SUNGROW
Clean power for all

User Manual

PV Grid-Connected Inverter

SG150CX

SG150CX-UEN-Ver13-202504

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About This Manual

The manual mainly contains the product information, as well as guidelines for installation, operation, and maintenance. The manual does not include complete information about the photovoltaic (PV) system. Readers can get additional information at **www.sungrowpower.com** or on the webpage of the respective component manufacturer.

Validity

This manual is valid for the following model of low-power grid-connected PV string inverters:

- SG150CX

It will be referred to as "inverter" hereinafter unless otherwise specified.

Target Group

This manual is intended for professional technicians who are responsible for installation, operation, and maintenance of inverters, and users who need to check inverter parameters.

The inverter must only be installed by professional technicians. The professional technician is required to meet the following requirements:

- Know electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Have received professional training related to the installation and commissioning of electrical equipment.
- Be able to quickly respond to hazards or emergencies that occur during installation and commissioning.
- Be familiar with local standards and relevant safety regulations of electrical systems.
- Read this manual thoroughly and understand the safety instructions related to operations.

How to Use This Manual

Please read this manual carefully before using the product and keep it properly at a place for easy access.

All contents, pictures, marks, and symbols in this manual are owned by SUNGROW. No part of this document may be reprinted by the non-internal staff of SUNGROW without written authorization.

Contents of this manual may be periodically updated or revised, and the actual product purchased shall prevail. Users can obtain the latest manual from **support.sungrowpower.com** or sales channels.

Security Declaration

For details on the product's network security vulnerability response process and vulnerability disclosure, please visit the following website: https://en.sungrowpower.com/security-vulnerability-management.

For more information on network security, please refer to the user manual of the communication module or the Data Logger that comes with the product.

Symbols

This manual contains important safety instructions, which are highlighted with the following symbols, to ensure personal and property safety during usage, or to help optimize the product performance in an efficient way.

Please carefully understand the meaning of these warning symbols to better use the manual.

⚠ DANGER

Indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

⚠ WARNING

Indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

⚠ CAUTION

Indicates low-risk potential hazards that, if not avoided, may lead to minor or moderate injury.

NOTICE

Indicates potential risks that, if not avoided, may lead to device malfunctions or financial losses.

“NOTE” indicates additional information, emphasized contents or tips that may be helpful, e.g., to help you solve problems or save time.

Contents

1 Safety Instructions

When installing, commissioning, operating, and maintaining the product, strictly observe the labels on the product and the safety requirements in the manual. Incorrect operation or work may cause:

- Injury or death to the operator or a third party.
- Damage to the product and other properties.

⚠ WARNING

- **Do not perform any operation on the product (including but not limited to, handling, installing, powering on, or maintaining the product, performing electrical connection, and working at heights) in harsh weather conditions, such as thunder and lightning, rain, snow, and Level 6 or stronger winds. SUNGROW shall not be held liable for any damage to the device due to force majeure, such as earthquakes, floods, volcanic eruptions, mudslides, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and other extreme weathers.**
- **In case of fire, evacuate from the building or product area and call the fire alarm. Re-entry into the burning area is strictly prohibited under any circumstances.**

NOTICE

- **Tighten the screws with the specified torque using tools when fastening the product and terminals. Otherwise, the product may be damaged. And the damage caused is not covered by the warranty.**
- **Learn how to use tools correctly before using them to avoid hurting people or damaging the device.**
- **Maintain the device with sufficient knowledge of this manual and use proper tools.**

- The safety instructions in this manual are only supplements and cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions.
- SUNGROW shall not be held liable for any damage caused by violation of general safety operation requirements, general safety standards, or any safety instruction in this manual.
- When installing, operating, and maintaining the product, comply with local laws and regulations. The safety precautions in this manual are only supplements to local laws and regulations.
- During the product transport, installation, wiring, maintenance, etc., the materials and tools prepared by users must meet the requirements of applicable local laws and regulations, safety standards, and other specifications. SUNGROW shall not be held liable for any damage to the product caused by the adoption of materials and tools that fail to meet the above-mentioned requirements.
- Operations on the product, including but not limited to, handling, installing, wiring, powering on, maintenance, and use of the product, must not be performed by unqualified personnel. SUNGROW shall not be held liable for any damage to the product resulting from operations done by unqualified personnel.
- Where the transport of the product is arranged by users, SUNGROW shall not be held liable for any damage to the product that is caused by users themselves or the third-party transport service providers designated by the users.
- SUNGROW shall not be held liable for any damage to the product caused by the negligence, intent, fault, improper operation, and other behaviors of users or third-party organizations.
- SUNGROW shall not be held liable for any damage to the product arising from reasons unrelated to SUNGROW.

1.1 Unpacking and Inspection

⚠ WARNING

- **Check all safety signs, warning labels and nameplates on devices.**
- **The safety signs, warning labels and nameplates must be clearly visible and cannot be removed or covered before the device is decommissioned.**

NOTICE

After receiving the product, check whether the appearance and structural parts of the device are damaged, and check whether the packing list is consistent with the actual ordered product. If there are problems with the above inspection items, do not install the device and contact your distributor first. If the problem persists, contact SUNGROW in time.

1.2 Installation Safety

DANGER

- **Make sure there is no electrical connection before installation.**
- **Before drilling, avoid the water and electricity wiring in the wall.**

CAUTION

Improper installation may cause personal injury!

- **If the product supports hoisting transport and is hoisted by hoisting tools, no one is allowed to stay under the product.**
- **When moving the product, be aware of the product weight and keep the balance to prevent it from tilting or falling.**

NOTICE

Before operating the product, must check and ensure that tools to be used have been maintained regularly.

1.3 Electrical Connection Safety

DANGER

- **Before electrical connections, please make sure that the inverter is not damaged, otherwise it may cause danger!**
- **Before electrical connections, please make sure that the inverter switch and all switches connected to the inverter are set to "OFF", otherwise electric shock may occur!**

DANGER

The PV string will generate lethal high voltage when exposed to sunlight.

- **Operators must wear proper personal protective equipment during electrical connections.**
- **Must ensure that cables are voltage-free with a measuring instrument before touching DC cables.**
- **Respect all safety instructions listed in relevant documents about PV strings.**
- **The inverter must not be connected to a PV string that requires positive or negative grounding.**

DANGER

Danger to life due to a high voltage inside the inverter!

- **Be sure to use special insulation tools during cable connections.**
- **Note and observe the warning labels on the product, and perform operations strictly following the safety instructions.**
- **Respect all safety instructions listed in this manual and other pertinent documents.**

WARNING

Damage to the product caused by incorrect wiring is not covered by the warranty.

- **Electrical connection must be performed by professionals.**
- **All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned.**

WARNING

- **Check the positive and negative polarity of the PV strings, and connect the PV connectors to corresponding terminals only after ensuring polarity correctness.**
- **During the installation and operation of the inverter, please ensure that the positive or negative poles of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in equipment damage. The damage caused by this is not covered by the warranty.**
- **Do not connect any load between the inverter and the AC circuit breaker directly connected to it, so as to prevent the switch from tripping by mistake.**
- **Determine the specifications of AC circuit breakers strictly in compliance with the applicable local laws and regulations and safety standards or the recommendation by SUNGROW. Otherwise, the switch may not open in time in the event of something abnormal, which may then lead to safety incidents.**

NOTICE

Comply with the safety instructions related to PV strings and the regulations related to the local grid.

1.4 Operation Safety

DANGER

When routing cables, ensure a distance of at least 30 mm between the cables and heat-generating components or areas to protect the insulation layer of cables from aging and damage.

When the product is working:

- **Do not touch the product enclosure.**
- **It is strictly forbidden to plug and unplug any connector on the inverter.**
- **Do not touch any wiring terminal of the inverter. Otherwise, electric shock may occur.**
- **Do not disassemble any parts of the inverter. Otherwise, electric shock may occur.**
- **It is strictly forbidden to touch any hot parts of the inverter (such as the heat sink). Otherwise, it may cause burns.**
- **Do not connect or remove any PV string or any PV module in a string. Otherwise, electric shock may occur.**
- **If the inverter is equipped with a DC switch, do not operate it. Otherwise, it may cause device damage or personal injury.**

Do not take other actions, such as setting parameters or cutting off power, during the process of inverter firmware update, to avoid update failure.

1.5 Maintenance Safety

DANGER

Risk of inverter damage or personal injury due to incorrect service!

- **Before maintenance, disconnect the AC circuit breaker on the grid side and then the DC switch. If a fault that may cause personal injury or device damage is found before maintenance, disconnect the AC circuit breaker and wait until the night before operating the DC switch. Otherwise, a fire inside the product or an explosion may occur, causing personal injuries.**
- **After the inverter is powered off for 5 minutes, measure the voltage and current with professional instrument. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.**
- **Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the inverter after it cools down.**

DANGER

Touching the power grid or the contact points and terminals on the inverter connected to the power grid may lead to electric shock!

- **The power grid side may generate voltage. Always use a standard voltmeter to ensure that there is no voltage before touching.**

CAUTION

To prevent misuse or accidents caused by unrelated personnel, post prominent warning signs or demarcate safety warning areas around the product.

NOTICE

To avoid the risk of electric shock, do not perform any other maintenance operations beyond those described in this manual. If necessary, contact your distributor first. If the problem persists, contact SUNGROW. Otherwise, the losses caused is not covered by the warranty.

NOTICE

- **If the paint on the inverter enclosure falls or rusts, repair it in time. Otherwise, the inverter performance may be affected.**
- **Do not use cleaning agents to clean the inverter. Otherwise, the inverter may be damaged, and the loss caused is not covered by the warranty.**
- **As the inverter contains no parts that can be maintained, never open the enclosure of the inverter or replace any internal components without authorization. Otherwise, the loss caused is not covered by the warranty.**
- **Do not open the maintenance door in rainy or snowy weather. If it is inevitable, take proper protective measures to avoid the ingress of rainwater and snow into the maintenance compartment; otherwise, the product's operation may be affected.**
- **Before closing the maintenance door, check whether there is any object left inside the maintenance compartment, such as screws, tools, etc.**
- **It is recommended for users to use cable sheathing to protect the AC cable. If the cable sheathing is used, make sure it is positioned inside the maintenance compartment.**

1.6 Disposal Safety

⚠ WARNING

Please scrap the product in accordance with relevant local regulations and standards to avoid property losses or casualties.

2 Product Description

2.1 System Introduction

The SG150CX inverter is a three-phase grid-connected string PV inverter without a transformer.

As an integral component of the PV power system, the inverter converts the DC generated from the PV strings into grid-compatible AC and feeds the AC into the utility grid.

⚠ WARNING

Do not connect any local load, except for the axis tracking system, between the inverter and the AC-side circuit breaker.

NOTICE

The PV modules used in the system must be Class II PV modules as defined in the 61730-1 standard.

When designing the system, ensure that the operating ranges of the devices connected to the inverter all satisfy the inverter's requirements for operation.

The inverter is applicable only in the scenarios specified in this manual.

The typical application of the inverter is illustrated in the figure below.

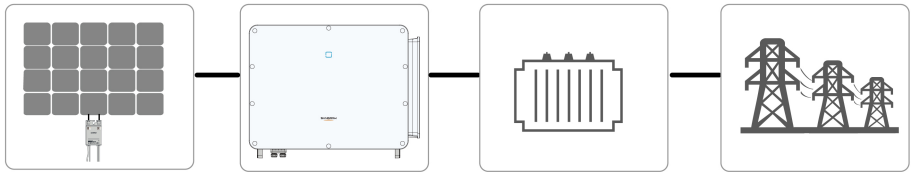
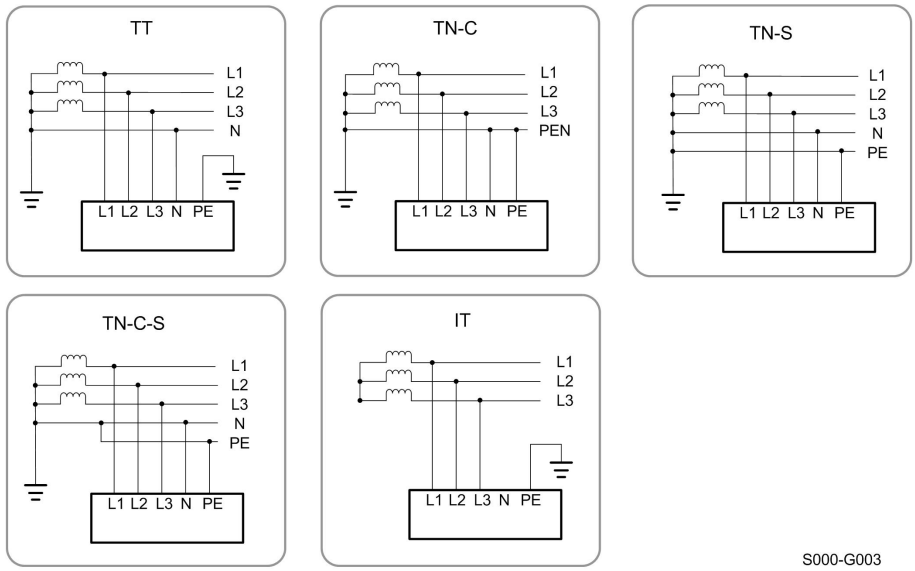


figure 2-1 Application of Inverter in the PV Power System

No.	Name	Remarks
A	PV string	Monocrystalline silicon PV modules, polycrystalline silicon PV modules, or thin-film PV modules that do not require grounding.
	RSD (Optional)	The RSD equipment (rapid shutdown equipment) is connected to the PV module through input cables to enable the rapid shutdown function. Up to two PV modules can be attached to one RSD.
B	Inverter	SG150CX

No.	Name	Remarks
C	Step-up transformer	Used to boost the output voltage of the inverter to a grid-compatible level (optional).
D	Grid	Grid configurations supported by the inverter are shown below.



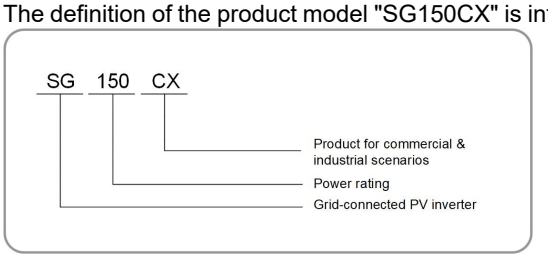
Please refer to the RSD user manual for details.

Please contact your local sales staff to confirm that the RSD is available for sale in your territory.

2.2 Product Introduction

Product Model

The definition of the product model "SG150CX" is introduced as follows.



Inverter External Design

The external design of the inverter is shown below.

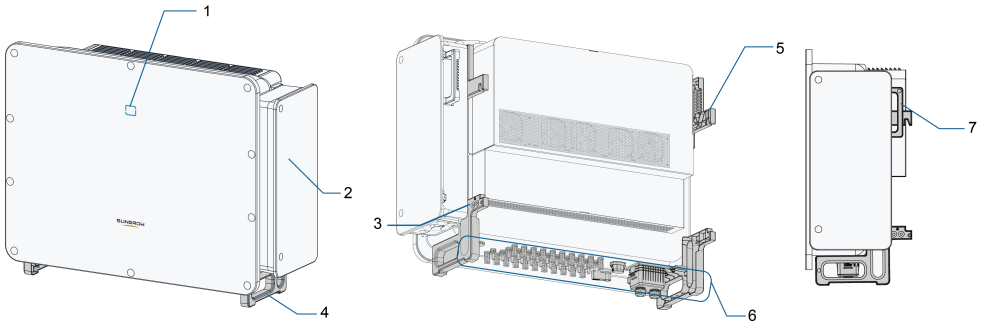


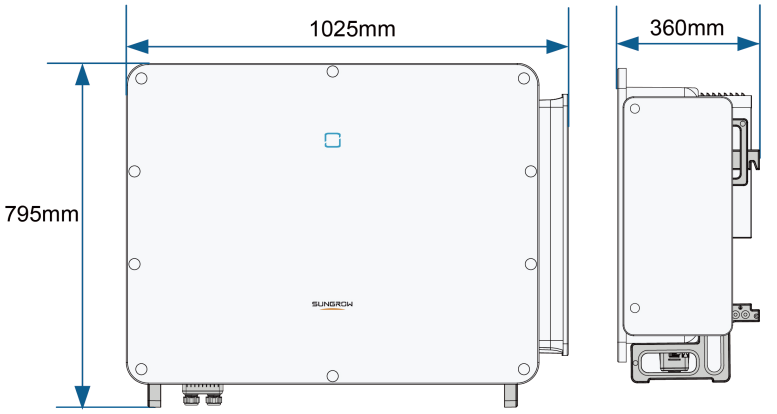
figure 2-2 Inverter External Design

*The figure here is for illustration only and the real product may differ.

No.	Name	Description
1	LED indicator	Indicates the current status of the inverter.
2	AC junction box	Used for AC wiring.
3	External grounding terminals	Two grounding terminals are provided. Use at least one of them for grounding.
4	Bottom handles	Two handles, used for inverter handling.
5	Mounting ears	Two mounting ears, used to hang the inverter to the mounting bracket.
6	Wiring area	Houses the DC switch, DC PV terminals, and communication terminals. For details, see "5.2 Terminal Description".
7	Labels	Nameplate, warning signs, and QR code, etc.

Dimensions

The overall dimensions of the inverter are shown below.



Weight

Model	Weight
SG150CX	≤100 kg

2.3 Signs on the Product

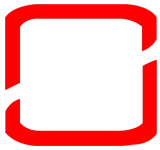
Sign	Description
	Disconnect the inverter from all external power sources before inverter maintenance.
	Burn hazard due to the hot surface that may exceed 60℃.
	Danger to life due to high voltages! After the inverter is disconnected from the external power source, wait at least 5 minutes before touching any of its internal conductive parts. Installation and operation must only be performed by qualified technical persons.
	Danger to high voltages! The inverter must be grounded before it is powered on.
	Do not dispose of the inverter as household waste.
	Read the manual before performing any operation on the inverter.
	CE mark of conformity. EU/EEA Importer.
	TUV mark of conformity.
	RoHS labeling The product complies with the requirements of the applicable EU directives.
	Regulatory compliance mark.

* The table shown here is for reference only. The actual product received may differ.

2.4 LED Indicator

The LED indicator on the front of the inverter indicates the working state of the inverter.

table 2-1 LED Indicator State Description

LED Color	State	Definition
 Blue	On	The device is connected to the grid and operating normally.
	Fast blink (Period: 0.2s) 	The Bluetooth connection is established, and there is data communication. No system fault occurs.
	Slow blink (Period: 2s) 	The device is in standby or startup state (not feeding power into the grid).
	Slow blink once, fast blink three times	The inverter is performing PID recovery.
 Red	On	A fault occurs and the device cannot connect to the grid.
	Blink	The Bluetooth connection is established, data communication in process, and a system fault occurs.
 Gray	OFF	Both the AC and DC sides are powered down.

⚠ WARNING

Voltage may still be present in AC side circuits after the indicator is off. Pay attention to the electricity safety when operating.

2.5 Circuit Diagram

The following figure shows the main circuit of the inverter.

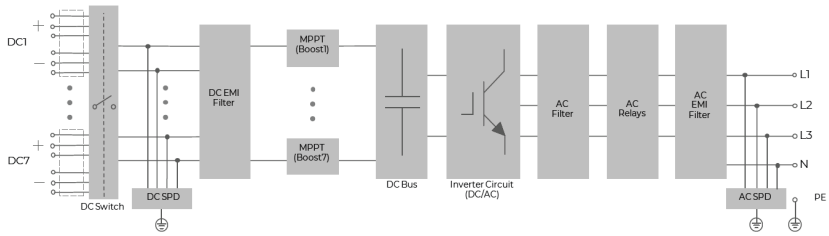


figure 2-3 Circuit Diagram

- DC Switches can safely disconnect the PV input when necessary to ensure the safe operation of the inverter and the safety of personnel.
- The DC SPD provides a discharge circuit for the DC side overvoltage to prevent it from damaging the internal circuits of the inverter.
- EMI filters can filter out the electromagnetic interference inside the inverter to ensure that the inverter meets the requirements of electromagnetic compatibility standards.
- The MPPT is used to ensure a maximum power from PV arrays at different PV input conditions.
- The Inverter Circuit converts the DC power into grid-compliant AC power and feeds it into the grid.
- The AC filter filters the output AC component of high frequency to ensure that the output current meets the grid requirements.
- The AC relay isolates the AC output of the inverter from the grid, making the inverter safe from the grid in case of inverter failure or grid failure.
- The AC SPD provides a discharge circuit for the AC side overvoltage to prevent it from damaging the internal circuits of the inverter.

DANGER

If the lightning level exceeds the protection level of the product, surge protection and overvoltage protection may fail, resulting in electric shock and fatal injury!

2.6 Function Description

The inverter is equipped with the following functions:

Conversion Function

The inverter converts the DC into grid-compatible AC and feeds the AC into the grid.

Data Storage and Display

The inverter logs system information like running information, error records, etc.

Parameter Configuration

The inverter provides various parameter configurations. Users can set parameters via the App to meet different needs and optimize the inverter performance.

Communication Interface

The inverter is designed with standard RS485 communication interfaces and communication accessory port.

- The standard RS485 communication interfaces are used to establish communication with monitoring devices and to upload monitoring data to a monitoring background through communication cables.
- The communication accessory port is used to connect communication module manufactured by SUNGROW, and upload monitoring data by means of wireless communication.

The inverter can be connected to communication devices via either of the two interfaces. When communication is established between the inverter and the communication devices, users can view inverter information or set inverter parameters, such as running parameter and protection parameter, through the iSolarCloud.

It is recommended to use the communication module from SUNGROW. Using a device from other companies may lead to communication failure or other unexpected damage.

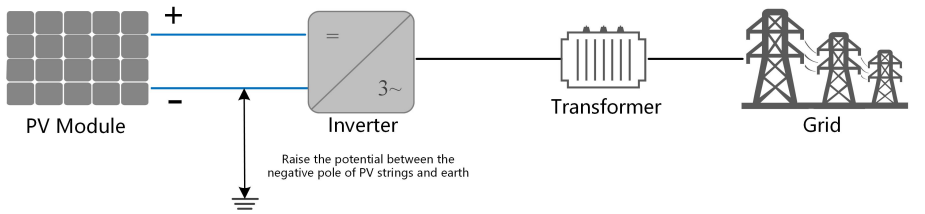
Protection Function

The inverter is equipped with anti-island protection, LVRT/HVRT, DC reversed polarity protection, AC short circuit protection, leakage current protection, DC over-voltage/over-current protection, etc.

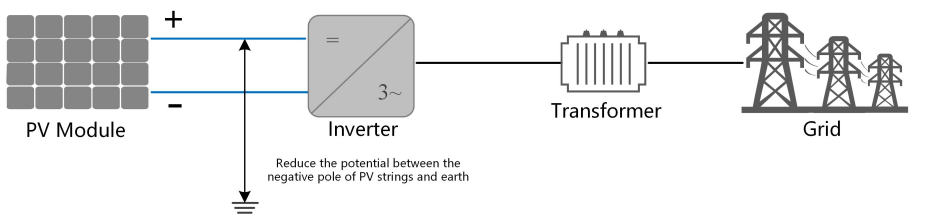
PID Recovery

The PID effect (Potential Induced Degradation) of PV modules will cause serious damage to generated output and yield, which can be avoided or recovered by PID recovery function.

- For positive voltage scheme, after the PID is enabled, the voltage to ground of all PV strings is greater than 0, and therefore the PV string-to-ground voltage is a positive value.



- For negative voltage scheme, after the PID is enabled, the voltage to ground of all PV strings is lower than 0, and therefore the PV string-to-ground voltage is a negative value.



NOTICE

- **Before enabling the PID recovery function, make sure the voltage polarity of the PV modules to ground meets requirement. If there are any questions, contact the PV module manufacturer or read the corresponding user manual.**
- **If the voltage scheme for the PID protection / recovery function does not meet the requirement of corresponding PV modules, the PID will not work as expected or even damage the PV modules.**
- **If the PID recovery function is enabled, it only works at night.**
- **PID recovery function and reactive power generation at night cannot be enabled at the same time.**
- **After the PID recovery function is enabled, the voltage of the PV string to ground is 500Vdc by default.**
- **When the inverter is in the PID recovery state (the indicator blinks blue once at long intervals and blinks at short intervals for three times), disable the PID recovery in the iSolarCloud App before manually powering on and maintaining the inverter.**

AFCI Function

- AFCI activation

  This function can be enabled to detect whether arc occurs in the DC circuit of the inverter.

- AFCI self-test

  This function is intended to detect whether the AFCI function of the inverter is normal.

RSD Functions

- Module-level shutdown

  Quickly reduce module voltage.

- Module-level monitoring

  The RSD can monitor the performance of modules.

3 Unpacking and Storage

3.1 Unpacking and Inspection

The product is thoroughly tested and strictly inspected before delivery. Nonetheless, damage may still occur during shipping. For this reason, please conduct a thorough inspection after receiving the product.

- Check the packing case for any visible damage.
- Check the scope of delivery for completeness according to the packing list.
- Check the inner contents for damage after unpacking.

Contact SUNGROW or the transport company in case of any damage or incompleteness, and provide photos to facilitate services.
Do not dispose of the original packing case. It is recommended to store the device in the original packing case when the product is decommissioned.

NOTICE

After receiving the product, check whether the appearance and structural parts of the device are damaged, and check whether the packing list is consistent with the actual ordered product. If there are problems with the above inspection items, do not install the device and contact your distributor first. If the problem persists, contact SUNGROW in time.
If any tool is used for unpacking, be careful not to damage the product.

3.2 Inverter Storage

Proper storage is required if the inverter is not installed immediately.

- Store the inverter in the original packing case with the desiccant inside.
- The storage temperature must be always between -40℃ and +70℃, and the storage relative humidity must be always between 0 and 95 %, non-condensing.
- In case of stacking storage, the number of stacking layers should never exceed the limit marked on the outer side of the packing case.
- The packing case should be upright.
- If the inverter needs to be transported again, pack it strictly before loading and transporting it.

- Do not store the inverter in places susceptible to direct sunlight, rain, and strong electric field.
- Do not place the inverter in places with items that may affect or damage the inverter.
- Store the inverter in a clean and dry place to prevent dust and water vapor from eroding.
- Do not store the inverter in places with corrosive substances or susceptible to rodents and insects.
- Carry out periodic inspections. Inspection shall be conducted at least once every six months. If any insect or rodent bites are found, replace the packaging materials in time.
- If the inverter has been stored for more than a year, inspection and testing by professionals are required before it can be put into operation.

NOTICE

Please store the inverter according to the storage requirements. Product damage caused by failure to meet the storage requirements is not covered by the warranty.

4 Mechanical Mounting

⚠ WARNING

Respect all local standards and requirements during mechanical installation.

4.1 Safety During Mounting

⚠ DANGER

Make sure there is no electrical connection before installation.

Before drilling, avoid the water and electricity wiring in the wall.

⚠ WARNING

For specific requirements for the installation environment, see "4.2.1 Installation Environment Requirements". In case the environment where the product is installed does not meet the requirements, SUNGROW shall not be held liable for any property damage arising therefrom.

⚠ CAUTION

Improper handling may cause personal injury!

- **When moving the product, be aware of its weight and keep the balance to prevent it from tilting or falling.**
- **Wear proper protective equipment before performing operations on the product.**
- **The bottom terminals and interfaces of the product cannot directly contact the ground or other supports. The product cannot be directly placed on the ground.**

NOTICE

During installation, ensure that no device in the system causes it hard for the DC switch and the AC circuit breaker to act or hinders maintenance personnel from operating.

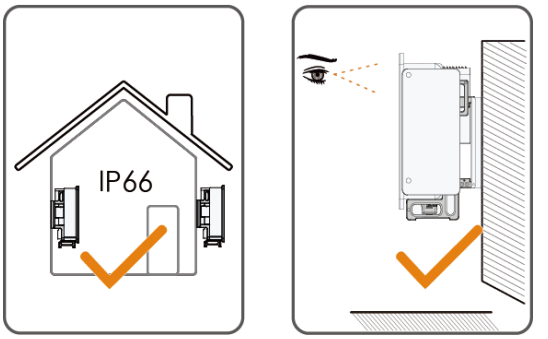
If drilling is required during installation:

- **Wear goggles and protective gloves when drilling holes.**
- **Make sure to avoid the water and electricity wiring in the wall before drilling.**
- **Protect the product from shavings and dust.**

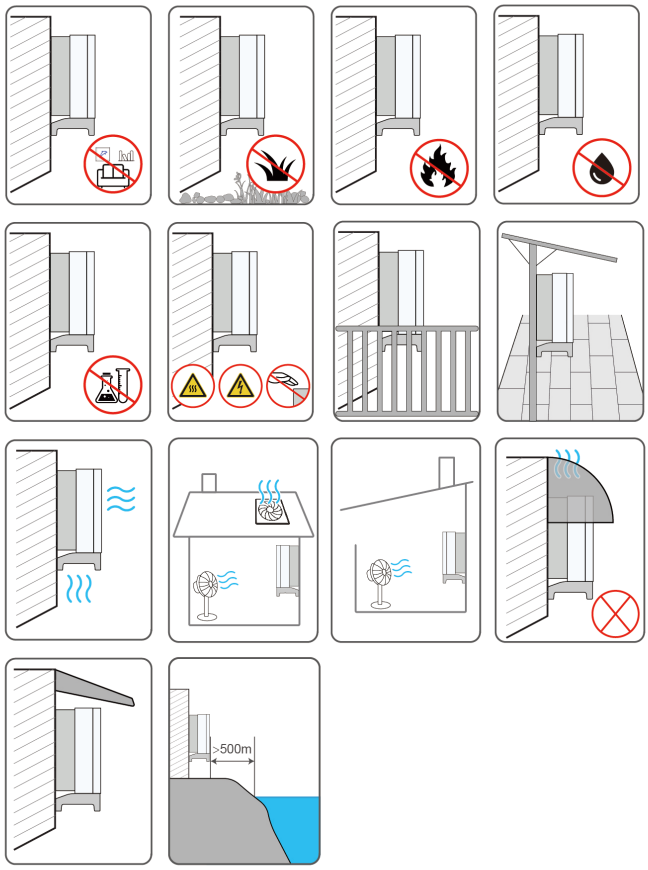
4.2 Location Requirements

To a large extent, a proper installation location ensures safe operation, service life, and performance of the inverter.

- The inverter with protection rating IP66 can be installed both indoors and outdoors.
- The inverter should be installed at a height that allows easy viewing of the LED indicator panel, as well as easy electrical connection, operation and maintenance.

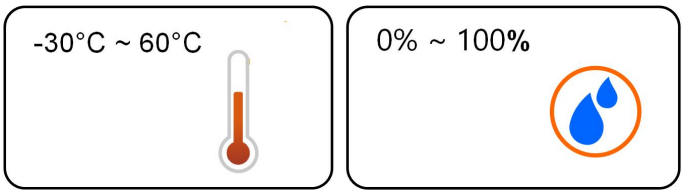


4.2.1 Installation Environment Requirements



- The inverter produces noise during operation, thus it is not recommended to install it in places for residential purpose. If this cannot be avoided, it is recommended to install the inverter in a place over 25 meters away from the residential area, or take noise mitigation measures.
- If the inverter is installed in a place with lush vegetation, weed on a regular basis. In addition, the ground beneath the inverter needs to undergo certain treatment, such as laying cement or gravel, etc. (an area of 3m×2.5m is recommended).
- Do not install the inverter in an environment with flammables, explosives, or smoke.
- Do not install the inverter in places prone to water leak, e.g., under the air-conditioner vent, the air vent, or the cable outlet window of the machine room, so as to prevent device damage or short circuit caused by intrusion of water.
- Do no install the inverter in a place with corrosives such as corrosive gas and organic solvent, etc.
- When the inverter is running, its surface may carry high voltages or get very hot. Do not touch it; otherwise, it may lead to burns or electric shocks.

- Do not install the inverter in a place that is easy to reach for people.
- The installation site must have solid ground, free of rubber-like soils (which cannot be effectively compacted) or weak soils, and should not be prone to subsidence. Also, avoid low-lying areas where water or snow may easily accumulate. Ensure the site is located above the highest recorded water level in the area.
- Do not install the inverter in a position that could be flooded.
- To prevent vegetation or water on the ground from impacting inverter operation, if the space above meets the designated requirements, elevate the inverter to an appropriate height.
- Install the inverter in a place with shelter, so as to prevent it from getting impacted by direct sunlight and severe weather (e.g. snow, rain, and lightning). The inverter will derate in high temperatures for self-protection. If installed in a place directly exposed to sunlight, as the temperature rises, the inverter may witness power reduction.
- Good heat dissipation is very important to the inverter. Please install the inverter in a ventilated environment.
- If the inverter needs to be installed in a closed or semi-closed environment, please install additional heat dissipation or ventilation devices. Furthermore, while the inverter is operating, ensure the indoor ambient temperature does not exceed the outdoor ambient temperature. A semi-closed environment refers to a special space where natural ventilation is limited and gas or heat may easily accumulate, although it is not fully enclosed on all six sides.
- Please consult SUNGROW before installing inverters outdoors in areas prone to salt damage, which mainly are coastal areas within 500 meters of the coast. The sedimentation amount of salt spray is correlated to the characteristics of the seawater, sea winds, precipitation, air humidity, topography, and forest coverage in the adjacent sea areas, and there are substantial differences between different coastal areas.
- Do not install the inverter in an environment contaminated with chemicals such as halogen and sulfide.
- Do not install the inverter in an environment with vibration and strong electromagnetic field. Strong-magnetic-field environments refer to places where magnetic field strength measures over 30 A/m.
- In dusty environments such as places full of dust, smoke, or floc, particles may cling to the device's air outlet or heat sink, thus impacting its heat dissipation performance or even getting it damaged. Therefore, do not install the inverter in dusty environments. If the inverter has to be installed in such environments, please clean its fans and heat sink on a regular basis to ensure a good heat dissipation performance.
- The average temperature approximately 1 m around the inverter should be taken as its ambient operating temperature. The temperature and humidity should meet the requirements below:



4.2.2 Carrier Requirements

The mounting structure where the inverter is installed must comply with local/national standards and guidelines. Ensure that the installation surface is solid enough to bear four times the weight of the inverter and is suitable for the dimensions of the inverter (e.g. cement walls, plasterboard walls, etc.).

Do not install the inverter on a carrier that may vibrate in resonance, so as to avoid making bigger noise.

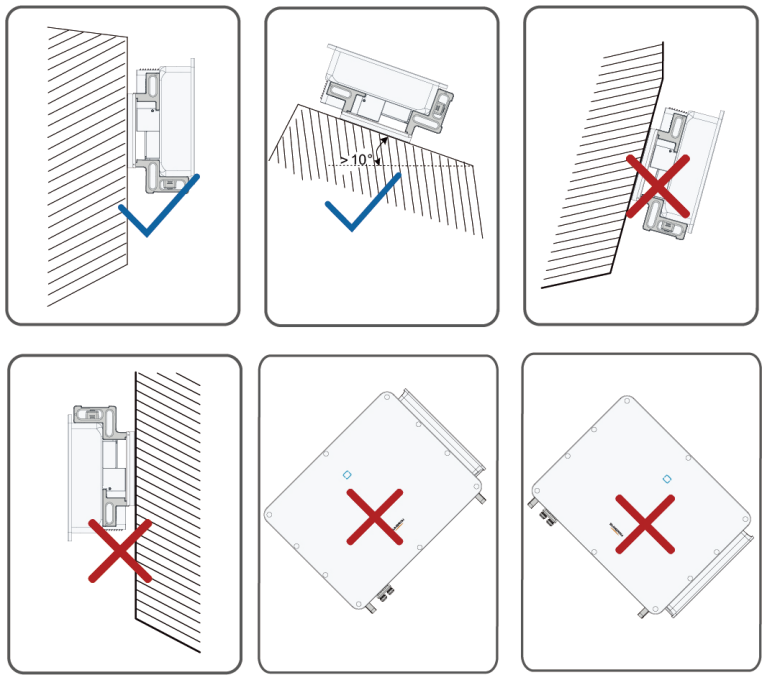
Installation on combustible building materials is strictly prohibited. Suitable mounting surfaces include:

Non-combustible wall surfaces: Concrete, fire-resistant gypsum board, brick wall, etc. Non-combustible roof structures: Color-Coated corrugated steel roofing sheets, precast concrete slabs, fiber-reinforced cement boards, etc.

4.2.3 Installation Angle Requirements

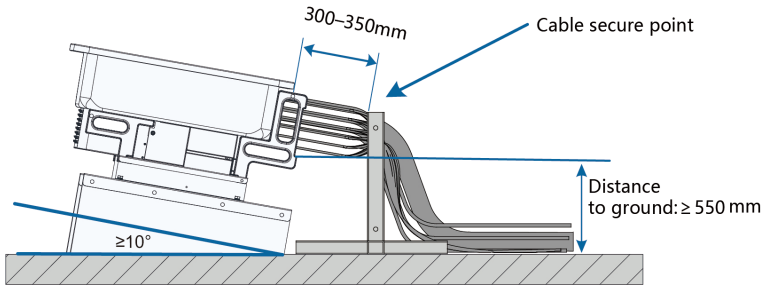
It is recommended that the inverter be installed vertically or tilted backward. Forward or upside-down installation and installation at a left tilt, right tilt, or excessive back tilt are not allowed.

Backward installation does not apply to floating power plants.



Backward Installation Requirements

To install the inverter on level ground, add a rack under it to ensure the installation angle meets the specified requirements. The figure below presents an inverter mounted on a rack.



Take into account the below requirements when designing a racking system for the inverter:

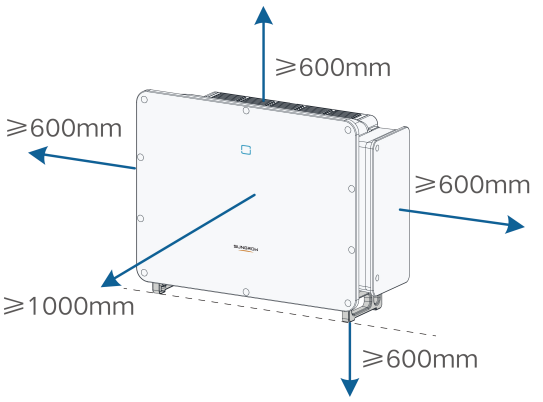
- Consider the climatic conditions at the site. Take protection measures against rain and snow if necessary.
- The waterproof connectors should be ≥550mm off the ground.
- Secure the cables with cable ties at a distance of 300–350mm from the DC connectors and the waterproof communication connectors. This prevents the connectors from loosening due to stress caused by cable hanging down or swaying, hence avoiding impairing the ingress protection performance of the inverter.
- Tighten the waterproof connectors at the torques specified in this manual. Ensure they are secure and well-sealed.

In case of any questions, please contact SUNGROW.

4.2.4 Installation Space Requirements

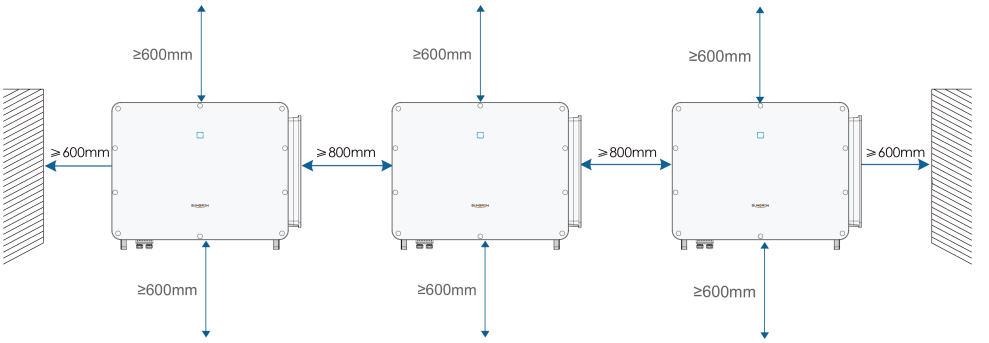
Space Required for Installing One Single Inverter

Make sure there is sufficient space around the inverter for good ventilation. The space requirements for installing one inverter are shown in the figure below.

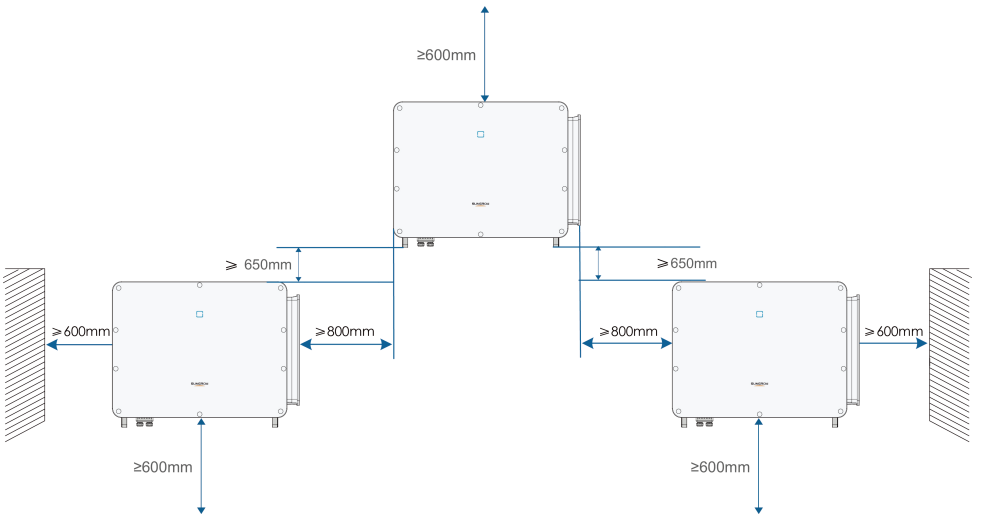


If the actual space reserved for the inverter is smaller than that required in the figure, before maintaining its fans, lift the inverter away from the bracket or wall.

Inverters Installed in One Row

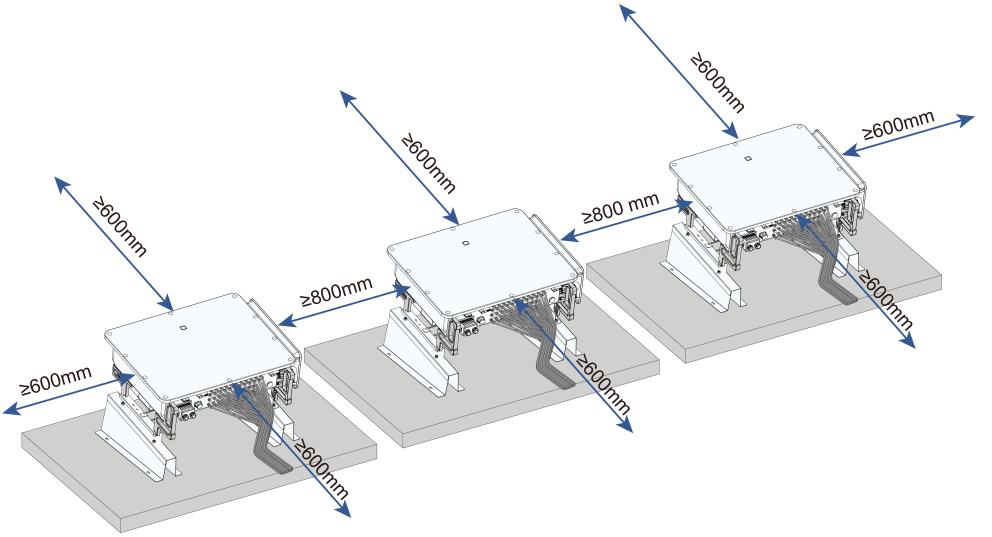


Inverters Installed in an Inverted-T Pattern



Inverters Installed at a Back Tilt in One Row (Not Recommended)

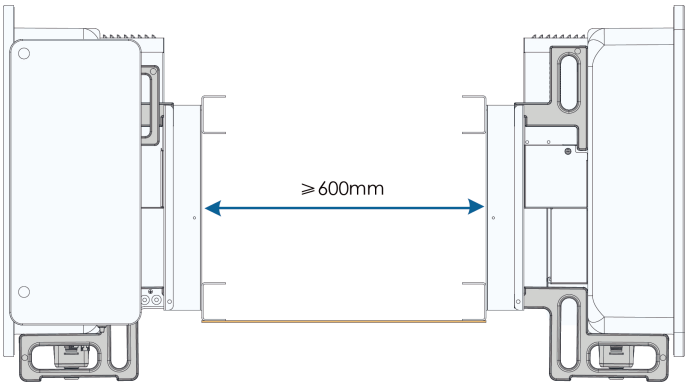
See “Backward Installation Requirements” in "4.2.3 Installation Angle Requirements" for the racking system requirements for backward installation.



Backward installation is not recommended as the inverter is prone to derate due to direct sunlight in this scenario.

Inverters Installed Back-to-back

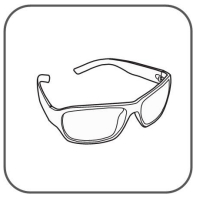
For two inverters installed back-to-back, the distance between them should be at least 600mm. In this scenario, a baffle should be added between the two inverters to make a channel for heat dissipation. The baffle should be placed horizontally between the two inverters, without blocking their air outlets.

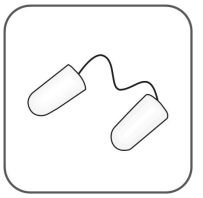


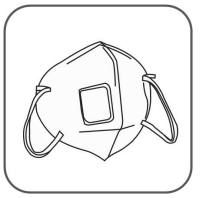
- In case the inverters need to be arranged in tiers with one above another, please refer to the "Installation Instructions for Commercial & Industrial Application Scenarios".
- To learn about the heat dissipation requirements for inverters installed indoors, please contact SUNGROW.

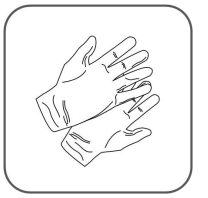
4.3 Installation Tools

Installation tools to be used include but are not limited to those listed below. If necessary, use other auxiliary tools at the site.


Goggles

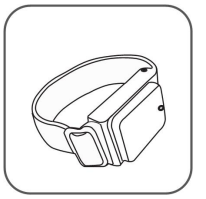

Earplugs

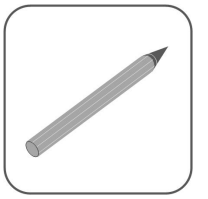

Dust mask


Safety gloves


Safety shoes

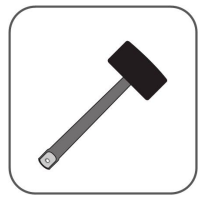

Utility knife


Anti-static wrist strap


Marker

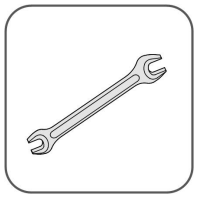
Level

Hammer drill (φ12)



Rubber mallet

Phillips screwdriver (M4, M6, M8)

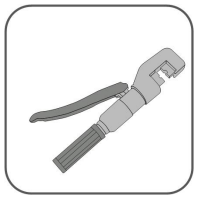


Open-end wrench (16mm, 33mm)

Socket wrench set (M4, M8, M12)

Wire cutter

Wire strippers

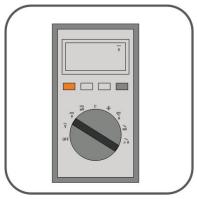


Hydraulic pliers

Heat gun

Slotted screwdriver (M2, M3, M6)

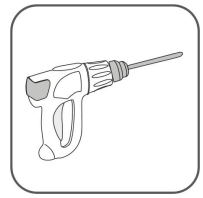
Connector wrench



Multimeter (≥1100V DC)

Vacuum cleaner

Scissors



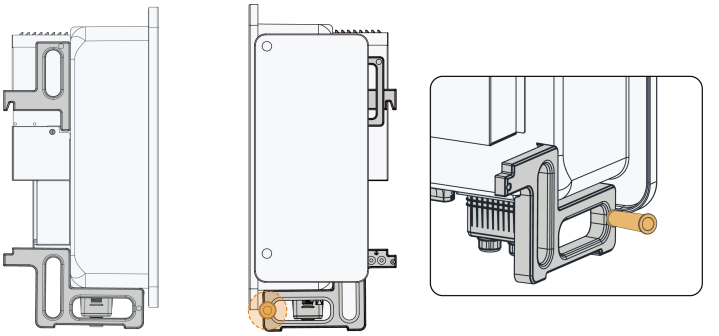
Electric drill (φ12)

Crimping tool (4–6mm^2)

4.4 Move the Inverter

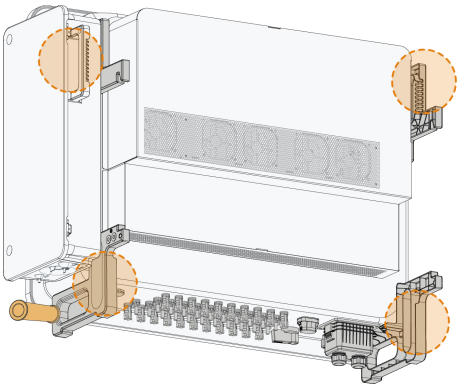
Before installation, take the inverter out of the packing crate and move it to the target position.

It is recommended to move the inverter using its top and bottom handles and the add-on handles. Grip the handles, lift the inverter, and move it to the target position.



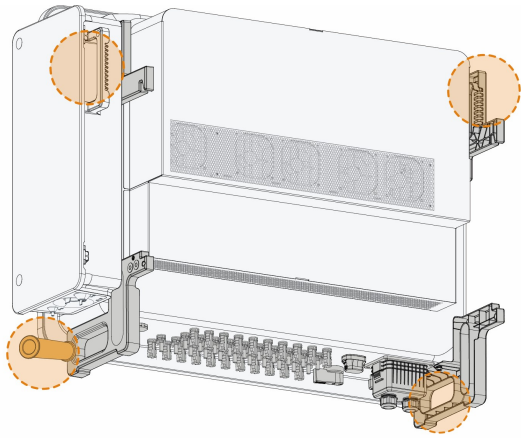
Move an Inverter that Lays Flat

To take the inverter out of the crate, use mainly the vertical handles at the top and bottom of the inverter (as indicated in the figure below).



Hang the Inverter to the Mounting bracket

To hang the inverter to the mounting bracket, use mainly the top vertical handles, the bottom-left horizontal handle, and the bottom-right add-on handle.



CAUTION

Improper handling may lead to personal injury!

- **Properly decide the number of installation personnel to handle the inverter based on the inverter's weight. Installation personnel should wear protective equipment such as anti-impact shoes and safety gloves.**
- **Always pay attention to inverter's center of gravity during handling and prevent it from getting tilted.**
- **Putting the inverter directly on a hard ground may cause damage to its metal enclosure. Therefore, protective material such as foam or a sponge mat should be placed underneath the inverter.**
- **Move the inverter by holding its handles. Do not move it by gripping its connectors.**

4.5 Install the Mounting Bracket

Use a mounting bracket to mount the inverter on a wall or a PV bracket (PV module holder). The dimensions of a mounting bracket assembly are shown below.

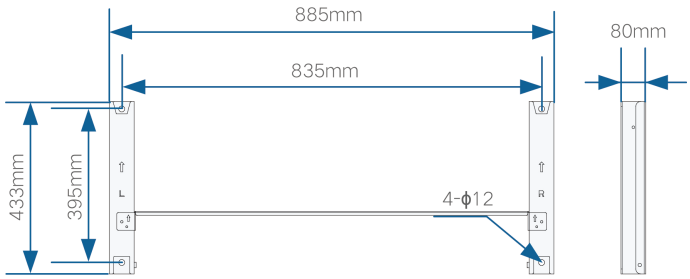


figure 4-1 Dimensions of Mounting Bracket

Reserve sufficient space when installing the mounting bracket. Make sure the space requirements for inverter installation are met.

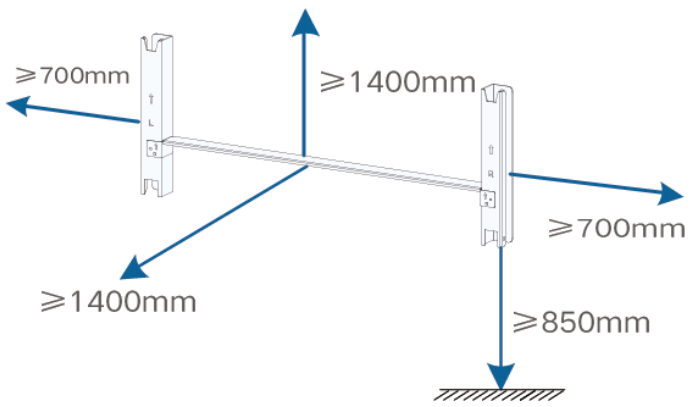


figure 4-2 Requirements of Space Reserved for Inverter Installation

4.5.1 Mounted on PV Bracket

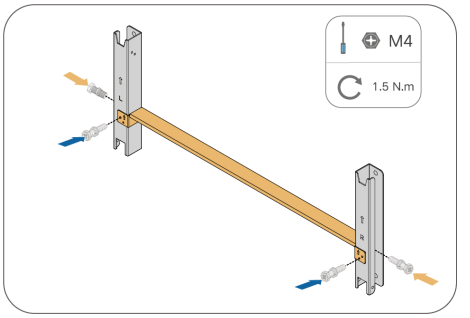
Tools

Item	Specifications
Phillips screwdriver	M4
Marker	-
Level	-
Electric drill	Drill bit: φ12
Wrench	16mm

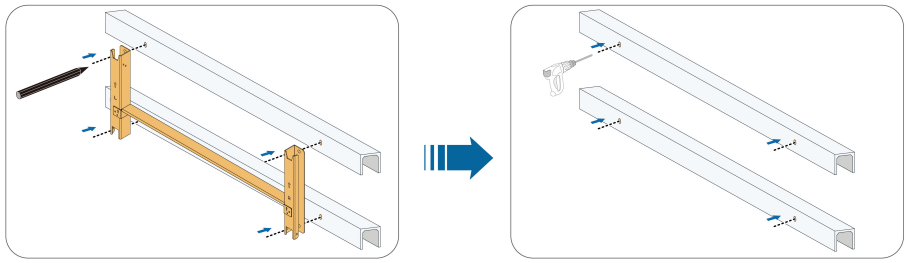
Required Materials

Item	Quantity	Specifications	Source
Cross-slotted screw	4	M4×10	Included in the scope of delivery
Bolt assembly	4	M10	Included in the scope of delivery

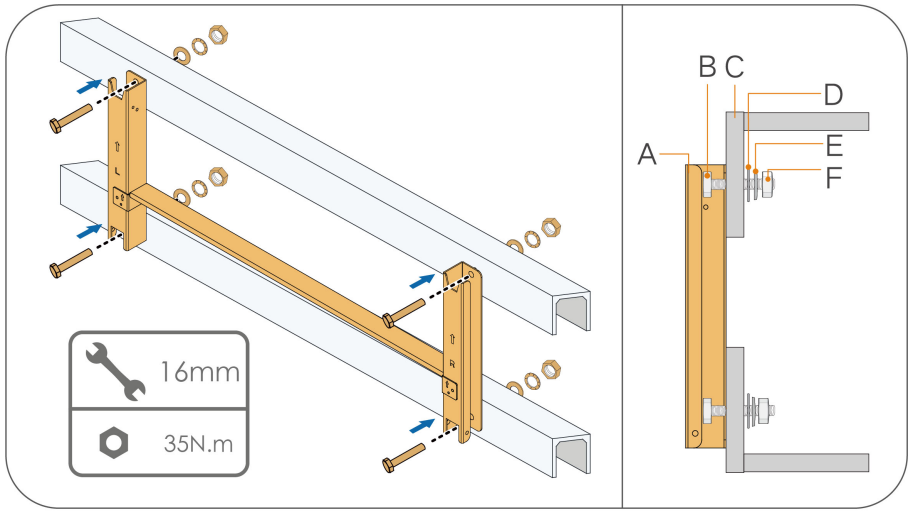
Step 1 Assemble the mounting bracket together by fixing the two sub-brackets to the two sides of the connecting plate.



Step 2 Put the mounting bracket assembly on the PV bracket, adjust its angle with the assistance of the level, and mark the hole positions for drilling. Then, drill holes at the corresponding positions using an electric drill.



Step 3 Fix the mounting bracket with bolts.



(A) Mounting bracket (B) Fully threaded bolt (C) Metal bracket (D) Flat washer (E) Spring washer (F) Hexagon nut

- - End

4.5.2 Mounted on Pole

Tools

Item	Specifications
Phillips screwdriver	M4
Marker	-
Level	-
Electric drill*	Drill bit: φ12
Wrench	16mm

*Decide whether to use tools of different specifications based on the size of the bolts used for the matching clamp.

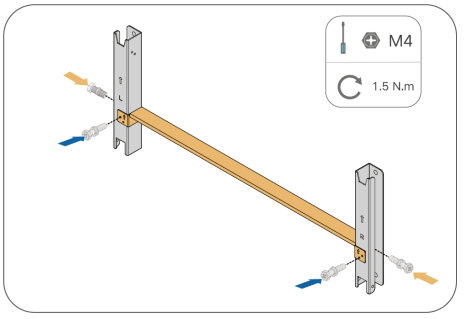
Required Materials

Item	Quantity	Specifications	Source
Cross-slotted screw	4	M4×10	Included in the scope of delivery
Bolt assembly	4	M10	Included in the scope of delivery
Nut assembly	4	M10	Prepared by the user
Steel U-channel	2	-	Prepared by the user
Clamp	2	Decide according to the size of the pole	Prepared by the user

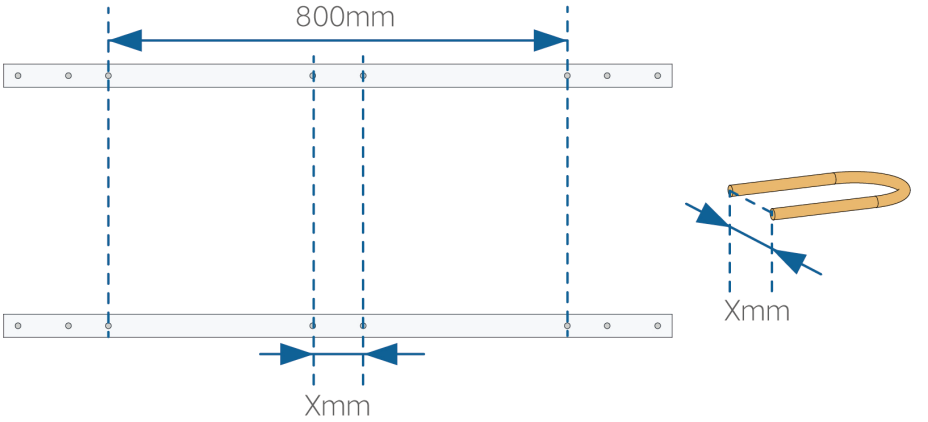
Step 1 Bury the pole to an appropriate depth in the ground at the installation site.

Skip this step if the inverter is pole-mounted on a cement pillar or PV bracket.

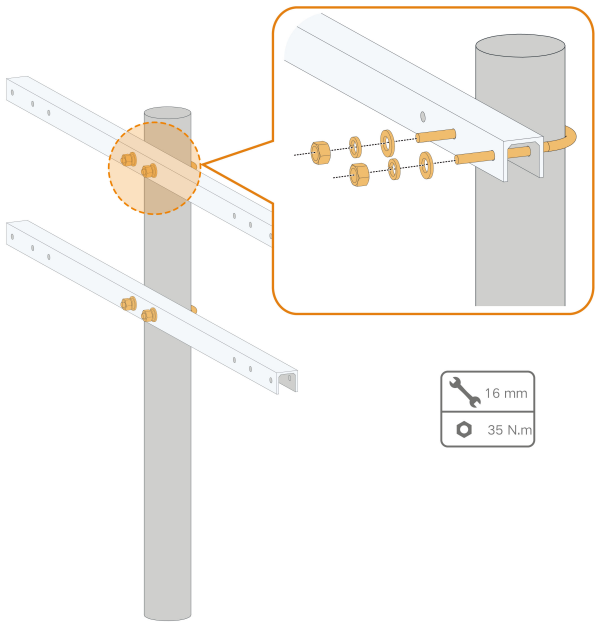
Step 2 Assemble the mounting bracket together by fixing the two sub-brackets to the two sides of the connecting plate.



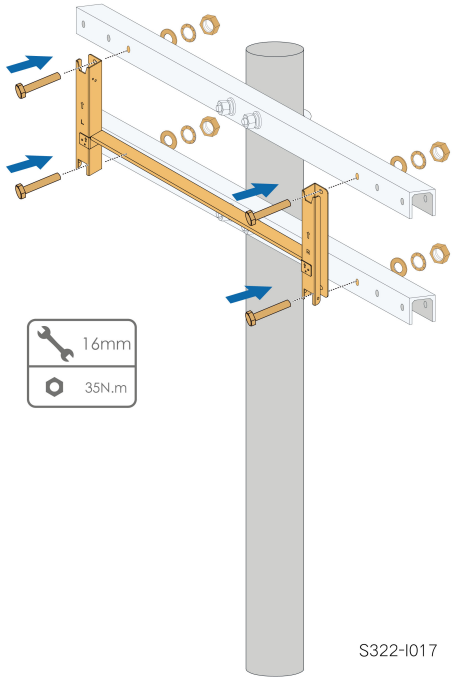
Step 3 Mark the hole positions on the U-channels by referring to the instructions in the figure below, and drill holes.



Step 4 Fix the U-channels to the pole with bolts and clamps.



Step 5 Fix the mounting bracket to the U-channels with bolts.



- - End

4.5.3 Mounted on Wall

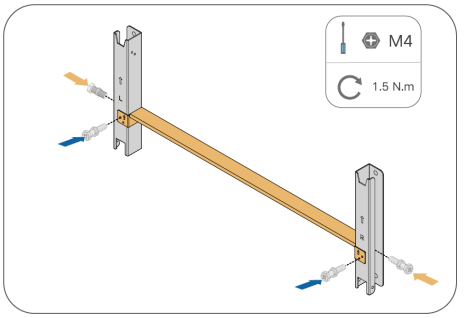
Tools

Item	Specifications
Phillips screwdriver	M4
Marker	-
Level	-
Hammer drill	Drill bit: φ12
Wrench	16 mm

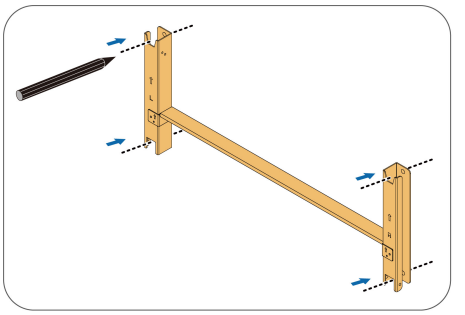
Required Materials

Item	Quantity	Specifications	Source
Cross-slotted screw	4	M4×10	Included in the scope of delivery
Expansion bolt	4	M10×95 (recommended)	Prepared by the user

Step 1 Assemble the mounting bracket together by fixing the two sub-brackets to the two sides of the connecting plate.

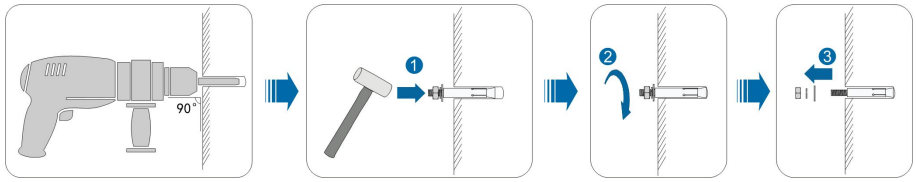


Step 2 Put the mounting bracket assembly at the target position. Adjust its angle with the assistance of the level, and mark the hole positions for drilling.



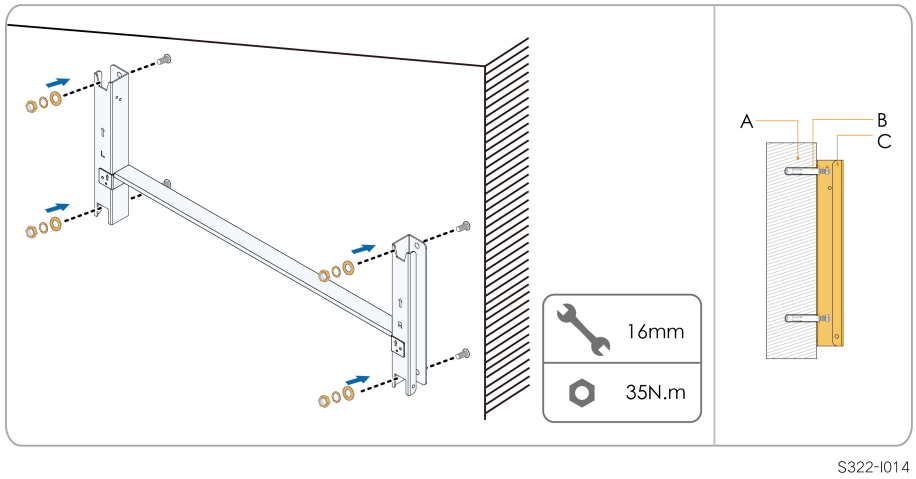
S322-I013

Step 3 Drill holes using a hammer drill, and clean the holes. Then, insert the expansion bolts into the holes, and tap the bolts using a rubber mallet to secure them in place. Next, tighten the nuts at the end of the bolts using a wrench to make the bolt sleeves expand. After that, remove the nuts, spring washers, and flat washers, and keep them properly for later use.



After removing the nuts, spring washers, and flat washers, make sure the ends of expansion bolt sleeves are flush with the wall surface. Otherwise, the mounting bracket will not stay stable on the wall.

Step 4 Hang the mounting bracket to the expansion bolts, and fit the washers and nuts to fix it.



(A) Wall (B) Bolt assembly (C) Mounting bracket

- - End

4.6 Mount the Inverter

Tools

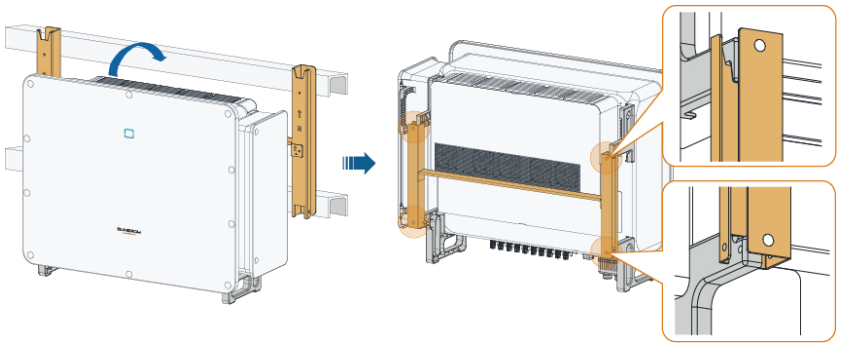
Item	Specifications
Phillips screwdriver	M6

Required Materials

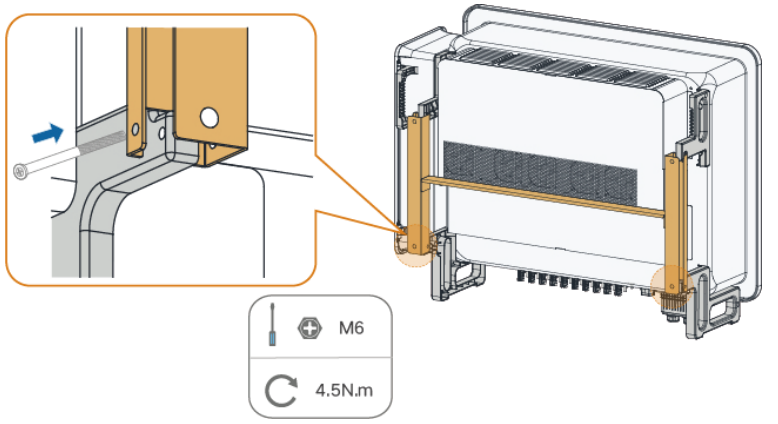
Item	Quantity	Specifications	Source
Cross-slotted screw	2	M6×65	Included in the scope of delivery

Step 1 Take the inverter out of the packing crate.

Step 2 Hang the inverter to the mounting bracket. Ensure the inverter's mounting ears fit perfectly into the mounting bracket.



Step 3 Fix the inverter to the mounting bracket with screws.



NOTICE

The inverter's left and right sides must be fixed to the mounting bracket with screws, otherwise, the inverter may not be secure.

- - End

4.7 Installing the RSD (Optional)

If RSDs are selected for the system, install the RSDs by referring to the SR20D-M Quick Installation Guide。

5 Electrical Connection

5.1 Safety Instructions

DANGER

The PV string will generate lethal high voltage when exposed to sunlight.

- **Operators must wear proper personal protective equipment during electrical connections.**
- **Must ensure that cables are voltage-free with a measuring instrument before touching DC cables.**
- **Respect all safety instructions listed in relevant documents about PV strings.**

DANGER

- **Before electrical connections, please make sure that the inverter switch and all switches connected to the inverter are set to "OFF", otherwise electric shock may occur!**
- **Ensure that the inverter is undamaged and all cables are voltage free before performing electrical work.**
- **Do not close the AC circuit breaker until the electrical connection is completed.**

WARNING

Do not damage the ground conductor. Do not operate the product in the absence of a properly installed ground conductor. Otherwise, it may cause personal injury or product damage.

Please use measuring devices with an appropriate range. Overvoltage can damage the measuring device and cause personal injury.

Damage to the product caused by incorrect wiring is not covered by the warranty.

- **Electrical connection must be performed by professionals.**
- **Operators must wear proper personal protective equipment during electrical connections.**
- **All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned. Cables used shall comply with the requirements of local laws and regulations.**
- **The factors that affect cable selection include rated current, cable type, routing mode, ambient temperature, and maximum expected line loss.**

NOTICE

All electrical connections must comply with local and national/regional electrical standards.

- **Cables used by the user shall comply with the requirements of local laws and regulations.**
- **Only with the permission of the national/regional grid department, the inverter can be connected to the grid.**

NOTICE

- **Install the external protective grounding cable first when performing electrical connection and remove the external protective grounding cable last when removing the inverter.**
- **Keep the AC output cable and the DC input cable close to each other during electrical connection.**
- **Comply with the safety instructions related to PV strings and the regulations related to the utility grid.**

NOTICE

- **After being crimped, the OT terminal must wrap the wires completely, and the wires must contact the OT terminal closely.**
- **When using a heat gun, protect the device from being scorched.**
- **Keep the PV+ cable and PV– cable close to each other when connecting DC input cables.**
- **Before connecting a power cable (such as the AC cable, the DC cable, etc.), confirm that the label and identifier on the power cable are correct.**
- **When laying out communication cables, separate them from power cables and keep them away from strong interference sources to prevent communication interruption.**
- **All vacant terminals must be covered with waterproof covers to prevent affecting the protection performance.**
- **Ensure that AC output cables are firmly connected. Failing to do so may cause inverter malfunction or damage to its AC connectors.**
- **When the wiring is completed, seal the gap at the cable inlet and outlet holes with fireproof/waterproof materials such as fireproof mud to prevent foreign matter or moisture from entering and affecting the long-term normal operation of the inverter.**

The cable colors in figures in this manual are for reference only. Please select cables according to local cable standards.

5.2 Terminal Description

Terminals of the SG150CX are located at its side and bottom, as shown in the figure below.

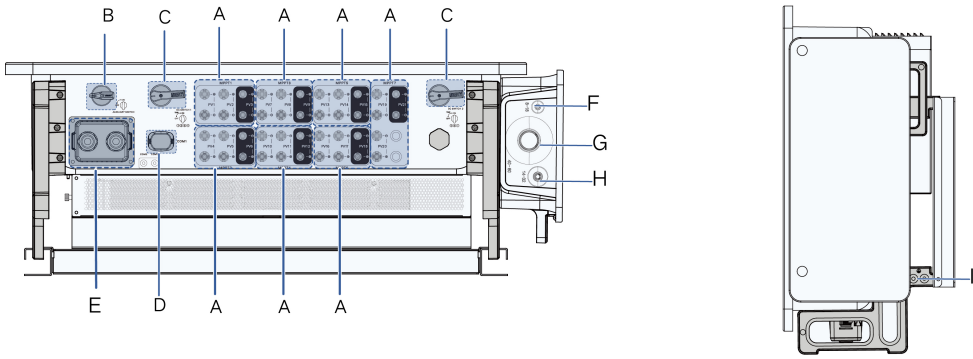


figure 5-1 SG150CX Terminal Description

*The figure is for reference only and the real product may differ.

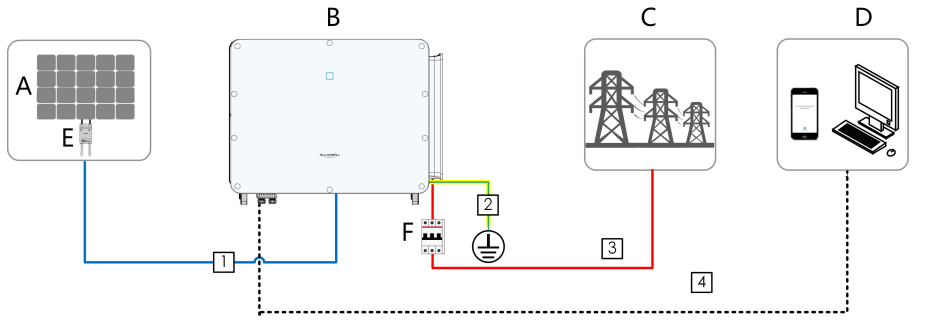
No.	Name	Label	Remarks
A	DC PV terminals	+ / -	21 pairs, PV connector
B	Auxiliary switch	AUXILIARY SWITCH	Used to assist in powering on the inverter for the first time.
C	DC switch	DC SWITCH	Used to control the connection and disconnection of DC inputs.
D	Communication terminal	COM1	Used for connecting a communication module.
E	Communication terminals	COM2, COM3	Used for RS485 communication and DI/DO wiring.
F	Tracker terminal	Tracker	Used for power supply wiring of the tracking system.
G	AC wiring terminal	AC	Used for AC output wiring.
H	Spare grounding point*	AC	Used for internal grounding.
I	External grounding terminals	⏚	Used for reliable grounding of the inverter. Two grounding terminals are provided. Use at least one of them for grounding.

*If the PE cable is a separate single-core cable, lead it through the spare grounding point into the AC junction box for wiring.

*Before performing maintenance, ensure the inverter is shut down and all switches are disconnected.

5.3 Electrical Connection Overview

To connect the inverter to the PV system, these electrical connections should be completed: external grounding, and connections of the grid and the PV strings.



(A) PV string (B) Inverter (C) Utility grid

(D) Monitoring device (E) RSD (Optional) (F) AC circuit breaker

table 5-1 Cable Requirements

No.	Cable	Type	Specification	
			Outer Diameter (mm)	Cross-sectional area of conductor (mm²)
1	DC cable	PV cable up to the 1100V standard	4.7–6.4	4–6
2	Additional grounding cable	Outdoor single-core copper cable	/	Same as the PE wire of the AC cable
3	AC cable	Outdoor five-core copper cable	40–80	L1, L2, L3, and N wire: 150–300 PE wire: See "table 5-2 PE Wire Requirements"
		Outdoor four-core copper cable Outdoor grounding cable	L1, L2, L3, and N wire: 40–80 PE wire: 14–32	

No.	Cable	Type	Specification	
			Outer Diameter (mm)	Cross-sectional area of conductor (mm^2)
		Outdoor single-core copper cable	18–40	L1, L2, L3, and N wire: 120–300
		Outdoor five-core aluminum cable*	40–80	L1, L2, L3, and N wire: 240–300 PE wire: See "table 5-2 PE Wire Requirements"
		Outdoor four-core aluminum cable* Outdoor grounding cable	L1, L2, L3, and N wire: 40–80 PE wire: 14–32	
		Outdoor single-core aluminum cable	18–40	L1, L2, L3, and N wire: 150–400
4	Communication cable	Shielded twisted-pair cable (terminal block)	4.5–18	0.2–1.5

*If the aluminum cable is used, the copper-to-aluminum terminal is required. For details, refer to " Aluminum Cable Requirements".

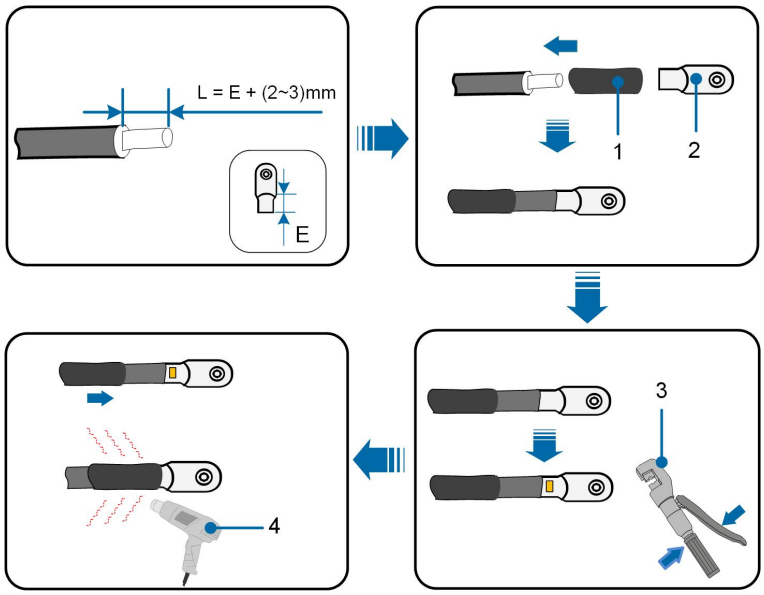
If a sealing plate intended for single-core cables is needed, please contact SUNGROW.

table 5-2 PE Wire Requirements

Cross-sectional area of the PE wire	Remarks
S/2 S: Cross-sectional area of the phase wire	This rule applies only if the phase wires and the PE wire are identical in material. If the materials are different, make sure the cross-section of the PE wire allows it to produce a conductance equivalent to that resulting from the application of this table.

5.4 Crimp OT/DT terminal

Crimp OT/DT terminal



1. Heat shrink tubing
2. OT/DT terminal
3. Hydraulic pliers
4. Heat gun

Aluminum Cable Requirements

If an Aluminum cable is selected, use a copper to Aluminum adapter terminal to avoid direct contact between the copper bar and the Aluminum cable.

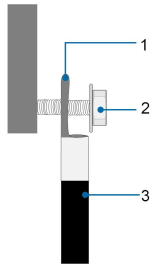


figure 5-2 Aluminum Cable Connection

1. Copper to Aluminum adapter terminal
2. Flange nut
3. Aluminum cable

NOTICE

Ensure that the selected terminal can directly contact with the copper bar. If there are any problems, contact the terminal manufacturer.

Ensure that the copper bar is not in direct contact with the aluminum wire. Otherwise, electrochemical corrosion may occur, impairing the reliability of electrical connection.

5.5 External Protective Grounding Connection

DANGER

- **There are large currents during the inverter's operation. If the inverter is powered on and put into operation without being grounded, it may lead to electric shock hazards or failures of major protective functions such as surge protection. Therefore, before powering on the inverter, make sure it has been reliably grounded; otherwise, damages caused therefrom will not be covered by warranty.**
- **When performing electrical connections of the inverter, give the highest priority to grounding. Be sure to carry out the grounding connection first.**

WARNING

- **Since the inverter is not equipped with a transformer, neither the negative electrode nor the positive electrode of the PV string can be grounded. Otherwise, the inverter will not operate normally.**
- **Connect the grounding terminal to the external protective grounding point before AC cable connection, PV string connection, and communication cable connection.**
- **The external protective grounding point provides a reliable ground connection. Do not use an improper grounding conductor for grounding, Otherwise, it may cause product damage or personal injury.**
- **Depending on Local Rules, please also ground the PV panel subconstruction to the same common grounding point (PE Bar) in addition to local lightning protection rules.**

WARNING

The external protective grounding terminal must meet at least one of the following requirements.

- **The cross-sectional area of the grounding cable is not less than 10 mm^2 for copper wire or 16 mm^2 for aluminum wire. It is recommended that both the external protective grounding terminal and the AC side grounding terminal be reliably grounded.**
- **If the cross-sectional area of the grounding cable is less than 10 mm^2 for copper wire or 16 mm^2 for aluminum wire, ensure that both the external protective grounding terminal and the AC side grounding terminal are reliably grounded.**

The grounding connection can be made by other means if they are in accordance with the local standards and regulations, and SUNGROW shall not be held liable for the possible consequences.

5.5.1 External Protective Grounding Requirements

All non-current carrying metal parts and device enclosures in the PV power system should be grounded, for example, subconstruction of PV modules and inverter enclosure.

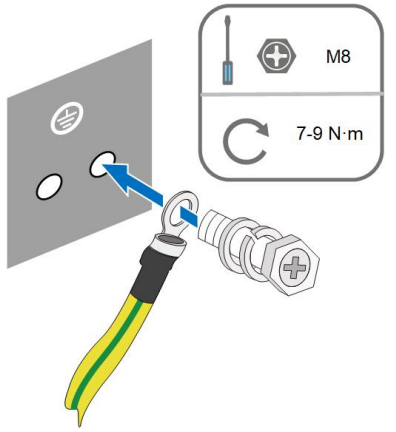
When there is only one inverter in the PV system, connect the external protective grounding cable to a nearby grounding point.

When there are multiple inverters in the PV system, connect the external protective grounding terminals of all inverters and the grounding points of the PV module subconstruction to ensure equipotential connections to ground cables (according to the onsite conditions).

5.5.2 Connection Procedure

Step 1 Prepare the cable and OT/DT terminal, refer to " Crimp OT/DT terminal".

Step 2 Remove the screw on the grounding terminal and fasten the cable with a screwdriver.



Step 3 Apply paint to the grounding terminal to ensure corrosion resistance.

The grounding screws have been anchored to the side of the inverter before delivery, and do not need to be prepared.

There are two grounding terminals. Use one of them to ground the inverter.

- - End

5.6 AC Cable Connection

5.6.1 AC-side Requirements

The inverter can only be connected to the utility grid with the permission of the local power company.

Before grid connection, confirm that the grid voltage and frequency meet the requirements for the inverter operation. For details, see "**Technical Data**". If the requirements are not met, contact the power company for help.

AC Circuit Breaker

An independent 3-pole or 4-pole circuit breaker should be installed on the AC side of each inverter, to ensure it can disconnect from the grid in a safe manner.

Inverter	Recommended Rated Voltage	Recommended Rated Current
SG150CX	400V	315A

WARNING

- **An AC circuit breaker should be installed between the inverter AC side and the grid, to ensure the inverter can disconnect from the grid in a safe manner.**
- **It is not allowed for different inverters to share one AC circuit breaker.**
- **Do not connect any local load between the inverter and the AC circuit breaker.**

Requirements for Multiple Inverters in Parallel Connection

Where multiple inverters are connected to the grid in parallel, the total number of parallel inverters should not exceed 25. If more than 25 inverters need to be connected, contact SUNGROW first.

Maximum Number of RSDs

If SUNGROW Logger1000 is used, a maximum of 4900 RSDs can be connected.

MV Transformer

The MV transformer used together with the inverter should meet the following requirements:

- A distribution transformer can be used. The transformer should be suitable for a PV system with a typical cyclical load pattern (with loads during the daytime and no load at night).
- A dry-type transformer or an oil-immersed transformer can be used, and the shield winding is not strictly necessary.
- The line voltages on the LV side of the transformer must conform with the line voltages on the AC output side of the inverter. To connect to a grid that adopts the IT earthing system, the withstand voltage to ground of the step-up transformer's LV winding, the AC cables, and the secondary equipment (such as relay protection, detection and measuring, and other auxiliary devices) should not be lower than the system voltage of 1100V.
- The withstand voltage between the two double-split windings of the transformer in the same phase should not be lower than the system voltage of 1100V.
- The line voltages on the HV output side of the transformer must be consistent with the voltage rating of the grid at the installation site.
- To keep the voltage consistent with the grid voltage, a transformer with a tap changer on its HV side is recommended.

- The operating capacity of the transformer should meet the inverter's output requirements. The transformer should be able to run 1.1 times overloaded for a long term at an ambient temperature of 30℃.
- A transformer with a short-circuit impedance of 7% (allowable tolerance: ±10%) is recommended.
- The voltage drop of system cable should be no more than 3%.
- The DC component that the transformer can withstand should be 1% of the fundamental current at rated power.
- With regard to thermal rating, the load profile of the inverter and the environmental conditions at the installation site must be taken into account.
- The apparent power of the inverter must not exceed the transformer power. The maximum AC current of all inverters connected in parallel must be taken into account. If more than 25 inverters need to be connected to the grid, contact SUNGROW for more specific technical solutions first.
- The transformer should have overload and short-circuit protection features.
- As a critical component of the grid-connected PV system, the transformer's capability to withstand system faults should always be considered. The faults may include system short-circuit, grounding fault, and voltage drop, etc.
- Take into account the environmental conditions at the site, such as the ambient temperature, relative humidity, altitude, and air quality, when selecting and installing the transformer.

5.6.2 OT/DT Terminal Requirements

OT/DT terminals (not included in the scope of delivery) are required for AC cable connections. Please prepare the OT/DT terminals by following the requirements below.

OT/DT Terminals for AC Phase Wires

- Specification: M12

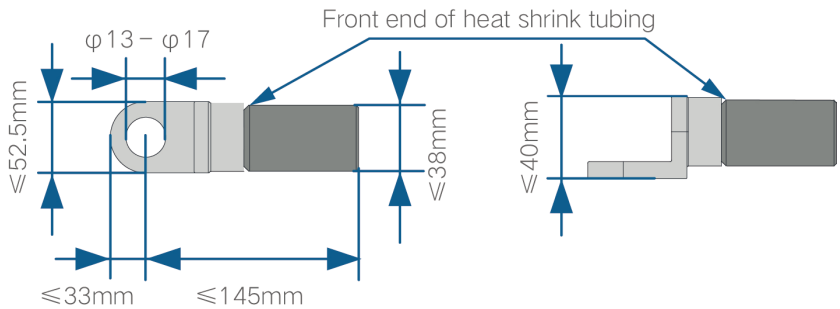


figure 5-3 Dimensions of Terminal After Crimping

OT/DT Terminal for AC PE wire

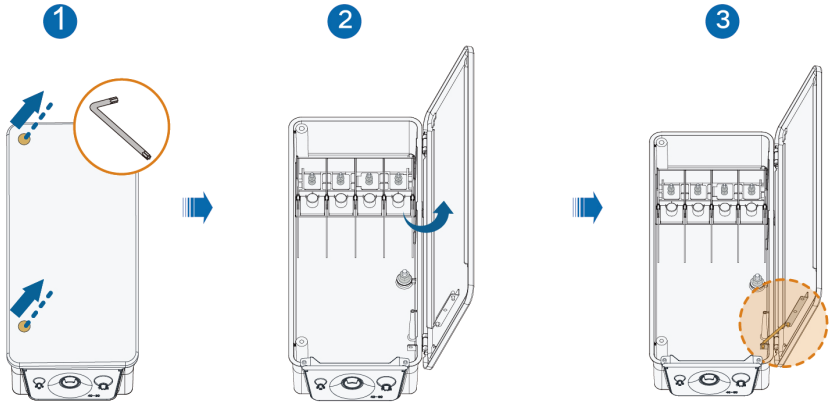
- Specification: M12

5.6.3 Wiring Steps

This section gives instructions on wiring using a five-core cable. These steps apply to the four-core cable as well.

Step 1 Switch off the AC-side circuit breaker and prevent it from switching on inadvertently.

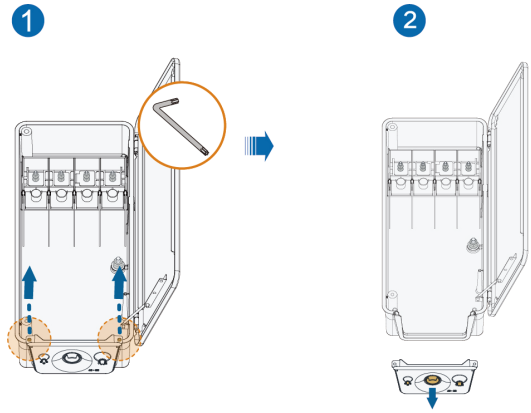
Step 2 Loosen the two screws on the front door of the AC junction box using the Allen wrench (included in the scope of delivery), and open the door. Secure the door restrictor rod to keep the door open during wiring.



S322-E004

The screws on the door of the junction box are captive screws. After the door is opened, the screws stay on the door and hence will not be lost.

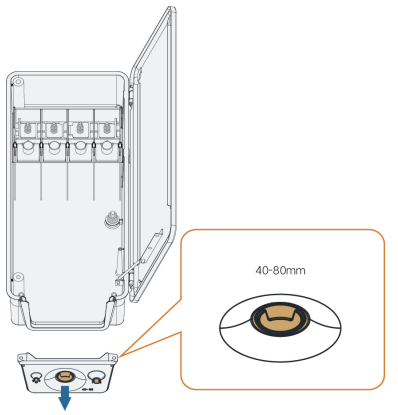
Step 3 Loosen the screws on the bottom sealing plate using the Allen wrench and take the sealing plate out.



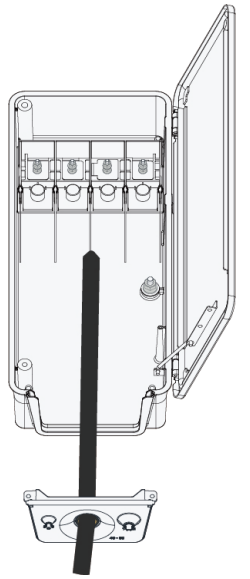
S322-E005

The screws on the sealing plate are captive screws. After the sealing plate is taken down, the screws stay on the plate and hence will not be lost.

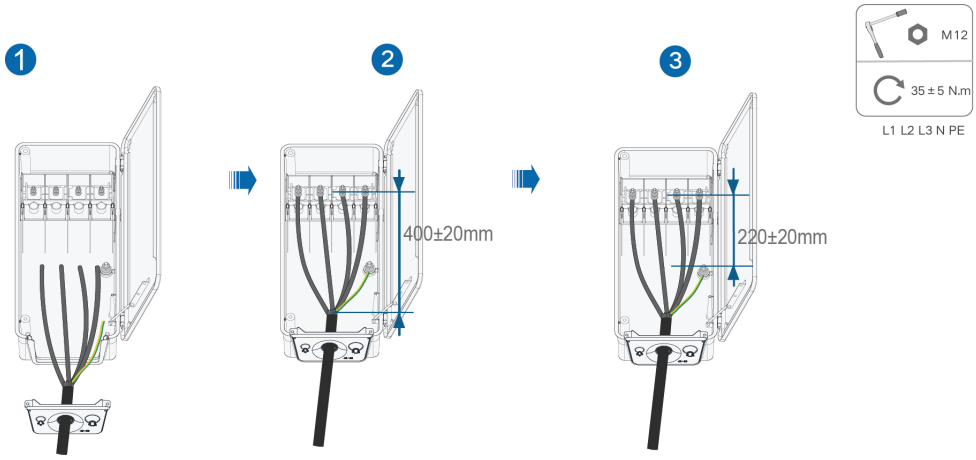
Step 4 Tear off the seal.



Step 5 Lead the cable through the opening on the sealing plate.



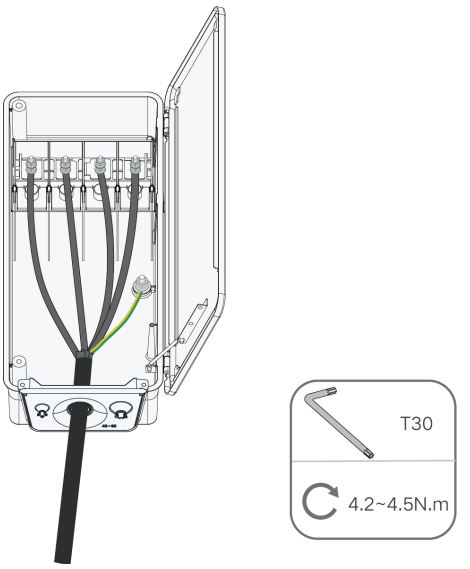
Step 6 Strip the external protective layer of the AC cable inside the junction box, by referring to the figure below. Crimp the OT/DT terminals onto the stripped wires, and then fix the wires to the corresponding terminals (for the tightening torques, see the torque label inside the junction box). Then, organize the wires and put the bottom sealing plate back.



NOTICE

- **If a multi-core cable is used, it is recommended the strip length of the L2 wire be 15mm shorter than those of L1 and L3 wires.**
- **When wiring, make sure the centers of the OT/DT terminals of the wires align horizontally on the same line.**

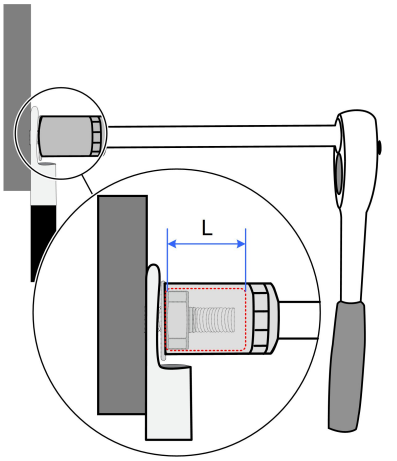
Step 7 Tighten the screws on the bottom sealing plate.



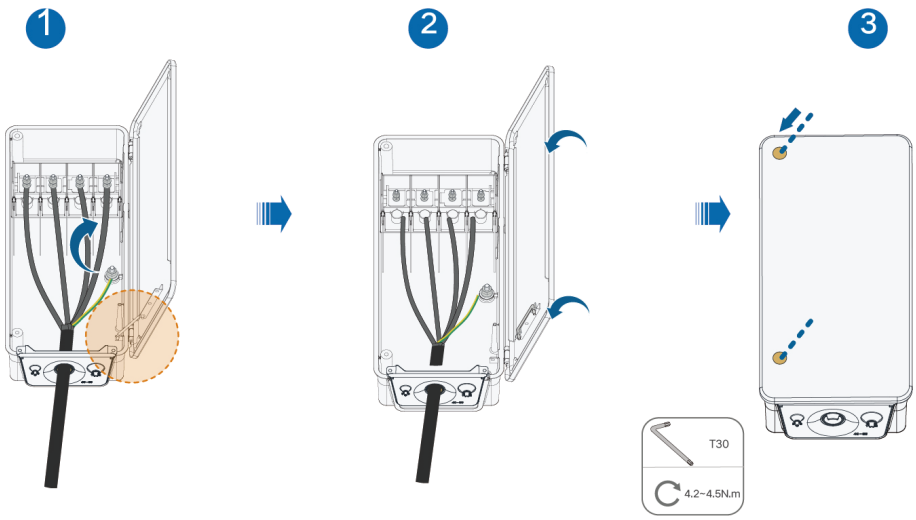
NOTICE

Pay attention to the connections of the PE and N wires. Connecting a phase wire to the position of the PE or N wire may lead to permanent damage to the inverter.

Ensure that the inner depth L of the socket used is ≥28mm.

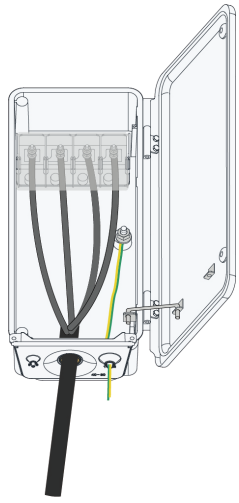


Step 8 Remove the restrictor rod and put it back in its original position, to release the restriction on the door of the junction box. Then, close the door and tighten the two screws on it using the Allen wrench.



- - End

*If the PE cable is a separate single-core cable, lead it through the spare grounding point into the AC junction box for wiring.



5.7 DC Cable Connection

DANGER

The PV string will generate lethal high voltage when exposed to sunlight.

- **Respect all safety instructions listed in relevant documents about PV strings.**

⚠ WARNING

- **Make sure the PV array is well insulated to ground before connecting it to the inverter.**
- **Make sure the maximum DC voltage and the maximum short circuit current of any string never exceed inverter permitted values specified in "Technical Data".**
- **Check the positive and negative polarity of the PV strings, and connect the PV connectors to corresponding terminals only after ensuring polarity correctness.**
- **During the installation and operation of the inverter, please ensure that the positive or negative electrodes of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in equipment damage. The damage caused by this is not covered by the warranty.**
- **Electric arc or contactor over-temperature may occur if the DC connectors are not firmly in place, and the loss caused is not covered by the warranty.**
- **If the DC input cables are reversely connected or the positive and negative terminals of different MPPT are shorted to ground at the same time, while the DC switch is in the "ON" position, do not operate immediately. Otherwise, the inverter may be damaged. Please turn the DC switch to "OFF" and remove the DC connector to adjust the polarity of the strings when the string current is lower than 0.5 A.**
- **Use the DC connectors supplied with the product for DC cable connection. Using incompatible DC connectors may result in serious consequences, and the device damage is not covered under warranty.**
- **Inverters do not support full parallel connection of strings (Full parallel connection refers to a connection method in that strings are connected in parallel and then connected to the inverter separately).**
- **Do not connect one PV string to multiple inverters. Otherwise, the inverters may be damaged.**

NOTICE

The following requirements about PV string connection must be met. Otherwise, it may cause irreversible damage to the inverter, which is not covered by the warranty.

- **Mixed use of PV modules of different brands or models in one MPPT circuit, or PV modules of different orientation or inclination in a string may not damage inverter, but will cause system bad performance!**
- **The inverter enters standby state when the input voltage ranges between 1,000 V and 1,100 V. The inverter returns to running state once the voltage returns to the MPPT operating voltage range, namely, 180 V to 1,000 V.**

NOTICE

Note the following items when laying cables on site:

- **The axial tension on PV connectors must not exceed 80 N. Avoid axial cable stress on the connector for a long time during field wiring.**
- **Radial stress or torque must not be generated on PV connectors. It may cause the connector waterproof failure and reduce connector reliability.**
- **Leave at least 50 mm of slack to avoid the external force generated by the cable bending affecting the waterproof performance.**
- **Refer to the specifications provided by the cable manufacturer for the minimum cable bending radius. If the required bending radius is less than 50 mm, reserve a bending radius of 50 mm. If the required bending radius is greater than 50 mm, reserve the required minimum bending radius during wiring.**

5.7.1 PV Input Configuration

- The inverter supports multiple PV inputs and provides MPP trackers for all PV inputs, as shown in the figure below.
- The inverter offers several independently operating MPPTs for the PV inputs. Therefore, the configuration of PV strings, such as the model and number of PV modules and tilt and azimuth angles, connected to one MPPT can be different from those connected to another.
- Up to 3 PV strings can be connected to one MPPT. For the best use of their input power, make sure the PV strings connected to the same MPPT are identical in configuration, such as the model and number of PV modules and tilt and azimuth angles.

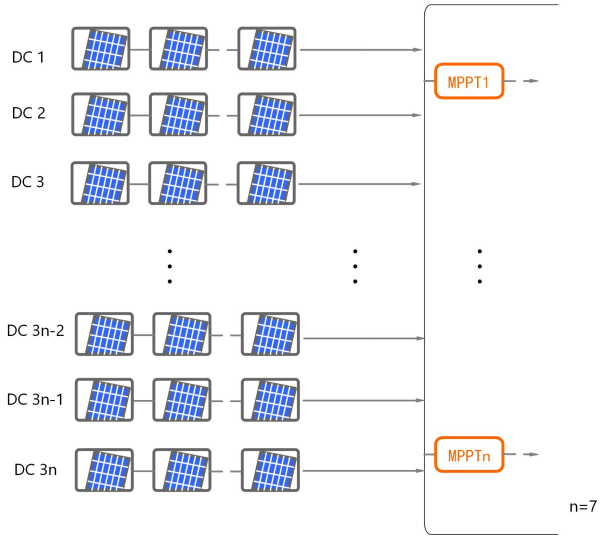


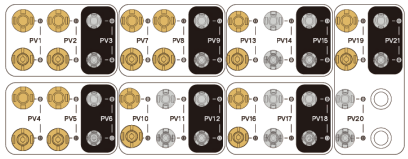
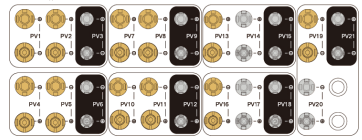
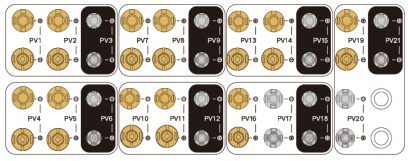
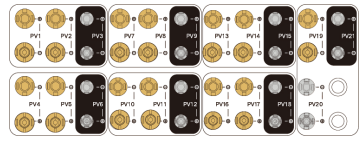
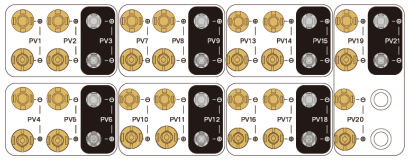
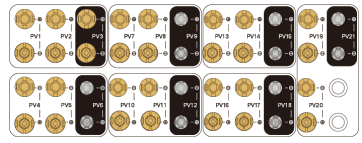
figure 5-4 PV Input Configuration

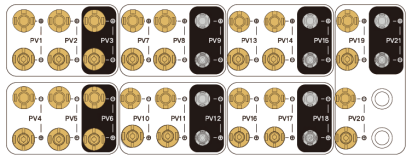
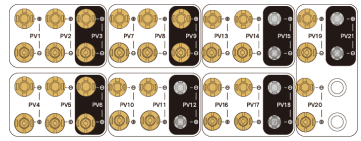
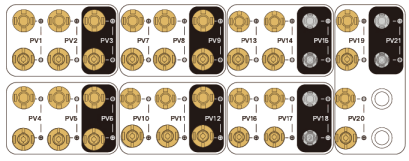
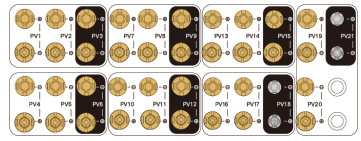
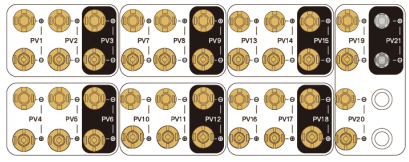
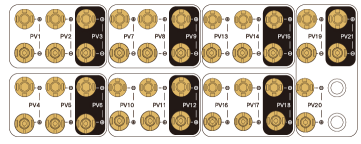
Prior to connecting the PV strings to the inverter, make sure the strings all meet the below requirements:

Open-circuit Voltage Limit of Each Input	Max. Current for Input Connector
1100V	30A

Wiring Instructions

If the number of PV strings is 10 to 21, it is recommended to perform DC input wiring by referring to the table below.

Number of PV Strings	DC PV Terminals	Number of PV Strings	DC PV Terminals
10	Connect to PV1, PV2, PV4, PV5, PV7, PV8, PV10, PV13, PV16, PV19 	11	Connect to PV1, PV2, PV4, PV5, PV7, PV8, PV10, PV11, PV13, PV16, PV19 
12	Connect to PV1, PV2, PV4, PV5, PV7, PV8, PV10, PV11, PV13, PV14, PV16, PV19 	13	Connect to PV1, PV2, PV4, PV5, PV7, PV8, PV10, PV11, PV13, PV14, PV16, PV17, PV19 
14	Connect to PV1, PV2, PV4, PV5, PV7, PV8, PV10, PV11, PV13, PV14, PV16, PV17, PV19, PV20 	15	Connect to PV1, PV2, PV3, PV4, PV5, PV7, PV8, PV10, PV11, PV13, PV14, PV16, PV17, PV19, PV20 

Number of PV Strings	DC PV Terminals	Number of PV Strings	DC PV Terminals
16	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV10, PV11, PV13, PV14, PV16, PV17, PV19, PV20 	17	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV9, PV10, PV11, PV13, PV14, PV16, PV17, PV19, PV20 
18	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV9, PV10, PV11, PV12, PV13, PV14, PV16, PV17, PV19, PV20 	19	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV9, PV10, PV11, PV12, PV13, PV14, PV15, PV16, PV17, PV19, PV20 
20	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV9, PV10, PV11, PV12, PV13, PV14, PV15, PV16, PV17, PV18, PV19, PV20 	21	Connect to PV1, PV2, PV3, PV4, PV5, PV6, PV7, PV8, PV9, PV10, PV11, PV12, PV13, PV14, PV15, PV16, PV17, PV18, PV19, PV20, PV21 

- To connect PV strings constituted by 210 (G12) modules, ensure the number of strings connected to each MPPT is ≤ 2.
- The inverter does not support the connection of strings connected in parallel externally.

5.7.2 Assembling PV Connectors

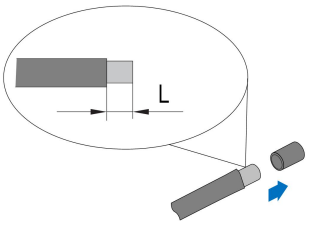
DANGER

High voltage may be present in the inverter!

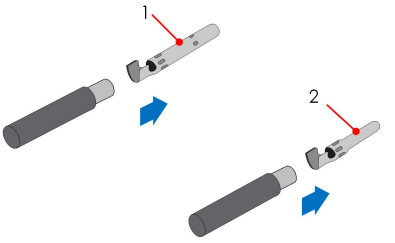
- **Ensure all cables are voltage-free before performing electrical operations.**
- **Do not connect the AC circuit breaker before finishing electrical connection.**

SUNGROW provides corresponding PV connectors in the scope of delivery for quick connection of PV inputs. To ensure IP66 protection, use only the supplied connector or the connector with the same ingress of protection.

Step 1 Strip the insulation from each DC cable by 8 mm ~ 10 mm.

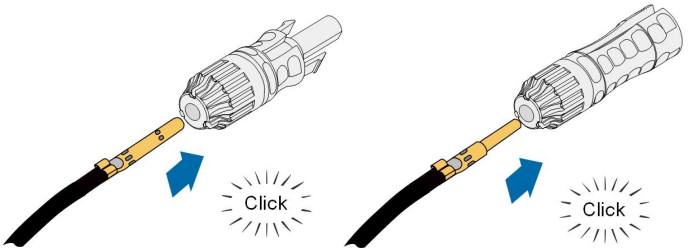


Step 2 Assemble the cable ends with the crimping pliers.

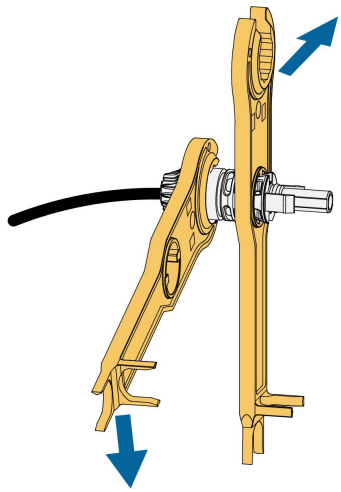


1: Positive crimp contact 2：Negative crimp contact

Step 3 Lead the cable through the cable gland, and insert the crimp contact into the insulator until it snaps into place. Gently pull the cable backward to ensure firm connection.



Step 4 Tighten the cable gland and the insulator.



Step 5 Check for polarity correctness.

NOTICE

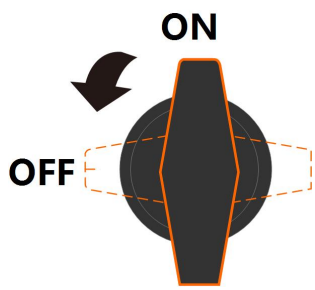
If the PV polarity is reversed, the inverter will be in a fault or alarm state and will not operate normally.

- - End

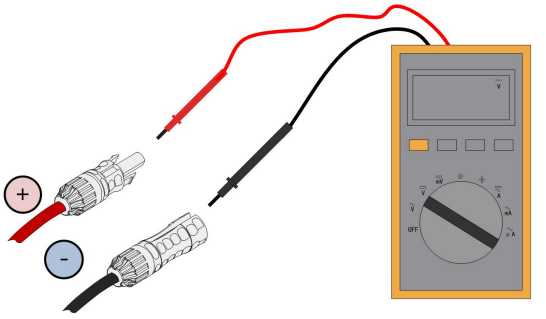
5.7.3 Installing PV Connector

Step 1

Step 2 Ensure that the auxiliary switch and the DC switches are in "OFF" position. Otherwise, manually turn them to "OFF".



Step 3 Check the cable connection of the PV string for polarity correctness and ensure that the open circuit voltage in any case does not exceed the inverter input limit of 1100 V.

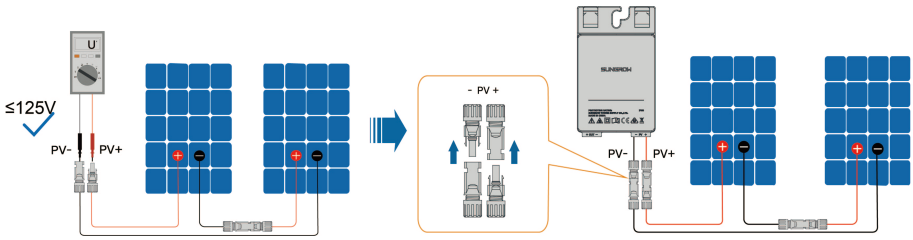


NOTICE

The multimeter must have a DC voltage range of at least 1100 V. If the voltage is a negative value, the DC input polarity is incorrect. Please correct the DC input polarity. If the voltage is greater than 1100 V, too many PV modules are configured to the same string. Please remove some PV modules.

Step 4 RSD Wiring (Optional).

1 Connect the PV+ and PV- cables of the RSD respectively to the positive and negative terminals in the junction box of the PV module.



NOTICE

- **Before connecting the PV module to the RSD's input terminals, use a multimeter to test the module's output voltage and ensure it is below 125V. Excessive module output voltage may damage the PV module or the RSD, and such damage will not be covered by the warranty.**
- **Do not connect the PV module to the OUT+ and OUT- of the RSD. Otherwise, the RSD or PV module will be damaged, and such damage will not be covered by warranty.**

2 Connect the positive probe of a multimeter to the OUT+ of the RSD, and negative probe to OUT-, to check whether there is a fault in the RSD. If the typical value of the output voltage (U) is 1V, the RSD has no fault.

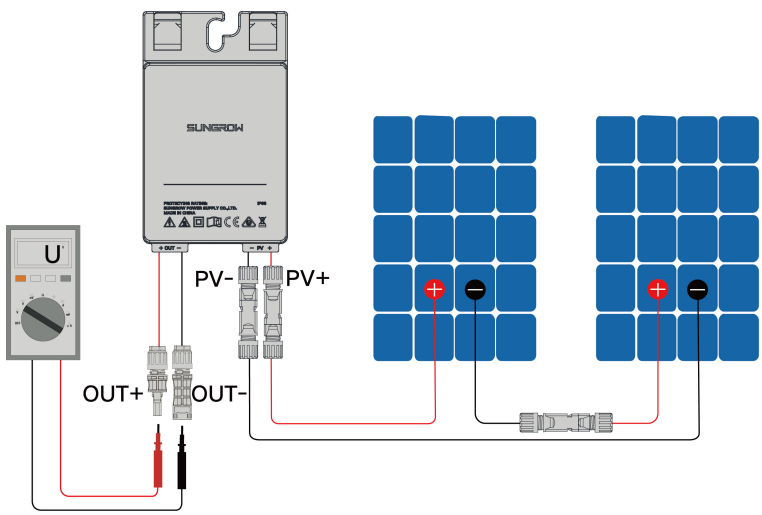


table 5-3 Output Voltage

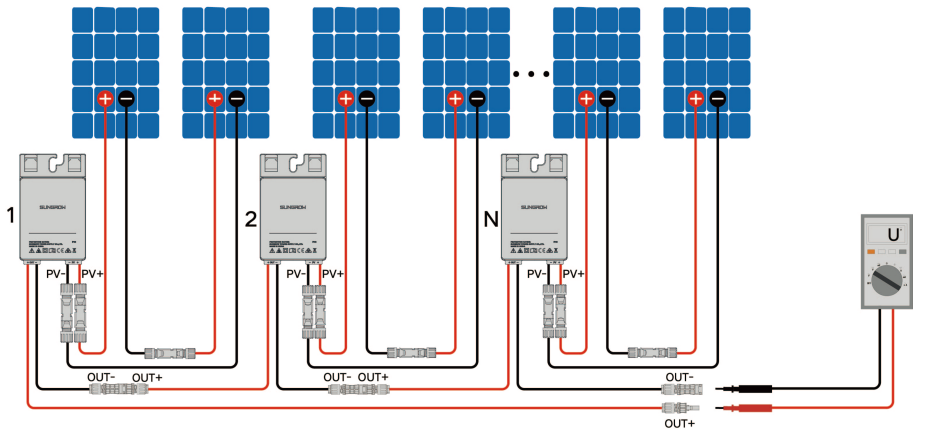
Voltage	Possible Cause	Suggestions
0.9 V≤U≤1.1 V	Nothing abnormal with the RSD.	/
U < 0.9 V	1. Poor sunlight. 2. No PV module is connected to the input side of the RSD. 3. The wiring of the RSD is wrong. 4. There is a fault in the RSD.	1. Measure the voltage when there is sufficient sunlight. 2. Connect the PV module to the input side of the RSD. 3. Re-connect the RSD cables correctly. Make sure the input side of the RSD is connected to the output side of the PV module. 4. Replace the RSD.
U > 1.1 V	There is a fault in the RSD.	Replace the RSD.

NOTICE

Complete the RSD wiring and measure the output voltage by following the steps below.

- **After completing the wiring of an RSD, use a multimeter to measure its output voltage. Ensure that the output voltage of each RSD is within the normal range.**
- **After confirming that the output voltages of all RSDs are normal, use a multimeter to measure the output voltages of RSDs in the same string.**
- **If you do not check the RSD output voltages and confirm the string has been wired properly in this step, in case of something abnormal, you may have to check the whole wiring again, where rework is required.**

3 Where multiple RSDs are used, connect the OUT- of the first RSD to the OUT+ of the second one, and so on. Use a multimeter to test the positive and negative terminals of the RSDs. If the typical value of the output voltage is 1 V*N (N = number of RSDs), the system is fault-free.



NOTICE

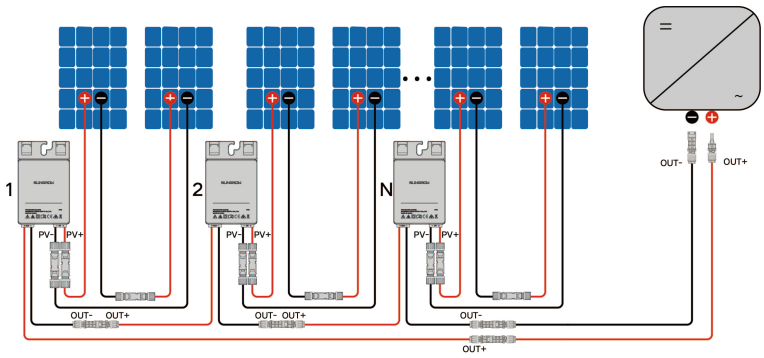
In the actual wiring, the connection of the negative/positive terminal of the first RSD to that of the second one (whether connecting OUT1+ to OUT2-, or OUT1- to OUT2+) should be decided considering the negative and positive terminals of the inverter.

table 5-4 Output Voltage

Voltage	Possible Cause	Suggestions
U=1*N	Nothing abnormal with the RSD.	/
U=0	1. The PV string is open-circuited. 2. The cables are not connected to the same string.	1. Check whether the string is open-circuited. 2. Identify the string cables correctly.
U<0	1. The probes are connected reversely. 2. The cable labels are incorrect.	1. Reconnect the positive and negative probes correctly. 2. Prepare cable labels correctly.

Voltage	Possible Cause	Suggestions
U<0.9*N	1. The input cables of some RSDs are not connected. 2. The output cables of some RSDs are not connected. 3. The output cables of some RSDs are connected reversely.	Check whether the cables of modules and strings are properly connected.
U>1.1*N	1. The actual number of RSDs in the string is greater than expected. 2. The PV module is connected to the string directly, not connected to any RSD.	1. Check whether the number of RSDs in the string is correct. 2. Check whether the cables of modules and strings are properly connected.

4 Connect the OUT+ of the first RSD and the OUT- of the last one to the DC input terminals of the inverter.



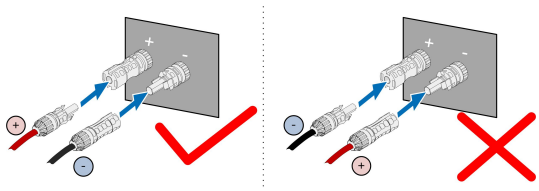
WARNING

- **If all modules in a string go offline or show no current during plant creation on iSolarCloud, first check whether the string output voltage is within the normal range as instructed in Step 3. If the voltage is normal, inspect the wiring for reverse polarity or disconnection.**
- **The total power of PV modules in a PV string should not exceed the maximum input power of a single input of the inverter.**

NOTICE

- **The RSD supports full-coverage deployment only.**
- **To deploy the RSD, the use of Y-type connectors on the input side of the inverter is not supported, as the RSD is not compatible with such connectors.**

Step 5 Connect the PV connectors to corresponding terminals until there is an audible click.



Step 6 Follow the foregoing steps to connect PV connectors of other PV strings

Step 7 Seal any unused PV terminal with a terminal cap.

NOTICE

Turn the corresponding DC switch to "ON" after the PV string is connected to the PV terminal on the inverter.

- - End

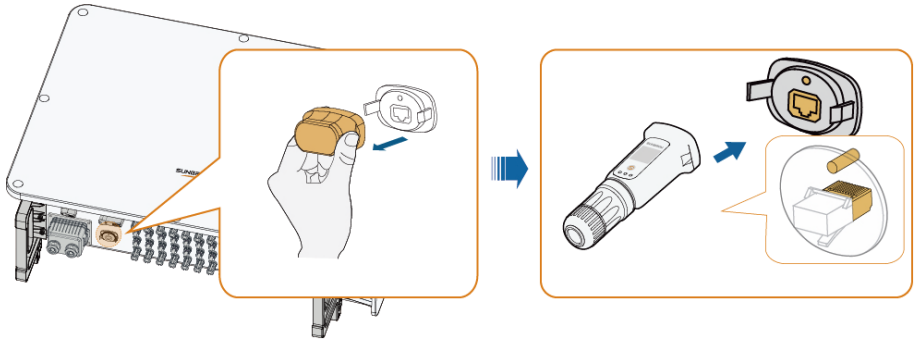
NOTICE

- **After the PV string is connected to the input terminal on the inverter, please turn on the corresponding DC switch.**
- **Only when the DC switch is set to "ON", the DC surge protective device is able to provide effective protection against electrical surges.**

5.8 Communication Connection

5.8.1 Wireless Communication Module Connection (Optional)

Install the wireless communication module to the communication interface with a silk screen of COM3 at the bottom of the inverter.



*The image shown here is for reference only. The actual product you receive may differ.

NOTICE

Once the communication module is in use, do not connect the inverter to a 3rd party data logger at the same time via RS485.

For details on module installation and configuration, refer to the manual delivered together with the module.

5.8.2 WiNet-S2 Connection (optional)

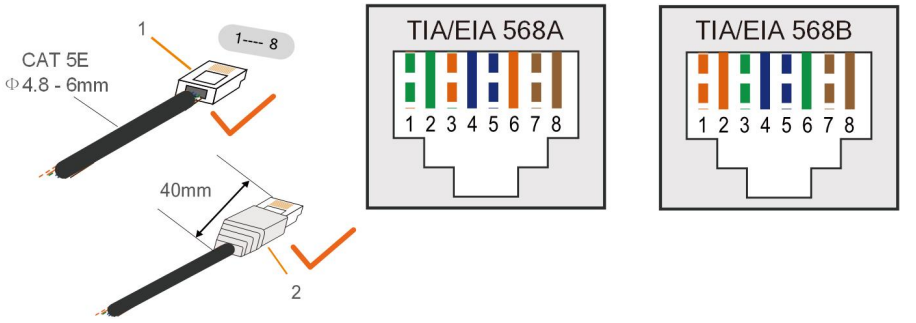
The WiNet-S2 module supports Ethernet communication and WLAN communication. It is not recommended to use both communication methods at the same time.

For details, see the quick guide for the WiNet-S2 module. Scan the following QR code for the quick guide.

WiNet-S2

5.8.2.1 Ethernet Communication

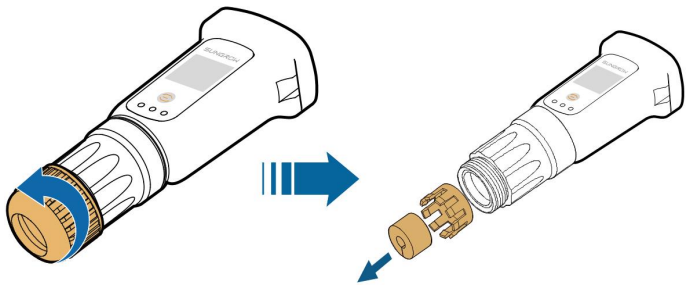
Step 1 (Optional) Strip the insulation layer of the communication cable with an Ethernet wire stripper, and lead the corresponding signal cables out. Insert the stripped communication cable into the RJ45 plug in the correct order, and crimp it with a crimper.



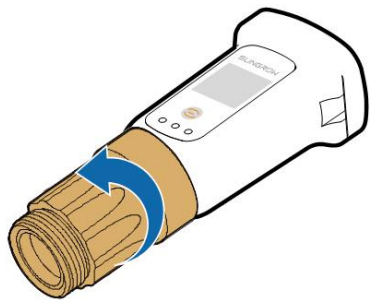
1: RJ45 plug 2: Protective cap

Skip this step if a standard network cable with RJ45 plug is prepared.

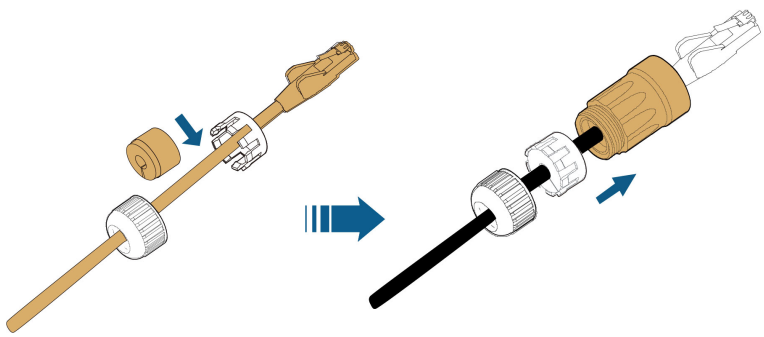
Step 2 Unscrew the swivel nut from the communication module and take out the inner sealing ring.



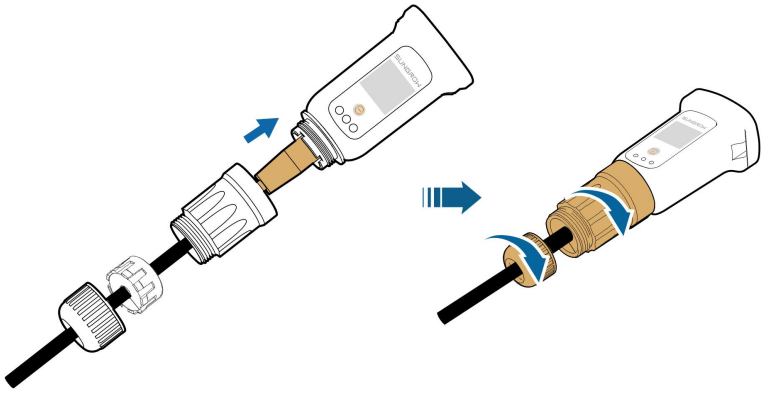
Step 3 Unscrew the housing from the communication module.



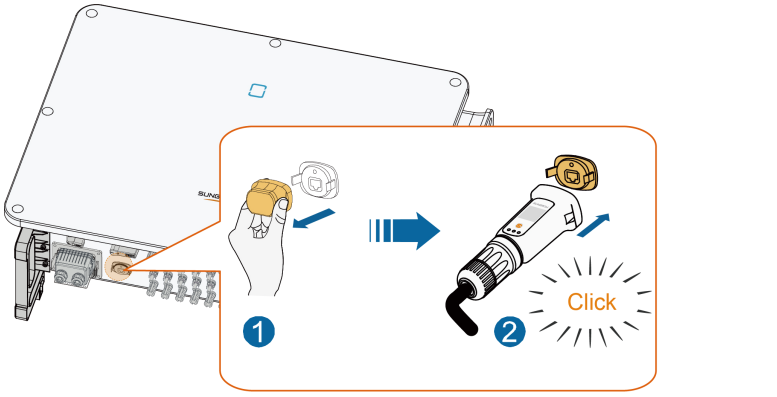
Step 4 Thread the network cable through the swivel nut and gasket. Afterwards, route the cable into the opening of the sealing. Finally, insert the cable through the housing.



Step 5 Insert the RJ45 plug into the front plug connector until there is an audible click and tighten the housing. Install the gasket and fasten the swivel nut.



Step 6 Remove the waterproof lid from the **COM3** terminal and install WiNet-S.



S321-E020

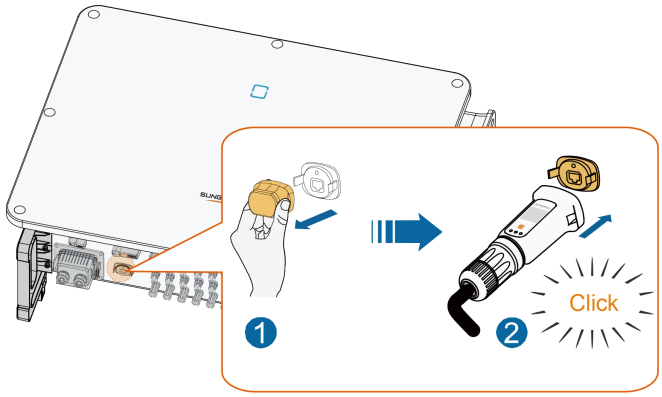
Step 7 Slightly shake it by hand to determine whether it is installed firmly.

- - End

5.8.2.2 WLAN Communication

Step 1 Remove the waterproof lid from the **COM1** terminal.

Step 2 Install the module. Slightly shake it by hand to determine whether it is installed firmly, as shown below.



S321-E020

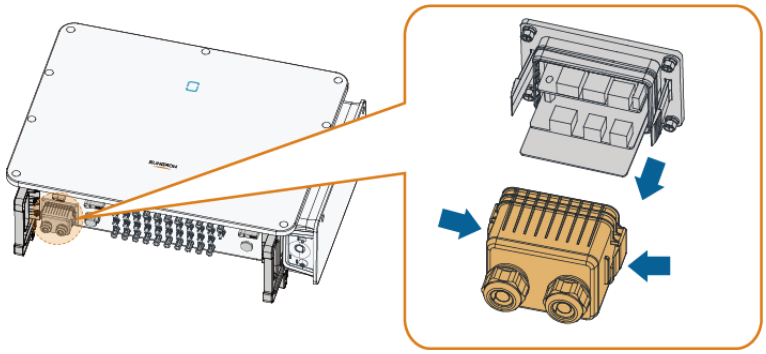
Step 3 Refer to the guide delivered with the module for the set-up.

- - End

5.8.3 Communication Junction Box

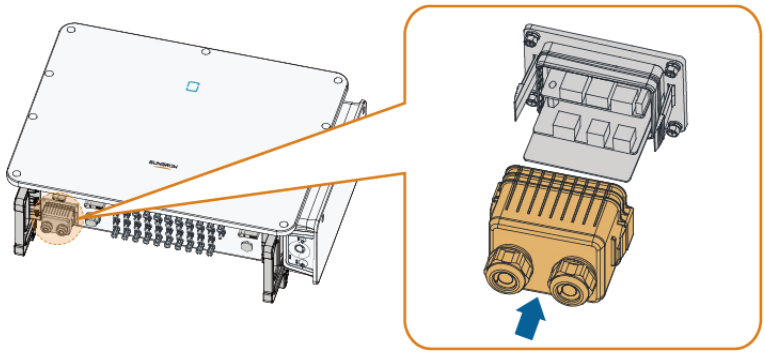
Remove the Communication Junction Box

Squeeze both sides of the communication junction box with force, and pluck it out.



Install the Communication Junction Box

Put the junction box back and ensure a firm connection.



5.8.4 Communication Wiring Area

The communication wiring area of the inverter is composed of two communication terminal boards, with the upper one mainly for RS485 communication interfaces and the lower for DI/DO interfaces.

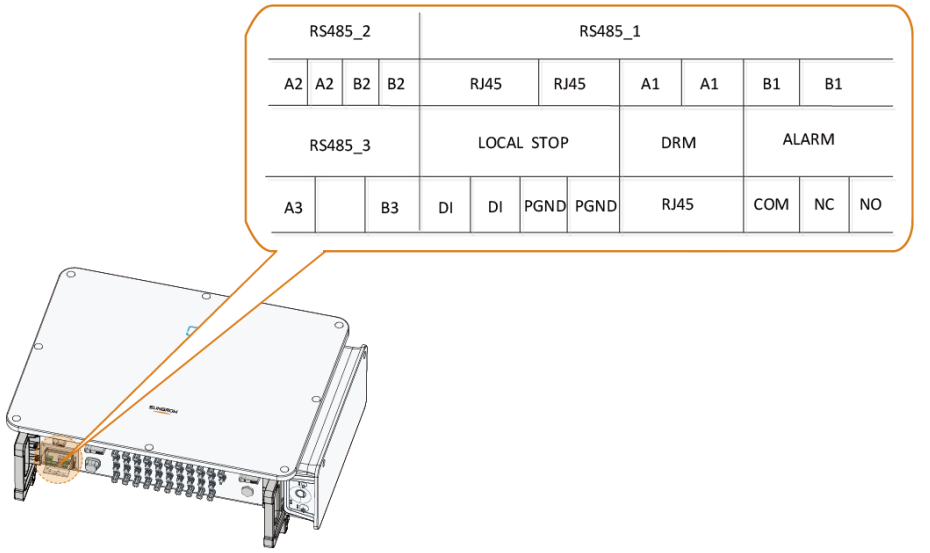


table 5-5 Terminal Description

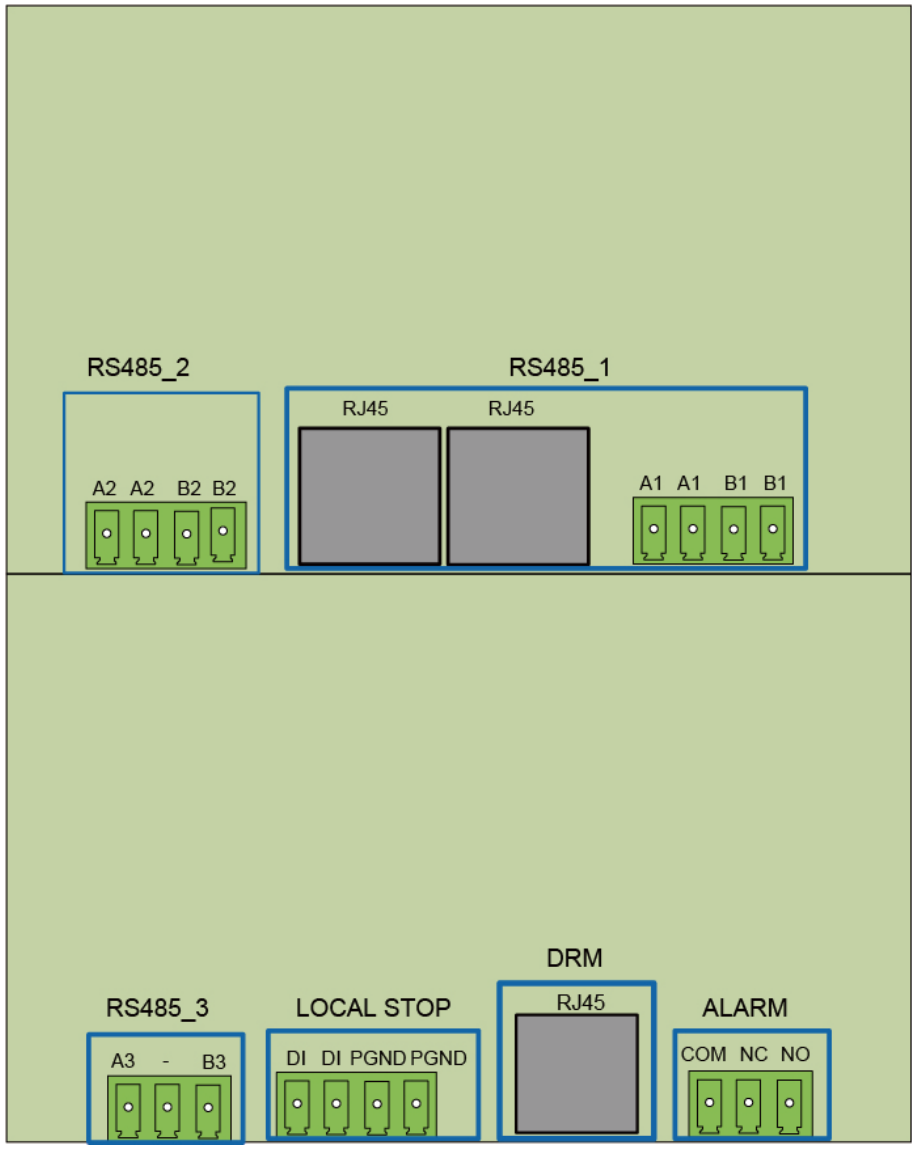
No.	Label	Description
1	RS485_1	• Used to connect an external intelligent communication box for data interaction with the upper computer or other monitoring devices. • It can be used for the parallel connection of multiple inverters.
2	RS485_2	• Used to connect an external intelligent communication box. • Spare port reserved for communication module in scenarios where multiple inverters are cascaded.
3	RS485_3	Used to connect an external energy meter.
4	LOCAL STOP	Emergency stop.
5	DRM	For external Demand Response Enabling Device ("AU"/ "NZ")
6	ALARM	It can be used to connect an external LED indicator or other indication device to show whether the inverter is in the fault state.

The wireless communication module and the intelligent communication box cannot be used together.

5.8.5 RS485 Connection

5.8.5.1 Interface Description

The RS485 communication interfaces of the inverter are shown in the figure.



The terminals are defined as follows:

table 5-6 RS485_1

No.	Definition
A1	RS485A OUT, RS485A differential signal (+)
A1	RS485A IN, RS485A differential signal (+)
B1	RS485B OUT, RS485B differential signal (-)
B1	RS485B IN, RS485B differential signal (-)

table 5-7 RS485_2

No.	Definition
A2	RS485A OUT, RS485A differential signal (+)
A2	RS485A IN, RS485A differential signal (+)
B2	RS485B OUT, RS485B differential signal (-)
B2	RS485B IN, RS485B differential signal (-)

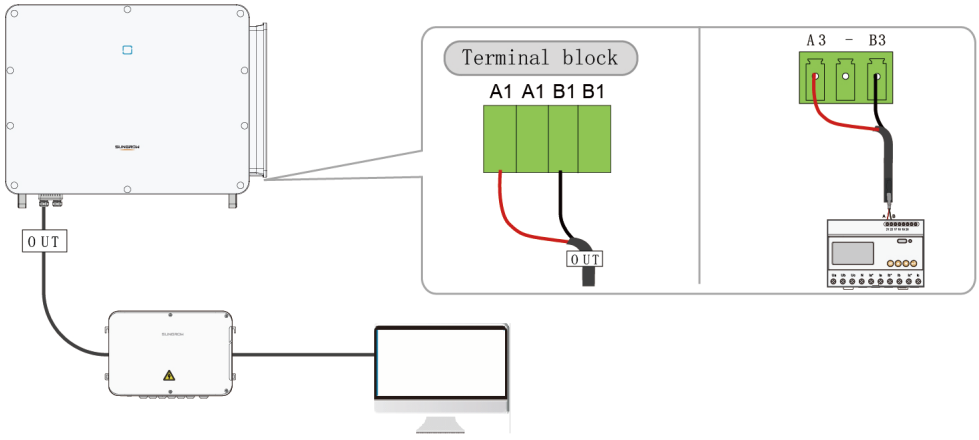
table 5-8 RS485_3

No.	Definition
A3	RS485A differential signal (+)
B3	RS485B differential signal (-)

5.8.5.2 RS485 Communication Wiring

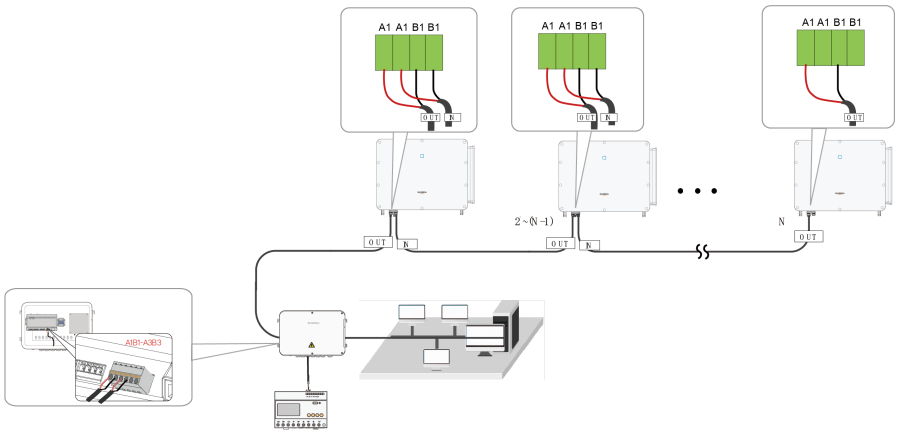
Communication of One Inverter

Where only one inverter engages in the communication, only one RS485 communication cable is required for wiring.



Multi-inverter Communication

Where multiple inverters engage in the communication, connect the inverters in daisy chain using RS485 communication cables.



The RS485 communication cable should not exceed 1200m.

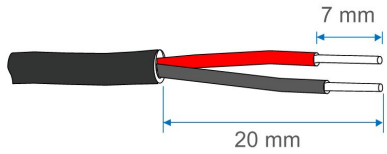
If multiple inverters are connected to the intelligent communication box for communication, ensure the maximum number of daisy chains and connected devices meet the relevant requirements (see the user manual for the intelligent communication box).

5.8.5.3 Connection Procedure (Terminal Block)

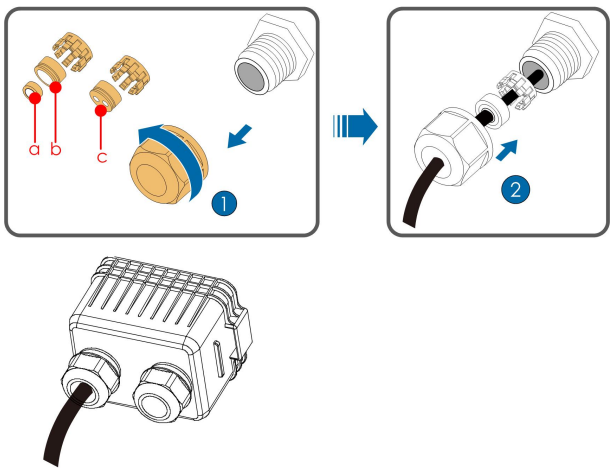
Step 1 Remove the communication junction box, referring to " Remove the Communication Junction Box".

Step 2 Unscrew the swivel nut of the junction box and select the sealing ring according to the cable diameter.

Step 3 Strip off the protective layer and insulation layer of proper length.

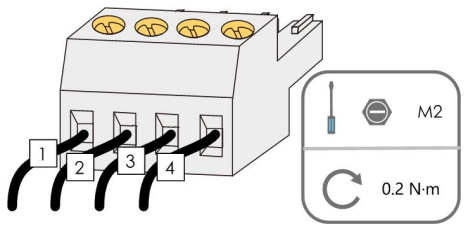


Step 4 Lead the cable through the swivel nut, the sealing ring and the junction box in sequence.



Outer Diameter D(mm)	Sealing Rings
4.5 ~ 6	c
6 ~12	a + b
12 ~ 18	b

Step 5 Connect cables to the terminal socket.



Step 6 Insert the terminal socket into the corresponding terminal block.

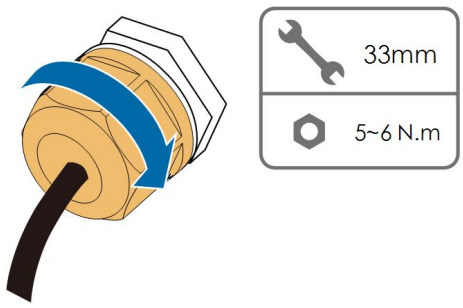
table 5-9 Terminal description

No.	Description
1	RS485 A+
2	RS485 A+
3	RS485 B-
4	RS485 B-

Step 7 If other cables should be connected to the communication circuit board, skip the subsequent steps and continue wiring. Otherwise, perform as follows.

Step 8 Install the communication junction box, referring to" Install the Communication Junction Box"。

Step 9 Pull slightly the cable backward and screw the swivel nut clockwise.

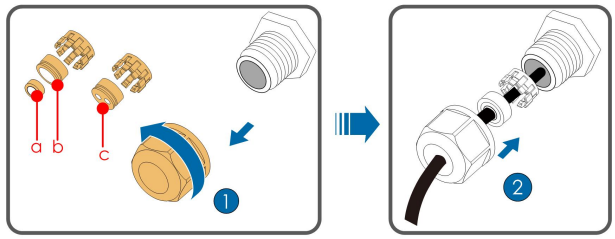


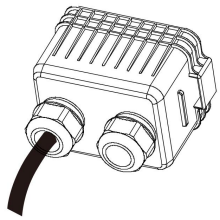
- - End

5.8.5.4 Connection Procedure (RJ45 Interface)

Step 1 Remove the communication junction box, referring to" Remove the Communication Junction Box".

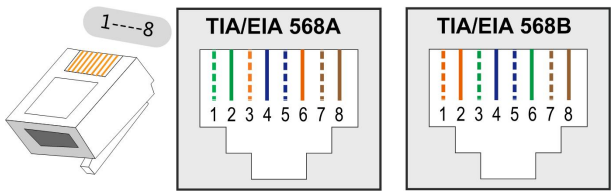
Step 2 Unscrew the swivel nut of the junction box and select the sealing ring according to the cable diameter. Lead the cable through the swivel nut, the sealing ring and the junction box in sequence.





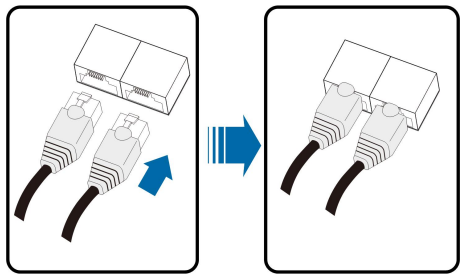
Outer Diameter D(mm)	Sealing Rings
4.5 ~ 6	c
6 ~ 12	a + b
12 ~ 18	b

Step 3 Strip the insulation layer of the Ethernet cable with a stripper, lead out the signal wire, and insert it into the RJ45 connector (pins 3 and 6 are used for communication). Use the RJ45 crimping tool to crimp the RJ45 connector.



Pins 1 and 2 supply power to the SUNGROW communication module. Do not connect or use these two pins when making an RS485 communication cable. Otherwise, the inverter or other devices connected through the communication cable may be damaged.

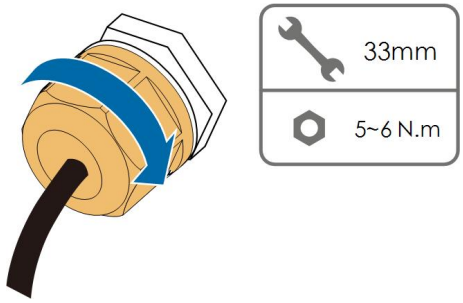
Step 4 Insert the RJ45 connector into the RJ45 jack.



Step 5 If other cables should be connected to the communication circuit board, skip the subsequent steps and continue wiring. Otherwise, perform as follows.

Step 6 Install the communication junction box, referring to" Install the Communication Junction Box".

Step 7 Pull slightly the cable backward and screw the swivel nut clockwise.



- - End

5.8.6 Smart Energy Meter Connection

The inverter can provide export control but will require the use of a external smart meter. The export control functionality has not been tested to AS/NZS 4777.2:2020.

The inverter is equipped with the feed-in power limit function, so as to meet the requirements of some national standards or grid standards for the output power at the grid connection point.

Contact SUNGROW to ensure that the Smart Energy Meter model is available locally.

This section mainly describes the cable connections on the inverter side. Refer to the quick guide delivered with the Smart Energy Meter for the connections on the meter side.

Procedure

For detailed connection description of the Smart Energy Meter cable, refer to the section "5.8.5.2 RS485 Communication Wiring" .

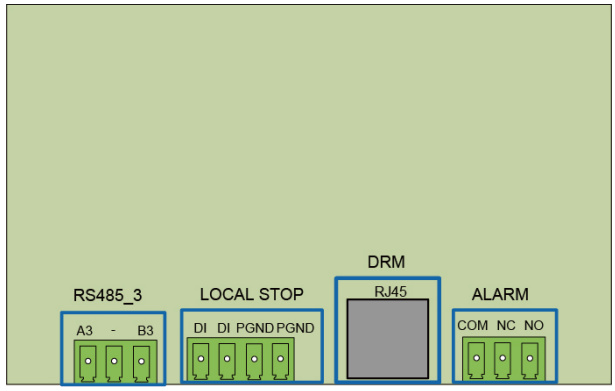
NOTICE

The energy meter is mainly used to detect the direction and magnitude of the current. And the energy meter data may not be used for billing purposes.
In the scenario where the meter is directly connected to the inverter, if the meter needs to be replaced midway, it is suggested to choose a new, unused meter. Otherwise, the statistics of meter energy data given by the inverter may be abnormal.

5.8.7 Dry Contact Connection

5.8.7.1 Dry Contact Function

The configuration circuit board is provided with fault output dry contact and emergency stop dry contact, as shown in the figure below.



DO terminal (fault output dry contact)

The relay can be set to output fault alarms, and user can configure it to be a normally open contact (COM & NO) or a normally closed contact (COM & NC).

The relay is initially at the NC contact, and it will trip to another contact when a fault occurs. When alarm occurs, signal status change will not be triggered.

Use LED indicators or other equipment to indicate whether the inverter is in the faulty state. The following Figures show the typical applications of normally open contact and normally closed contact:

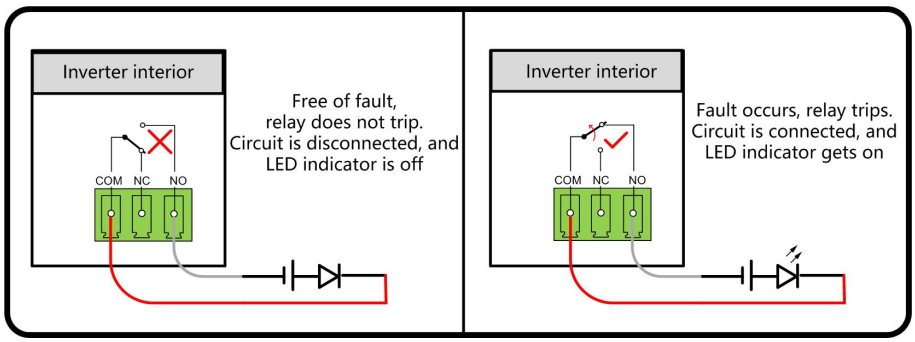


figure 5-5 Normally open contact

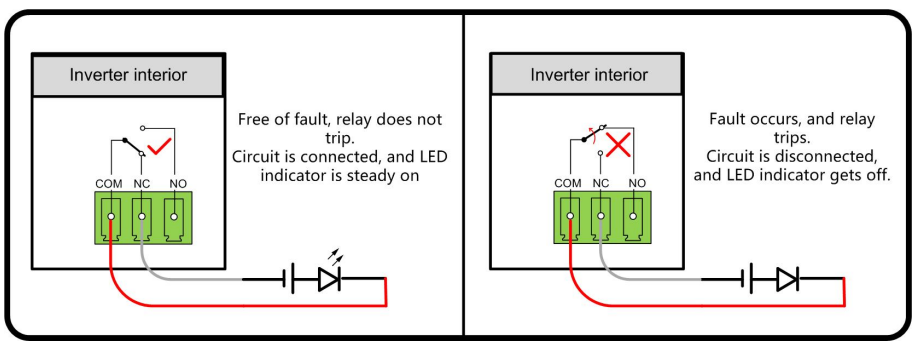


figure 5-6 Normally closed contact

Devices connected to the relay should comply with related requirements:

AC-Side Requirements	DC-Side Requirements
Max. voltage: 230 Vac	Max. voltage: 24 Vdc
Max. current: 3 A	Max. current: 3 A

DI terminal (emergency stop dry contact)

The dry contact can be configured to be an emergency stop contact.

When the DI contact and PGND contact are shorted by external controlled switch (The external switch can be configured as normally open contact or normally closed contact), the inverter will immediately shutdown.

NS Protection

NS Protection is used for German market currently. For a plant with an installed power over 30kW, an external NS Protection Relay is connected to inverters that are connected to each other with NS Protection terminals. When the grid runs abnormally, the status of the relay's dry contact changes, and the inverters are emergently shut down.

NS Protection (including Passive Valid) can be set. When NS Protection is enabled on the iSolarCloud, the inverters will operate normally when DI contact and PGND contact are

shorted by external controlled switch, and the inverters will emergently stop when DI contact and PGND contact are disconnected.

The dry contacts only support passive switch signal input.

The following figure shows the typical application of local stop dry contact.

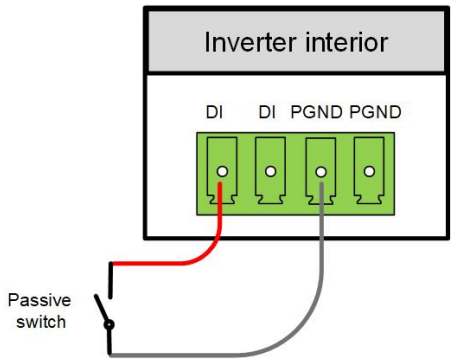


figure 5-7 Local stop contact

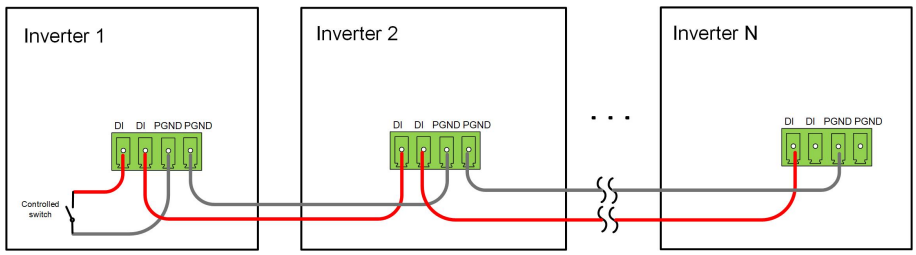


figure 5-8 Daisy chain topology

When wiring DI dry contacts, ensure that the maximum wiring distance meet the requirements in "10.2 Wring Distance of DI Dry Contact".

5.8.7.2 Wiring Procedure

Connection method of the dry contacts is similar to that of the RS485 terminal block.

Refer to the wiring of terminal block described in chapter "5.8.5.3 Connection Procedure (Terminal Block)"to implement fault output, emergency shutdown and NS protection.

5.8.8 DRM Connection

5.8.8.1 DRM Function

DRM

The inverter supports the demand response modes as specified in the standard AS/NZS 4777. The inverter has integrated a terminal for connecting to a DRED. After the connection, the method of asserting DRMs as specified in the follow table.

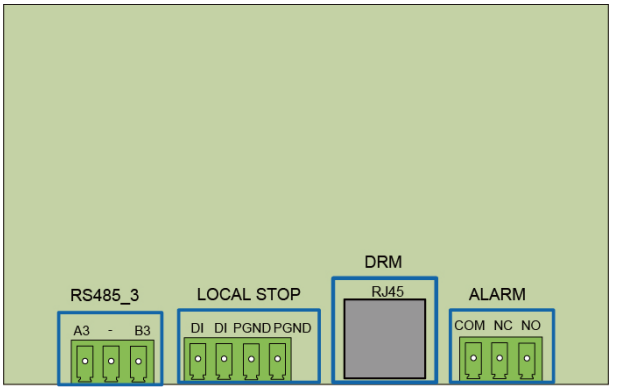


table 5-10 Method of Asserting DRMs

Mode	Method of Asserting
DRM0	Asserted by shorting pins 5 and 6
	Asserted when the impedance between pins 5 and 6 is detected to be above 20 kΩ

Enable the DRM function through the iSolarCloud App. If there are any problems, contact your distributor first. If the problem persists, contact SUNGROW.

The DRM function is only applicable to devices for Australia and New Zealand.

Only DRM0 is supported by the inverter.

Ripple Control

In Germany, the grid company uses the Ripple Control Receiver to convert the grid dispatching signal and send it as a dry contact signal.

Wiring of the ripple control receiver dry contact cables is shown in the figure below:

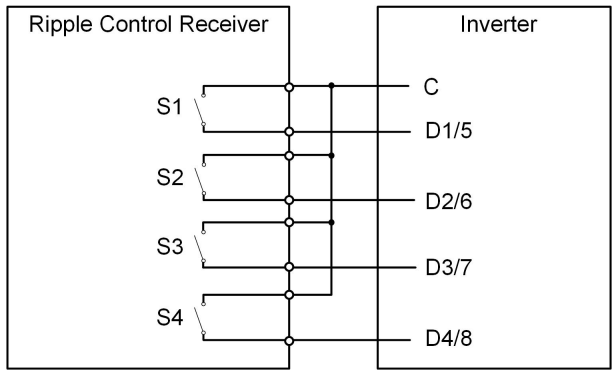


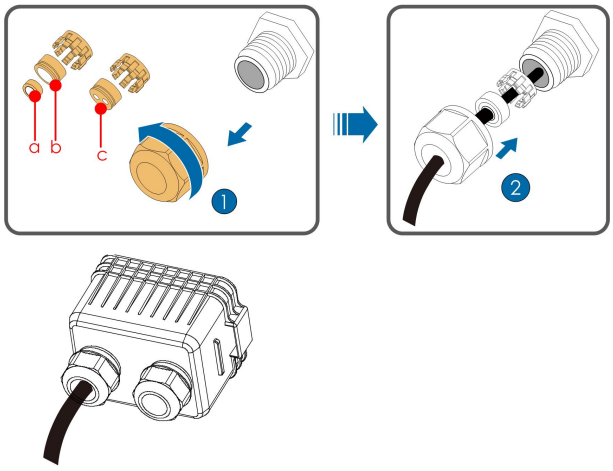
table 5-11 Method of Asserting DI Mode

S1	S2	S3	S4	Switch Operation on External RCR	Output power (in % of the Max. AC output power)
0	0	0	0	None	100%
1	0	0	0	Close S1	100%
0	1	0	0	Close S2	60%
0	0	1	0	Close S3	30%
1	1	0	0	Close S1 and S2	0% (disconnect from grid)

5.8.8.2 Connection Procedure

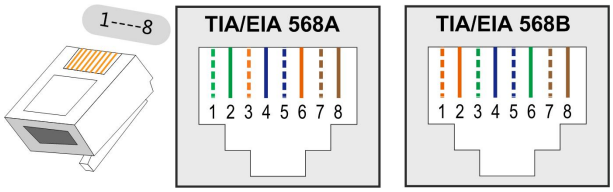
Step 1 Remove the communication junction box, referring to" Remove the Communication Junction Box".

Step 2 Unscrew the swivel nut of the junction box and select the sealing ring according to the cable diameter. Lead the cable through the swivel nut, the sealing ring and the junction box in sequence.



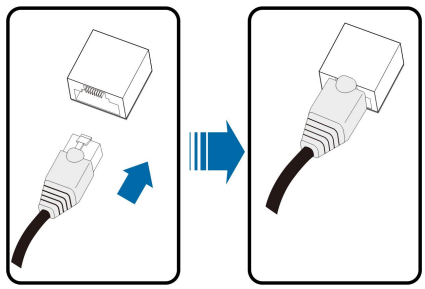
Outer Diameter D(mm)	Sealing Rings
4.5 ~ 6	c
6 ~ 12	a + b
12 ~ 18	b

Step 3 Strip the insulation layer of the Ethernet cable with a wire stripper, and insert the signal wires to the RJ45 connector. Crimp the RJ45 connector with a crimping tool.



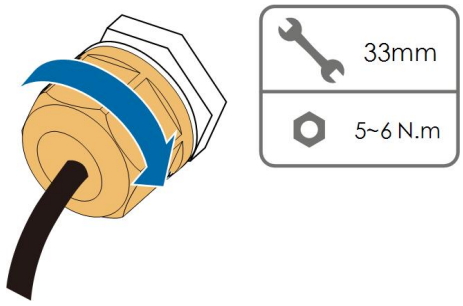
Pin	Assignment for inverters capable of both charging and discharging
1	DRM 1/5
2	DRM 2/6
3	DRM 3/7
4	DRM 4/8
5	RefGen
6	Com/DRM0
7	V+
8	V-

Step 4 Insert the RJ45 connector to the RJ45 jack.



Step 5 Install the communication junction box, referring to" Install the Communication Junction Box".

Step 6 Pull slightly the cable backward and screw the swivel nut clockwise.



- - End

6 Commissioning

6.1 Inspection Before Commissioning

Check the following items before starting the inverter:

- All equipment has been reliably installed.
- DC switch(es) and AC circuit breaker are in the "OFF" position.
- The ground cable is properly and reliably connected.
- The AC cable is properly and reliably connected.
- The DC cable is properly and reliably connected.
- The communication cable is properly and reliably connected.
- The unused terminals are sealed.
- No foreign items, such as tools, are left on the top of the machine or in the junction box (if there is).
- The AC circuit breaker is selected in accordance with the requirements of this manual and local standards.
- All warning signs & labels are intact and legible.

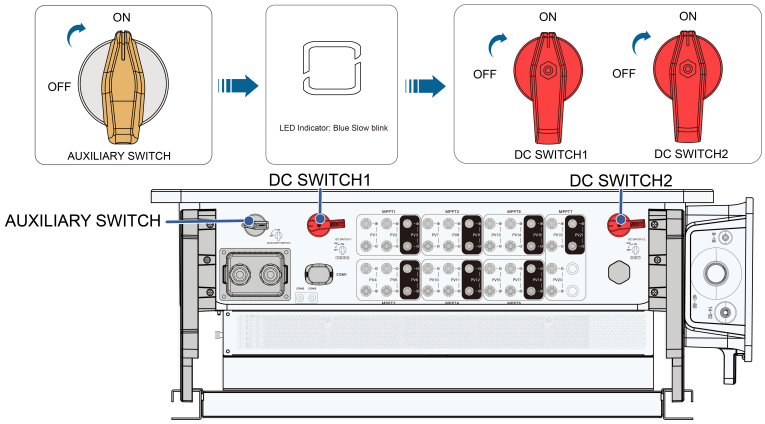
6.2 Commissioning Procedure

If the requirements for the above-mentioned items are all met, proceed as follows to start up the inverter for the first time.

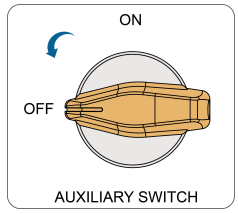
Step 1 Turn the auxiliary switch on the bottom of the inverter to “ON”. Check the indicator on the inverter.

Step 2 If the indicator is on, turn the other DC switches to “ON”.

- If the inverter indicator is not on after 30 seconds, do not close the DC switches (SWITCH1, SWITCH2 with red knobs), and meanwhile turn off the auxiliary switch. Check if the input cable is connected in reversed polarity, or if the input voltage meets the requirements for startup voltage. After inspections, go through again the commissioning procedure. If the indicator is still not on, turn off the auxiliary switch and contact SUNGROW for technical support.



Step 3 Turn the auxiliary switch on the inverter to “OFF”.



NOTICE

- **Please follow the above steps strictly in order. Otherwise, the product may get damaged, and the loss caused will not be covered by the warranty.**
- **If the DC side is powered up while the AC side is not, the inverter indicator may turn red, and the inverter will report a “Grid Power Outage” fault and "PV1 Connection Abnormal" fault (the fault information can be viewed on the iSolarCloud App. See “Records” for details). The fault will be cleared automatically once the AC circuit breaker between the inverter and the grid is closed.**
- **Before closing the AC circuit breaker between the inverter and the power grid, measure the AC voltage with a multimeter set to “AC voltage”, making sure it is within the allowable range. Otherwise, the inverter may be damaged.**

The auxiliary switch needs to be closed only when the system is first powered on, and should be open during operation.

Step 4 Close the AC circuit breaker between the inverter and the grid.

Step 5 Install the iSolarCloud App, see "7.2 Install iSolarCloud" for details.

Step 6 It is required to set initial protection parameters on the iSolarCloud App when the inverter is connected to the grid for the first time. If, with sufficient light, the grid conditions meet the grid connection requirements, the inverter will work normally.

Step 7 The home page is automatically displayed when the setting is completed. The indicator is steady blue, and the inverter is in grid-connected operation.

⚠ WARNING

It is strictly forbidden to close the DC switch if the inverter is in grid-connected status. Otherwise, the inverter may be damaged due to the lack of insulation impedance detection, and the loss caused is not covered by the warranty.

- - End

7 iSolarCloud App

7.1 About iSolarCloud

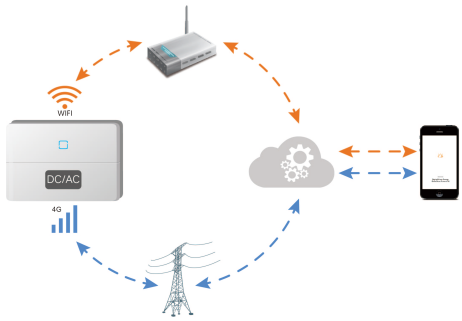
The iSolarCloud App is a mobile application used for power plant management. The App provides plant operation analysis service and enables intelligent mobile O&M. It is designed with functions such as plant operation data display, rapid plant access, remote parameter setting, quick fault location and notification, and power yield and revenue analysis. With iSolarCloud, convenient and efficient end-to-end plant O&M is allowed.

Connection Methods

Users can log in to the App via remote connection or local access for plant monitoring.

Login by Establishing a Direct Connection (Local)

Establish communication between the mobile phone and the WiFi wireless communication module or the inverter's built-in Bluetooth module to enable mobile maintenance of the inverter. Users can check the information about and set parameters for the inverter.



Login Via Account and Password (Remote)

Login via Bluetooth connection is applicable only for SUNGROW inverters with built-in Bluetooth modules. Please consult your retailer/installer about whether the inverter is equipped with a Bluetooth module.

Login with an Account (Remote)

Establish communication between the communication module and the home router or base station to enable data exchange between the inverter and the cloud server. Users can check the inverter data or send commands to control the inverter on the App.

Direct Login (Near end)

7.2 Install iSolarCloud

This section introduces how to download and install the iSolarCloud App.

Procedure

Step 1 Search for **iSolarCloud** in App Store, Google Play or other App stores, or scan the QR code below with a mobile phone and download the App by following the onscreen instructions.

Step 2 Tap the downloaded installation package and follow the onscreen instructions to complete the installation. The icon of iSolarCloud will then appear on the screen.

- - End

7.3 User Identity

There are two types of user accounts: **Owner** and **Retailer/Installer**.

The **Owner** can view the plant information, create a plant, set common parameters, and share a plant, etc.

The **Retailer/Installer** can assist the Owner in creating/managing a plant, manage users and organizations, and set grid-related parameters and advanced parameters, etc.

The default account and password are as shown in the table below. Please change the password as soon as possible to keep your account secure.

table 7-1 Default account and password

Role	Account Name	Password
User	user	pw1111
Retailer/Installer	admin	pw8888

To learn how to change passwords, please consult the**iSolarCloud App user manual** .Navigate to: "**Device Commissioning (V2.1.6.20250218 or Later)→Device Connection→Device Connection via WLAN →Identity Verification**".

7.4 Device Commissioning

For device commissioning operations, please refer to the **Device Commissioning** in the **iSolarCloud App User Manual**. Alternatively, you can scan the QR code below to access the **Device Commissioning** section of the manual.

8 System Decommissioning

8.1 Disconnecting the Inverter

⚠ CAUTION

Danger of burns!

Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the inverter after it cools down.

For maintenance or other service work, the inverter must be switched off. Proceed as follows to disconnect the inverter. Lethal voltages or damage to the inverter will follow if otherwise.

Step 1 Disconnect the external AC circuit breaker and prevent it from inadvertent reconnection.

Step 2 Rotate the DC switch to the "OFF" position for disconnecting all of the PV string inputs.

Step 3 Wait about 5 minutes until the capacitors inside the inverter completely discharge.

Step 4 Ensure that the DC cable is current-free with a current clamp.

- - End

8.2 Dismantling the Inverter

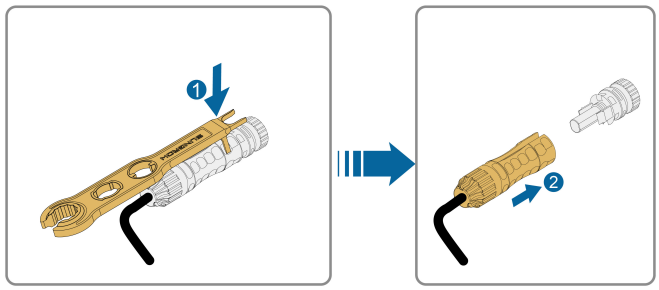
⚠ CAUTION

Risk of burn injuries and electric shock!

After the inverter is powered off for 5 minutes, measure the voltage and current with professional instrument. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.

- Before dismantling the inverter, disconnect the inverter from both AC and DC power sources.
- If there are more than two layers of inverter DC terminals, dismantle the outer DC connectors before dismantling the inner ones.
- If the original packing materials are available, put the inverter inside them and then seal them using adhesive tape. If the original packing materials are not available, put the inverter inside a cardboard box suitable for the weight and size of this inverter and seal it properly.

Step 1 Refer to "5 Electrical Connection" to disconnect all cables in reverse steps. In particular, when removing the DC connector, use a connector wrench to loosen the locking parts and install waterproof plugs.



Step 2 Refer to "4 Mechanical Mounting", to dismantle the inverter in reverse steps.

Step 3 If necessary, remove the wall-mounting bracket from the wall.

Step 4 If the inverter will be used again in the future, please refer to "3.2 Inverter Storage" for a proper conservation.

- - End

8.3 Disposal of Inverter

Users take the responsibility for the disposal of the inverter.

⚠ WARNING

Please scrap the inverter in accordance with relevant local regulations and standards to avoid property losses or casualties.

NOTICE

Some parts of the inverter may cause environmental pollution. Please dispose of them in accordance with the disposal regulations for electronic waste applicable at the installation site.

9 Troubleshooting and Maintenance

9.1 Troubleshooting

Once the inverter fails, the fault information is displayed on the App interface. If the inverter is equipped with an LCD screen, the fault information can be viewed on it.
The fault codes and troubleshooting methods of all PV inverters are detailed in the table below, and only some of the faults may occur to the model you purchased. When a fault occurs, you can check the fault information according to the fault code on the mobile app.

Fault Code	Fault Name	Corrective Measures
2, 3, 14, 15	Grid Overvoltage	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is higher than the set value. 2. Check whether the protection parameters are appropriately set via the App or the LCD. Modify the overvoltage protection values with the consent of the local electric power operator. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
4, 5	Grid Undervoltage	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is lower than the set value. 2. Check whether the protection parameters are appropriately set via the App or the LCD. 3. Check whether the AC cable is firmly in place. 4. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.

Fault Code	Fault Name	Corrective Measures
8	Grid Overfrequency	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid frequency, and contact the local electric power company for solutions if the grid frequency is beyond the set range. 2. Check whether the protection parameters are appropriately set via the App or the LCD. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
9	Grid Underfrequency	
10	Grid Power Outage	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Check whether the grid supplies power reliably. 2. Check whether the AC cable is firmly in place. 3. Check whether the AC cable is connected to the correct terminal (whether the live wire and the N wire are correctly in place). 4. Check whether the AC circuit breaker is connected. 5. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
12	Excess Leakage Current	1. The fault can be caused by poor sunlight or damp environment, and generally the inverter will be reconnected to the grid after the environment is improved. 2. If the environment is normal, check whether the AC and DC cables are well insulated. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
13	Grid Abnormal	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid, and contact the local electric power company for solutions if the grid parameter exceeds the set range. 2. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.

Fault Code	Fault Name	Corrective Measures
17	Grid Voltage Imbalance	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid voltage. If grid phase voltages differ greatly, contact the electric power company for solutions. 2. If the voltage difference between phases is within the permissible range of the local power company, modify the grid voltage imbalance parameter through the App or the LCD. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
28, 29, 208, 212, 448-479	PV Reserve Connection Fault	1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists. *The code 28 to code 29 are corresponding to PV1 to PV2 respectively. *The code 448 to code 479 are corresponding to string 1 to string 32 respectively.
532-547, 564-579	PV Reverse Connection Alarm	1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. Contact Sungrow Customer Service if the preceding causes are ruled out and the alarm persists. *The code 532 to code 547 are corresponding to string 1 to string 16 respectively. *The code 564 to code 579 are corresponding to string 17 to string 32 respectively.

Fault Code	Fault Name	Corrective Measures
548-563, 580-595	PV Abnormal Alarm	Check whether the voltage and current of the inverter is abnormal to determine the cause of the alarm. 1. Check whether the corresponding module is sheltered. If so, remove the shelter and ensure module cleanness. 2. Check whether the battery board wiring is loose, if so, make it reliably connected. 3. Check if the DC fuse is damaged. If so, replace the fuse. 4. Contact Sungrow Customer Service if the preceding causes are ruled out and the alarm persists. *The code 548 to code 563 are corresponding to string 1 to string 16 respectively. *The code 580 to code 595 are corresponding to string 17 to string 32 respectively.
37	Excessively High Ambient Temperature	Generally, the inverter will resume operation when the internal or module temperature returns to normal. If the fault persists: 1. Check whether the ambient temperature of the inverter is too high; 2. Check whether the inverter is in a well-ventilated place; 3. Check whether the inverter is exposed to direct sunlight. Shield it if so; 4. Check whether the fan is running properly. Replace the fan if not; 5. Contact Sungrow Power Customer Service if the fault is due to other causes and the fault persists.
43	Excessively Low Ambient Temperature	Stop and disconnect the inverter. Restart the inverter when the ambient temperature rises within the operation temperature range.

Fault Code	Fault Name	Corrective Measures
39	Low System Insulation Resistance (Earth Fault)	Wait for the inverter to return to normal. If the fault occurs repeatedly: 1. Check whether the ISO resistance protection value is excessively high via the app or the LCD, and ensure that it complies with the local regulations. 2. Check the resistance to ground of the string and DC cable. Take corrective measures in case of short circuit or damaged insulation layer. 3. If the cable is normal and the fault occurs on rainy days, check it again when the weather turns fine. 4. If there are batteries, check whether battery cables are damaged and whether terminals are loose or in poor contact. If so, replace the damaged cable and secure terminals to ensure a reliable connection. 5. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
106	Grounding Cable Fault	1. Check whether the AC cable is correctly connected. 2. Check whether the insulation between the ground cable and the live wire is normal. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
88	Electric Arc Fault	1. Disconnect the DC power supply, and check whether any DC cable is damaged, the connection terminal or fuse is loose or there is a weak contact. If so, replace the damaged cable, fasten the terminal or fuse, and replace the burnt component. 2. After performing step 1, reconnect the DC power supply, and clear the electric arc fault via the App or the LCD, after that the inverter will return to normal. 3. Contact Sungrow Customer Service if the fault persists.

Fault Code	Fault Name	Corrective Measures
84	Reverse Connection Alarm of the Meter/CT	1. Check if the meter is wrongly connected. 2. Check if the input and output wiring of the meter is reversed. 3. If the existing system is enabled, please check if the rated power setting of the existing inverter is correct.
514	Meter Communication Abnormal Alarm	1. Check whether the communication cable and the terminals are abnormal. If so, correct them to ensure reliable connection. 2. Reconnect the communication cable of the meter. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the alarm persists.
323	Grid Confrontation	1. Check whether the output port is connected to actual grid. Disconnect it from the grid if so. 2. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
75	Inverter Parallel Communication Alarm	1. Check whether the communication cable and the terminals are abnormal. If so, correct them to ensure reliable connection. 2. Reconnect the communication cable of the meter. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the alarm persists.

Fault Code	Fault Name	Corrective Measures
7, 11, 16, 19–25, 30–34, 36, 38, 40–42, 44–50, 52–58, 60–69, 85, 87, 92, 93, 100–105, 107–114, 116–124, 200–211, 248–255, 300–322, 324–328, 401–412, 600–603, 605, 608, 612, 616, 620, 622–624, 800, 802, 804, 807	System Fault	1. Wait for the inverter to return to normal. 2. Disconnect the AC and DC switches, and disconnect the battery side switches if there are batteries. Close the AC and DC switches in turn 15 minutes later and restart the system. 3. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.
59, 70–74, 76–83, 89, 216–218, 220–233, 432–434, 500–513, 515–518, 635–638, 900, 901, 910, 911, 996	System Alarm	1. The inverter can continue running. 2. Check whether the related wiring and terminal are abnormal, check whether there are any foreign materials or other environmental abnormalities, and take corresponding corrective measures when necessary. 3. If the fault persists, please contact Sungrow Power Customer Service.
264-283	MPPT Reverse Connection	1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists. *The code 264 to code 279 are corresponding to string 1 to string 20 respectively.
332-363	Boost Capacitor Overvoltage Alarm	1. The inverter can continue running. 2. Check whether the related wiring and terminals are abnormal, check whether there are any foreign materials or other environmental abnormalities, and take corresponding corrective measures when necessary. If the fault persists, please contact Sungrow Power Customer Service.

Fault Code	Fault Name	Corrective Measures
364-395	Boost Capacitor Overvoltage Fault	1. Disconnect the AC and DC switches, and disconnect the battery side switches if there are batteries. Close the AC and DC switches in turn 15 minutes later and restart the system. 2. If the fault persists, please contact Sungrow Power Customer Service.
1548-1579	String Current Reflux	1. Check whether the number of PV modules of the corresponding string is less than other strings. If so, disconnect the DC switch and adjust the PV module configuration when the string current drops below 0.5 A. 2. Check whether the PV module is shaded; 3. Disconnect the DC switch to check whether the open circuit voltage is normal when the string current drops below 0.5 A. If so, check the wiring and configuration of the PV module, 4. Check whether the orientation of the PV module is abnormal.
1600 - 1615, 1632 - 1655	PV Grounding Fault	1. When the fault occurs, it is forbidden to directly disconnect the DC switch and unplug PV terminals when the direct current is greater than 0.5 A; 2. Wait until the direct current of the inverter falls below 0.5 A, then disconnect the DC switch and unplug the faulty strings; 3. Do not reinsert the faulty strings before the grounding fault is cleared; 4. If the fault is not caused by the foregoing reasons and still exists, contact Sungrow Customer Service.
1616	System Hardware Fault	1. It is prohibited to disconnect the DC switch when the DC current is greater than 0.5 A when the fault occurs. 2. Disconnect the DC switch only when the inverter DC side current drops below 0.5 A. 3. It is prohibited to power up the inverter again. Please contact Sungrow Customer Service.

Once a fault occurs to the RSD, the fault information is displayed on the App.

Fault Code	Fault Name	Possible Cause	Corrective Method
4	Input overvoltage	The PV voltage is higher than the set protection threshold value	Check whether the open-circuit voltage of the PV module connected to the RSD exceeds the maximum input voltage allowed by the RSD.
512	Hardware fault	A hardware fault occurs to the RSD	Please contact Sungrow Customer Service.

- If there is a string current backfeed fault, first check whether the RSD is offline.
- Contact the dealer if the measures listed in the “Troubleshooting Method” column have been taken but the problem persists. Contact SUNGROW if the dealer fails to solve the problem.

9.2 Maintenance

9.2.1 Maintenance Notices

DANGER

Risk of inverter damage or personal injury due to incorrect service!

- **Be sure to use special insulation tools when perform high-voltage operations.**
- **Before maintenance, disconnect the AC circuit breaker on the grid side and then the DC switch. If a fault that may cause personal injury or device damage is found before maintenance, disconnect the AC circuit breaker and wait until the night before operating the DC switch. Otherwise, a fire inside the product or an explosion may occur, causing personal injuries.**
- **Turn the DC switch from ON to OFF and continue to turn it 20 degrees counterclockwise, the DC switch can be locked here. (For countries “AU” and “NZ”)**
- **After the inverter is powered off for 5 minutes, measure the voltage and current with professional instrument. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter**
- **Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the inverter after it cools down.**

DANGER

When maintaining the product, it is strictly prohibited to open the product if there is an odor or smoke or if the product appearance is abnormal. If there is no odor, smoke, or obvious abnormal appearance, repair or restart the inverter according to the alarm corrective measures. Avoid standing directly in front of the inverter during maintenance.

CAUTION

To prevent misuse or accidents caused by unrelated personnel: Post prominent warning signs or demarcate safety warning areas around the inverter to prevent accidents caused by misuse.

NOTICE

Restart the inverter only after removing the fault that impairs safety performance. As the inverter contains no component parts that can be maintained, never open the enclosure, or replace any internal components.
To avoid the risk of electric shock, do not perform any other maintenance operations beyond this manual. If necessary, contact your distributor first. If the problem persists, contact SUNGROW. Otherwise, the losses caused is not covered by the warranty.

NOTICE

Touching the PCB or other static sensitive components may cause damage to the device.

- **Do not touch the circuit board unnecessarily.**
- **Observe the regulations to protect against electrostatic and wear an anti-static wrist strap.**

9.2.2 Routine Maintenance

Item	Method	Period
Device clean	Check whether the air outlet and heat sink are blocked by dust and other objects. Check if the air inlet and outlet are normal. Clean the air inlet and outlet, if necessary.	Six months to a year (depend on the dust contents in air)
Fans	Check whether there is a fan alarm on the App. Check whether there is any abnormal noise when the fan is rotating. Clean or replace the fans if necessary (see the following section).	Once a year
Cable entry	Check whether the cable entry is insufficiently sealed or the gap is excessively large, and reseal the entry when necessary.	Once a year
Electrical connection	Check whether cables are loose or fall off. Check whether the cable is damaged, especially the part in contact with the metal enclosure.	Six months to a year

9.2.3 Cleaning Air Inlet and Outlet

A significant amount of heat is generated when the inverter is working.
In order to maintain good ventilation, please check to make sure the air inlet and outlet are not blocked.
Clean the air inlet and outlet with soft brush or vacuum cleaner if necessary.

9.2.4 Fan Maintenance

⚠ DANGER

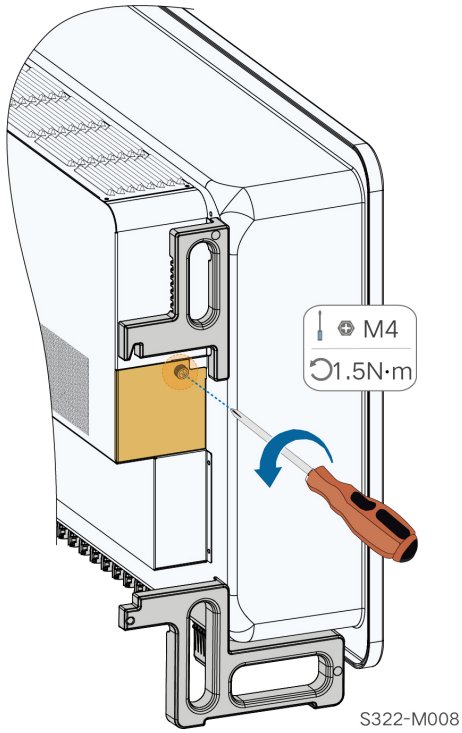
- **Power off the inverter and disconnect it from all power sources before maintaining its fans.**
- **Wait 5 minutes after the inverter is powered off, then test the voltage and current using specialized measurement instruments. Maintenance and operation must only be performed by qualified personnel who wear protective equipment after confirming that no voltage or current is present.**
- **Fan maintenance must only be performed by qualified technical persons.**

The inverter is equipped with built-in fans for heat dissipation during operation. If the fans do not function properly, the inverter may not be able to cool down, which may have the inverter operate at lower efficiency or derate. Therefore, it is necessary to keep the fans clean and replace the fan if it is damaged.

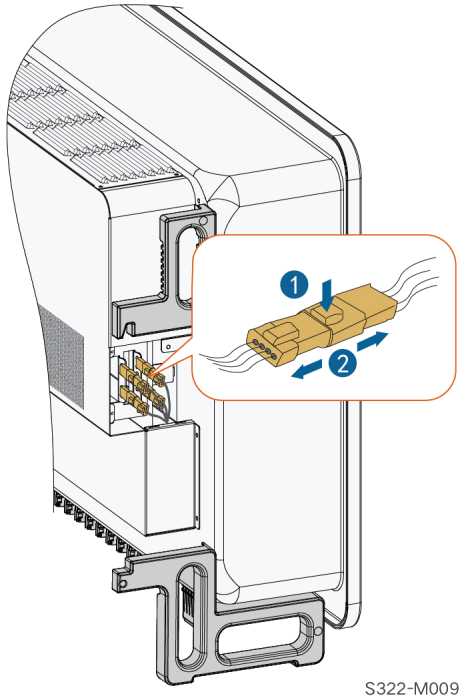
Steps to clean and replace the fan are shown as follows:

Step 1 Stop the inverter by referring to "8.1 Disconnecting the Inverter".

Step 2 Loosen the screw on the cover plate for the fans of the inverter.

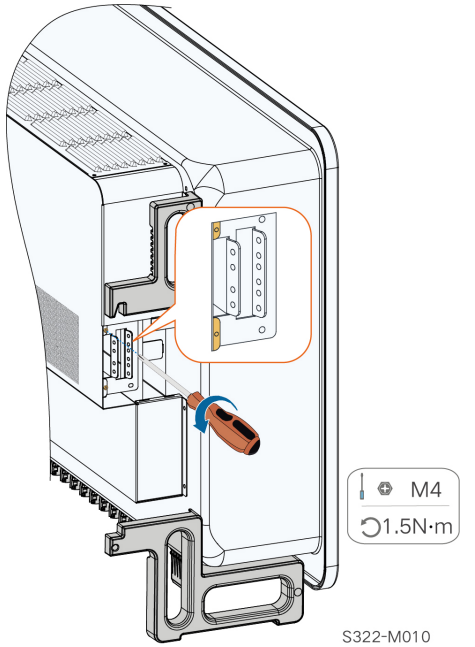


Step 3 Press the key on the connector to release its locking element, and pull the connector out. Then, loosen the screws on the fan holder.



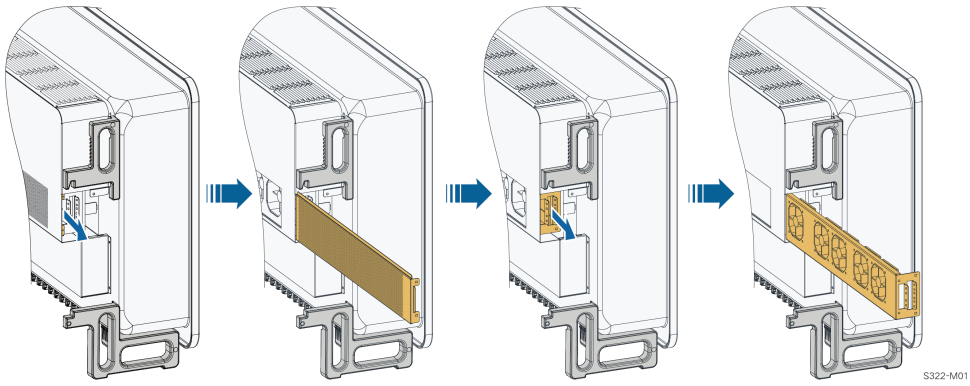
S322-M009

Step 4 Loosen the screws on the side of the fans.



S322-M010

Step 5 Pull out the fan holder and clean the fans using a soft brush or a vacuum cleaner. Replace the fan if it is damaged.



- - End

10 Appendix

10.1 Technical Data

Parameter	SG150CX
Input (DC)	
Recommended max. PV input power	210 kWp
Max. PV input voltage(1)	1100V
Min.PV input voltage/Startup input voltage	180 V / 200 V
Rated input voltage	600V
MPPT voltage range	180 ~ 1000 V
MPPT voltage range for rated power(2)	550 V – 850 V
No. of independent MPP inputs	7
No. of PV strings per MPPT	3 / 3 / 3 / 3 / 3 / 3 / 3
Max. PV input current	336 A (48 A * 7)
Max. DC short-circuit current	462 A (66 A * 7)
Max. current for DC connector	30 A
Output (AC)	
Rated AC output power	150 kW
Max. AC output apparent power	165 kVA
Max. AC output current	250.7 A; 380 Vac 240.6 A; 400 Vac
Rated AC output current	227.9 A; 380 Vac 216.5 A; 400 Vac
Rated AC voltage	3 / N / PE, 220 V / 380 V, 230 V / 400 V
AC voltage range	320 V - 480 V
Rated grid f requency	50 Hz / 60 Hz
Grid f requency range	45 Hz – 55 Hz / 55 Hz – 65 Hz

Parameter	SG150CX
Input (DC)	
Harmonic (THD)	≤1 % (at 400 V A C voltage and rated power)
Power factor at rated power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / AC connection	3 / 3-N-PE
Efficiency	
Max. efficiency	98.8%
European efficiency	98.2%
Protection & function	
Grid monitoring	Yes
DC reverse polarity protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Surge protection	DC Type I+II / AC Type II
Ground fault monitoring	Yes
DC switch	Yes
PV string current monitoring	Yes
Intelligent DC arc interrupter	Yes
Arc fault circuit interrupter (AFCI)	Yes
PID recovery function	Yes
RSD compatibility (3)	Optional
Common parameters	
Dimensions (W*H*D)	1025*795*360 mm
Weight	≤ 100 kg
Mounting method	Wall-mounting bracket
Topology	Transformerless
Degree of protection	IP66
Night power consumption	≤ 7 W

Parameter	SG150CX
Input (DC)	
Corrosion	C5
Operating ambient temperature range	-30 ℃ - 60 ℃
Allowable relative humidity range (non-condensing)	0 % - 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m
Display	LED, Bluetooth+APP
Communication	RS485 / WLAN (optional) / Ethernet (optional)
DC connection type	EVO2 (Max. 6 mm²)
AC connection type	OT / DT terminal For copper wire: 120mm² ~300 mm² For aluminum wire: 150 mm² ~400 mm²
AC cable specification	Outside diameter 18 mm - 38 mm
Grid compliance	IEC EN 62109-1/-2; IEC 60529; IEC 61000-6-1/-2/-3/-4;EN 55011; CISPR 11; IEC 63027; EN 50549-1-10/-2-10; IEC 61727; IEC 62116; IEC 61683; EN 50530; IEC 60068-1/-2/-14/-27/-30/-64; IEC/EN 61000-3-11/12; VDE4110; VDE4120; PSE 2018; NC RFG; IEC 62920; TOR Erzeuger Typ A; TOR Erzeuger Typ B; OVERichtlinie R25/03.20; G99; CEI 0-16; CEI 0-21; VDE0126; NTS UNE 217001/217002; NTS 631; IEC 60947.2; PEA; MEA; IEC 62910; DEWA; NRS 097; IRR-DCC-MV
Grid support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control

Note (1): Input voltage exceeding the MPPT operating voltage range triggers inverter protection.

Note (2): The voltage difference between MPPTs should be less than 200 V. The voltage of the configured string should be higher than the lower limit of the rated MPPT voltage.

Note (3): For SR20D-M RSD compatibility, please consult Sungrow before placing an order.

10.2 Wring Distance of DI Dry Contact

The wiring distance between DI dry contact terminals must meet the requirements in the table below. The wiring distance L is the total length of all DI signal cables.

$$L = 2\sum_{k=1}^{n} L_k$$

L_K refers to the cable length in one direction between the DI dry contact terminal of the k^{th} inverter and the corresponding terminal of the $(k-1)^{th}$ inverter.

table 10-1 Correspondence Between Inverter Quantity and Maximum Wiring Distance

Number of Inverter	Maximum Wiring Distance(unit:m)	
	16AWG / 1.31mm²	17AWG / 1.026mm²
1	13030	10552
2	6515	5276
3	4343	3517
4	3258	2638
5	2606	2110
6	2172	1759
7	1861	1507
8	1629	1319
9	1448	1172
10	1303	1055
11	1185	959
12	1086	879
13	1002	812
14	931	754
15	869	703
16	814	660
17	766	621
18	724	586
19	686	555
20	652	528
21	620	502
22	592	480

Number of Inverter	Maximum Wiring Distance(unit:m)	
	16AWG / 1.31mm²	17AWG / 1.026mm²
23	567	459
24	543	440
25	521	422

NOTICE

In case the specification of the cable used is not included in the table above, when there is only one inverter, ensure that the line impedance of the input node is less than 300Ω; and when there are multiple inverters connected in the daisy chain, ensure that the impedance is less than 300Ω/number of inverter.

10.3 Quality Assurance

When product faults occur during the warranty period, SUNGROW will provide free service or replace the product with a new one.

Evidence

During the warranty period, the customer shall provide the product purchase invoice and date. In addition, the trademark on the product shall be undamaged and legible. Otherwise, SUNGROW has the right to refuse to honor the quality guarantee.

Conditions

- After replacement, unqualified products shall be processed by SUNGROW.
- The customer shall give SUNGROW a reasonable period to repair the faulty device.

Exclusion of Liability

In the following circumstances, SUNGROW has the right to refuse to honor the quality guarantee:

- The free warranty period for the whole machine/components has expired.
- The device is damaged during transport.
- The device is incorrectly installed, refitted, or used.
- The device operates in harsh conditions beyond those described in this manual.
- The fault or damage is caused by installation, repairs, modification, or disassembly performed by a service provider or personnel not from SUNGROW.
- The fault or damage is caused by the use of non-standard or non-SUNGROW components or software.
- The installation and use range are beyond stipulations of relevant international standards.

- The damage is caused by unexpected natural factors.

For faulty products in any of above cases, if the customer requests maintenance, paid maintenance service may be provided based on the judgment of SUNGROW.

Product data such as product dimensions are subject to change without prior notice. The latest documentation from SUNGROW should take precedence in case of any deviation.

10.4 Contact Information

In case of questions about this product, please contact us. We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Fault code/name
- Brief description of the problem

For detailed contact information, please visit: **https://en.SUNGROWpower.com/contactUS**

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