禾望电气
Hopewind

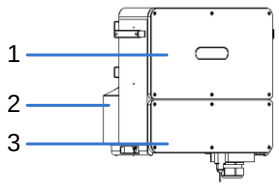
# hopeSun 系列
## 100KTL
# 组串式光伏逆变器
# 快速安装指南

**⚠ 注意**

1. 由于产品升级或其他原因，本手册内容会不定期更新。除非另有约定，本手册仅作为使用指导，文档中的所有陈述、信息和建议都不构成任何明示或暗示的担保。
2. 在任何情况下，本手册中的指导都不可取代用户手册及产品机身上的安全警示及说明。
3. 设备的所有操作必须由专业人员进行。操作人员应当充分熟悉整个光伏发电系统的构成、工作原理，及项目所在地的相关标准。
4. 安装设备前请根据"装箱清单"检查交付件是否完整齐备，机体有无明显的外部损坏。如果缺少任何物件或存在任何损坏，请联系经销商。
5. 发生以下两种情况，不在质保范围内。
   - 拆除防拆标签；
   - 未按照本手册及用户手册的要求存储、搬运、安装和使用设备所导致的设备损坏。

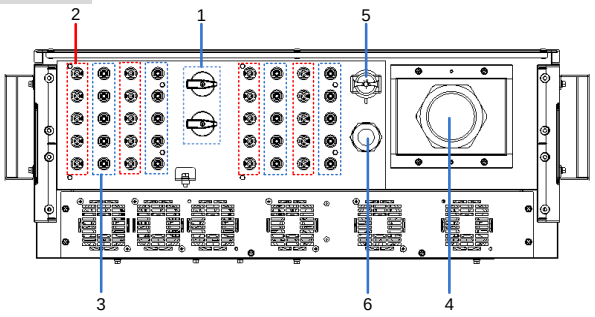
# 1.产品简介

逆变器正面



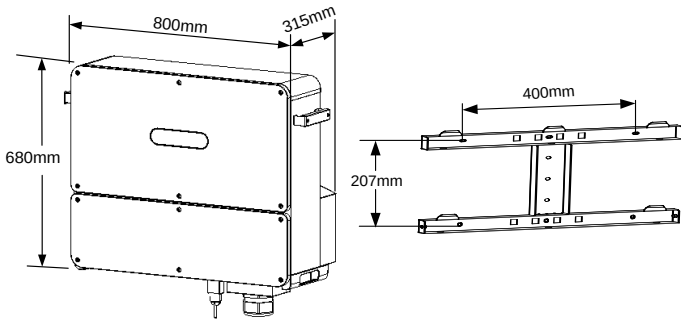

(1)上门板
(2)散热风扇
(3)下门板

端口说明




(1)直流开关 DC SWITCH
(2) PV+接线端子(1+ ~ 20+)
(3) PV-接线端子(1- ~ 20-)
(4)交流输出端子防水锁头
(5) Wi-Fi/GPRS 通信接口
(6) RS485 输出端子防水锁头

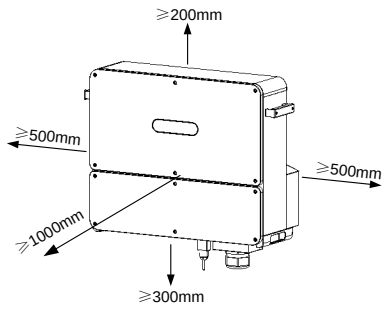
逆变器及挂板安装孔位尺寸




# 2.安装要求及工具准备

📖 本手册仅作安装指导，详尽安装要求请参考用户手册。

安装空间




工具准备

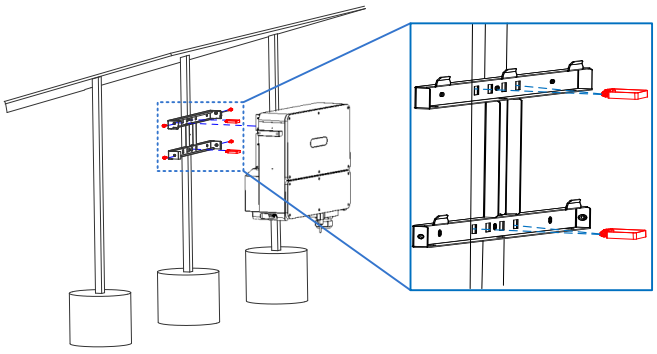
| 工具或设备 | 用途 | 备注 |
|---|---|---|
| 4#内六角扳手 | 逆变器下门板拆装 | |
| 十字螺丝刀(PH2) | 松开/紧固输出端子档板的螺钉 | 螺栓规格：M6 和 M8 |
| 管型端子压线钳 | 压接通信线缆端子 | |
| 套筒扳手 | 输出电缆的连接 | 螺栓规格：M8 |
| MC4 端子压线钳 | 压接 MC4 端子 | 输入电缆需要压接成 MC4 端子，才能与逆变器上的 PV+/PV-端子连接。 |
| MC4 拆除工具 | | |
| 剥线钳 | 剥线 | |
| 万用表 | 测量电压，确保接线、安装时安全 | |
| 安全防护用具 | 施工必要的劳动保护 | 绝缘鞋、手套等 |

# 3.逆变器安装

逆变器的包装中附带有挂板，安装时需先安装挂板，再将逆变器挂放并紧固在挂板上。可根据实际安装环境需要，选择抱柱/抱杆式安装、挂架式安装两种安装方式。

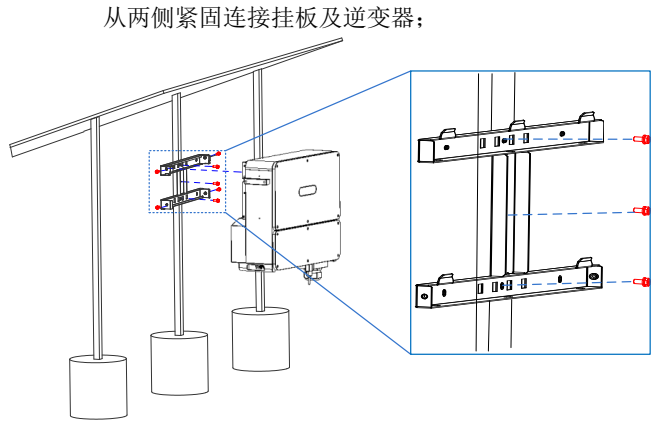
## ● 喉箍抱杆式安装

1) 在挂板背侧使用至少 2 PCS 喉箍穿过箍带安装孔（喉箍客户自备）；将挂板放置到安装位置，扎紧箍带；
2) 将逆变器轻轻的由上至下挂在挂板上，检查两侧，确保固定在正确的位置上，使用 4 PCS M8 螺钉（随机附件）从两侧紧固连接挂板及逆变器；



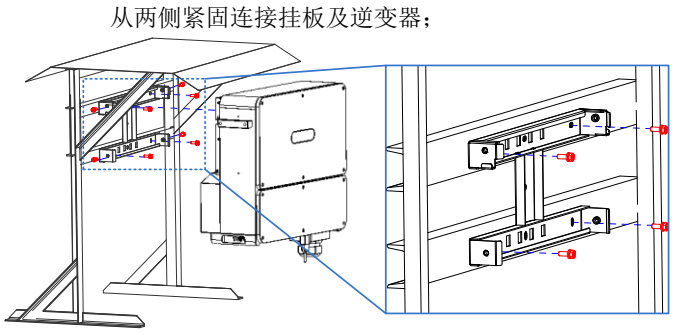
## ● 螺钉抱杆式安装

1) 使用 3 PCS M8 螺钉（随机附件）将挂件固定在安装位置；
2) 将逆变器轻轻的由上至下挂在挂板上，检查两侧，确保固定在正确的位置上，使用 4 PCS M8 螺钉（随机附件）从两侧紧固连接挂板及逆变器；



## ● 螺钉挂架式安装

1) 使用 4 PCS M8 螺钉（随机附件）将挂件固定在安装位置；
2) 将逆变器轻轻的由上至下挂在挂板上，检查两侧，确保固定在正确的位置上，使用 4 PCS M8 螺钉（随机附件）从两侧紧固连接挂板及逆变器；



📖 避免逆变器受到阳光直射、雨淋与积雪，可延长使用寿命。建议选择带遮挡的安装地点，若无法满足，请搭建遮阳棚（选配件）。

📖 逆变器也可通过挂板安装在承重墙壁上，请客户根据现场安装环境、墙壁承重等因素，自行购买 M8 膨胀钉在墙壁打孔安装。

# 4.电气连接

**⚠ 危险**

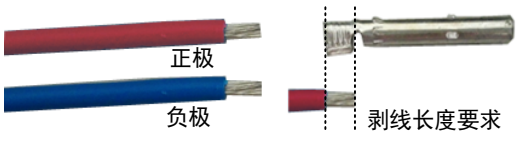
1. 连接线缆时，禁止带电操作，并遵守《组串式逆变器用户手册》中的相关要求。
2. 在连接线缆前，请完成以下准备工作，以免造成人身伤害。
   1) 断开逆变器直流开关。确保逆变器处于关机状态，并贴好警示标识。
   2) 确定输入电缆的正、负极，并做好标识。确保输入电缆与光伏组串的连接断开。
   3) 确认光伏组串的开路电压没有超过规定限值。
   4) 确认对应的交流汇流箱断路器处于断开状态。
3. 在连接输入线缆时，确保输入电缆的正、负极与组串式逆变器 PV 端子正、负极对应。

## ● 输出侧电缆接线

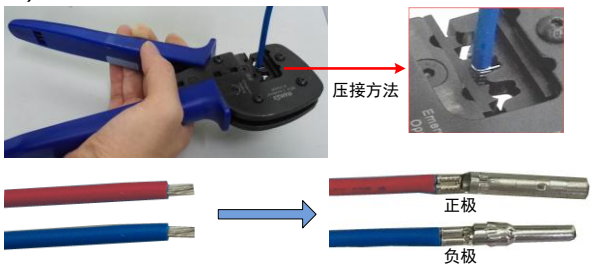
1. 地线连接：地线接线处位于壳体外部，贴有 PE 标识。地线线缆线径不小于 16mm$^2$。螺栓规格为 M6。注意：必须保证接地线缆与接地排可靠连接。
2. 交流输出电缆连接：
   1) 将逆变器底部的"AC OUTPUT"防水锁头上的锁紧帽拧下；
   2) 将交流线缆依次穿入锁紧帽和逆变器底部"AC OUTPUT"防水锁头，依次连接至交流接线端子排的 A,B,C,N 上，紧固力矩为 8N•m。

## ● PV 输入电缆接线

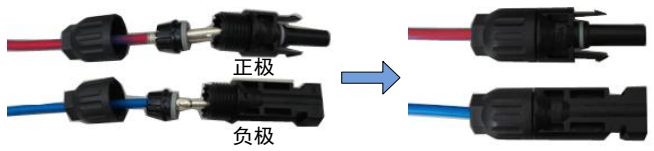
1. 压接 MC4 端子：
   1) 确认输入电缆的正、负极，并已做好标识。
   2) 使用剥线钳剥线；




   3) 按照正确的极性，将电缆与对应线芯压接到一起。




   4) 按照正确的极性，将线芯插入 MC4 连接器的公头和母头，并拧紧连接器后盖。




2. 确定输入电缆的极性后，将每一路输入电缆正、负极与组串式逆变器输入端子 PV+、PV-一一对应连接。正极接 PV+，负极接 PV-。

## ● 线缆选择

| 名称 | 位号 | 推荐电缆规格 | 备注 |
|---|---|---|---|
| PV 支路输入电缆 | 1+ ~20+<br>1- ~ 20- | 行业通用光伏线缆，型号：PV1-F<br>推荐各 PV+、PV-支路均使用横截面积为 4.0mm$^2$ 的电缆 | 无 |
| 交流输出电缆 | A、B、C、N | 4 芯户外线缆（A,B,C,N）或 3 芯户外线缆（A,B,C）<br>导线截面积推荐值（铜线缆）：35mm$^2$ | 交流输出只有 1 个防水锁头，规格为 32mm~38mm。<br>输出为 Φ8 接线端子，锁螺钉时请用套筒校力。 |
| RS485 通信电缆 | X3-P2<br>X3-P3 | 推荐使用专用通讯电缆，或横截面积不小于 0.75mm$^2$ 的 4 芯或 2 芯屏蔽双绞电缆 | RS485 通信电缆只有一个防水锁头，规格为 18mm~25mm。 |
| PE 接地电缆 | PE | 推荐使用至少 1 根横截面积为 16mm$^2$ 的接地专用电缆 | 无 |

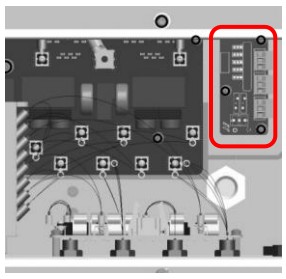
## ● 直流输入端子选择

逆变器有两个直流输入开关（DC SWITCH），输入路数与接入端子的选择推荐见下表。

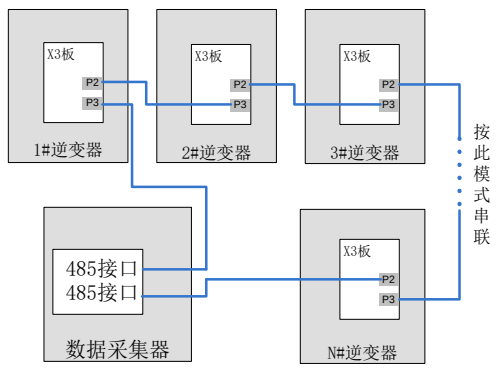
| 输入路数 | 逆变器直流输入端子 |
|---|---|
| 1 | PV1 |
| 2 | PV1、PV2 |
| 3 | PV1、PV2、PV3 |
| 4 | PV1 ~ PV3、PV4 |
| 5 | PV1 ~ PV4、PV5 |
| 6 | PV1 ~ PV5、PV6 |
| 7 | PV1 ~ PV6、PV7 |
| 8 | PV1 ~ PV7、PV8 |
| 9 | PV1 ~ PV8、PV9 |
| 10 | PV1 ~ PV9、PV10 |
| … | … |
| 20 | PV1 ~ PV19、PV20 |

## ● RS485 通信线缆接线

在 RS485 转接板 X1 上，两个 RS485 接口（标记为 P2、P3），如图所示。处于串联中的组串式逆变器，此接口用于连接临近组串式逆变器。



1. 将过线孔的保护膜取出，将 RS485 线缆穿过防水锁头，与 RS485 转接板 X3 上的接口连接。
2. 多台逆变器的连接建议采用下图所示方式串联。




# 5.安装后检查

| | |
|---|---|
| 1. 确认逆变器已经可靠安装到位 | ☐ |
| 2. 检查地线是否正确连接，连接是否可靠牢固，确保无断路、短路 | ☐ |
| 3. 检查输出线缆是否正确连接，连接是否可靠牢固，确保无断路、短路 | ☐ |
| 4. 检查直流输入线缆连接极性是否正确，连接是否可靠牢固，确保无断路、短路 | ☐ |
| 5. 检查 RS485 通信线缆连接是否正确且可靠牢固 | ☐ |
| 6. 检查逆变器底部所有已使用的接头是否涂上防火泥 | ☐ |
| 7. 检查逆变器下门板是否装回，门板螺钉是否紧固 | ☐ |
| 8. 检查不需要使用的直流输入端子是否已经密封 | ☐ |
| 9. 检查直流开关 DC SWITCH 是否处于闭合状态 | ☐ |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版本：V1.0

禾望电气 Hopewind

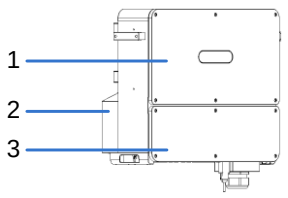
# hopeSun Series
## 100KTL
# String Type PV Inverter Quick Installation Guide

**CAUTION**

1. The contents of this manual are subject to irregular updates due to product upgrades or other reasons. Unless otherwise agreed, this manual is only used as guidance. All statements, information and recommendations in the document do not constitute any express or implied warranty.
2. In any case, guidance in this manual cannot replace safety warnings and instructions on user manuals and product fuselage.
3. All operations of the equipment must be carried out by professionals. Operators should be fully familiar with the composition, working principles and standards of the whole PV system.
4. Before installing the equipment, check whether the delivery is complete and whether the body has obvious external damage according to the "packing list". If there are any missing items or any damage, please contact the distributor.
5. The following two situations occur and are not covered by the warranty.
   - Remove the tamper-evident label;
   - Equipment damage caused by failure to store, handle, install, and use the equipment in accordance with the requirements of this manual and the user manual.

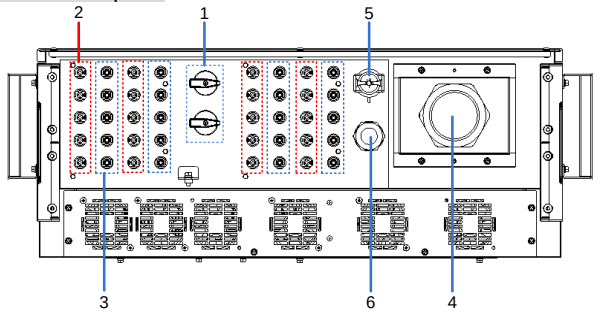
# 1. Product Introduction

Inverter front



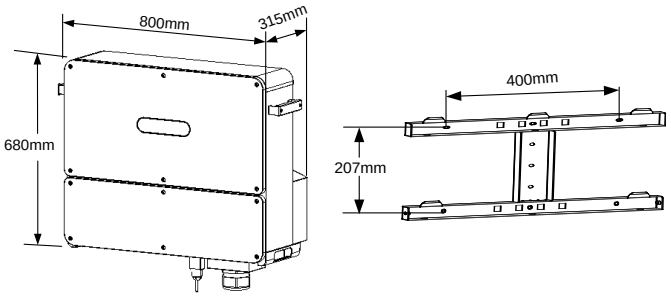

(1) Upper door
(2) Radiator fans
(3) Lower door

Port description




(1) DC SWITCH
(2) PV+ terminals (1+ ~ 20+)
(3) PV- terminals (1- ~ 20-)
(4) AC output terminal waterproof lock
(5) Wi-Fi/GPRS communication interface
(6) RS485 output terminal waterproof lock

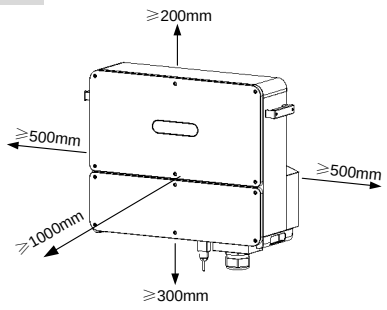
Inverter and hanging plate size




# 2. Installation Requirements and Tools Preparation

📖 This manual is for installation guidance only. Please refer to the user manual for detailed installation requirements.

Installation Space




Tool preparation

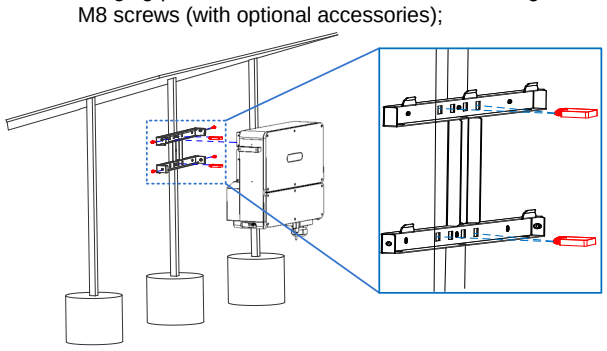
| Tools or equipment | Use | Remarks |
|---|---|---|
| 4# Inner hexagon spanner | Lower doorplate disassembly | |
| Phillips screwdriver (PH2) | Fasten the grounding screws and pegboard screws | Bolt specifications: M6 and M8 |
| Tube type crimping pliers | Tube type crimping pliers | |
| Socket wrench | Output cable connection | Bolt specifications：M8 |
| MC4 crimping pliers | Crimp the MC4 terminals | The input cable needs to be crimped into the MC4 terminal before it can be connected to the PV+/PV- terminal on the inverter |
| MC4 removal tool | | |
| Wire stripper | | |
| Multimeter | Measure voltage to ensure wiring and installation safety | |
| Safety equipment | Necessary labor protection for construction | Insulating shoes, gloves, etc |

# 3. Inverter Installation

There is a hanging plate in the package of the inverter. When installing, the hanging plate must be installed first, and then the inverter should be hung and fastened on the hanging plate. According to the actual installation environment needs, two types of installation methods are selected, namely the column/pole mount and wall mount.

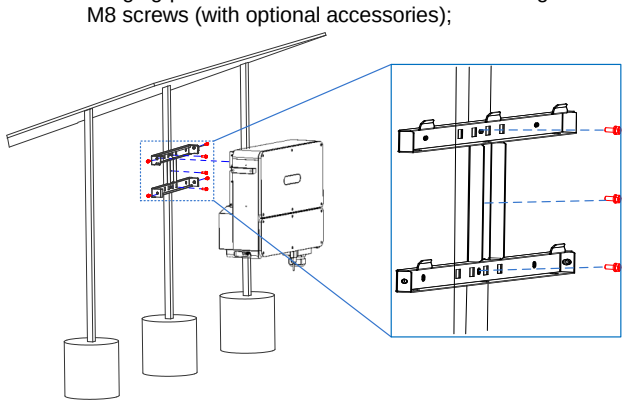
- Hoop Mounting

1) Use at least 2 PCS hose clamps through the strap mounting hole on the back side of the hanging plate (customer-supplied hose clamps);
2) Hang the inverter on the hanging plate and fasten the hanging plate and inverter from both sides using the 4 PCS M8 screws (with optional accessories);



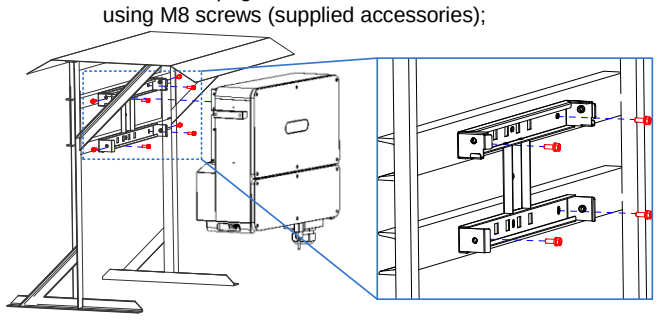
- Screw Rod Mounting

1) Use 3 PCS M8 screws (with accessories) to fix the pendant in the mounting position;
2) Hang the inverter on the mounting plate and fasten the hanging plate and inverter from both sides using the 4 PCS M8 screws (with optional accessories);



- Bracket Mounting

1) Use 4 PCS M8 screws (supplied accessories) to fasten the hanging plate to the bracket.
2) Hang the inverter on the hanging plate, and fasten the connection pegboard and the inverter from both sides by using M8 screws (supplied accessories);



📖 Avoid direct sunlight, rain and snow, so that the service life of the junction box can be prolonged. It is recommended to choose sheltered installation sites. If they can not be satisfied, please set up a sun shading shelter.

📖 This way of installation can install the inverter on the load-bearing walls or supports. If you want to install the wall, customers should buy M8 expansion nails to install holes on the wall according to the factors such as the installation environment and load bearing on the wall.

# 4. Electrical Connections

**DANGER**

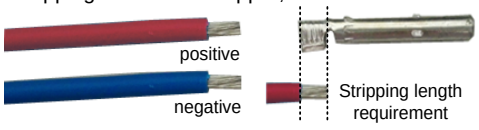
1. When connecting cables, do not operate live and follow the relevant requirements in the Inverter's Manual.
2. Before connecting the cable, please complete the following preparations so as not to cause bodily injury.
   5) Disconnect the inverter DC switch. Ensure that the inverter is in shutdown state and attach warning signs.
   6) Confirm the positive and negative pole of the input cable and mark it well. Make sure the connection between input cable and PV cluster is broken.
   7) It is confirmed that the open circuit voltage of PV cluster does not exceed the specified limit.
   8) Confirm that the corresponding AC box circuit breaker is in a state of disconnection.
3. When connecting the input cable, ensure that the positive and negative poles of the input cable correspond to the positive and negative poles of the PV terminals of the series inverter.

- Output side cable connection

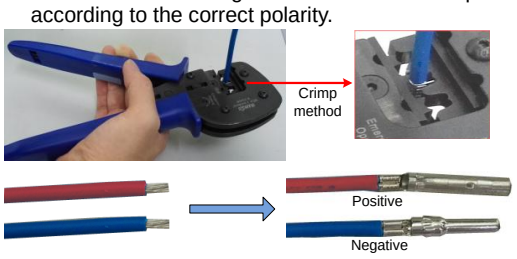
1. Ground connection: ground wire connection is located outside the shell, with PE logo attached. The wire and cable diameter of the ground wire is not less than 16mm$^2$. The bolt specification is M6. Note: The ground cable must be reliably connected to the grounding bar.
2. DC output cable connection：
   1) Screw off the locking cap on the "AC OUTPUT" waterproof lock at the bottom of the inverter.
   2) The AC cables are connected to A, B, C and N of the AC terminal row in turn, and the fastening torque is 8N*m.

- PV Input Cable Connection

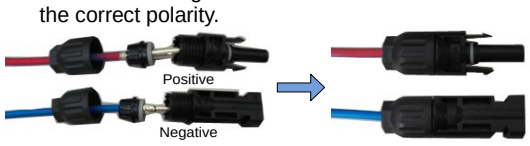
1. Crimp MC4 terminal:
   1) Confirm the positive and negative terminals of the input cable and mark them.
   2) Stripping with a wire stripper;




   3) Press the cable together with the corresponding core according to the correct polarity.




   4) Insert the core into the male and female ends of the MC4 connector and tighten the connector back cover according to the correct polarity.




2. After determining the polarity of the input cable, connect the positive and negative terminals of each input cable to the PV+ and PV- input terminals of the inverter one by one. The positive electrode is connected to PV+ and the negative electrode is connected to PV-

- Cable Selection

| Name | Label | Recommended Cable Specifications | Note |
|---|---|---|---|
| PV branch input cable | 1+ ~20+<br>1- ~ 20- | It is recommended to use a cable with a cross-section of 4.0 mm2 for each PV+ and PV- branch. | -- |
| AC output cable | A、B、C、N | 4 core outdoor cable (A, B, C, N) or 3 core outdoor cable (A, B, C) Recommended cross sectional area of conductor (copper):35mm$^2$ | The AC output has only 1 waterproof locks with a specification of 22mm~32mm. The output is a Φ8 terminal. When the screw is locked, use the sleeve to correct the force.。 |
| RS485 communication cable | X3-P2<br>X3-P3 | It is recommended to use a special communication cable or 4-core or 2-core shielded twisted pair cable with a cross-sectional area of not less than 0.75mm$^2$. | The RS485 communication cable has only one waterproof lock and the size is 18mm~25mm. |
| PE ground cable | PE | It is recommended to use at least one grounded dedicated cable with a cross-sectional area of 16 mm$^2$. | -- |

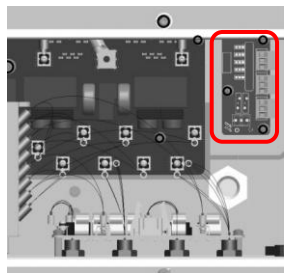
- DC Input Terminal Selection

The inverter has two DC input switches (DC SWITCH). The number of input circuits and the selection of access terminals are recommended in the table below.

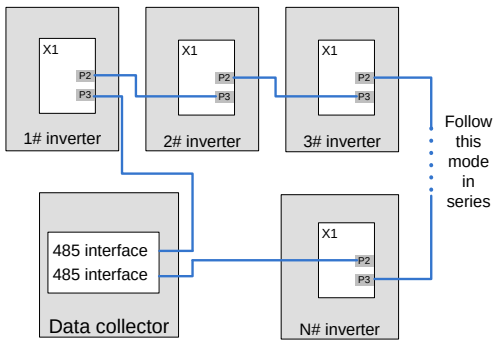
| Number of input channels | DC input terminal of inverter |
|---|---|
| 1 | PV1 |
| 2 | PV1、PV2 |
| 3 | PV1、PV2、PV3 |
| 4 | PV1 ~ PV3、PV4 |
| 5 | PV1 ~ PV4、PV5 |
| 6 | PV1 ~ PV5、PV6 |
| 7 | PV1 ~ PV6、PV7 |
| 8 | PV1 ~ PV7、PV8 |
| 9 | PV1 ~ PV8、PV9 |
| 10 | PV1 ~ PV9、PV10 |
| … | … |
| 20 | PV1 ~ PV19、PV20 |

- RS485 Communication Cable Connection

On the RS485 adapter board X1, two RS485 interfaces (labeled P2, P3) are shown. A collection and distribution combiner box in series, this interface is used to connect adjacent collection and distribution combiner boxes.



1. Take out the protective film of the wire hole and connect the RS485 cable through the waterproof lock head to connect with the interface on the RS485 adapter board X1.
2. The connection of multiple inverters is suggested to be connected in series in the following diagram.




# 5. Post-installation Check

| | |
|---|---|
| 1. Confirm that the inverter is securely installed in place | ☐ |
| 2. Check if the ground wire is properly connected, whether the connection is reliable and secure, and ensure that there is no open-circuit or short-circuit | ☐ |
| 3. Check that the output cable is properly connected, that the connection is reliable and secure, and that there is no open-circuit or short-circuit. | ☐ |
| 4. Check whether the DC input cable connection polarity is correct, whether the connection is reliable and secure, and ensure that there is no open-circuit or short-circuit. | ☐ |
| 5. Check if the RS485 communication cable connection is correct and reliable. | ☐ |
| 6. Check that all used joints on the bottom of the inverter are coated with fireproof mud | ☐ |
| 7. Check if the inverter's lower door panel is replaced and the door panel screws are tightened. | ☐ |
| 8. Check if the DC input terminals that are not needed are sealed | ☐ |
| 9. Check if DC SWITCH is closed | ☐ |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