用。 其他外力作用都会导致组件的额外下沉，因此对组件的任何操作应符合本手册规定。

Modules can be installed in the following ways: fixed bracket-bolt installation, fixed bracket-pressure block installation and tracking bracket installation.

Notice:

1) The module load values listed in this manual are test loads. The installation method is for reference only. The test results of third-party testing and internal testing shall prevail.

2) Yoursun does not provide relevant installation accessories. System installers or trained professionals must be responsible for the design, installation, mechanical load calculation and system safety of the photovoltaic system.

3) Before installation, you should pay attention to the following matters:

a) Check whether the modules appearance is damaged. If any dirt or residue remains, clean the modules;

b) Check whether the serial number of the modules is correct.

4) The maximum load that the front and back of different types of modules can bear depends on the installation method. If the environment where the module is installed is snowy and windy, special protection should be taken during module installation to meet actual requirements.

Note: Design load = test load÷1.5 (safety factor)

5) The modules must be installed on the bracket according to the following installation methods. If there are other installation methods, please consult Yoursun and obtain Yoursun's consent, otherwise the warranty will be invalid.

6) When the fixed bracket is installed in a manner that complies with the provisions of this manual, the modules will sink to varying degrees due to gravity. This situation is a normal physical phenomenon and does not affect the normal use of the modules. Other external forces will cause additional sinking of the modules, so any operations on the modules should comply with the provisions of this manual.

5.1 安装位置及工作环境/Installation location and working environment

云上新能源光伏组件不可以用于外太空应用。不要用镜子或者放大镜聚光照向组件表面。

组件必须安装在合适的安装支架上，这些安装支架位于合适的建筑物、地面或者其他结构上。组件不得安装在可能被淹没在水中的位置。

推荐的环境温度应在 -40 ℃ (-40°F) 至 40°C (104°F) 之间。温度限值定义为安装地的月平均最高和最低温度。极限工作温度应为 -40°C (-40°F) 和 70°C (158°F)。

确保组件不受超过最大允许载荷的风或雪影响。组件应安装在全年无遮挡的位置。

对于安装在雷击概率高的位置的光伏系统，建议采取防雷措施。不要在可能产生或收集可燃气体的地方使用组件。

组件不能在极端地区或天气条件下安装和使用，高腐蚀性区域应慎重考虑。

详细需求请联系云上新能源技术支持部门。

Yoursun photovoltaic modules cannot be used in outer space applications. Do not use mirrors or magnifying glasses to focus light on the modules surface.

Modules must be mounted on suitable mounting brackets located on a suitable building, ground or other structure. Modules must not be installed where they may be submerged in water.

Recommended ambient temperature should be between -40°C (-40°F) and 40°C (104°F). Temperature limits are defined as the monthly average maximum and minimum temperatures at the installation site. Extreme operating temperatures shall be -40°C (-40° F) and 70°C (158°F).

Ensure that modules are not affected by wind or snow that exceeds the maximum allowable load. Modules should be installed in a location that is unobstructed year-round.

For photovoltaic systems installed in locations with a high probability of lightning strikes, lightning protection measures are recommended. Do not use modules where flammable gases may be generated or collected.

Modules cannot be installed and used in extreme areas or weather conditions, and highly corrosive areas should be carefully considered.

If you have any questions, please contact the Yoursun technical support department.

5.2 倾斜角选择/Selection of tilt angle

组件的倾斜角是在组件表面和水平地面之间角度。组件在垂直面对辐照时产生最大功率输出。

在北半球，组件通常应朝南，而在南半球，组件通常应朝北。

有关最佳安装角度的详细信息，请参阅标准太阳能光伏安装指南或咨询信誉良好的太阳能安装商或系统集成商。积聚在组件表面的灰尘会影响组件性能。云上新能源建议安装组件时倾角至少为10度，这样雨水更容易将灰尘洗掉。

The tilt angle of a module is the angle between the module surface and the horizontal ground. Modules produce maximum power output when irradiated vertically.

In the Northern Hemisphere, modules should generally face south, while in the Southern Hemisphere, modules should generally face north.

For more information on optimal mounting angles, refer to standard solar PV installation guidelines or consult a reputable solar installer or system integrator. Dust accumulated on module surfaces can affect modules performance. Yoursun recommends installing modules at an angle of at least 10 degrees so that rain can more easily wash away dust.

5.3 机械安装/Mechanical installation

常规要求：确保组件的安装方法和支撑系统足够坚固以承受所有载荷条件。安装者必须提供此保证。安装支持系统必须由具有静态机械分析能力的第三方机构根据当地国家或国际标准进行测试。

组件安装支架必须由耐用、耐腐蚀和抗紫外线的材料制成。组件必须牢固地连接到安装结构上。

在冬季降雪量大的地区，选择合适的安装系统高度，使组件的最低边缘在任何时间内都不会被雪覆盖。

此外，确保组件的最低位置部分足够高，避免植物遮挡或者风沙。

当组件平行于墙壁或屋顶时，组件与墙壁或屋顶表面间至少需要10厘米的间隙，以便空气流通和避免接线受损。不要试图在玻璃表面和组件的边框上钻孔，因为这将使质保失效。

在屋顶上安装组件之前，确保屋顶结构合适。此外，安装组件所需的任何屋顶穿孔必须适当密封以防止泄漏。观察组件边框的线性热膨胀（两个组件之间的建议最小距离为10mm）。组件边框会在低温下弯曲。

避免边框到横向拉力和压力，这可能会损坏边框和玻璃。

组件已经过认证，背面的最大静态负载为2400Pa，正面的最大静态负载为2400Pa或5400Pa，取决于组件类型（请参考以下安装方法细节）。

安装方法不得导致不同金属与组件的铝边框直接接触，因为这会导致电偶腐蚀。IEC 60950标准建议金属组合不超过0.6伏的电化学电位差。

云上新能源组件可以横向或纵向安装。对于双面组件，为了更好背面发电，组件尾部和屋顶或地面建议至少为1米距离。

General requirements: Ensure that the installation method and support system of the modules are strong enough to withstand all loading conditions. The installer must provide this warranty. Installation support systems must be tested according to local national or international standards by a third party agency with static mechanical analysis capabilities.
Modules mounting brackets must be made of durable, corrosion-resistant and UV-resistant materials. Modules must be securely attached to the mounting structure.
In areas with heavy winter snowfall, choose an appropriate mounting system height so that the lowest edge of the module is not covered with snow at any time.
In addition, ensure that the lowest part of the module is high enough to avoid obstruction by plants or wind and sand.

When modules are parallel to a wall or roof, a minimum clearance of 10 cm is required between the module and the wall or roof surface to allow air circulation and avoid damage to the wiring. Do not attempt to drill holes into the glass surface and frame of the module as this will void the warranty.

Before installing modules on your roof, make sure the roof structure is suitable. Additionally, any roof penetrations required to install modules must be properly sealed to prevent leaks. Observe the linear thermal expansion of the modules frame (recommended minimum distance between two modules is 10mm). Modules borders can bend at low temperatures.

Avoid lateral pull and pressure on the bezel, which may damage the bezel and glass. Modules are certified for a maximum static load of 2400Pa on the rear and 2400Pa or 5400Pa on the front, depending on modules type (see installation method details below).

The installation method must not result in direct contact between dissimilar metals and the aluminum frame of the module as this can lead to galvanic corrosion. The IEC 60950 standard recommends that metal combinations do not exceed an electronically potential difference of 0.6 volts.

Yoursun modules can be installed horizontally or vertically. For bifacial modules, in order to better generate electricity from the back, it is recommended that there be at least 1 meter between the rear of the module and the roof or the ground.

5.4 安装方法/Installation method

组件可以通过夹块或者螺栓固定到支架上。必须根据以下示例和建议安装组件。如果未按照这些说明安装组件， 请提前咨询云上新能源，并且必须获得云上新能源的认可，否则此行为可能会损坏组件并导致产品质保失效。

Modules can be fixed to the bracket via clamps or bolts. Modules must be installed according to the following examples and recommendations. If Modules are not installed in accordance with these instructions, please consult Yoursun in advance and must obtain Yoursun's approval, otherwise this behavior may damage the modules and void the product warranty.

安装孔螺栓安装/Installation of mounting hole bolts

组件应通过位于边框背面的安装孔用螺栓固定到支撑结构上。请参阅图 2（安装详细信息）中所示的内容。

请参考，请采用下图材料：

The assembly should be bolted to the supporting structure through the mounting holes located on the back of the frame. See what is shown in Figure 2 (Installation Details).

For reference, please use the following materials:

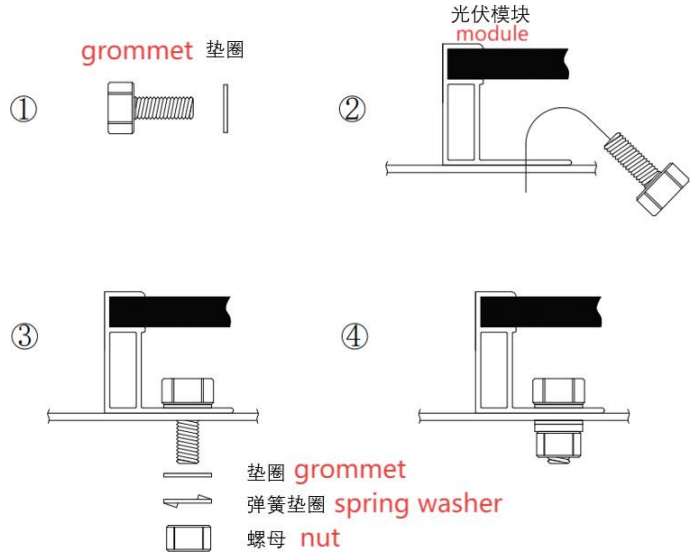


图2：安装细节/Figure 2: Installation details

5.5 安装位置及对应载荷/Installation location and corresponding load

低/正常载荷条件适用于大多数环境条件下的安装：组件背面最大静载荷为2400Pa，组件正面最大静载荷为2400Pa。

高等级负载条件适用于暴风雨、大雪等较恶劣环境条件下的安装：组件背面最大静载荷为2400Pa ，最大静载荷组件正面为5400Pa。

Low/normal load conditions are suitable for installation under most environmental conditions: the maximum static load on the back of the module is 2400Pa , and the maximum static load on the front of the module is 2400Pa .

High-level load conditions are suitable for installation in harsh environmental conditions such as storms and heavy snow: the maximum static load on the back of the module is 2400Pa , and the maximum

The static load on the front of the component is 5400Pa.

图3：安装位置与对应载荷关系

Figure 3: Relationship between installation position and corresponding load

注：设计载荷=测试载荷÷1.5（安全系数），本手册所列载荷数据均为测试载荷

Note: Design load = test load÷1.5 (safety factor), the load data listed in this manual are test loads

5.6 电气安装/Electrical installation

5.6.1 电气特性/Electrical characteristics

额定电气特性，在标准测试条件下，Isc 在 +/- 5% 范围内，Voc 在 +/- 3% 范围内，但对于 Pmax，它在 +/-3% 以内。标准测试条件：1000W/㎡ 辐照度，25℃组件温度和 1.5AM。

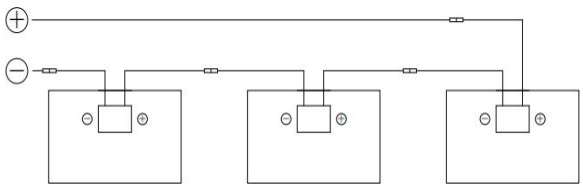
在正常情况下，光伏组件可能会产生比标准测试条件下更多的电流或电压。因此，在确定组件额定电压、导体能力、保险丝尺寸和连接到组件输出的控件尺寸时，标在组件上的短路电流 Isc 和开路电压 Voc 的值应乘以1.25安全系数。

当组件直接串联时，电压是相加的，当组件直接并联时，组件电流是相加的，如图4。电气特性不同的组件不得直接串联。

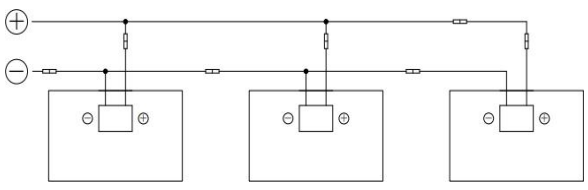
Rated electrical characteristics, under standard test conditions Isc within +/-5% and Voc within +/-5%, but for Pmax it is within +/-3%. Standard test conditions: 1000W/㎡ irradiance, 25℃ module temperature and 1.5 AM.

Under normal conditions, PV modules may produce more current or voltage than under standard test conditions. Therefore, the values of short-circuit current Isc and open-circuit voltage Voc marked on the module should be multiplied by a 1.25 safety factor when determining the module voltage rating, conductor capacity, fuse size and control size connected to the module output.

When the modules are directly connected in series, the voltages are added, and when the modules are directly connected in parallel, the module currents are added, as shown in Figure 4. Modules with different electrical characteristics must not be connected directly in series.



串联连接/series connection



并联连接/parallel connection

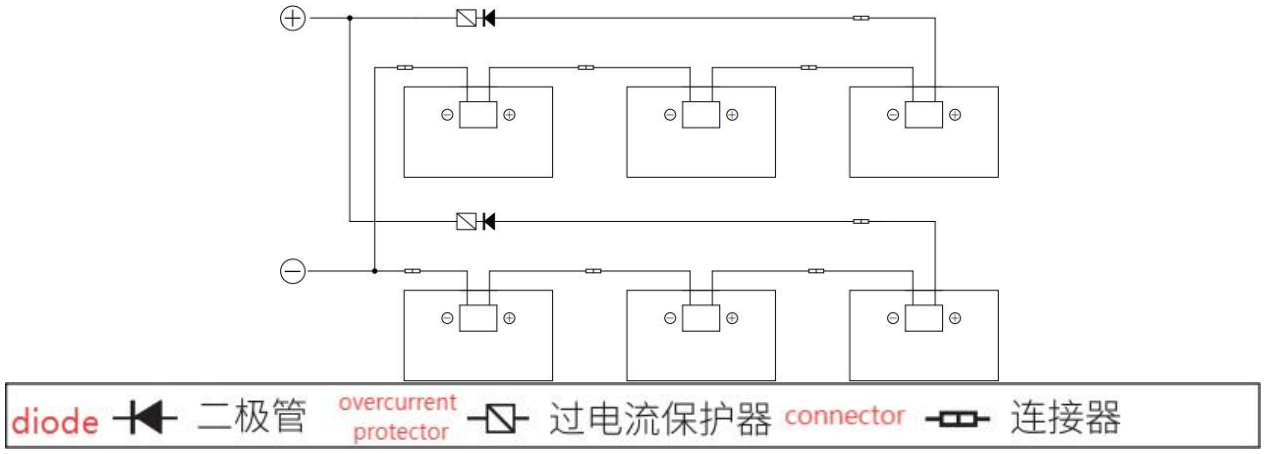


图4：串联和并联接线的电气图

Figure 4: Electrical diagram of series and parallel wiring

组件和所有其他电气设备的最大耐压（云上新能源组件的最大系统电压为 DC 1500V） 在开路运行时大于系统在该安装地点在最低温度时候产生的电压。

开路电压的校正系数可根据以下公式计算： Cvoc = 1-β voc *(25-T)。T 是系统位置的最低预期环境温度。

β(%/ ℃ ）为所选组件Voc的温度系数（参考相应的产品单页）。

当反向电流可能超过组件的最大熔断器额定值时，必须使用额定值适当的过流保护装置。每个组串都需要一个过流保护装置，当大于两串以上的组件并联安装，如图4.

The maximum withstand voltage of the modules and all other electrical equipment (maximum system voltage for modules is DC 1500V) when operating in open circuit is greater than the voltage generated by the system at the lowest temperature at the installation location.

The correction coefficient of the open circuit voltage can be calculated according to the following formula: Cvoc = 1-βvoc*(25-T). T is the lowest expected ambient temperature at the system location.

β(%/℃) is the temperature coefficient of the selected module Voc (refer to the corresponding product sheet).

When reverse current flow may exceed the maximum fuse rating of the module, an appropriately rated overcurrent protective device must be used. Each string requires an overcurrent protection device. When more than two strings of modules are installed in parallel, as shown in Figure 4.

组件最大串联数量计算方法

Maximum series connection number calculation

公式 Formula	最大系统电压 V≥N×Voc×[1+β×(Tmin-25)] Maximum system volyage V≥N×Voc×[1+β×(Tmin-25)]
V	最大系统电压 Maximum system volyage
Voc	开路电压（详见产品规格书） Open Circuit voltage（See date sheet）
β	开路电压温度系数（参考产品规格书） Temperature coefficient of open circuit voltage
Tmin	安装现场最低环境温度 The lowest ambient temperature at installation site

最大并联数量计算方法

Maximun parallel connection number calculation

公式 Formula	并联数量≤保险丝额定值/ Isc+1 N≤Fuse rating /Isc+1
N	最大并联数量 The number of maximum parallel connection
Isc	短路电流（详见产品规格书） The short circuit current of each module（See date sheet）

5.6.2 电缆和接线/Cables and wiring

这些接线盒的设计使其易于串联互连，它们有连接良好的电缆和防护等级为IP68的连接器。每个组件都有两根单导线，一正一负，预先接线在接线盒内。这些电缆一端的正极接头需要牢固地插入到另一个组件的负极接头。

使用经批准可在组件的最大短路电流下使用的具有合适横截面积的导线。云上新能源建议安装人员仅使用符合光伏系统直流（DC）布线条件的耐日光电缆。最小线径应为4平方毫米(12AWG)。

These junction boxes are designed to be easily interconnected in series, they have well-connected cables and connectors rated IP68. Each module has two single conductors, one positive and one negative, pre-wired inside the junction box. The positive connector on one end of these cables needs to be securely plugged into the negative connector on the other module.

Use conductors of suitable cross-sectional area that are approved for use at the maximum short-circuit current of the module. Yoursun recommends that installers use only sunlight-resistant cables that meet the conditions for direct current (DC) wiring of photovoltaic systems. Minimum wire diameter should be 4mm² (12AWG).
额定值要求最小接线/Rating requires minimum wiring：

检测标准	电缆尺寸	温度等级
EN 50618: 2014	4㎜²	-40 ℃至+90 ℃
Testing standards	Cable size	Temperature level
EN 50618: 2014	4㎜²	-40 ℃ to +90 ℃

电缆应固定在安装结构上，以避免对电缆和/或组件造成机械损坏。不要对电缆施加压力。电缆最小弯曲半径不应小于电缆直径的8倍。任何因过度弯曲或电缆管理系统造成的电缆损坏均不在云上新能源的质保范围内。对于固定，请使用适当的方法，例如专为连接到组件边框而设计的耐日光电缆扎带和/或电线管理夹。虽然电缆具有耐日光和防水功能，但请尽可能避免阳光直射和水浸入电缆。

电缆布置必须符合当地法律法规。

Cables should be secured to the mounting structure to avoid mechanical damage to the cables and/or modules. Do not put pressure on the cable. The minimum bending radius of the cable should not be less than 8 times the cable diameter. Any cable damage caused by excessive bending or cable management systems is not covered by Yoursun’ s warranty. For securing, use appropriate methods such as sunlight-resistant cable ties and/or wire management clips designed for attachment to module frames. Although the cable is sunlight-resistant and waterproof, please avoid direct sunlight and water immersion in the cable as much as possible.

Cable layout must comply with local laws and regulations.

5.6.3 连接器/Connectors

保持连接器干燥清洁，并确保在连接组件之前用手拧紧连接器盖。请勿尝试使用潮湿、脏污或有其他故障的连接器进行电气连接。避免阳光照射和连接器浸水。避免将连接器放在地面或屋顶表面上。

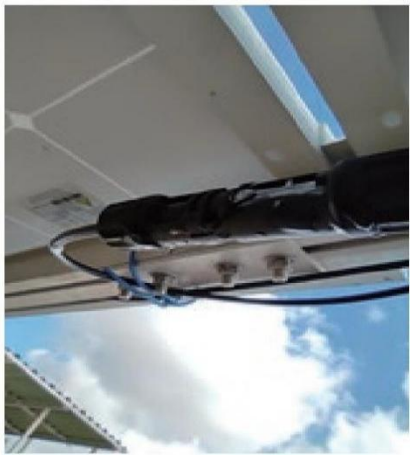
错误的连接会导致电弧和电击。检查所有电气连接是否牢固。确保所有锁定连接器都完全接合并锁定。连接器互连必须达到相应的IP防护等级，才能达到电气安全。

接头连接处及使用环境中请勿接触有机溶剂及其他腐蚀性物质，如酒精、汽油、杀虫剂、除草剂等，详情请咨询云上新能源。否则如因这方面原因造成连接器开裂，云上新能源概不负责。如下为两个不正确用法的例子：

Keep connectors dry and clean, and be sure to hand-tighten connector caps before connecting modules. Do not attempt to make electrical connections with wet, dirty, or otherwise defective connectors. Avoid sunlight and water immersion in the connector. Avoid placing connectors on the ground or roof surfaces.

Incorrect connections can cause arcing and electric shock. Check that all electrical connections are tight. Make sure all locking connectors are fully engaged and locked. Connector interconnections must reach the corresponding IP protection level to achieve electrical safety.

Please do not come into contact with organic solvents and other corrosive substances, such as alcohol, gasoline, pesticides, herbicides, etc., at the joint connection and the use environment. Please consult Yoursun for details. Otherwise, Yoursun will not be responsible if the connector cracks due to this reason. The following are two examples of incorrect usage:



请注意：连接器的解锁方式根据当地法律法规有所不同

Please note: Connector unlocking methods vary according to local laws and regulations

5.6.4 旁路二极管/Bypass Diode

与云上新能源组件一起使用的接线盒包含与光伏电池串并联的旁路二极管。在部分遮蔽的情况下，二极管分流未遮蔽电池产生的电流，从而限制组件发热和性能损失。旁路二极管不是过电流保护装置。

如果已知或怀疑二极管出现故障，安装人员或维护提供商应联系云上新能源。切勿尝试自行打开接线盒。请注意防止感应雷击、电流回流和错误连接。

Junction boxes used with Yoursun modules contain bypass diodes in series and parallel with the photovoltaic cells. In the case of partial shielding, the diodes shunt the current generated by the unshielded cell, thereby limiting modules heating and performance loss. Bypass diodes are not overcurrent protection devices.

If a diode is known or suspected to be faulty, the installer or maintenance provider should contact Yoursun. Never attempt to open the junction box yourself. Please pay attention to prevent induced lightning strikes, current backflow and incorrect connections.

5.6.5 接地/Grounding

接地仅用于带边框组件。

云上新能源组件使用氧化铝边框来抵抗腐蚀。组件边框需要连接到接地设备以防止雷击和静电。接地装置应与铝合金内部充分接触，并穿透边框氧化表面。

请不要在组件的边框上钻任何额外的接地孔，否则质保将失效。

除设备接地外，云上新能源还推荐负极系统接地。没有遵守这些建议可能影响系统性能。

接地方法不应导致异种金属与组件的铝边框直接接触，从而导致电偶腐蚀。 IEC 60950标准建议金属组合不超过0.6V的电化学电位差。

框架导轨有预钻孔，上面标有接地标志。这些孔应该用于接地目的而不是安装。

可以采用以下接地方法：

使用接地螺栓，靠近组件中间的边缘一侧有一个直径为4.2mm的接地孔。接地标志的中线与接地孔重合，方向与长框相同。组件之间的接地必须得到合格电工的认可。接地装置必须由合格的电气制造商生产。推荐扭矩值为2.3 Nm。12 AWG铜线可与接地螺栓一起用作设备接地导体。安装时不应压扁铜线。

Grounding is only used for framed modules.

Yoursun modules use aluminum oxide frames to resist corrosion. Module frames need to be connected to grounding equipment to prevent lightning strikes and static electricity. The grounding device should be in full contact with the interior of the aluminum alloy and penetrate the oxidized surface of the frame.

Please do not drill any additional grounding holes on the frame of the module, otherwise the warranty will be void.

In addition to equipment grounding, Yoursun also recommends negative system grounding. Failure to follow these recommendations may affect system performance.

Grounding methods should not result in direct contact of dissimilar metals with the aluminum frame of the modules, causing galvanic corrosion. The IEC 60950 standard recommends that metal combinations not exceed an electrochemical potential difference of 0.6V.

The frame rails are pre-drilled and marked with a ground mark. These holes should be used for grounding purposes and not for installation.
The following grounding methods can be used:
Using a grounding bolt, there is a 4.2mm diameter grounding hole on one side of the edge near the middle of the modules. The center line of the grounding mark coincides with the grounding hole, and the direction is the same as the long frame. Grounding between modules must be approved by a qualified electrician. The grounding device must be produced by a qualified electrical manufacturer. The recommended torque value is 2.3 Nm. 12 AWG copper wire can be used with ground studs as the equipment grounding conductor. Copper wires should not be crushed during installation.

图5：安装方法/Figure 5: Installation method

使用未使用的安装孔接地洞。
现有未使用的安装孔可用于接地。
将接地夹块对准边框上的安装孔。将接地线夹和带接地线的边框穿线 螺栓。
将带齿垫圈放入另一侧，然后拧紧并锁紧螺母。推荐锁紧螺母扭矩为2.0N.m~2.2N.m
将接地线穿过接地夹块。接地线的材料和尺寸应符合相关法律和标准要求。
收紧接地线螺栓。
额外的第三方接地设备。
云上新能源组件可以使用第三方接地设备接地，只要它们通过认证，并且通过合适的安装。

Use unused mounting holes for ground holes.

Existing unused mounting holes can be used for grounding.

Align the grounding clamp block with the mounting hole on the frame. Thread the grounding clamp and the frame with the grounding bolt through.

Place the toothed washer on the other side, then tighten and lock the nut. The recommended locking nut torque is 2.0N.m~2.2N.m

Pass the ground wire through the ground clamp block. The material and size of the grounding wire should comply with relevant laws and standards.

Tighten the ground wire bolt.

Additional third party grounding equipment.

Yoursun modules can be grounded using third-party grounding equipment, as long as they are certified and properly installed.

6、操作和维护/Operation and maintenance

需要对组件进行定期检查和维护，尤其是在保修范围内。用户有义务在发现问题后尽快通知云上新能源。

Modules require regular inspection and maintenance, especially if covered under warranty. Users are obliged to notify Yoursun as soon as possible after discovering problems.

6.1 清洁/Cleaning

前面板积聚的灰尘可能会降低功率输出，甚至可能导致局部热点效应。工业废水或鸟粪可能是严重的污染，严重程度取决于异物的透明度。积聚的灰尘通常不会有危险。

当组件运行时，可能存在明显降低功率输出的环境因素。 云上新能源建议组件表面不应有任何障碍物或者遮挡。

清洗时要注意穿戴合适的衣服并佩戴绝缘手套。清洗前后均要先检查组件的完整性，确保组件无破裂、损坏、接头松动等，防止有电击危险。

清洗频率取决于污垢的累积速度。在很多情况下，前面板是可以用雨水清洗的。建议用湿海绵或软布擦拭玻璃表面。请勿使用含有酸或碱的清洁剂清洁玻璃。

建议清洗的时间选择在光照强度较弱或者温度相对较低的清晨或傍晚，以减少潜在的电击或灼伤风险。对于双玻组件，需要定期清洗组件背面，清洗注意事项参考如上，同时需特别注意保护线缆连接位置。

Dust accumulation on the front panel may reduce power output and may even cause a localized hot spot effect. Industrial wastewater or bird droppings can be serious contaminants, the severity of which depends on the transparency of the foreign matter. Accumulated dust is generally not dangerous.

When a module is operating, there may be environmental factors that significantly reduce power output. Yoursun recommends that there should be no obstacles or obstructions on the module surface.

Be sure to wear appropriate clothing and insulating gloves when cleaning. Before and after cleaning, check the integrity of the modules to ensure that they are not cracked, damaged, or have loose joints to prevent the risk of electric shock.

The frequency of cleaning depends on how quickly dirt accumulates. In many cases, the front panel can be cleaned with rainwater. It is recommended to wipe the glass surface with a damp sponge or soft cloth. Do not use cleaning agents containing acids or alkalis to clean glass.

It is recommended to clean in the early morning or evening when the light intensity is weak or the temperature is relatively low to reduce the potential risk of electric shock or burns. For double-glass modules, the back of the module needs to be cleaned regularly. Please refer to the cleaning precautions above. At the same time, special attention must be paid to protecting the cable connection locations.

6.2 目视检查/Visual inspection

目视检查组件是否有外观缺陷，并重点检查如下事项：

检查组件玻璃是否有破碎、裂痕等。

检查组件是否有老化现象、沿电池导线有无腐蚀。腐蚀通常是由于湿气渗入组件引起的。

检查组件背板是否有灼伤痕迹。

检查组件与支架间的固定螺丝是否有松动或损坏，连接器连接是否紧密，并进行及时调整或修复。

检查接地是否良好。

检查组件表面是否有障碍物、异物遮挡。

检查连接器和电缆。

建议每六个月进行一次以下预防性维护：

检查连接器的密封性，电缆连接是否牢固，若有松动会导致阵列损坏。

检查接线盒处密封胶有无开裂，是否有裂缝、腐蚀等。

Visually inspect the modules for appearance defects and focus on the following items:

Check whether the modules glass is broken or cracked.

Check whether the modules are aging and whether there is corrosion along the battery wires. Corrosion is usually caused by moisture penetrating modules.

Check the modules backplane for signs of burns.

Check whether the fixing screws between the modules and the bracket are loose or damaged, whether the connector connection is tight, and make timely adjustments or repairs.

Check whether the grounding is good.

Check whether there are obstacles or foreign objects on the surface of the modules.

Check connectors and cables.

The following preventive maintenance is recommended every six months:

Check the sealing of the connector and whether the cable connection is secure. If there is any looseness, the array may be damaged.

Check whether the sealant at the junction box is cracked, cracked, corroded, etc.

7、接线盒信息/Junction box

接线盒供应商 Terminal box supplier	型号 model number
宁波博朋电子有限责任公司 Ningbo Bopeng Electronics Co.,Ltd	BP-MS30100A,BP-MS30100B
连接器供应商 Connector supplier	型号 model number
浙江弗沙朗能源股份有限公司 Zhejiang Forsol Energy Co., Ltd.	SIKE6,1500VDC，30A (4mm^2) IP68,-40℃-85℃
线缆供应商 Cable supplier	型号 model number
无锡鑫宏业线缆科技股份有限公司 Wuxi Xinhongye Wire & Cable Co., Ltd.	62930　IEC 131 1×4mm
二极管供应商 Diode supplier	型号 model number
江西萨瑞微电子技术有限公司 Jiangxi Sari Microelectronics Technology Co., LTD	SFT4010

8、联系方式/Contacts

公司：云上新能源开发（杭州）有限公司
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Postal code: 311100
Email: yoursun2021@163.com

9、产品范围/Product range

安装手册适用于以下组件类型。由于产品不断创新、研发，产品类型如有变更，恕不另行通知。
The installation manual is suitable for the following module types. Due to continuous product innovation and research and development, product types are subject to change without prior notice.

型号/Module	功率范围/Power Range	尺寸/Dimension
SF-17N50D	450-470W	1762*1134*30
SF-23N68D	610-635W	2382*1134*30
SF-24N70D	625-650W	2465*1134*30
SF-23N68DW-R	700-730W	2384*1303*30
SF-24N70DW-R	735-765W	2465*1303*30
SF-25N82DW-R	740-770W	2500*1303*30