# 光伏保险丝连接器使用说明书

# PV-Fuse Connector User Manual

## MC-15F

| 修改履历记录表 Revision History Record Form | | | | | |
|---|---|---|---|---|---|
| 序号<br>No. | 版本<br>Version | 变更章节<br>Change Section | 变更内容<br>Change Content | 日期<br>Date | 备注<br>Remark |
| 1 | A1 | N/A | New version | 2026-1-16 | New Model |

# 目录 CONTENTS

# 安全须知 Safety instructions

## 警告 WARNING

1. 安装前请先阅读使用说明书，并遵守安装说明和安全须知，否则可能会导致因电击、电弧、火灾或系统故障而危及人身安全。
2. 安装前请先检查产品是否完好，请勿使用损坏或者零件缺失的产品。
3. 安装人员须持电工证或受过电气培训合格的人员。
4. 禁止在带电的情况下安装或拆卸本产品，安装或拆卸前必须先切断电源。
5. 本品只能使用一次，安装后勿再调整使用。如有损坏，请更换。
6. 断开的连接器请使用防尘帽，以免异物进入污染。
7. 本品防水等级为IP68(1m1h),但是不能置于水中使用，不能将本品置于屋顶表面。
8. 产品禁止在含小分子油、烃、酚、酮、氨合物等与塑料有腐蚀的环境中使用。禁止在连接器里添加或涂抹任何油脂及润滑剂。
9. 产品安装使用符合光伏组件要求。
10. 本连接器与MC4系列产品连接使用。
11. 请妥善保管使用说明书，并将其移交给后续用户。

1. Please read the  manual before installation and follow the installation instructions and safety notices, ohterwise would in life-threatening injuries due to electric shock, electric arcs, fire,  or failure of the system.
2. Please check that the product is in good condition before installation. Do not use products that are damaged or have missing parts.
3. The installer must have an electrician's license or a qualified person with electrical training.
4. Do Not Disconnect Under Load: PV plug connections must not be disconnected while under load. They can be placed in a no load state by switching off the DC/AC converter or breaking the AC circuit.
5. This product can only be used once. Do not adjust its use after installation.
6. Broken connectors Please use a dust hat to prevent foreign objects from entering the pollution.
7. This product is IP68 (1M1H) classification of waterproof, but can not be used in water, can not be placed on the roof.
8. The product is prohibited from use in environments containing small molecules of oil, hydrocarbons, phenols, ketones, ammonia, etc. that are corrosive to plastics. It is prohibited to add or apply any grease or lubricant to the connector.
9.The product installation and use meet the requirements of PV modules.
10. This connector is compatible with MC4 series products..
11. Please safeguard the instruction manual and hand it over to a subsequent user.

## 应用范围 Intended use

本品用于光伏直流 (DC) 电路中的电气连接，亦可用作低压直流 (LVDC) 部件。如果需要作其他用途，则需要在符合本品技术参数的情况下使用。

This product is used for electrical connections in PV direct current (DC) circuits, and can also be used as low voltage direct current (LVDC) components. If additional use is required, it shall be used in compliance with the technical parameters of this product.

## 符合性声明Declaration of Conformity

1. 本系列“gPV”型熔断器及胶座，依据下述国际与欧洲标准，由TÜV机构完成测试与认证，适用于光伏直流系统的安全保护。

| 认证机构 certification body | 测试依据标准 test basis standard | 标准内容简述 Brief description of standard content |
|---|---|---|
| TÜV | IEC 62852:2014 + A1:2020 EN 62852:2015 + A1:2020 | 适用于直流电压不超过 1500V 的光伏系统连接器与设备的安全标准。本产品的设计与测试符合其对电气间隙、爬电距离、耐压及温度升高等要求。 The design and testing of this product comply with the safety standards for connectors and equipment used in photovoltaic systems with a DC voltage not exceeding 1500V, meeting the requirements for electrical clearance, creepage distance, withstand voltage, temperature rise, and other related criteria. |
| TÜV | EN/IEC 60947-3:2021 | 低压开关设备和控制设备标准第 3 部分：开关、隔离器、隔离开关及熔断器组合电器。本产品作为隔离电器，符合其关于隔离功能和安全性的规定。 Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units. As an isolating device, this product complies with the relevant provisions regarding isolating function and safety. |
| 自我声明 | IEC 60269-6:2010 + A1:2021 (GB/T 13539.6-2024) | 低压熔断器标准第 6 部分：太阳能光伏能源系统保护用熔断体的补充要求。本产品“gPV”特性符合此专用标准。 Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems. The "gPV" characteristics of this product comply with this dedicated standard. |

本产品作为光伏直流侧过电流保护元件，其安全性、隔离性能及熔断特性均满足上述权威标准要求。

As a DC-side overcurrent protection component for photovoltaic systems, this product demonstrates excellent safety, isolation performance, and fuse characteristics. Meet the above authoritative standards.

## 保险丝结构特性Fuse structural characteristics

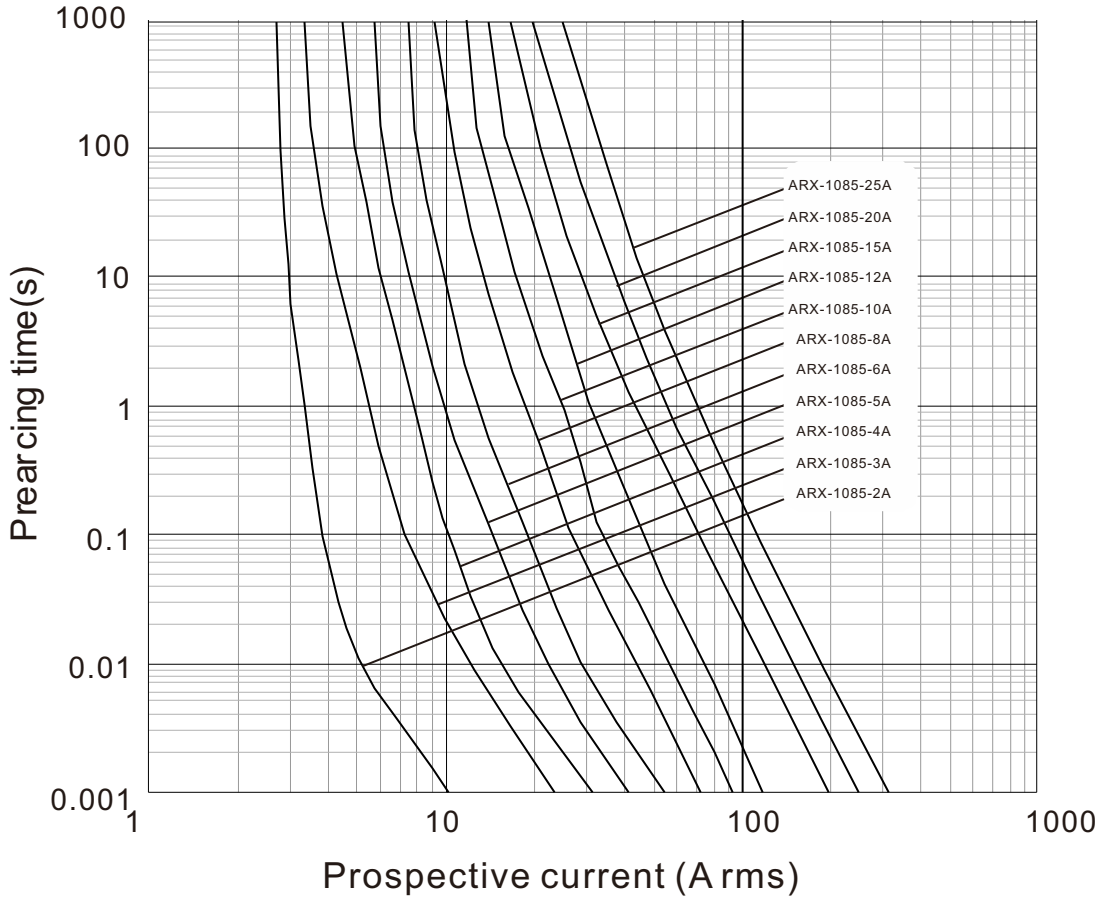
由纯银片制成的变截面熔体封装于由高强度瓷制成的熔管内，熔管中充满经化学处理过的高纯度石英砂和特殊处理化学物资作为灭弧介质，熔体二端采用点焊与触头牢固电连接。

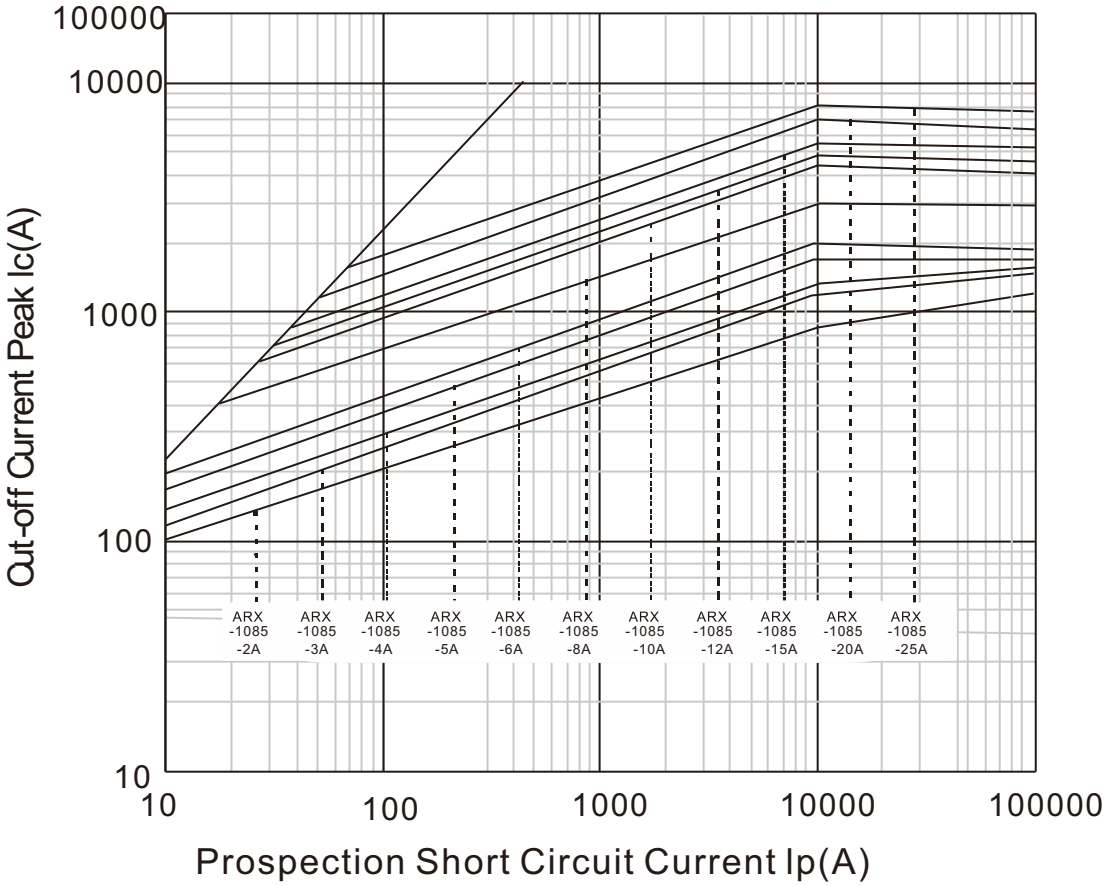
The variable cross-section fuse element, made of pure silver sheet, is encapsulated in a high-strength porcelain fuse tube. The tube is filled with chemically treated high-purity quartz sand and special chemical materials as the arc-extinguishing medium. Both ends of the fuse element are securely connected to the contacts by spot welding.

## 技术参数　Product Speciffcations

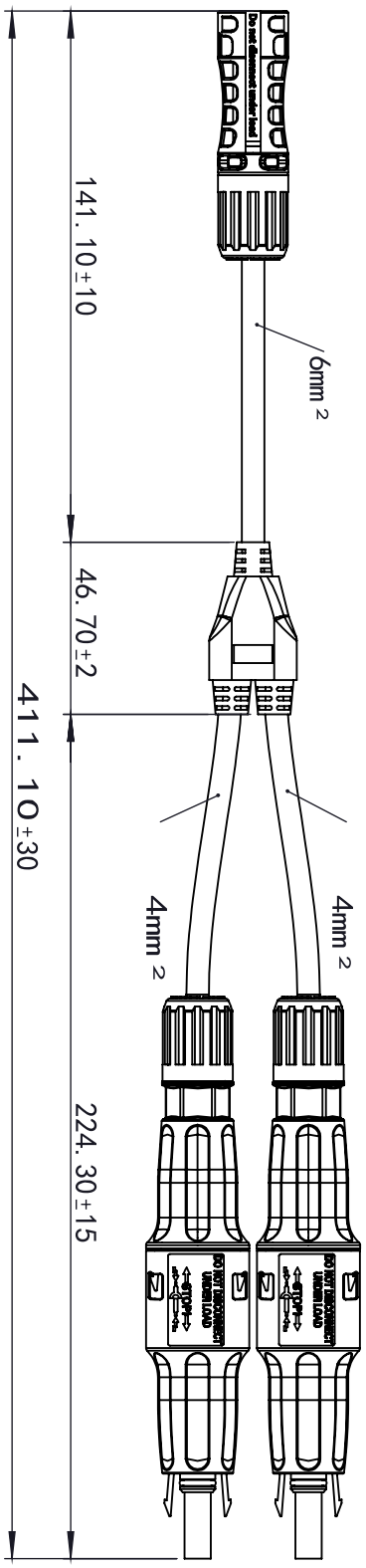
| | |
|---|---|
| 连接器系统<br>Connector system | Φ4mm |
| 额定电压<br>Rated Voltage | 1500V |
| 额定电流<br>Rated current | 5A/10A/15A/20A/25A/30A（Options） |
| 额定分断力<br>Rated breakingcapacity | 20KA |
| 环境温度范围<br>Operating Temperature range | -40℃~70℃ |
| 防水等级<br>Waterproof class | Insertion：IP68;<br>Non-insertion：IP2X |
| 接触电阻<br>Contact resistance | ≤1mΩ |
| 安全等级<br>Safety class | DcⅡ |
| 连接系统<br>Connected system | Multipoint connection |
| 连接方式<br>Wiring | Plug-and-play |
| 导体<br>Conductor | Copper tin-plated |
| 绝缘材质<br>Insulation material | PPO |
| 自锁系统<br>Self-locking system | Embedded |
| 防火等级<br>Flame class | UL94-V-0 |

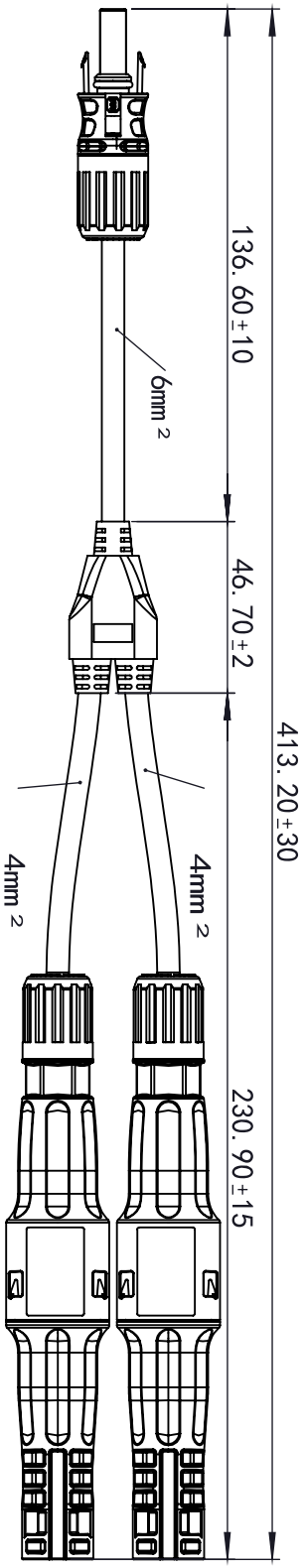
## 特性曲线图 Characteristics Curve



## 零件尺寸 Parts Size(mm)



## 功能介绍 Function introduction

本光伏保险丝连接器适用于额定电压为DC1500V、额定电流为5A至30A（可选）且额定分断能力可达20kA的电路，为光伏发电设备和其他半导体设备提供短路和过载保护。该连接器与MC4对接兼容。

This photovoltaic fuse connector is suitable forcircuits with a rated voltage of DC1000v, a rated current of 5A to 30A (optional), and a rated breakingcapacity up to 20kA, serving as short-circuit andoverload protection for photovoltaic powergeneration devices and other semiconducto requipment. This connector is compatible with MC4docking.

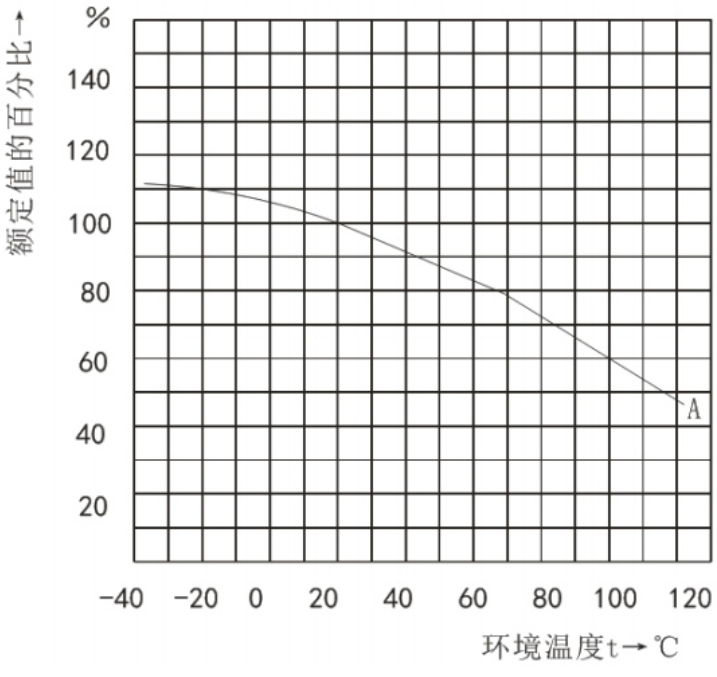
## 环境对电流的影响及修正
## The influence of the environment on current and itscorrection

1. 不同环境温度下使用电流修正值：
在 20℃环境温度下，我们推荐熔断体的实际工作电流不应超过额定电流值。选用熔断体时应考虑到环境及工作条件，如封闭程度、空气流动、连接电缆尺寸（长度、截面）、瞬时峰值等方面的变化；熔断体的电流承载能力试验是在 20℃环境温度下进行的，实际使用时受环境温度变化的影响。环境温度越高，熔断体的工作温度就越高，其寿命也就越短。相反，较低的温度下运行将延长熔断体的寿命。

1. Current correction values for use at differentambient temperatures: At an ambient temperatureof 20°C,we recommend that the actual workingcurrent of the fuse should not exceed the ratedcurrent value. when selecting fuses, environmentaland working conditions should be taken intoaccount, such as changes in the degree of sealingair flow, the size (length, cross-section) of theconnecting cable, and the instantaneous peakvalue, etc. The current-carrying capacity test of thefuse was conducted at an ambient temperature of20°C,and in actual use.

例如：在某一使用场合的环境温度为 20℃，选用“gPV”型熔断体的额定电流 In=16A，现在上述熔断体用在 70℃高温环境中工作，就必须额外减少工作电流，从上图曲线 A 表明 70℃时运行额定值的百分比 0.78，为确保熔断体不发生误动作，应重新选择该熔断体的额定电流值：
In=16A/0.78=20.512A；按熔断体标准电流等级选择 In=20A。
注：曲线线路为保护用的“gPV”型熔断体曲线。

For example:In A certain application scenarlowhere the ambient temperature is 20'C, the ratedcurrent in of the "gPy" type fuse is selected as 16A.Now that the above-mentioned fuse is working in ahigh-temperature environment of 70°c, the workingcurrent must be further reduced. As shown by CurveA in the above figure, the percentage of theoperating rated value at 70'c is 0.78. To ensure thatthe fuse does not malfunction, the rated current ofthe fuse should be reselected.




环境温度对电流承载能力影响的典型曲线

## 环境对电流的影响及修正
## The influence of the environment on current and itscorrection

2. 不同海拔下使用的电流修正系数：

Current correction coefficients used at differentaltitudes:

| 海拔高度 altitude | ≤2000m | 2000m~3000m | ≥3000m | 举 列 List |
|---|---|---|---|---|
| 电流修正系数 Current correction factor | 1 | 0.9 | 0.8 | 额定电流 10A 的产品海拔2500m 降容使用后额定电流为 0.9×10=9A For a product with a rated current of 10A, when used at an altitude of 2500m, the derated current is 0.9 × 10 = 9A |

**安装地点的海拔不超过2000m(如若要超过此2000m，需要注明要求，本公司可以按照客户要求进行设计开发)。**

The installation site altitude should not exceed 2000m. If it exceeds 2000m, specific requirements must be specified, and our company can perform customized design and development according to customer requirements.

## 物料情况及存储 Material conditions and storage

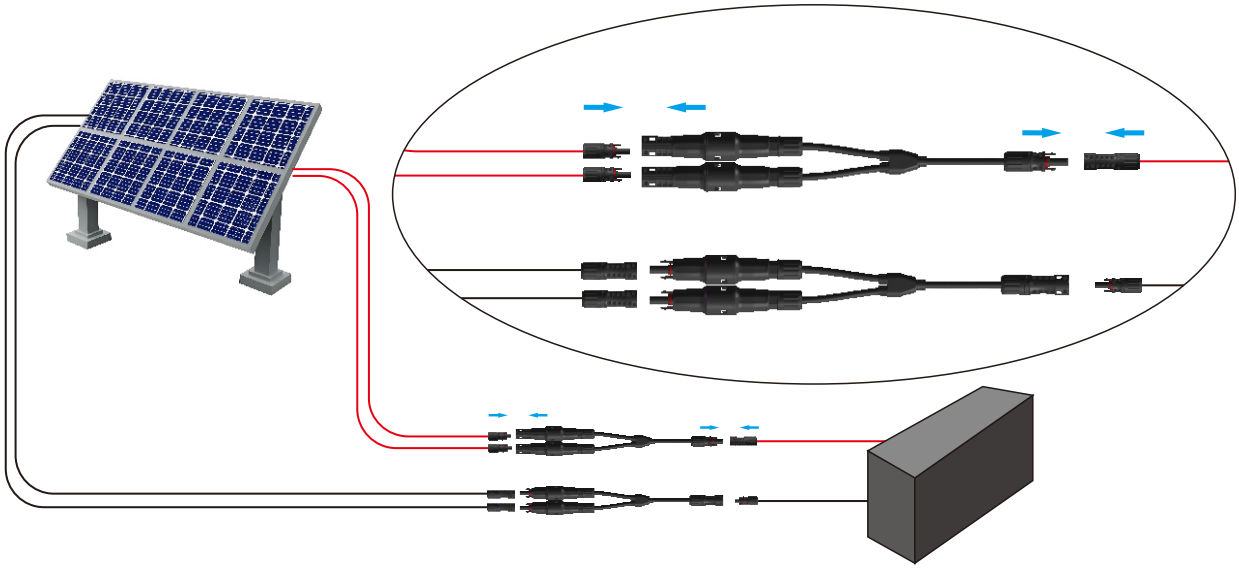
1. 绝缘壳体: PPO;
2. 端子：铜导镍;
3. 防水圈：硅胶;
4.保险丝：铜镀银;
5.产品储存环境
   ①. 无雨雪侵入;
   ②. 空气流通;
   ③. 湿度小于70%;
   ④. 环境温度小于40C,24h平均温度小于35c, 低温高于-5c;
   ⑤. 周围空气无酸性、碱性或者其他腐蚀气体。

1.Insulating housing: PPO;
2. Terminal: copper tin nickel;
3.Waterproof ring: Silicone;
4.Fuse.silver-plated copper;
5. Product storage environment.
   ①.No entry of snow or rain ;
   ②.With air circulation/ventilation ;
   ③.Relative humidity (RH) less than 70%;
   ④.Ambient temperature not exceeding +40°C, with a 24-hour average temperature below +35°C and a low temperature above -5°C;
   ⑤.The surrounding atmosphere shall be free of acidic, alkaline, or other corrosive gases。

# 快速安装 Quick installation

安装前请检查产品是否完好，电流安培量是否匹配需求。

Before installation, make sure the product is undamaged and the current amperage matches your requirements.



将保险丝连接器安装在光伏系统的正极电路中，使用光伏连接器连接。
将连接器公母座对插，直到啮合, 轻拉连接器（Max≤20N)，确保连接器已经啮合。

Install the fuse connector in the positive circuit ofthe photovoltaic system and connect it using a PV connector.
Plug the male and female of the connector together until they are roded.Check correct engagement by gently pulling the connector (maximum pulling force≤20 N).

# 电缆布线和电线管理 Cable routing and wire management

使用连接器时请使用扎带或线码来固定
When using connectors, employ cable ties or wire clamps for fixation.

正确布线示意图
Correct wiring diagram

注意：*不要让连接器受到污染；
*不要置于屋顶表面；
*不要置于水中；
*不要让连接器受到机械压力。

禁止连接器悬空吊着使用
Prohibit the use of connectors with dangling (unterminated) ends

错误布线示意图
Incorrect wiring diagram

NOTE: *Do not allow connectors to be contaminated by the environment;
*Do not allow that the connector is directly on the rooffng surface;
*Do not allow that the connector is in standing water;
*Do not subject the connector to mechanical stress.

感谢阅读
Thanks for reading