

# 亿晶半片双面双玻组件安装手册

## GENERAL INSTALLATION MANUAL

For EGING Double glass PV modules with bifacial and half-cell

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## 1. 介绍 Introduction

- ☆ 非常感谢您选择常州亿晶光电科技有限公司的半片双面双玻光伏组件（以下简称“组件”）。

Thank you for choosing the Double glass PV modules with bifacial and half-cell of Changzhou EGing Photovoltaic Technology Co., Ltd. (Hereinafter referred "modules" )

- ☆ 本安装手册提供了亿晶组件的安装和安全使用信息。

This manual contains information for the installation and safe handling of EGing modules Photovoltaic Modules.

- ☆ 本手册不具备任何质保书的意义。本手册介绍了亿晶组件的安全安装和正确操作的相关信息，在安装、运转和维护组件前，必须仔细阅读本手册。如果有任何问题，请联系我们，以获得进一步的信息。安装人员必须遵守手册中提到的所有安全防范规则。在安装组件前，安装人员必须熟悉组件的机械和电气要求。

This manual does not have the significance of any warranty book. This manual introduces the safe installation and handling information, please read this manual carefully before installation、transportation and maintenance. If you have any questions, please contact us for further information. The installation workers have to observe all the safety rules that this manual mentioned. The installation workers must be familiar with the mechanical and electrical requirement of the product.

## 2. 免责声明 Disclaimer

- ☆ 随着光伏技术的更新，我公司会对说明书相关信息进行改进，恕不另行通知。本说明书只针对陆地安装使用，用户应该仔细阅读并遵守。请仔细阅读本手册中的描述和图纸，不按照本手册中提到的方法安装组件会导致保修失效。

EGing reserves the right to modify and update the manual. This specification installation manual only meets the ground systems, users should read and observe carefully. Please reading the descriptions and drawings in this manual carefully, the guarantee will fail if you do not refer to the installation method in this manual.

- ☆ 在使用光伏产品时，可能会导致侵犯第三方的专利或其它权利，这些不属于亿晶的责任范围。客户并不因使用亿晶的产品，而获得任何专利或者专利权利的使用授权，无论是明示的或隐含的。

When using modules, you may infringe patents or other rights of third parties, which EGing will not be liable for. Clients do not have any patents or the use of patent rights authorized when using EGing products, expressed or implied.

- ☆ 本手册中所有的内容均属于亿晶的知识财产，这些财产源于亿晶长期的技术与经验的探索和积累。

The information in this manual is the intellectual property of EGing, the property is based on EGing long-term technology and experience in the exploration and accumulation.

## 3. 通则 General

- ☆ 组件的安装需要一定程度的专业技能，应该由有合格执照的专业人员进行操作。

The installation of PV modules requires a great degree of skill and should only be performed by a qualified licensed professional, including licensed contractors and licensed electricians.

- ☆ 亿晶所有的双玻组件都配备了终端接线盒，接线盒上配有一定长度的线缆和接线头（分公头和母头），方便组件之间的电气连接。

All EGing glass-glass modules are provided with terminal junction boxes. For the convenient of electrical connection between the modules, the junction box is equipped with a cable and connector of a certain length, which can be divided into male and female head.

- ☆ 亿晶的组件设计符合国际 IEC61215、IEC61730 以及 UL1703 等标准，其应用等级为 A 类（满足安全等级 II 的要求）。

EGing modules are designed in accordance with the international standard IEC61215, IEC61730 and UL1703. The solar modules have been qualified for application class A (equivalent to safety class II requirements).

- ☆ 组件的机械安装和电气安装应该参照当地相应的法规，包括电气法、建筑法和电力连接要求等。

The mechanical and electrical installation of the module should obey local regulations, including electrical law.

- ☆ 组件在运输或存储过程中，不要打开组件的包装，除非到达安装地点。

During transportation or storage, unless you reach the installation site, otherwise, do not open the package of the modules.

- ☆ 遵守系统中所有部分的安全警告。

Follow all safety precautions of other components used in the system.

#### 4. 机械安装 Mechanical Installation

- ☆ 不管组件的安装地点是屋顶还是地面或者其它，都应该采用合适的安全措施，安装过程应该使用必需的安全设备以避免可能出现的安全隐患。需要注意的是，根据当地的建筑消防法规，屋顶组件的安装可能需要采用额外的防火措施。

Regardless of the installation location of the modules, whether on the roof or on the ground or other locations, all the installation should adopt appropriate safety measures, the installation process should use the necessary safety equipment to avoid possible security risks. It needs to be noted that, according to local building fire codes, the installation of the roof assembly may need additional fire protection measures.

- ☆ 当阳光或者其他光源照射组件表面时，组件会产生电能。组件串联时，电压累加；组件并联时，电流累加。因此，大规模的光伏系统能产生很高的电压和电流，不恰当的操作可能导致严重的人身伤害或死亡。

When the module is under the sunshine or other light source, PV modules produce power. PV modules wired in series increase voltage; Wired in parallel increase current. So large scale photovoltaic system will produce high voltage and current, so, improper operation may result in serious personal injury or death.

##### 4.1 选择位置 Select the Location

- 组件安装的位置应有充足的阳光照射，请确保安装地点周围没有任何障碍物；

The location of module installation should have plenty of sunlight, and make sure that no obstructions around the installation site.

- 组件位置的选择应该符合各种电气和防火规范的要求，本组件的防火等级为C级，当组件安装在屋顶时，要求屋顶耐火，因此需要考虑房屋结构、屋顶原材料，以及当地的相关法律法；

The installation position of the module should be consistent with the requirements of various kinds electrical and fire code, fire rating of this module is for the C-class, when the modules are installed on the roof, the roof needs to be fire-resistant, therefore, the designing of the housing structure, the selection of raw material for the roof as well as the local relevant laws and regulations need to be taken into consideration.

- 若组件安装在大雪、低温、强风、水面上或近水区域（该区域极易受盐水腐蚀）、海岛、沙漠等区域，需采取适当的步骤以保证可靠性和安全性；要保持所有电接触体干净和干燥；

Take proper steps in order to maintain reliability and safety, in case the PV modules are used in areas such as: Heavy snow areas / extremely cold areas / Strong wind areas / Installations over, or near, water / Areas where installations are prone to salt water damage / Small islands or desert areas, all electrical contacts need to be kept clean and dry.

- 建议组件安装在温度为-20℃到46℃的环境中，组件极限工作环境温度为-40℃~85℃；  
We recommend that the modules are installed in an environment temperature from -20 °C to 46 °C , the limit working environment temperature of the module is -40 °C ~ 85 °C.

#### 4.2 选择倾角 Tilt Angle

- 组件的倾角是指组件与水平地面之间所成的夹角。当组件与太阳光垂直时，组件产能最大；  
The tilt angle of the PV module is the angle between the PV module and a horizontal ground surface. The PV module generates the maximum output power when it faces the sun directly.

- 在北半球，组件通常应该朝向南方；而在南半球，组件通常应该朝向北方；  
In the Northern Hemisphere, the PV modules should typically face south, and in the Southern Hemisphere, the PV modules should typically face north.

- 对于含蓄电池的固定支架的独立光伏系统，在设计最佳安装倾角时，需要保证在阳光稀缺时系统供电充足，若在阳光稀缺季节，系统产生的电能够满足负载要求，那么这个安装倾角也能满足其他季节的用电要求；对于固定支架的并网系统，为了在一年内组件产出最大功率，建议组件的安装倾角等于当地的纬度值；  
For the standalone systems with a battery where the PV modules are attached to a permanent structure, the tilt angle of the PV modules should be determined to optimize the performance when the sunlight is the scarcest. In general, if the electric power generation is adequate when the sunlight is the scarcest, then the angle chosen should be adequate during the rest of the year. For grid-connected installations where the PV modules are attached to a permanent structure, it is recommended to tilt the PV module at the angle equal to the latitude of the installation site so that the power generation from the PV module will be optimum throughout the year.

- 对于详细的安装角度，依据区域的不同而不同，可参考有经验的组件安装商给出的建议。  
For the detailed installation angle, which is different in different area, recommendations from experienced PV modules installation suppliers should be referred to.

#### 4.3 选择支架 Selecting the Proper Support Structure and Hardware

- 在设计选择支撑结构时，遵守所有安装指南和安全防护措施；  
Observe all instructions and safety precautions of the mounting system to be used with the module.

- 组件可以安装在地面，屋顶以及其它合适的支撑系统上，考虑支撑结构负荷量是系统设计者和安装者的责任；  
Modules can be installed on the ground, roof and other suitable support system. Load calculations are the responsibility of system designers or installers.
- 支撑结构必须用持久耐用、抗腐蚀和抗紫外辐射的材料做成，考虑所用材料的热膨胀系数；  
The mounting structure and hardware must be made of durable, corrosion-resistant and UV-resistant material, when selecting and dimensioning the sub-structure, please consider the various thermal expansion coefficients of the materials.
- 应该遵守支架所附的说明书指导和安全守则；  
Observe the support structure attached instructions guidance and safety rules.
- 组件出厂时，已经实现设计完毕，请不要尝试任何的改变组件结构或构造等行为。  
The design of the module is completed before delivery, please do not try to change the module structure or conduct any similar behavior.

#### 4.4 安装安全 Installing Security

- 地面安装时选择适合的安装高度，防止冬天下雪时组件的下半部分长时间被积雪覆盖；  
Select the appropriate mounting height when modules installation on the ground, to prevent the lower half of the modules from being covered by snow for long time in the winter.
- 组件背面要确保通风顺畅 (组件和安装表面的最小间隔推荐为20cm)，在屋顶安装时，安装固定组件时所需要穿透的屋顶应该适当密封，以防屋漏；  
Ensure the back of the module ventilation (the minimum interval between components and installation surface recommended as 20cm) , when installing modules on the roof, the roof need to properly sealed to prevent leaky house.
- 安装组件时应避免组件接触尖锐物体而导致组件划伤；切勿在组件表面放置重物；  
When installing modules should avoid contact with sharp objects to prevent modules scratch; modules are fragile, please handle gently in the installation process. Never stampede modules or place heavy objects on module surface.
- 请不要在组件上钻孔或做任何改变组件原有结构的操作，否则会影响组件的质量和寿命，且经过另外加工的组件将不在质保范围内；  
Do not drill holes or make any changes on the module, otherwise it will affect the quality and lifespan of the products, and modules after another processing will invalidate the warranty.
- 组件的安装必须在无压力，无外力和无变形的环境下运行；  
Modules must be installed in the environment under no pressure, no external force, and no deformation.
- 组件必须固定在耐用、有弹性垫子(橡胶材料等组成，推荐用EPDM：三元乙丙橡胶，或类似性质的材料)的基座上(由铝型材构成)。基座必须是固定的，不能移动，必须避免组件与基座上所有金属零部件的直接接触。  
Modules must be fixed to the base constituted by aluminum profiles of durable、elastic cushion(Rubber materials, recommended by EPDM or material of a similar nature). The base must be fixed, the contact of any the Metal parts on the base and the metal parts must be avoided.

**其他注意事项: Other Considerations**

- 组件属于易碎物品, 请轻拿轻放, 尤其在拆包过程中。人为破坏的组件不在质保范围内。  
Module belongs to fragile products. Please handle it with care, especially in the process of unpacking. Module damaged by manmade is beyond the scope of warranty.
- 因施工方造成隐裂或其他隐患, 导致功率衰减及其他不良的组件不享受我司相关质保。  
Modules with problems caused by the constructor, such as the problem of power degradation caused by cracks happened during construction, are beyond the scope of warranty.
- 不要让小孩或者未经许可的人接近组件安装所在地或者组件储存区域。  
Do not allow children or unauthorized person close to the module installation position or storage area.
- 在组件开箱前, 请把组件存储在阴冷和干燥的地方。  
Please store modules in cold and dry places before open the box of modules.
- 请保护好组件的包装, 在装卸组件时请稳拿轻放, 严禁让组件直接跌落。  
Please protect modules package, handle gently when unload modules, never drop modules directly.
- 不要踩踏组件。  
Do not Stampede modules.
- 不要拆卸组件、移动任何铭牌或黏附的部件。  
Do not disassemble modules, remove any nameplate or adhered parts.
- 不要通过拖拽接线盒及其电缆来移动组件。  
Do not move modules by dragging the junction boxes or cables.
- 不要将组件安装在有可燃气体或者水蒸气的区域。  
Do not install modules in areas where there is flammable gas or vapor.
- 不要人为地将光线聚集在组件上。  
Do not gather light on the module artificially.
- 佩戴适当的防护用品(例如手套、防护服、安全鞋、护目镜等)。  
Please wear appropriate protective equipment (eg. gloves, protective clothing, safety shoes, goggles, etc.)
- 在安装过程中用不透明材料完全覆盖组件以防止电流产生。  
Cover modules completely with an opaque material to prevent current from being generated while modules are installed.
- 确保其它系统元件(例如逆变器、电线、支撑结构等)在机械和电学特性方面兼容。  
Ensure that other system components (such as inverters, wires, support structure, etc.) are compatible with the mechanical and electrical properties.
- 不要试图使用或安装前板玻璃或后板玻璃损坏的组件。  
Do not attempt to use or install the module with damaged front or back glass.
- 不建议水平安装组件, 因为水平安装更容易积累污垢从而会影响功率输出。组件排水系统必须可靠, 由降雨引起的水或冷凝水积聚, 会导致玻璃面板和粘接物质(正面和背面玻璃间的封装材料)的腐蚀。  
The level installation of modules is not recommended, as the level installation accumulates dirt easily, and thus affects the power output. Module drainage system must be reliable, because the accumulation of rainfall water or condensed water will lead to corrosion of the glass panel and adhesive substance (the

encapsulating material between the front and rear glass).

- 请勿在组件的表面刷油漆或其他任何材料的粘胶剂。  
Do not use paint or any other adhesive materials onto the surface of modules.
- 当组件潮湿时不要操作，除非穿戴有合适的防电击装备。  
Do not operate when module is wet, unless wearing suitable protection equipment against electric shock.
- 请勿在雨雪天气或者大风条件下安装组件。  
Do not install modules in rainy, snowy, or windy conditions.
- 插紧连接器，确保导线通路；在负载工作的情况下，不要直接拔开连接器。  
Plug connectors firmly, ensuring that the wires are connected; Do not unplug the connectors directly while they are working.
- 更换组件时，请勿损坏周围的组件和安装结构。  
Do not damage the surrounding modules and mounting structure while exchanging modules.
- 用绝缘束将线缆捆绑在一起。从接线盒散落下来的线缆可能会导致诸如动物啃咬和在水坑中漏电的各种问题。  
Bundle the cables together with Insulation beam. The cables scattering down from the junction box may lead to various problems such as animal bites or leakage in the puddles.
- 安装之后线缆应该位于不会被阳光直接曝晒的地方，以防止线缆老化。  
The cable should not be in places of direct sunshine to prevent cable aging.
- 为了更好的防水效果，建议在组件安装时将接线盒端放置在支架上侧。  
For better waterproof effect, it is recommended that the junction box port is placed on the upper of the support when installing modules.

#### 4.5 安装方式 Installation

请确保安装手册中所描述的所有信息适用于你的安装。请仔细检查说明和图纸，不按其中的方式安装组件可能会使您的质保无效。这些安装方法的正面设计载荷为3600Pa，背面设计载荷为1600Pa（安全因子为1.5）。

Please make sure that all the information described in the installation manual is proper for your installation. Please review the descriptions and drawings carefully; not mounting the modules according to one of these methods may void your warranty. These mounting methods are designed for front side to allow module loading of 3600Pa and back side to allow module loading of 1600Pa (a safety factor of 1.5) .

##### 4.5.1 EG-\*\*\*P72-HD/BF-DG 和 EG-\*\*\*M72-HD/BF-DG 组件安装方式

###### Installation of EG-\*\*\*P72-HD/BF-DG and EG-\*\*\*M72-HD/BF-DG

对于 EG-\*\*\*P72-HD/BF-DG 和 EG-\*\*\*M72-HD/BF-DG 系列组件，尺寸为 2030\*1008\*30mm。

For the EG-\*\*\*P72-HD/BF-DG and EG-\*\*\*M72-HD/BF-DG series of glass- glass module, the size is 2030\*1008\*30mm.

##### 4.5.1.1 六个压块安装方式

#### 4.5.1.1 Mounting method of six pressing block

如图 1 所示，压块安装位置位于双面双玻半片组件长边，安装支架平行于组件长边，安装支架切勿遮挡电池片，两侧压块中心位置到组件短边距离必须在  $300 \pm 25\text{mm}$  之间，中间压块中心位置到组件短边距离为  $B$ ， $B$  必须在  $1015 \pm 25\text{mm}$  范围内。压块长度必须  $\geq 100\text{mm}$ 。图 2 为双面双玻半片组件边框型材图，压块与组件型材 A 面的重合长度为  $S$ （图 3）， $S$  不能大于  $9.5\text{mm}$ ，压块与安装支架之间使用螺栓连接（图 4），组件边框接地孔安装如图 5 所示。

As shown in figure 1, The mounting position of the block is located on the long side of the modules, The mounting bracket is parallel to the long side of the modules, Do not block the battery sheet when installing the bracket, The distance from the center of the two side blocks to the short side of the modules must be between  $300 \pm 25\text{mm}$ , The distance between the center of the two blocks must be  $1015 \pm 25\text{mm}$ , The length of the block must be  $\geq 100\text{mm}$ . FIG. 2 shows the frame profile of the modules, The overlapping length between the block and profile A of the modules is  $S$  (figure 3),  $S$  cannot be greater than  $9.5\text{mm}$ , Bolted connection between block and mounting bracket (figure 4), The modules grounding is shown in figure 5.

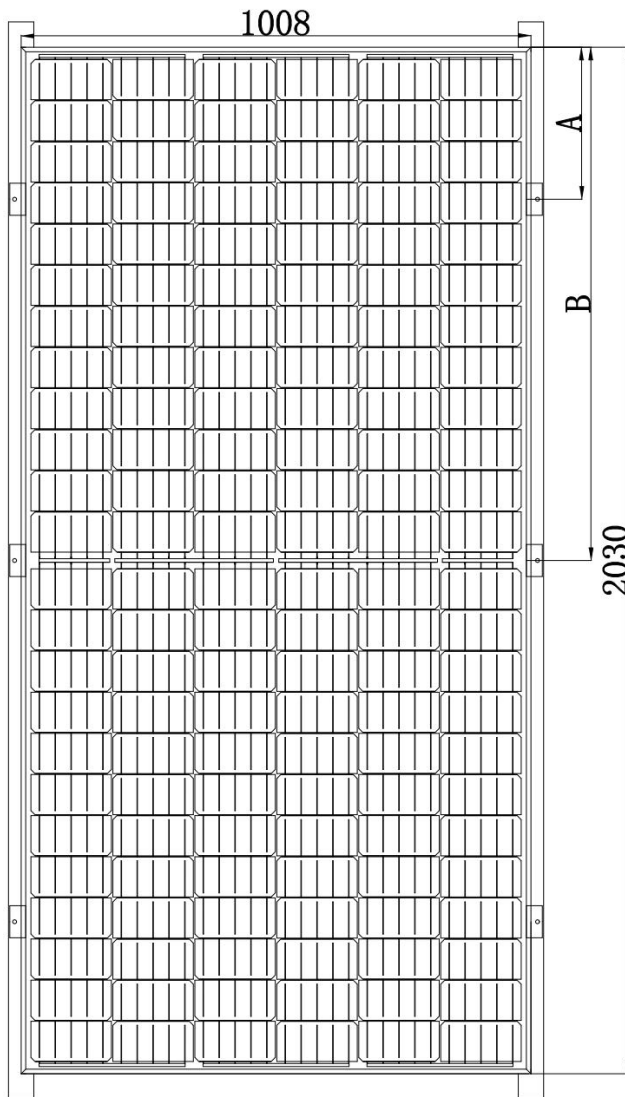


图 1: 压块安装位置图

Figure 1: location diagram of the block installation

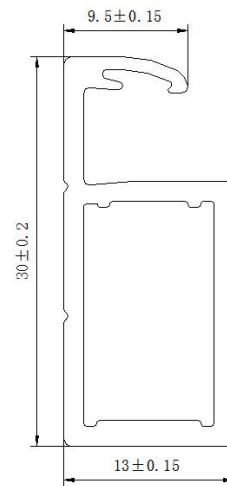


图 2: 边框型材图

Figure 2: sectional view of the aluminum frame

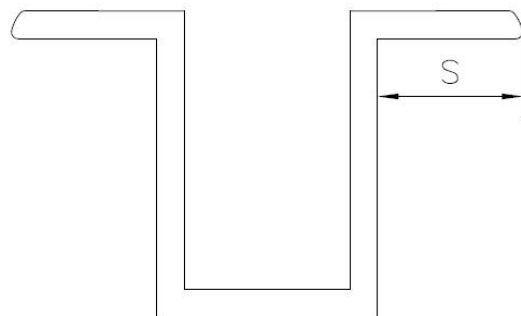


图 3: 压块尺寸要求图

Figure 3: size requirement of block



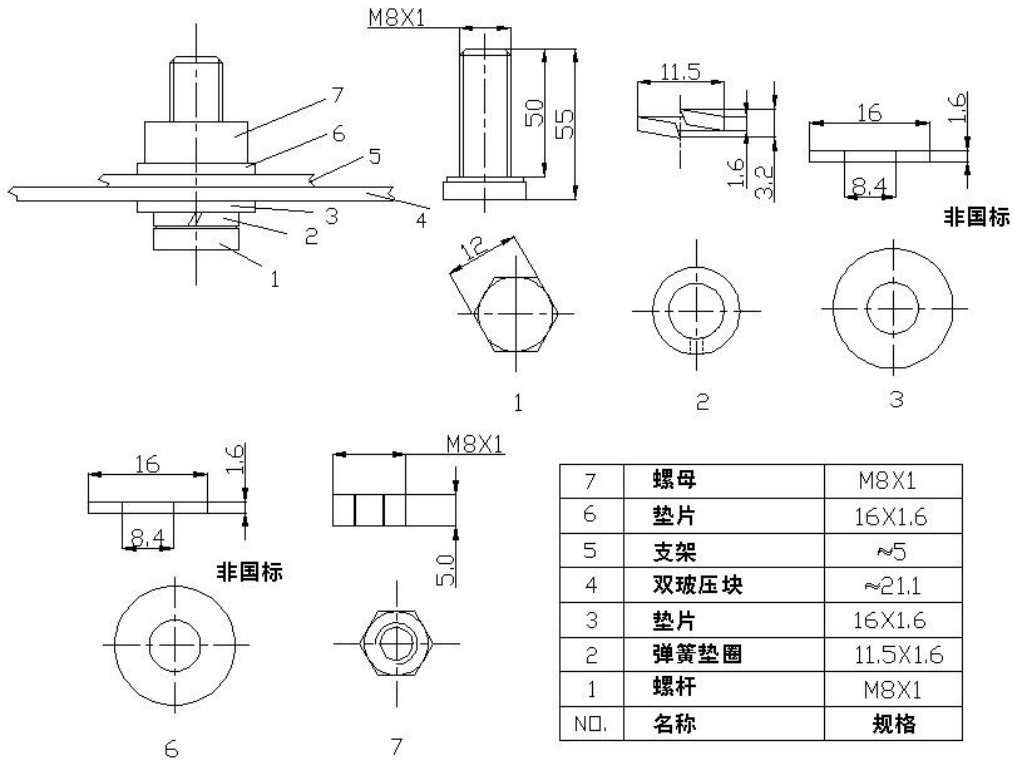


图 4: 压块与支架连接示意图

Figure 4: Bolted connection between block and mounting bracket

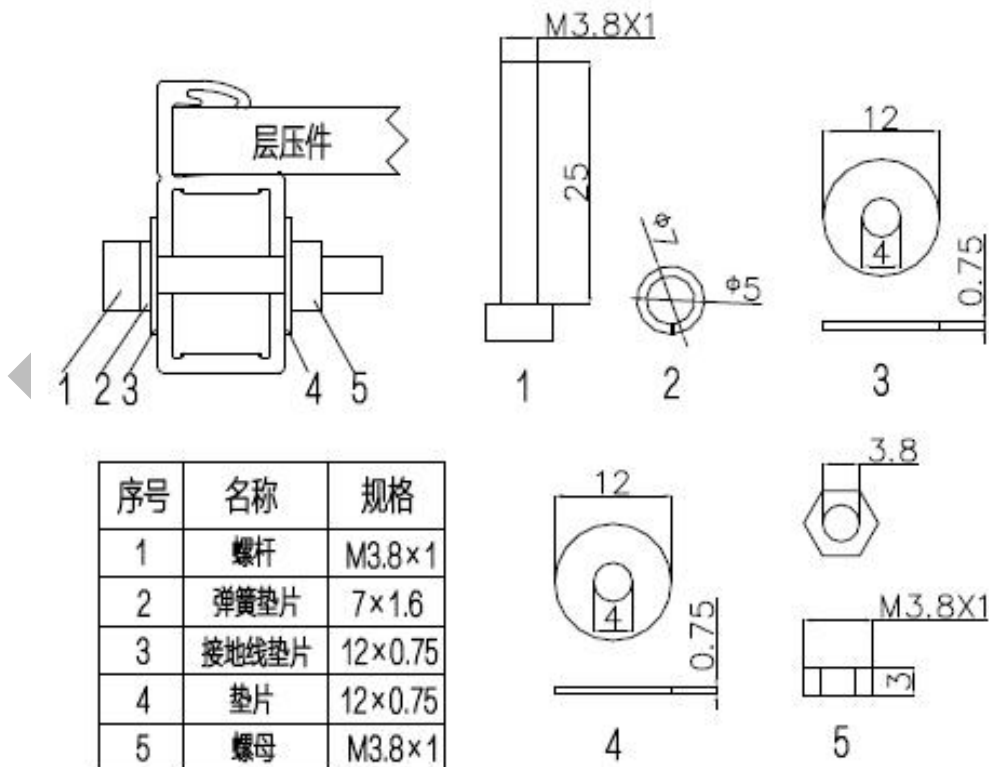


图 5: 接地孔安装示意图

Figure 5: Schematic diagram of ground installation

#### 4.5.2 EG-\*\*\*P60-HD/BF-DG 和 EG-\*\*\*M60-HD/BF-DG 组件安装方式

##### Installation of EG-\*\*\*P60-HD/BF-DG and EG-\*\*\*M60-HD/BF-DG

对于 EG-\*\*\*P60-HD/BF-DG 和 EG-\*\*\*M60-HD/BF-DG 系列组件，尺寸为 1704\*1008\*30mm。

For the EG-\*\*\*P60-HD/BF-DG and EG-\*\*\*M60-HD/BF-DG series of glass- glass module, the size is 1704\*1008\*30mm.

##### 4.5.2.1 四个压块安装方式

如图 6 所示，压块安装位置位于双面双玻半片组件长边，安装支架平行于组件长边，安装支架切勿遮挡电池片，压块中心位置到组件短边距离为 A，A 必须在  $352 \pm 25\text{mm}$  之间，两个压块中心位置间距为 B，B 必须在  $1000 \pm 25\text{mm}$  范围内，图 7 为双面双玻半片组件边框型材图，压块与组件型材 A 面的重合长度为 S（图 8），S 不能大于 9.5mm，压块与安装支架之间使用螺栓连接（图 9），组件边框接地孔安装如图 10 所示。

As shown in figure 4, The mounting position of the block is located on the long side of the modules, The mounting bracket is parallel to the long side of the modules, Do not block the battery sheet when installing the bracket, The distance from the center of the two side blocks to the short side of the modules must be between  $352 \pm 25\text{mm}$ , The distance between the center of the two blocks must be  $1000 \pm 25\text{mm}$ , FIG. 7 shows the frame profile of the modules, The overlapping length between the block and profile A of the modules is S (figure 8), S cannot be greater than 9.5mm, Bolted connection between block and mounting bracket (figure 9), The modules grounding is shown in figure 10.

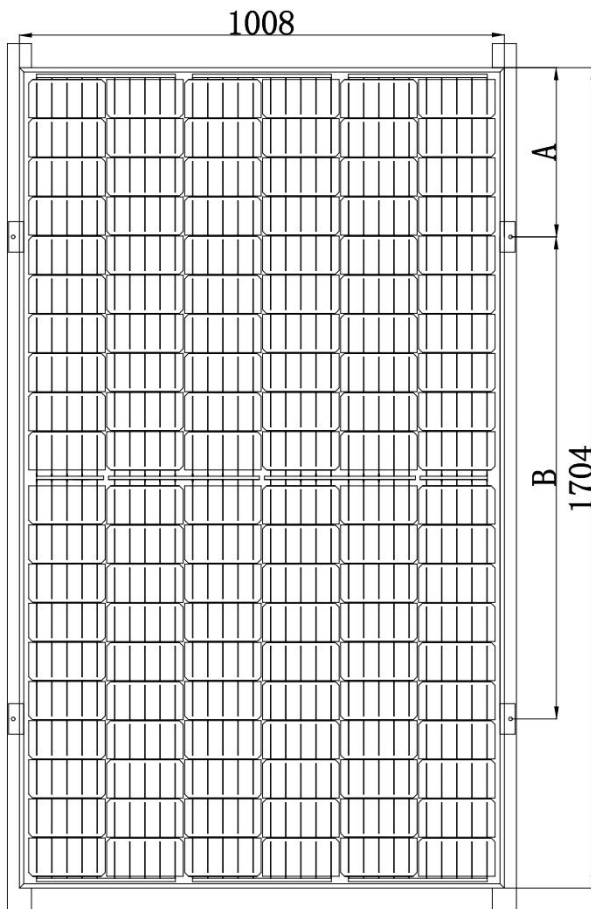


图 6: 压块安装位置图

Figure 6: location diagram of the block installation

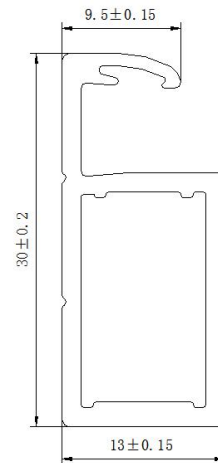


图 7: 双面双玻半片组件边框型材图

Figure 7: sectional view of the aluminum

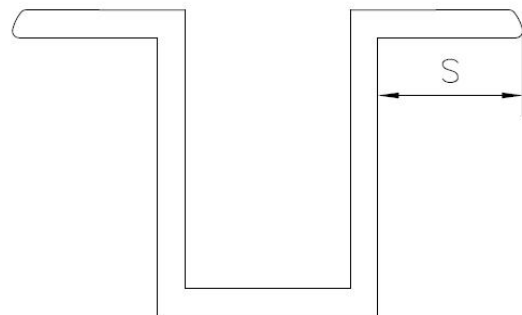


图 8: 压块尺寸要求图

Figure 8: size requirement of block

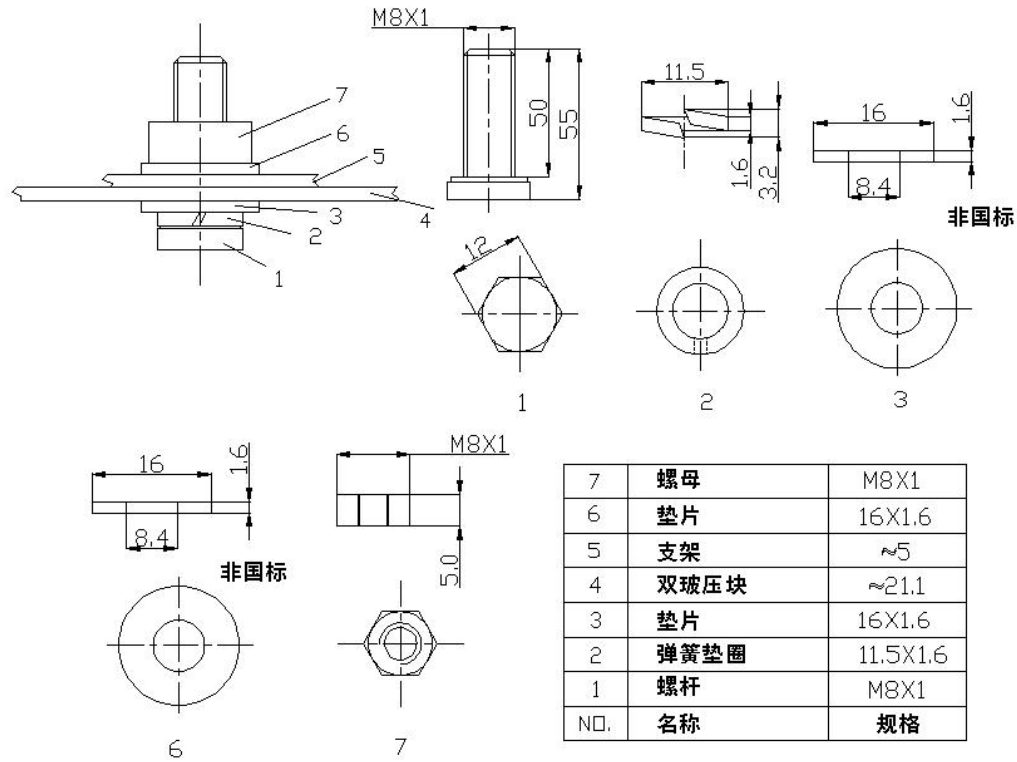


图 9：双面双玻半片组件压块与支架连接示意图

Figure 9: Bolted connection between block and mounting bracket

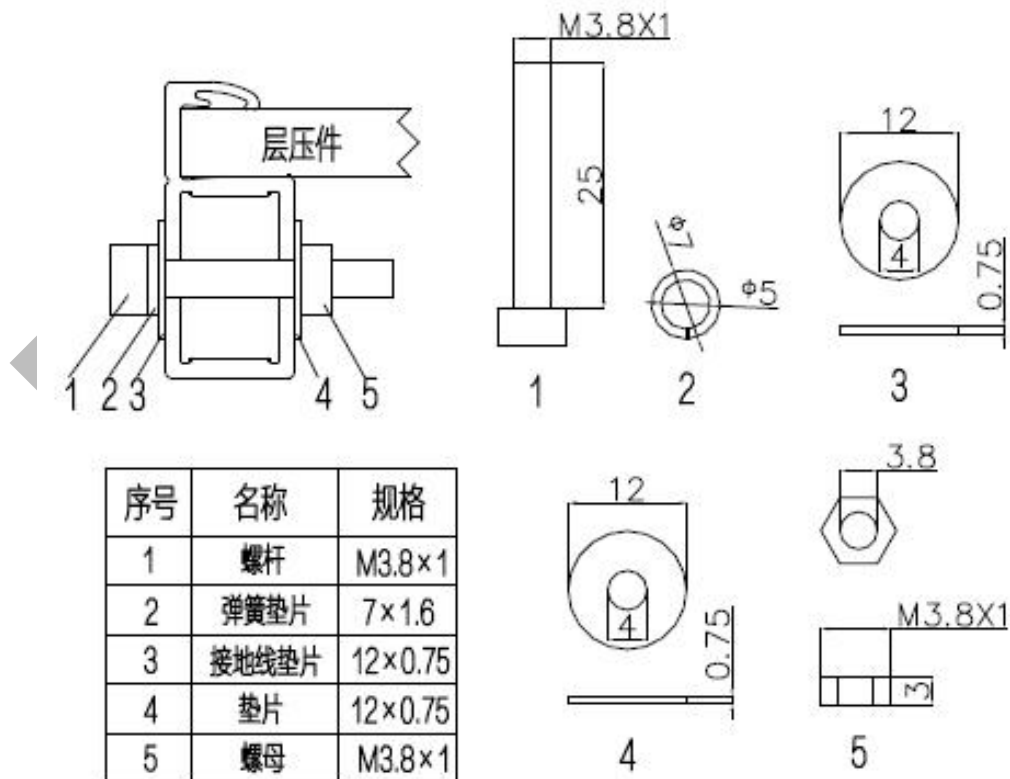


图 10：接地孔安装示意图

Figure 10: Schematic diagram of ground installation

## 5. 电气安装 Electrical Installation

### 5.1 连接 Connection

- 1) 不要在同一光伏系统中混合使用不同配置的组件。

Do not use modules of different configurations in the same system.

- 2) 为了确保系统的正常运行, 在将组件连接到电池或者其他组件时, 请注意观察电缆线的极性(图 11 和 12)。如果连接不正确, 旁路二极管可能会损坏。

In order to ensure the normal operation of the system, make sure the modules polarity is observed ( Fig.11 and Fig.12 ) when the modules are connected to the battery or other modules. Reverse polarity might cause damage to the protective diodes.

- 3) 本组件提供了接线盒(含有线缆和连接器)。参照相关标准, 以确定系统电缆线的尺寸、类型和导体温度等级等参数。推荐电缆尺寸: 横截面为  $4.0 \text{ mm}^2$ , 导线的额定温度:  $-40 \sim 120^\circ\text{C}$ ;

This module is supplied with junction box (containing cables and connectors). Refer to related standards to determine system wiring size, types and temperature ratings of conductors. Recommended cable size: cross-section is  $4.0 \text{ mm}^2$ , wire Rated temperature:  $-40 \sim 120^\circ\text{C}$

- 4) 组件串联连接电压累加。从一块组件的正极接线端连接到下一块组件的负极接线端。图 11 显示的是组件串联连接。

PV modules can be wired in series to increase voltage. Connect wires from the positive terminal of one module to the negative terminal of the next module. Fig.11 shows modules connected in series.

- 5) 组件并联连接电流累加。从一块组件的正极接线端连接到下一块组件的正极接线端。图 12 显示的是组件并联连接。

Connect PV modules in parallel to increase current. Connect wires from the positive terminal of one module to the positive terminal on the next module. Fig.12 shows modules connected in parallel.

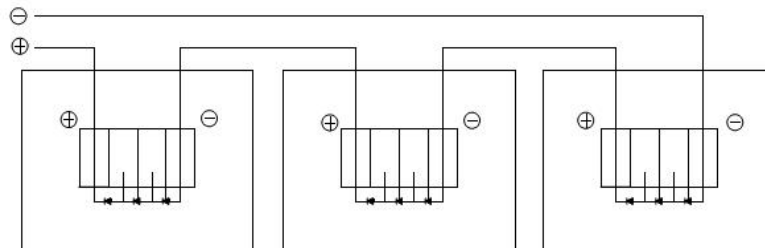


图 11 串联增加电压

Fig. 11 in series to increase voltage

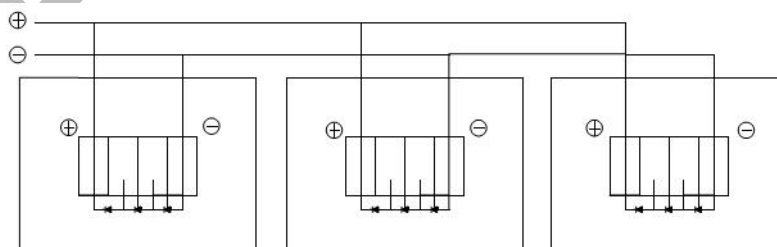


图 12 并联增加电流

Fig. 12 in parallel to increase current

## 组件配置（推荐） Module Configurations (recommended)

#无适当措施（如保险丝或防反二极管）下的最大并联串数：1串。

#If without appropriate measures (such as fuses or anti diode), the maximum number of parallel strings should be just 1 string.

注：在采取适当措施阻止反向电流流动的情况下（如防止组件和线缆过大电流的保险丝，防止串间电压不平衡的防反二极管），并联配置是没有限制的。

Note: In the case of taking appropriate measures to prevent reverse current flow (such as the fuse to prevent a large current of the modules and cables, the anti diode to prevent the voltage imbalance between strings), there is no restriction to the parallel configuration.

## 5.2 接地 Grounding

1) 遵守当地相关的电力法规和条例。

Observe all local electric codes and regulations.

2) 推荐使用接地线配件（接线鼻）连接接地电缆。

Recommend using ground wire accessories (wiring nose) to connect the ground cable.

3) 所有组件支撑支架或夹具必须妥善接地。对于金属支撑框架，框架表面必须电镀，保证其具有良好的导电性能，组件负极也必须接地，否则组件质保将失效。

All module supports or clamps must be properly grounded. For metal supporting frame, the frame surface must be electroplated to ensure a good conductivity. The negative pole must also be grounded, otherwise the guarantee will fail

## 5.3 电气安全 Electrical Safety

1) 不管组件是否连接，接触组件任何带电部位（如接线端子）都可能会造成烧伤、火花或是致命的电击。

Contact with electrically active parts of a PV module such as terminals can result in burns, sparks and lethal shock whether the PV modules is connected or not

2) 不建议将组件直接连接到负载上，因为取决于阳光辐照度的输出功率的变化有可能对所连接的负载造成损害。

Do not connect the PV modules directly to the loads since the variation of the output power depending on the solar irradiation causes damage for the connected load.

3) 出现问题时，立即关闭逆变器和断路器。

Turn off inverters and circuit breakers immediately, should a problem occur.

4) 不要遮挡组件，被遮蔽的电池片会发热（热斑效应），影响功率输出。

Do not shade the PV module. The shaded cell may become hot (hot spot phenomenon) which results in solder joints peeling off.

5) 在正常情况下，一块组件可能会遇到比在标准测试条件下产生更多的电流和（或）电压。因此，当计算额定电压、导线容量、熔断器规格、连接到组件输出端的控制器的尺寸时，应用该组件上标明的短路电流和开路电压值乘以 1.25 倍；

Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at Standard Test Conditions. Accordingly, the values of  $I_{sc}$  and  $V_{oc}$  marked on this module should be multiplied by a factor of 1.25 when determining module voltage ratings, conductor capacities, fuse sizes and size of controls connected to the module output.

- 6) 组件串联连接时，最大开路电压必须小于指定的系统最大电压（我公司组件的最大系统电压为 1500V）。最大开路电压与串联的组件数成比例。在组件并联连接的情况下，请一定要采取适当的措施（例如，用于组件及其线缆过电流保护的保险丝，用于预防串间电压不均衡的防反二极管），阻止反向电流。

In case of series connection, the maximum open circuit voltage must not be greater than the specified maximum system voltage (The maximum system voltage of modules from our company is 1500V). The voltage is proportional to the number of series. In case of parallel connection, please be sure to take proper measure (e.g. fuse for protection of module and cable from over current, and/or blocking diode for prevention of unbalanced strings voltage) to block the reverse current flow.

- 7) 组件背后的标签上最大功率  $P_{max}$ 、开路电压  $V_{oc}$ 、短路电流  $I_{sc}$ 、最大功率点电压  $V_{mp}$ 、最大功率点电流  $I_{mp}$  均为标称值，请参阅本手册附件中关于各种类型组件的电性能参数表。

The parameters including  $P_{max}/V_{oc}/I_{sc}/V_{mp}/I_{mp}$  on the black label are nominal value, please refer to the electrical properties of the various types of modules attached to this manual.

## 6. 维护 Maintenance

- ☆ 组件设计的使用寿命很长，必须进行定期检查和维修，尤其是质保期内，这是用户必须承担的责任，并且在发现组件有损坏的时候及时通知供应商（一般在 2 周内）。

The modules are designed for long life. The regular inspection and maintenance of the module must be carried out especially during the warranty period. It is the responsibility users must bear. When the module gets damaged, inform the supplier in time (usually 2 weeks)

- ☆ 如果组件的倾角大于等于 5 度，在大多数天气条件下正常的降雨足以保持组件玻璃表面的清洁。如果污垢积聚过多，只需用软布和水清洗玻璃表面。严禁使用含有碱、酸的清洁剂清洗组件。

If the angle of the PV module is 5 degrees or more, normal rainfall is sufficient to keep the module glass surface clean under most weather conditions. If dirt build-up becomes excessive, clean the glass surface only with a soft cloth using water. Do not use acidic or alkaline cleaning agent to wash the modules.

- ☆ 为了保证系统获得最大输出，建议定期清洗组件。清洗时严禁踩踏组件，做好安全防护工作。

In order to ensure the maximum output of the system, please clean the modules regularly. Do not trample on the module when washing it. Do the security work.

- ☆ 为了保证系统的运行，请定期检查接线和电线护套是否良好。

In order to ensure the operation of the system, please check the connection of wiring and the state of the jacket of wires regularly

- ☆ 不要使用化学品清洗组件玻璃表面。不要让水长时间停留在组件的玻璃表面，玻璃长时间浸水有可能出现“发霉”（玻璃的通病），从而导致功率的衰减。

Do not clean the glass surface with chemicals. Do not let water stay on the glass surface of PV modules for a long time. This creates a risk of white efflorescence (common problem with glass) which may result in the deterioration of energy generation

- ☆ 当组件表面有积雪时，组件下侧积雪更多（组件倾斜安装时），要采取适当的措施防止组件受损。

When there is snow load on the surface of modules, chances are there is more snow under the modules (when modules are installed in a tilt way), appropriate measures have to be taken so that PV modules will not be damaged.

附件：机械和电气额定值

### ANNEX: MECHANICAL AND ELECTRICAL RATINGS

标准测试条件：辐照度1kW/m<sup>2</sup>，AM 1.5和25℃电池温度。

Standard Test Conditions are : irradiance of 1kW/m<sup>2</sup>, AM 1.5 spectrum, and cell temperature of 25℃.

单个组件的Pmax公差为±3%。

Pmax of any individual module will be within ±3% tolerance of these specified values.

单个组件的Voc±3%，Isc公差为±5%。

Voc of any individual module will be within ±3% tolerance of these specified values.

Isc of any individual module will be within ±5% tolerance of these specified values.

表1中的规格和电气特性受技术和产品更新的限制。本文件中的信息如有变更，恕不另行通知。

Specifications and electric characteristics in Table 1 are subject to technical and product innovations. Information in this document is subject to change without notice.

表1：在STC下的EG系列光伏组件规格书

Table 1: Specifications for EG-series photovoltaic modules under STC

Type of cells	Type of Module	Maximum power Pmax (W)	Operating Voltage Vmp (V)	Operating Current Imp (A)	Open Circuit Voltage Voc (V)	Short Circuit Current Isc (A)	Max.Series Fuse Rating(A)	system voltage (V)
120 cells mono 120 片单晶	EG-310M60-HD/BF-DG	310	32.67	9.49	40.47	9.95	15	1500
	EG-315M60-HD/BF-DG	315	32.89	9.58	40.69	10.04	15	1500
	EG-320M60-HD/BF-DG	320	33.10	9.67	40.90	10.13	15	1500
	EG-325M60-HD/BF-DG	325	33.30	9.76	41.01	10.22	15	1500
	EG-330M60-HD/BF-DG	330	33.51	9.85	41.21	10.31	15	1500
	EG-335M60-HD/BF-DG	335	33.71	9.94	41.41	10.40	15	1500
	EG-340M60-HD/BF-DG	340	33.90	10.03	41.61	10.49	15	1500
	EG-345M60-HD/BF-DG	345	34.10	10.12	41.81	10.58	15	1500
144 cells mono 144 片单晶	EG-370M72-HD/BF-DG	370	39.03	9.48	48.28	9.98	15	1500
	EG-375M72-HD/BF-DG	375	39.23	9.56	48.48	10.06	15	1500
	EG-380M72-HD/BF-DG	380	39.42	9.64	48.67	10.14	15	1500
	EG-385M72-HD/BF-DG	385	39.61	9.72	48.86	10.22	15	1500
	EG-390M72-HD/BF-DG	390	39.80	9.80	49.05	10.30	15	1500
	EG-395M72-HD/BF-DG	395	39.98	9.88	49.23	10.38	15	1500
	EG-400M72-HD/BF-DG	400	40.17	9.96	49.42	10.46	15	1500
	EG-405M72-HD/BF-DG	405	40.34	10.04	49.61	10.54	15	1500

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