

System Manual

PV Grid-Connected Inverter

SG1100UD/SG1100UD-20/SG3300UD/SG3300UD-20/
SG4400UD/SG4400UD-20



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1 About This Manual

This manual describes the transportation and storage, mechanical installation, electrical connection, power up and shutdown, web operation, troubleshooting, and maintenance of the MV Grid-connected PV Inverter.

1.1 Validity

This manual applies to the following models:

- SG1100UD / SG1100UD-20
- SG3300UD / SG3300UD-20
- SG4400UD / SG4400UD-20

Unless otherwise specified, this manual takes SG4400UD as an example to briefly introduce the installation and operation methods of the product.

1.2 Target Group

This manual is intended for professional technicians who are responsible for the installation, operation, and maintenance of the MV Grid-connected PV Inverters. 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.
- Should be familiar with the composition and working principles of the PV system and its front- and rear-level equipment.
- 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 the relevant standards and specifications of the country/region where the project is located.

1.3 How to Use This Manual

Please read through this manual carefully before using the product and keep it properly in an easy-to-reach place, to avoid equipment damage or safety incidents caused by operation not in line with the safety instructions specified in the manual.

A large number of pictures are provided to help users better understand and use this manual. These pictures are used for illustration only and may not be an exact representation of the real product.

The products and product manuals are always in the process of improvement and upgrade. If the manual received is slightly inconsistent with the product, it may be a result of a product version upgrade, and the actual product shall prevail. For any questions, please contact SUNGROW Customer Service.

1.4 Symbol Explanations

To ensure the safety of the users and their properties when they use the product and to make sure that the product is used optimally and efficiently, this manual provides users with the relevant safety information which is marked by the following symbols. The symbols that may be used in this manual are listed below. Please read carefully to make better use of this manual.

DANGER

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

WARNING

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

CAUTION

CAUTION indicates a slightly hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

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



NOTE indicates additional information, emphasized contents or tips to help you solve problems or save time.

1.5 Explanation of Description

Type	Example
Select a menuitem	Select Device Monitoring in the navigation bar
Select multiple menus	Select Device Monitoring → Real-time Status
Select a button	Click Save

2 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

Please operate the product under the condition that you are familiar with and understand the content of this manual, and have appropriate tools.

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 on-site 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.

2.1 Unpacking and Inspection

WARNING

**Check all safety signs, warning labels, and nameplates on products.
Ensure that the safety signs, warning labels, and nameplates are clearly visible and not removed or covered before the product is decommissioned.**

NOTICE

After receiving the product, check whether the appearance and structural parts of the product are damaged, whether the transformer leaks oil, and whether the packing list is consistent with the actual ordered product. If there are problems with the above inspection items, do not install the product and contact SUNGROW in time.

2.2 Hoisting and Transportation

WARNING

Risk of personal injury or device damage due to incorrect operation!

- Follow the procedure of work of heights when walking on the top of the product.
- All hoisting and transportation must comply with the relevant codes and regulations of the nation/region where the project is located.

NOTICE

All equipment and tools used during operation must have been regularly maintained.

CAUTION

Improper hoisting may cause personal injury!

- It is strictly prohibited to stand within 5m - 10m outside the operating area (i.e., under the boom and the hoisted machine) to avoid casualties.
- The product must be hoisted and moved by professional personnel. Before the operation, be sure to wear personal protective equipment.
- Stop hoisting in the event of severe weather, such as heavy rain, thick fog, or strong wind.
- When hoisting and moving the product, be aware of its size and weight and keep the balance to prevent it from turning over or falling.

2.3 Electrical Connection

DANGER

Before electrical connections, please make sure that the product is not damaged. Otherwise, it may cause danger!

Before electrical connections, please make sure that the product switch and all switches connected to the product are set to "OFF", and use measuring equipment to ensure that there is no voltage at the connection. Otherwise, an electric shock may occur!

⚠ DANGER

PV modules will generate lethal high voltage when exposed to sunlight.

- **Operators must wear proper personal protective equipment during electrical connections.**
- **Before performing an electrical connection, be sure to disconnect the PVS and use measuring equipment to ensure that cables are voltage-free.**
- **Respect the protection requirements and precautions of PV modules.**

⚠ DANGER

Danger to life due to a high voltage inside the MV Grid-connected PV 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 precautions listed in this manual and other pertinent documents.**

⚠ WARNING

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

- **Perform wiring in the proper order as specified in the user manual, otherwise, it may cause fires.**
- **Electrical connection must be performed by professional personnel who wear personal protective equipment.**
- **All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned.**
- **Installation not performed in compliance with the installation specifications, or unauthorized installation or alteration, may result in safety incidents or equipment damage.**

⚠ WARNING

Before connecting the PV module to this product, check and confirm the polarity correctness of the PV module, and then connect it to the corresponding position of this product.

During the installation and operation of the product, please ensure that the positive or negative polarities of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in product damage. The damage caused by this is not covered by the warranty.

NOTICE

Comply with the regulations related to the local grid during wiring.

2.4 Operation

⚠ DANGER

When the product is working,

- It is strictly forbidden to touch the live parts of the product. Otherwise, an electric shock may occur.
- It is strictly prohibited to disassemble any parts of the product. Otherwise, an electric shock may occur.
- It is strictly prohibited to touch any hot parts of the product (such as the heat sink). Otherwise, it may cause burns.

2.5 Operation and Maintenance

⚠ DANGER

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

- Before maintaining the product, be sure to disconnect the output switch of the PVS and the load switch/disconnector of the transformer.
- After the inverter is powered off for 20 minutes, measure the voltage and current with measuring equipment. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.
- Maintenance operations need to be carried out by professional personnel wearing protective equipment to ensure that there is no voltage or current present.
- During maintenance, be sure to check the warning labels in the product and comply with the requirements on them.
- Even if the inverter is shut down, it may still be hot and cause burns. Operating the inverter with protective gloves after it cools down.

⚠ DANGER

The devices inside the inverter carry high voltage. Touching these devices may lead to fatal electric shock.

- Live line measurement can only be performed by professional personnel who know the PV system well. Before measurement, be sure to take proper protection methods (e.g., wear insulating gloves, etc.);
- During live line measurement, the operator must be accompanied by others to ensure personal safety.

⚠ DANGER

Electric shock or fire may occur due to device damage or system fault.

- Visually inspect for device damages or other hazards before the operation
- Check whether other external devices or circuit connections are in a safe state.
- Make sure the device is in a safe state before operating.

⚠ DANGER

Do not perform any work on the control cable while the product or the external control circuit is powered. The externally powered control circuit may generate hazardous voltages inside the product even after the power is disconnected.

⚠ DANGER

If only the DC switch is turned off, the cable connection terminals in the AC and DC cabinets of the inverter unit will still carry voltage.

⚠ WARNING

In daily operation, the doors of the product and its internal components must all be closed and locked. Besides, the keys should be pulled out and properly kept by the designated personnel. This prevents accidents caused by unauthorized entries and protects the internal components against rain water or damage by animals.

⚠ WARNING

Do not open the cabinet door of any component of the inverter on sandy and windy days or when the relative humidity exceeds 95%.

⚠ WARNING

If some devices need to be replaced during operation and maintenance, please contact SUNGROW.

⚠ WARNING

Wait at least 20 minutes after the product stops running and ensure that the voltage has dropped to within the safe voltage range, the low-voltage cabinet is connected with the grounding cable, the transfer switch, if any, is in the grounding position, the grounding switch, if any, is closed, and the load switch, if any, is open. After confirming that all inspection items meet the requirements, maintain or repair the product following the warning labels inside the product.

⚠ WARNING

Only qualified and authorized personnel are allowed to perform maintenance or other operations on the inverter.

⚠ CAUTION

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

NOTICE

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

NOTICE

If work is carried out while the device is live, insulation protection is necessary and at least two personnel should be present at the site at the same time. The PV plants where the inverter is located are usually located in off-city fields, and appropriate field rescue facilities should be prepared for use in need. Some components and devices of the inverter, such as inverter units and heat dissipation fans, may produce noise during operation. In case of a fault in the inverter, the noise may get louder. Therefore, earplugs are recommended when you get close to the inverter.

2.6 Disposal

Do not dispose of the MV Grid-connected PV Inverter or any of its internal components as regular waste. Please contact a specialized, authorized recycling agency in the local area to properly dispose of the MV Grid-connected PV Inverter or its components.

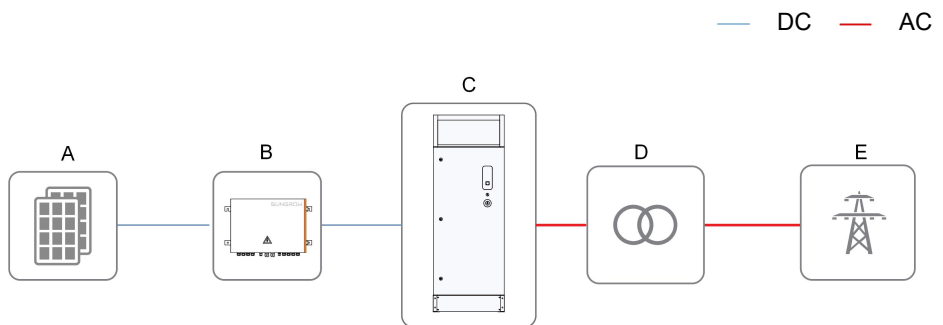
⚠ WARNING

Please scrap the MV Grid-connected PV Inverter in accordance with relevant local regulations and standards to avoid property losses or casualties.

3 Product Description

3.1 Product Introduction

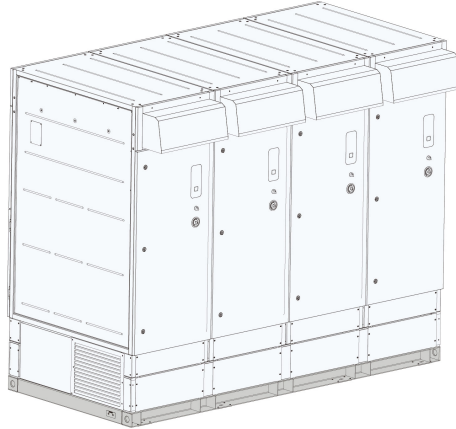
In large and medium-sized utility power plant systems, the PV grid-connected inverter, which contains multiple PV inverter units, transformers, and other equipment, provides a sound solution to convert the DC power generated by PV arrays into AC power, and feed it into the grid.



No.	Name	Description
A	PV array	Monocrystalline silicon, polycrystalline silicon, and thin film without grounding.
B	PVS	Combine the current of multiple PV strings and output.
C	PV grid-connected inverter	Convert the DC power from the PV arrays into AC power.
D	Transformer	Converts the low-voltage AC power output by inverter into medium-voltage AC power.
E	Grid	-

3.2 Product Composition

SG4400UD is taken as an example to introduce main devices inside the PV grid-connected inverter, The product consists of 4 inverter units.



The figure shows Inverter Units 1–4 from left to right.

* The figure is for illustration only. The actual product you have received may differ.

Model	Quantity
SG1100UD / SG1100UD-20	One inverter unit
SG3300UD / SG3300UD-20	Three inverter units
SG4400UD / SG4400UD-20	Four inverter units

3.3 Main Internal Equipment

3.3.1 Appearance of Inverter Unit

Appearance of Inverter Unit Version 1

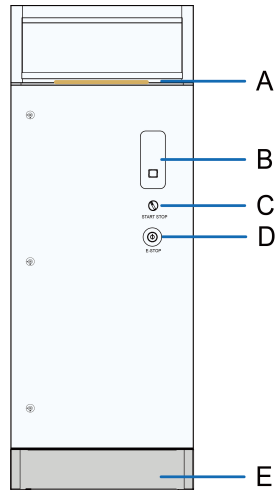


figure 3-1 Inverter Unit

Appearance of Inverter Unit Version 2 (Optional)

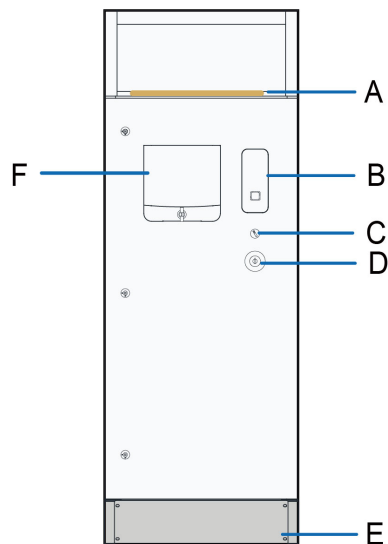


figure 3-2 Inverter Unit with LCD


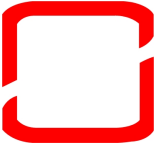

No.	Name
A	Top air inlet
B	Indicator panel
C	Start/Stop knob

No.	Name
D	Emergency stop button. In case of emergency, press this button to open the AC circuit breaker and DC load switch.
E	Base
F *	LCD

* is optional.

LED Indicator

table 3-1 Indicator Status Description

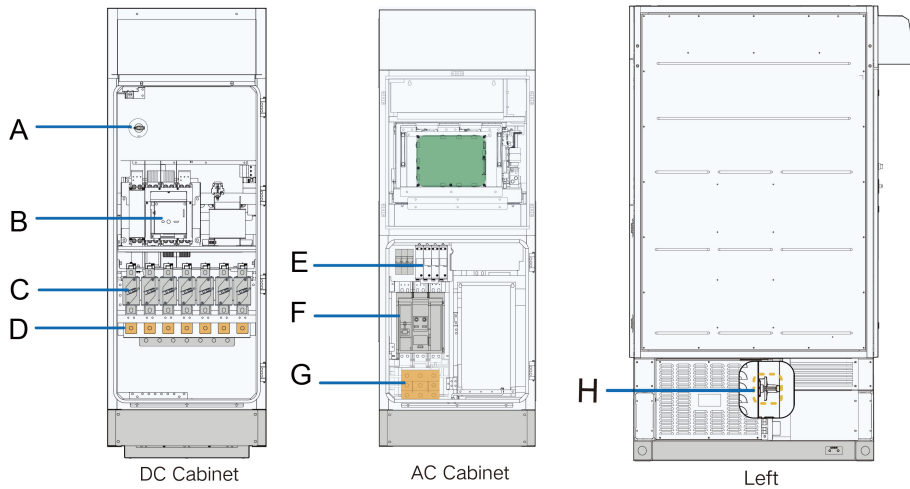
Color	Status	Description
 Blue	Steady on	The inverter is in grid-connected operation.
	Fast blinking (interval: 0.2s)	WiFi connection is established and data communication is in process. No fault is detected.
	Slow blinking (interval: 0.5s)	The inverter is in a deep standby state.
	Glowing and fading (interval: 2s)	The DC and AC side are powered on, or the AC side is powered on, the inverter is in a standby or is starting (not connected to the grid).
 Red	Steady on	A fault occurred and the system cannot be connected to the grid for power generation.
	Blinking (Interval 0.2s)	WiFi connection is established and data communication is in process. A fault is detected.
 Grey	Off	The AC and DC power are disconnected.

WARNING

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

3.3.2 Internal Structure of Inverter Unit

Open the front door of the inverter unit cabinet to see the DC cabinet, as shown in the left figure below. Open the back door of the inverter unit cabinet to see the AC cabinet, as shown in the right figure below.





* The figure is for reference only. And the actual product received shall prevail.








No.	Name	Description
A	Maintenance switch QS2	Disconnect it before maintenance and repair.
B	DC load switch QS1	Control the on/off of the DC side circuits of the inverter.
C	DC fuse	-
D	DC wiring copper bar	-
E	Fuse of AC side SPD	-
F	AC circuit breaker QF1	Control the on/off of the AC side circuits of the inverter.
G	AC wiring copper bar	-
H	Maintenance switch QS3	Disconnect it before maintenance and repair.



Maintenance switch QS2 could also be located at the bottom left corner of the AC side. The real product may differ.

3.4 Symbol on Products

Marks	Explanation
	Comply with CE certification.
	High voltage inside! Risk of electric shock by touching it!

Marks	Explanation
	The temperature here is beyond the acceptable range for the human body, please do not touch it arbitrarily to avoid personal injury.
	Firmly ground the protective ground terminal to ensure the safety of operators.
	The inverter can only be maintained and overhauled after being powered off for 20 minutes.
	It is recommended to wear noise-cancellation earplugs since the product may generate noise during operation.
	It is strictly forbidden to touch the fan blades when the fan is rotating.
	Read this manual carefully before any operation on the product.
	Do not dispose of this product as household waste.

⚠ WARNING

SUNGROW shall not be held liable for any equipment damage or safety incident caused by failure to observe the warning signs.

⚠ WARNING

Do not tear or damage the warning signs, and replace them immediately if they are blurry or damaged.

4 Transport and Storage

4.1 Precautions

CAUTION

Failure to transport and store the product in accordance with the requirements in this manual may invalidate the warranty.

4.2 Transportation Requirements

WARNING

In the whole process of loading, unloading, and transport, follow strictly the applicable safe operating procedure in the country/region where the project is located.

Tool and Personnel Requirements

- Choose appropriate means of transportation according to the size and weight of the product.
- All the tools used on the product, or during operation, must have undergone proper maintenance.
- The tool used for transport must have a sufficient load capacity.
- Extra traction may be required to move the equipment along a slope.
- Personnel engaged in loading, unloading, and anchoring operations should all have received relevant training, especially in safety.
- Transport the product in accordance with relevant local regulations and standards.

Safety Requirements

- The product must stand upright during transport.
- Do not put the products in stacks.
- During transportation, the product is placed horizontally with a tilt angle of $\leq 15^\circ$.
- Avoid collision or strong shock during transport.
- Wear proper personal protective equipment when operating the product.

Transport Route Requirements

- Before transport, inspect the transport route in advance, particularly for obstructions, to ensure the vehicle can travel safely and smoothly along the route.



Pre-transport route inspection should cover the following items: road conditions, height limits, actual heights, width limits, actual widths, weight limits, traffic restrictions, and potential obstructions.

- In most cases, the total weight of a truck that carries the product will exceed the general weight limit on the road. Therefore, to transport the product in a truck, an overweight permit from the relevant local agency in that area may be required.
- To transport the product by water, ensure the waterway meets the requirements for the vessel to sail fully-loaded.

4.3 Storage Requirements

4.3.1 Storage Environment

- the MV Grid-connected PV Inverter should be stored in an environment with a temperature ranging from -40°C to 70°C . If the ambient temperature is too low, take necessary heating measures for the MV Grid-connected PV Inverter's internal devices.
- the MV Grid-connected PV Inverter should be stored in a warehouse with a humidity of less than 55%. If the average ambient humidity is lower than 55%, it is suggested to change the desiccants every three months; if the humidity is higher than 55%, change the desiccants every month. The montmorillonite desiccant should be used. Each the inverter unit requires 8 bags of desiccant, 200g per bag. Before grid connection, take the desiccants out of the MV Grid-connected PV Inverter.
- Keep the product on a dry, flat, and solid ground that has sufficient bearing capacity and is not covered by vegetation. The ground where the product is kept should be flat, with a horizontal error of less than 0.25%, and have an overall slope of less than 5 degree.
- Avoid storing the MV Grid-connected PV Inverter in places where it may come in touch with rainwater, or in low-lying places, to prevent the accumulated rainwater from getting into it. If the MV Grid-connected PV Inverter must be stored outdoors due to restrictions on site, elevate its base off the ground to a certain height. The height should be decided according to the geological, meteorological, and other conditions on site.
- Avoid storing the MV Grid-connected PV Inverter in places where corrosive gas or dust may be produced or accumulated, or in places within 30 km (20 miles) of saline-alkaline land or pollution-generating industrial complex such as chemical plants and power plants (chemical gas class: 1C1, solid particle level: 1S2). Avoid storing the MV Grid-connected PV Inverter in environments contaminated with halogen and sulfur pollutants.
- Do not install the MV Grid-connected PV Inverter in places with vibration or a magnetic field strength of over 30A/m.
- Do not store the MV Grid-connected PV Inverter in environments with flammables and explosives.
- To prevent the MV Grid-connected PV Inverter from being stored for an overly long period of time, please apply the "first-in, first-out" method to product storage.

4.3.2 Protection During Storage

- During the process of product handling and storage, impacts or collisions to the product must be avoided.
- Before storage, make sure the doors of the product and its internal devices are all locked. During storage, avoid opening the doors, unless it is necessary.
- Seal off the product's air inlet/outlet and the DC cable inlet area. During the period of storage, make sure the protective films on the air inlet/outlet are intact. Meanwhile, take effective measures to prevent the ingress of rainwater, dust, and sand into the product.
- Do not have the MV Grid-connected PV Inverter stressed with heavy weights. The containers should not be stacked in more than four layers, and heavy weights are not allowed on the top of the MV Grid-connected PV Inverter, power distribution cabinet, transformer, and protective cover for low-voltage copper bars.

4.3.3 Routine Inspection for Long-term Storage

- Perform regular inspection, at least once every half a month. Check whether the dust cover is damaged and whether the product and its internal devices are intact.
- It is suggested that units that have not been put into operation (from the date of receipt by the customer) and the units shut down temporarily (from the date of shutdown) should not be stored for more than three months. If stored for a long period of time, sealing measures and necessary tests and inspections are required for the product. For products shut down temporarily, put desiccants inside them. It is needed to open the door and visually inspect the product and its internal devices for damage first.
- For a product shut down/stored for over six months, inspect its electrical components (IGBT module, switch, etc.), and take dehumidification and dedusting measures for the whole product. For detailed operation, please contact SUNGROW.
- The UPS and their batteries must be charged once every six months after leaving the factory (EXW Date).

5 Mechanical Mounting

WARNING

Respect all local standards and requirements during mechanical installation.

5.1 Safety Precautions

WARNING

- Personnel engaged in loading, unloading, and anchoring operations should all have received relevant training, especially in safety.
- Only install the product when it is complete and intact.
- Before installation, ensure that the product and all internal equipment are intact, without any damage.

WARNING

Risk of personal injury or device damage due to incorrect operation!

- Follow the procedure of work of heights when walking on the top of the MV Grid-connected PV Inverter.
- All hoisting and transportation must comply with the relevant codes and regulations of the nation/region where the project is located.

WARNING

The escape routes must be kept clear off any obstruction.

NOTICE

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

⚠ CAUTION

Improper hoisting may cause personal injury!

- It is strictly prohibited to stand within 5m - 10m outside the operating area (i.e., under the boom and the hoisted machine) to avoid casualties.
- Only professional personnel can operate the product, and be sure to wear personal protective equipment when operating.
- Stop hoisting in the event of severe weather, such as heavy rain, thick fog, or strong wind.
- Be sure to hoist the product smoothly and evenly to avoid collision and vibration. Do not turn the product upside down, nor hoist it for a long time.
- When hoisting and moving the product, be aware of its size and weight and keep the balance to prevent it from turning over or falling.

5.2 Inspection Before Installation

5.2.1 Scope of Delivery

Accessories delivered with the product are listed below:

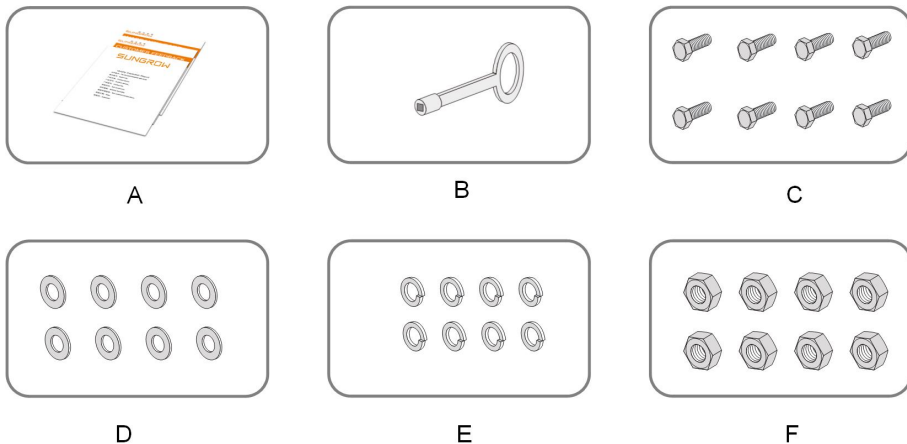


figure 5-1 Scope of Delivery

No.	Name
A	Relevant documents (the certificate of quality, warranty card, delivery inspection report, etc.)
B	Key
C	M16 × 45 bolt
D	M16 flat washer

No.	Name
E	M16 spring washer
F	M16 nut

* The M12 bolt combination is configured according to the actual product.



The accessories shown in above figures are for reference only. The product received may differ.

5.2.2 Product Inspection

- Check whether the product received is the ordered one.
- Check that the scope of delivery is consistent with the contract against the packing list.
- Visually check the product for any damage.

If any problems are found or there is any question, please contact the forwarding company or SUNGROW.

WARNING

Only install the product when it is complete and intact.

Before installation, ensure that:

- **The product is in good condition, without any damage.**
- **The product and all internal equipment are intact, without any damage.**

5.3 Installation Environment Requirements

5.3.1 Installation Site

- The climate environment and geological conditions, such as stress wave emission and underground water level, should be fully considered when selecting the installation site.
- The installation site should be dry and well ventilated.
- There should be no trees around the installation site to prevent branches or leaves blown off by heavy winds from blocking the door or air inlet.
- There are no underground facilities on site.
- The installation site should be away from areas where toxic and harmful gases are concentrated, and free from inflammable, explosive, and corrosive materials.
- Do not install the MV Grid-connected PV Inverter in places where corrosive gas or dust may be produced or accumulated, or in places within 30 km (20 miles) of saline-alkaline land or pollution-generating industrial complex such as chemical plants and power plants (chemical gas class: 1C1, solid particle level: 1S2).
- Do not install the MV Grid-connected PV Inverter in environments contaminated with halogen and sulfur pollutants.

- Do not install the MV Grid-connected PV Inverter in places with vibration or a magnetic field strength of over 30A/m.
- The installation site should be far away from residential areas to avoid noise.

5.3.2 Foundation



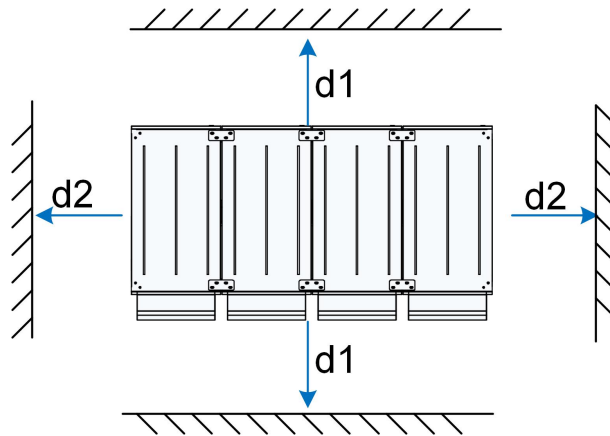
Given that the installation site has been decided and the foundation has been set up before the arrival of the product, details on these two items will not be included in this manual.

- The soil at the installation site should be compact. It is recommended that the relative density of soil at the installation site be no less than 98%. Take relevant measures to ensure a stable foundation in case of loose soil.
- If the MV Grid-connected PV Inverter is installed in a place with dense vegetation, in addition to regular weeding, harden the ground underneath the MV Grid-connected PV Inverter to stop weeds from growing.
- The foundation pit must be compacted and filled to provide sufficient and effective support for the product.
- The foundation should be higher than the horizontal ground to prevent the product base and the interior from rain erosion.
- The cross-sectional area and height of the foundation should meet the requirements.
- Cabling should be considered when building the foundation.
- Pre-bury the threading pipe at the bottom of the foundation according to the location of the cable inlet holes at the bottom of the product.
- A drainage system is necessary to prevent the bottom or internal equipment of the product from being soaked in water during the rainy season or during heavy rainfall.
- The dregs excavated during foundation construction should be removed immediately to avoid the latter impact on hoisting.
- Pre-bury the channel steel.
- According to the IEC 61936 standard, if mineral oil is used as the insulating liquid, an oil tray is necessarily required, to prevent the insulating liquid from leaking and thus contaminating the underground water or soil.

5.3.3 Space Requirements

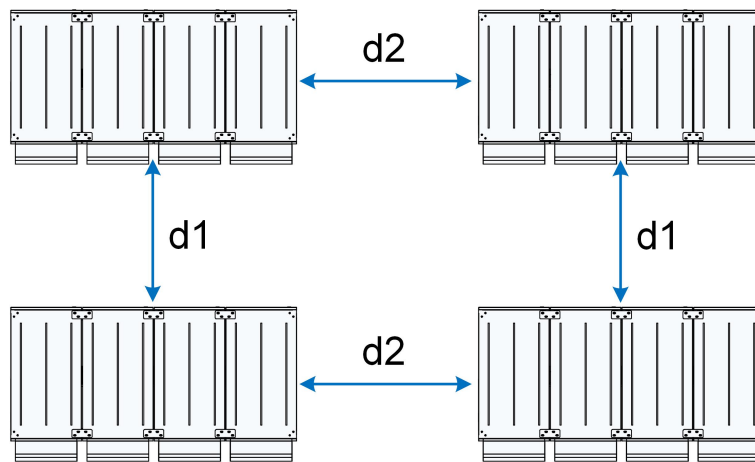
For good heat dissipation performance and ease of future maintenance, please reserve sufficient space for the product based on its surroundings during installation.

With obstructions or heat source around

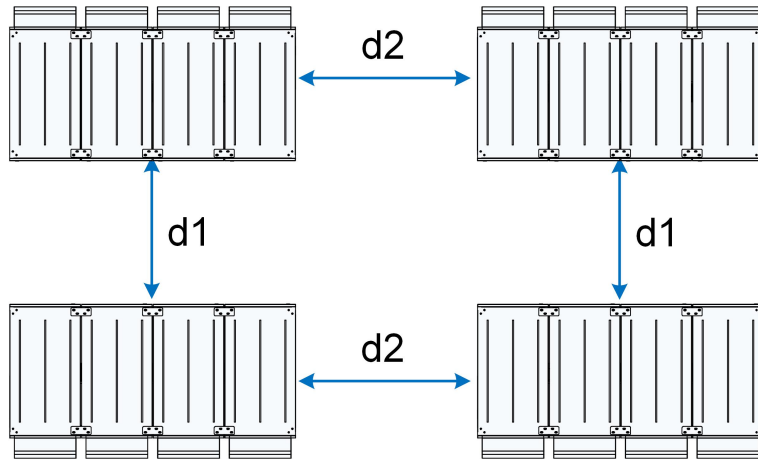


Mark	Space Requirements
$d1$	$\geq 4000\text{mm}$
$d2$	$\geq 2000\text{mm}$

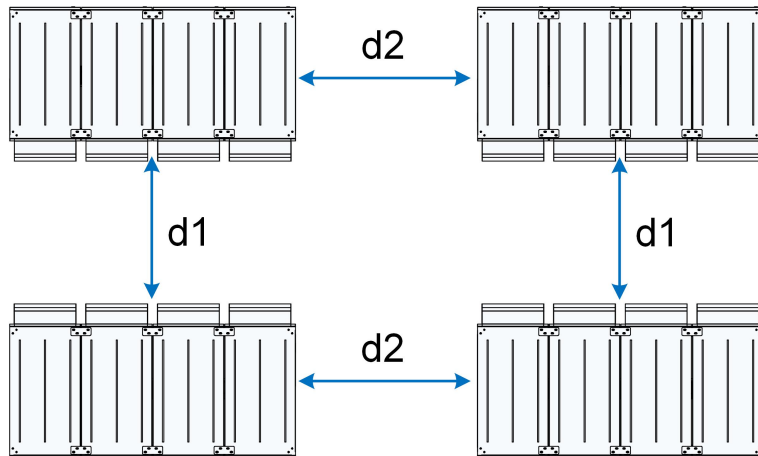
Arranged in rows (face the same direction)



Mark	Space Requirements
$d1$	$\geq 8000\text{mm}$
$d2$	$\geq 2000\text{mm}$

Arranged in rows (face opposite directions) 1

Mark	Space Requirements
d1	≥5000mm
d2	≥2000mm

Arranged in rows (face opposite directions) 2

Mark	Space Requirements
d1	≥5000mm
d2	≥2000mm

For arrangement modes and space requirements that are not mentioned in this manual, please confirm with SUNGROW.

5.3.4 Installation Position Requirements

The installation position needs to meet the heat dissipation performance of the product, and the appropriate position should be selected according to the installation location of the product.

NOTICE

- The transformer side of the product cannot be placed facing south.
- Considering the direction of summer gusts in the location where the product is installed, the transformer side should not be placed against the wind.

5.4 Hoisting and Fixing

5.4.1 Preparation Before Hoisting

⚠ WARNING

- Put up warning signages or fence off a warning zone in the operation area at the site.
- Make sure the cabinet doors of the product are all locked.

⚠ WARNING

- The whole hoisting work at the site should be carried out under the guidance of qualified technical persons.
- Professional cranes must be used and must be operated by qualified personnel. Otherwise, personal injury or product damage may occur!
- Follow strictly the safe operating procedure for the crane in the whole process of hoisting. The working site must be kept safe.
- Stop hoisting in the event of severe weather, such as heavy rain, thick fog, or strong wind.

⚠ CAUTION

- Improper hoisting may cause personal injury!
- It is strictly prohibited to stand within 5m - 10m outside the operating area (i.e., under the boom and the hoisted machine) to avoid casualties.

5.4.2 Crane and Sling Requirements

SG1100UD

- 1 Hoist the product by the 4 lifting lugs at its top.
- 2 The four slings should be identical in length. Each sling should have a length of ≥ 3 m and a lifting capacity of ≥ 2000 kg. You can use steel wire ropes or flexible synthetic slings.



If the steel wire rope is used, please use the rope with a tensile strength of ≥ 1670 Mpa and a diameter of ≥ 24 mm.

- 3 The flexible slings or steel wire ropes should be attached to the crane's hooks at one end, and the lifting lugs on the inverter at the other end.

SG1100UD×2~SG1100UD×4

- 1 Be sure to hoist the product with the four lifting points at the bottom of the platform and the lifting beam.
- 2 Two types of slings are used. Sling 1 is used to connect the lifting beam to the platform, and Sling 2 is used to connect the hook of the crane to the beam.

table 5-1 SG1100UD×2~SG1100UD×4 Sling Requirements

Item	Requirement
Sling 1	Four slings shall all measure 4.5m in length, and each has a lifting capacity of $\geq 4000\text{kg}$.
	Steel wire rope cannot be used as Sling 1.
Sling 2	The sling shall have a length of 8m and a lifting capacity of $\geq 9000\text{kg}$.
	Steel wire rope or flexible synthetic sling can be used as Sling 2. If the steel wire rope is used, please use the rope with a tensile strength of $\geq 1670\text{Mpa}$ and a diameter of $\geq 24\text{mm}$.

- 3 Beams will be provided, one set (1 beam) for each batch of delivery.
- 4 Shackles and Sling 2 will not be provided and should come with the crane, and should be selected according to the actual load.

WARNING

The hoisting work must be carried out by strictly following the relevant hoisting instructions, with specialized lifting devices used (such as lifting frames and slings).



- The strength of the slings to be used should be determined properly based on the inverter's weight.
- Make sure the connections of slings are all secure and reliable, and the length of the sling connected to each corner fitting is the same.
- The sling length can be adjusted properly based on the actual conditions at the site.
- The crane should have a sufficient boom length and swing radius.

5.4.3 During Hoisting

- Ensure safe and reliable connections of all slings.
- Ensure that the product is steady and not tilting during the whole hoisting process.
- The product should be hoisted vertically. Never drag the product on the ground or the top of the lower product, and never pull and push it on any surface.

- Suspend the hoisting when the product is hoisted 300 mm from the supporting surface to check the connection between slings and the product. Continue hoisting only after confirming a reliable connection.
- When the product is in place, place it lightly and smoothly. It is strictly forbidden to throw it to places outside the vertical landing place.
- The outdoor cabinet should be placed on a solid and flat site with good drainage and no obstacles or protrusions.
- Avoid scratching the product during hoisting.

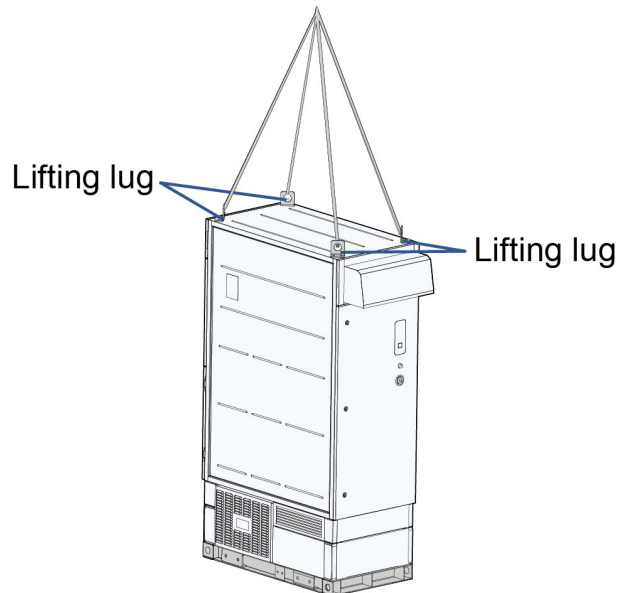


figure 5-2 SG1100UD Hoisting Diagram

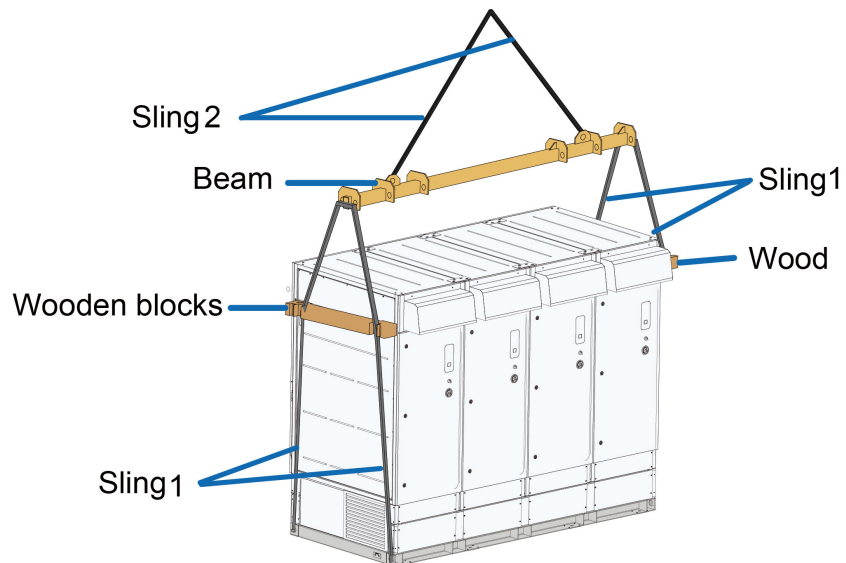


figure 5-3 SG4400UD Hoisting Diagram

When the cabinet is hoisted in place, remove the wooden blocks on both sides of the cabinet to ensure fine air intake of the whole product.

⚠ WARNING

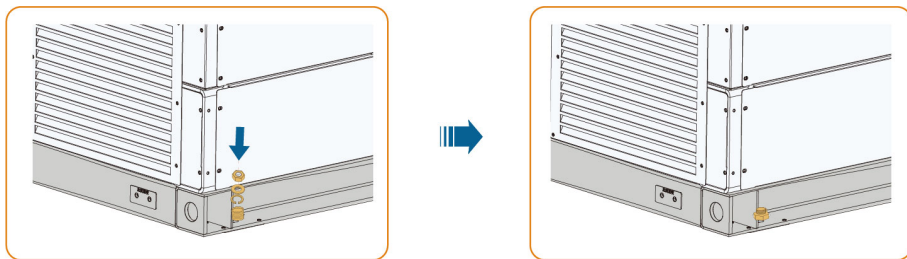
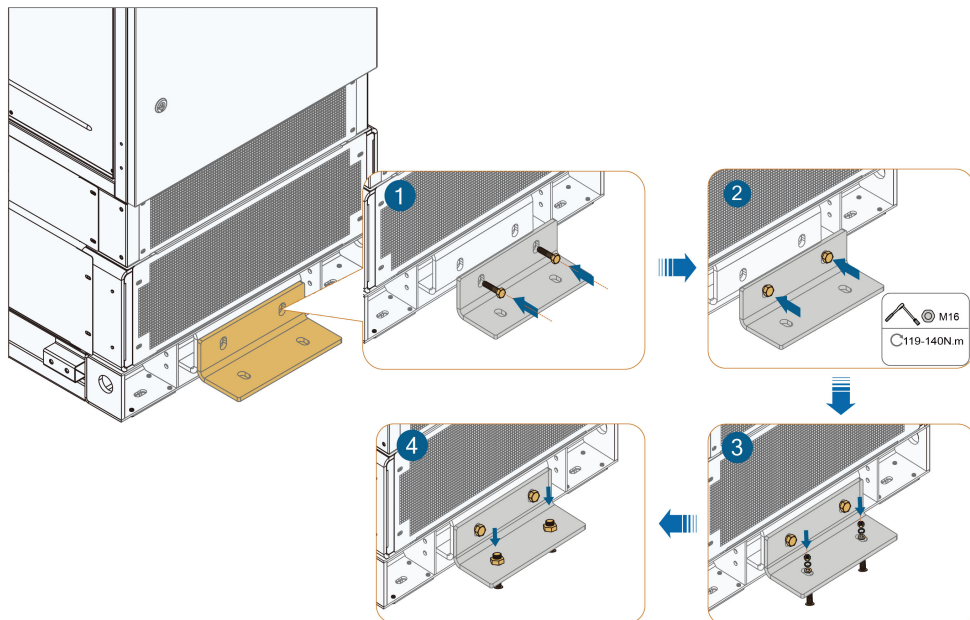
Be sure to hoist the product smoothly and evenly to avoid collision and vibration. Do not turn the product upside down, nor hoist it for a long time. Otherwise, personal injury or product damage may occur!

5.4.4 Fixing

Hoist the product to the intended location and fix it.

Fixed by Bolt

Through the positioning holes at the bottom of the product, secure it to the foundation with M12 bolts.

**Fixed by L-shaped Angle Steels**

6 Electrical Connection

6.1 Precautions

DANGER

- Before electrical connections, please make sure that the MV Grid-connected PV Inverter is not damaged, otherwise, it may cause danger!
- Before making electrical connections, check and confirm that the cables are all intact and well-insulated. Poor insulation or cable damage may result in safety hazards. If necessary, replace the cable immediately.
- Before electrical connections, please make sure that the product switch and all switches connected to the product are set to "OFF", and use measuring equipment to ensure that there is no voltage at the connection. Otherwise, an electric shock may occur!
- All switches cannot be closed until the electrical connection is completed.

DANGER

PV modules will generate lethal high voltage when exposed to sunlight.

- Operators must wear proper personal protective equipment during electrical connections.
- Before performing an electrical connection, be sure to disconnect the PVS and use measuring equipment to ensure that cables are voltage-free.
- Respect the protection requirements and precautions of PV modules.

DANGER

Danger to life due to a high voltage inside the MV Grid-connected PV Inverter!

- Be sure to use special insulation tools during cable connections.
- Note and observe the warnings on the product.
- Respect all safety precautions listed in this manual and other pertinent documents.

⚠ WARNING

Sand and moisture penetration may damage the electrical equipment in the product, or affect their operating performance!

- **Avoid electrical connections during sandstorms or when the relative humidity in the surrounding environment is greater than 95%.**
- **Carry out the electrical connection of the product on fine days with no wind and sand.**
- **Do not perform electrical connections in harsh weather conditions, such as thunder and lightning, rain, snow, and Level 6 or stronger wind.**

⚠ WARNING

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

- **Perform wiring by strictly following the wiring identifications inside the equipment.**
- **After completing each connection, carefully check that the connection is correct and secure.**
- **Electrical connection must be performed by professional personnel who wear personal protective equipment.**
- **The cables used in the PV generation system must be firmly connected, in good condition, and well insulated to appropriate sizes.**

⚠ WARNING

• **Check and confirm the polarity correctness of the PV string, and then connect it to the corresponding position of this product.**

- **When installing and operating the product, make sure that the positive or negative polarities of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in product damage. The damage caused by this is not covered by the warranty.**

⚠ WARNING

• **Use the dedicated operating lever to switch off the load switch of the transformer, by referring to the manual for the transformer.**

- **Open the outer and inner doors of the HV room of the transformer. Check and ensure that the voltage presence indicator on the inner door is off.**

NOTICE

Be sure to check the insulation of the PV generator set according to the instructions provided by the manufacturer. The PV generator set must be disconnected from the MV Grid-connected PV Inverter during the insulation check.

NOTICE

- Whenever necessary, wear proper protective equipment such as goggles, insulating gloves, and insulating shoes, and take all necessary auxiliary protective measures to ensure the safety of the personnel and the equipment.
- Before operating the product, check and ensure that the tools to be used have undergone regular maintenance.
- The modules of the MV Grid-connected PV Inverter have all been tested for insulation between the main circuit and the enclosure before the MV Grid-connected PV Inverter leaves the factory. Do not perform insulation and withstand voltage tests on any part of the MV Grid-connected PV Inverter (using a withstand voltage tester or megohmmeter).

NOTICE

- Comply with the safety instructions related to PV strings and the regulations related to the local grid.
- During electrical connection, do not forcibly pull any wires or cables, as this may compromise the insulation performance.
- Ensure that all cables and wires have sufficient space for any bends.
- Adopt the necessary auxiliary measures to reduce the stress applied to cables and wires.
- Keep a sufficient distance between the cable and the heating device to avoid aging and damage of the insulation layer of the cable caused by high temperature.
- For the potentially live parts near the area where the operation is performed, cover them with insulated cloth for insulation shielding.

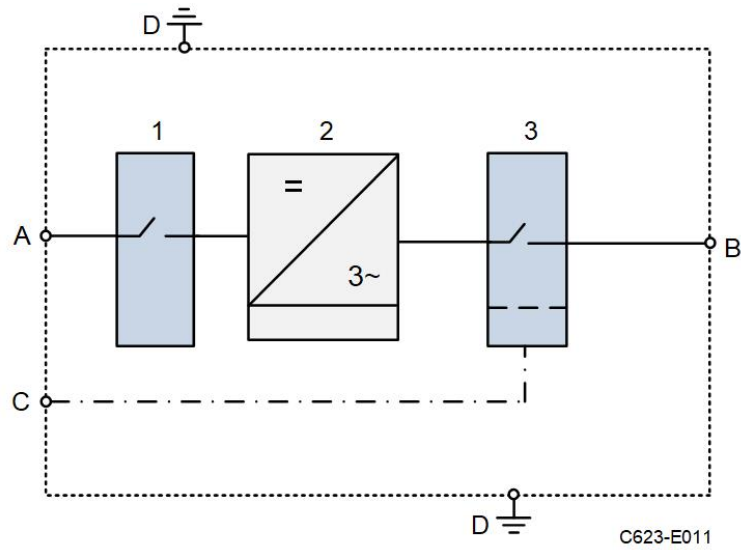
NOTICE

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 MV Grid-connected PV Inverter can be connected to the grid.

6.2 Wiring Overview

- Power cable
- - - Communication cable



1- DC cabinet

2- Module cabinet

3- AC cabinet

table 6-1 Interface Description

No.	Description	Recommended Cable Specifications
A	DC input port	400 mm ² at most
B	AC output port	70 mm ² — 400 mm ²
C	Communication port	2 x 0.75 mm ² — 2 x 1.5 mm ² shielded twisted pair cable
D	Grounding	60 mm x 100 mm hot-dip galvanized flat steel 50 mm ² — 95 mm ² grounding cable

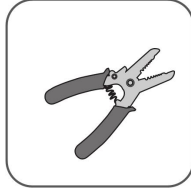
6.3 Preparation Before Wiring

6.3.1 Installation Tools

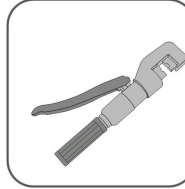
Installation tools include but are not limited to the following recommended ones. Use other auxiliary tools on site as needed.



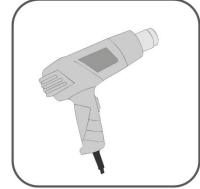
Torque screwdriver



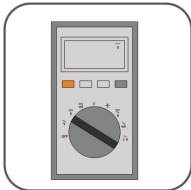
Wire stripper



Hydraulic clamp



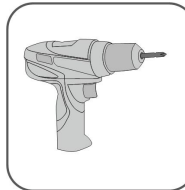
Heat gun



Multimeter



Screwdriver



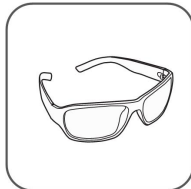
Electric drill



Torque wrench



Protective gloves



Goggles



Insulated shoes



Protective clothing

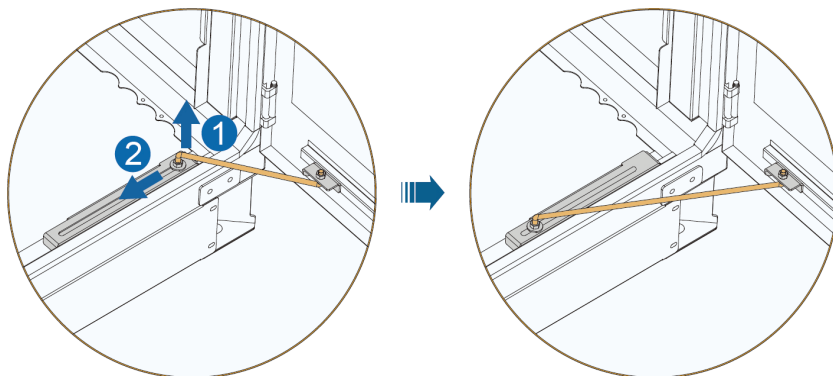


Hard hat

6.3.2 Open the Product Door

Step 1 Open the cabinet door.

Step 2 Fix the doors of the inverter unit cabinet.



Step 3 Remove the protective cover of the wiring area.

-- End

6.3.3 Cables

The cables must meet the following requirements:

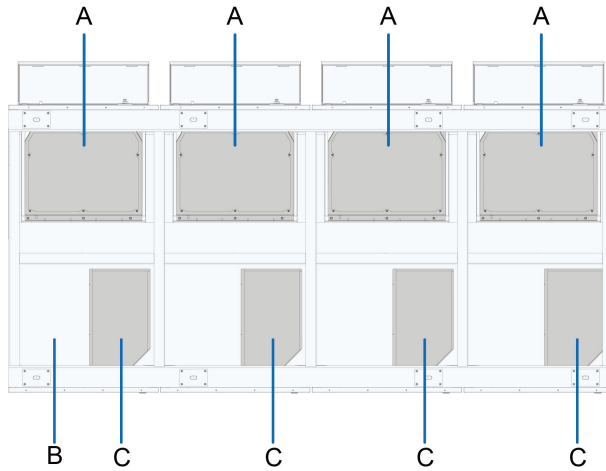
- The current carrying capacity of the cable should meet the requirements. Factors affecting the current-carrying capacity of a conductor include but are not limited to:
 - Environmental conditions
 - Type of the insulation material of the conductor
 - Cabling method
 - Material and cross-sectional area of the cable
- Select cables with a proper diameter according to the maximum load, and the cables should be long enough.
- All DC input cables must be of the same specifications and materials.
- Check the insulation of all DC input cables according to the applicable local rules.
- AC output cables of three phases must be of the same specifications and materials.
- Check the insulation of all AC output cables according to the applicable local rules.
- Only flame-retardant cables can be used.

NOTICE

Cables used shall comply with the requirements of local laws and regulations. The cable colors in figures in this manual are for reference only. Please select cables according to local cable standards.

6.3.4 Position of Cable Inlet

For easy wiring, cables between external devices and the product are routed into the product through the bottom cable inlet.



* The figure is for reference only. The product received may differ.

No.	Description
A	DC input cable inlet
B	Communication cable inlet
C	AC output cable inlet

6.3.4.1 Cable Inlet Preparation

Step 1 Identify the marks of hole positions.

Step 2 Drill holes at the marks.

Step 3 Lead cables into the cabinet through the holes, then secure the cables. Cables can be secured in different ways, usually with fireproof mud and waterproof connectors. Generally, you can choose one of them to secure the cables on site.

The figure below shows how to secure the cables with fireproof mud.

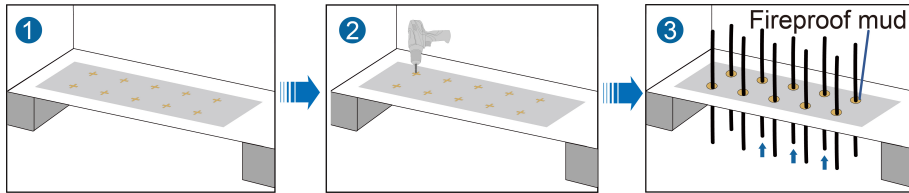


figure 6-1 Fireproof Mud

There are typically two types of waterproof connectors, single-hole and double-hole. The double-hole waterproof connector allows two cables to pass through. Please select waterproof connectors based on the actual situation and cable requirements on site. The figure below shows how to secure the cables with waterproof connectors.

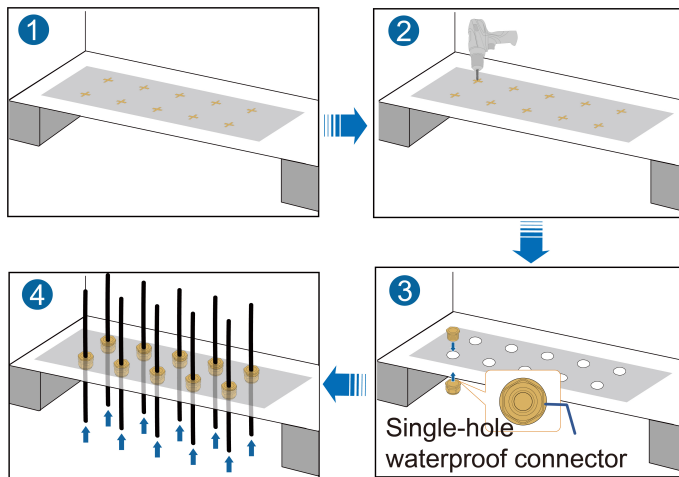


figure 6-2 Single-hole Waterproof Connector

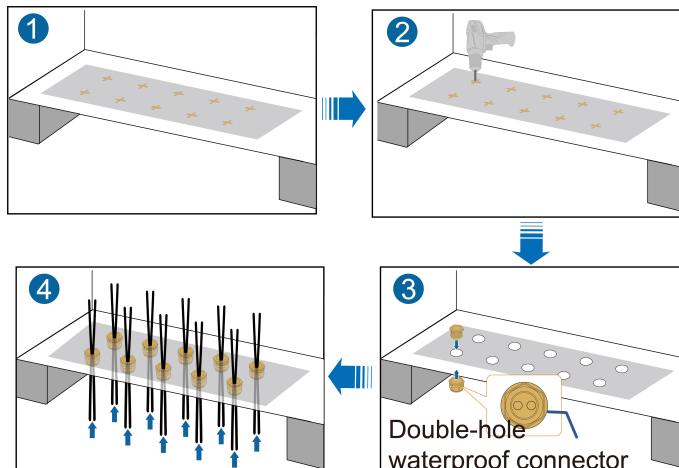


figure 6-3 Double-hole Waterproof Connector

Different wiring schemes have different requirements for cable diameter. The requirements for cable diameter are shown as follows.

Wiring scheme	Cables cured by	se- Number of inputs	Cable diameter
Wiring using single-core cables	Single-hole waterproof connector	5	400mm ² (outer diameter ≤ 42mm)
		6	
		7	
	Fireproof mud	5	400mm ² (outer diameter ≤ 42mm)
		6	
		7	
Wiring with cables connected to both sides of copper bar	Double-hole waterproof connector	5	300mm ² (outer diameter ≤ 26mm)
		6	Not available
		7	
	Fireproof mud	5	300mm ² (outer diameter ≤ 35mm)
		6	300mm ² (outer diameter ≤ 32mm)
		7	185mm ² (outer diameter ≤ 26mm)

* For the number of inputs and the cable size not mentioned above, please confirm with SUNGROW.

* Waterproof connectors (contact SUNGROW in advance if needed) or fireproof mud (prepared by users) are used to seal off the cable inlets/outlets.

WARNING

After wiring, seal off the cable inlet holes by filling the gaps around the cables with fireproof/waterproof materials such as fireproof mud to prevent the ingress of foreign matter or moisture, thus avoiding affecting the product's long-term operation.

-- End

6.4 Ground Connection

DANGER

Products must be reliably grounded!

- The grounding cable must be reliably grounded, otherwise, it may cause a fatal electric shock to the operator.
- The grounding cable must be reliably grounded, otherwise, equipment may be damaged if struck by lightning.
- The grounding cable must be reliably grounded, otherwise, equipment may not operate normally.

⚠ WARNING

- **Connect the grounding terminal to the protective grounding point before connecting AC cables, DC cables, and communication cables.**
- **Both grounding terminals on the side of the product must be connected to the protective grounding points reliably. SUNGROW shall not be held liable for any damage caused by the violation.**

NOTICE

- **Make necessary grounding and short-circuiting connections.**
- **Before connecting the grounding cable, remove the protective film at the grounding terminal first.**

NOTICE

Note the following during ground connection:

- **Observe specific codes and regulations of the country/region where the project is located to perform ground connections.**
- **All grounding connections inside the PV system must be secure and reliable.**
- **The grounding resistance must meet the requirements of local standards and regulations.**

6.4.1 Overview

There are two grounding methods: fixing by welding with grounding flat steel and fixing with grounding cable.

⚠ WARNING

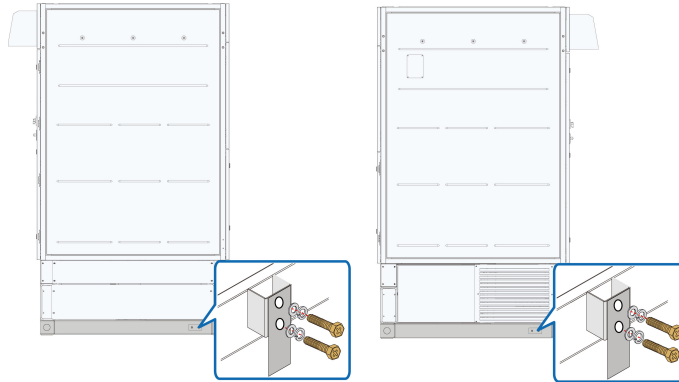
Before proceeding with the ground connection, tear off the protective film on grounding point.

NOTICE

After grounding is completed, whether made by using the flat steel or grounding cable, the exposed metal surface, except the fixing point of grounding connection, needs to go through anti-corrosion treatment.

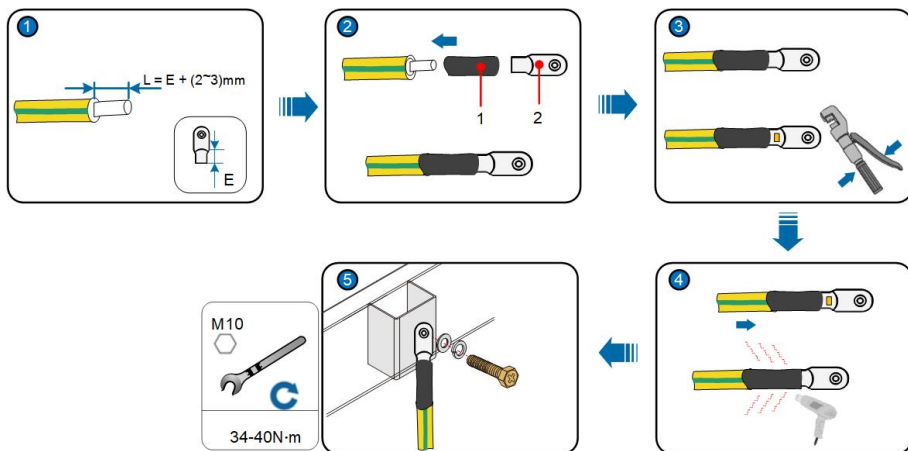
6.4.2 Grounding Flat Steel

Weld 60 mm x 100 mm hot-dip galvanized flat steel to the grounding point.



6.4.3 Grounding Cable

Use 50 mm² ~ 95mm² grounding cables to reliably connect the two grounding terminals to the grounding points of the system.



C000-E021

1: Heat shrink tubing

2: OT/DT terminal

6.5 DC Input 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 the ground before connecting it to the MV Grid-connected PV Inverter.**
- **Make sure the maximum DC voltage and the maximum short circuit current of any string never exceed the MV Grid-connected PV Inverter permitted values specified in "Technical Parameters".**
- **Check and confirm the polarity correctness of the PV string, and then connect it to the corresponding position of this product.**
- **When installing and operating the product, make sure that the positive or negative polarities of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in product damage. The damage caused by this is not covered by the warranty.**

⚠ WARNING

- **Observe all safety instructions specified by the manufacturer for the PV modules at the site.**
- **To ensure the stable and efficient operation of the whole system, it is recommended that the PV modules attached to the same the MV Grid-connected PV Inverter be identical in manufacturer and model, and the number of PV modules connected in series in each input should be the same.**
- **The open-circuit voltage of the PV array should not exceed the maximum DC input voltage of the MV Grid-connected PV Inverter. Overly high open-circuit voltage of the PV array may damage the MV Grid-connected PV Inverter.**
- **If a ground fault has been found in the PV module, before proceeding with the DC input wiring, remove the fault first.**

6.5.1 Overview

DC wiring area

Negative Grounding

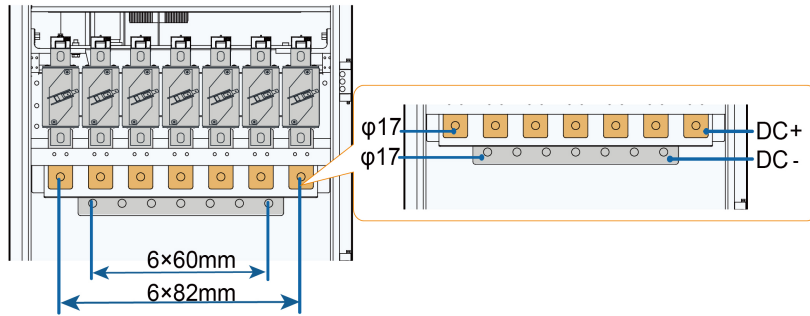


figure 6-4 7-way DC Input

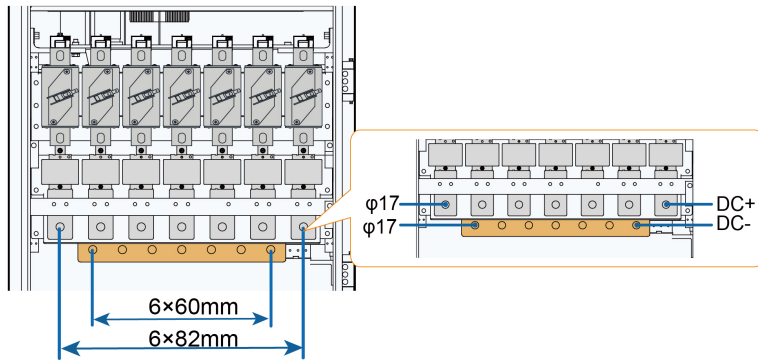


figure 6-5 7-way DC Input With MPLC

Floating Grounding

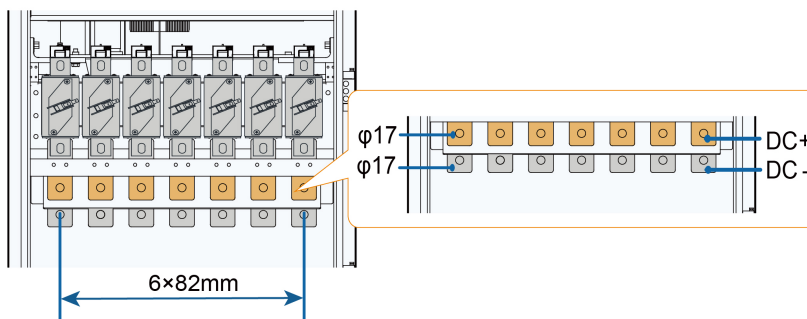


figure 6-6 7-way DC Input

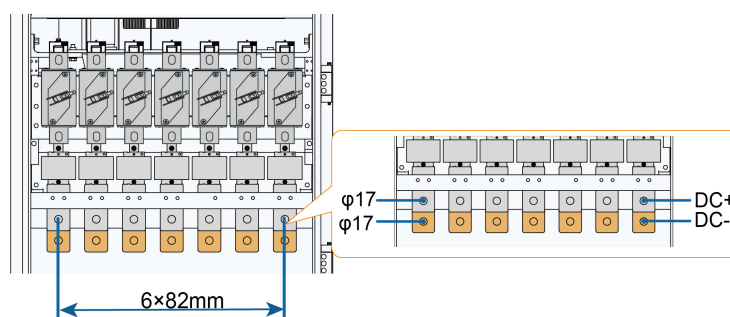


figure 6-7 7-way DC input With MPLC

* The wiring area is subject to the actual product.

Mark	Description
DC+	DC side positive cable connection area
DC-	DC side negative cable connection area
φ17	Copper bar diameter

Wiring hole	Bolt	Torque(N.m)
φ17	M16	119–140N.m

Illustrations in the manual are for the product with 7 DC inputs only.



- For the product with 6 DC inputs, in its DC wiring area, the first fuse and copper bar on the right in the illustration are removed.
- For the product with 5 DC inputs, in its DC wiring area, the first fuse and copper bar on the left and right in the illustration are removed.

6.5.2 Removing Insulation Board before Connection

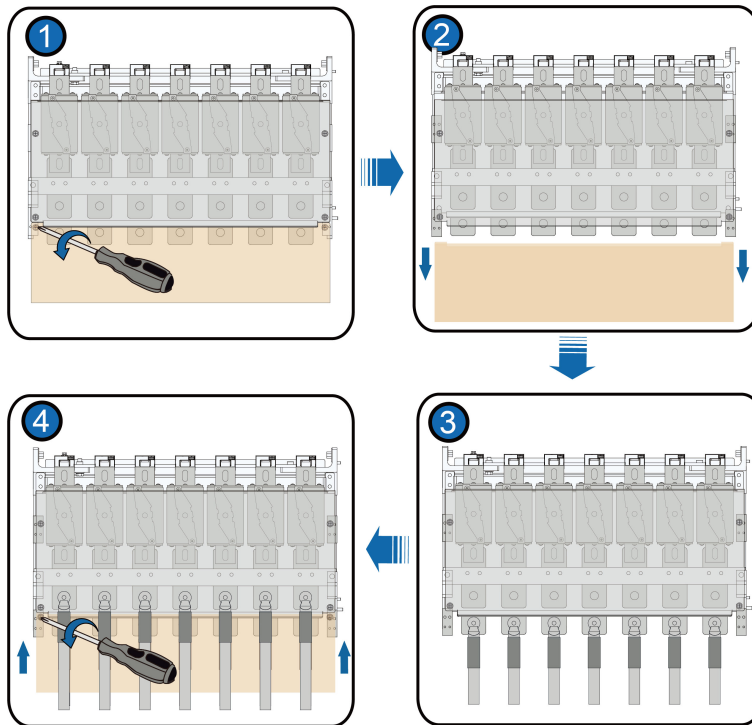
Removing insulation board before cable connections.

Step 1 Remove the two fixing screws on the insulation board with a screwdriver.

Step 2 Move insulation board down onto the bottom plate, and make sure it is placed between the positive and negative cables.

Step 3 Install the negative DC cables.

Step 4 Move the insulation board upward to its original position and install the two fixing screws.



Step 5 Finally , install the positive DC cables.

-- End

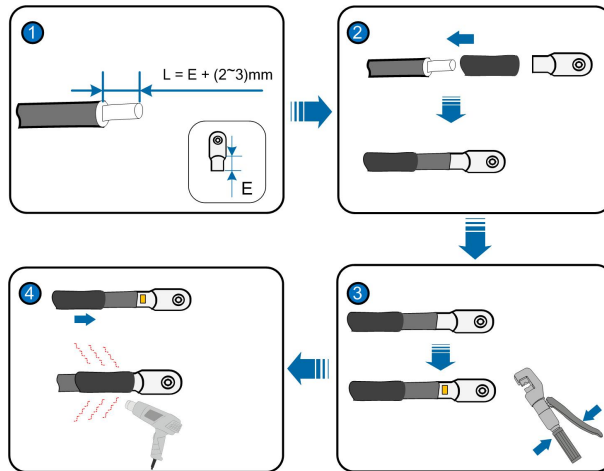
* The figure is for reference only. The product received may differ.

6.5.3 Procedure

Step 1 Lead the cable into the wiring area through the inlet hole, and mark the cable polarity.

Step 2 Strip the protective layer of the cable to expose the copper core of the wire with strippers.

Step 3 Install the OT/DT terminal to the wire and crimp them with a crimping tool. Install a heat shrink tubing to the terminal and heat it with a heat gun.



If the two-core or multi-core cable is used as the DC input cable, split the cable cores into wires outside the inverter first, before leading the cable into the inverter.

Step 4 Secure the OT/DT terminal to the copper bar by M16×45* bolts with a tightening torque of 119 - 140 N.m.

- If copper wires are used, fasten the bolt assembly as shown below.

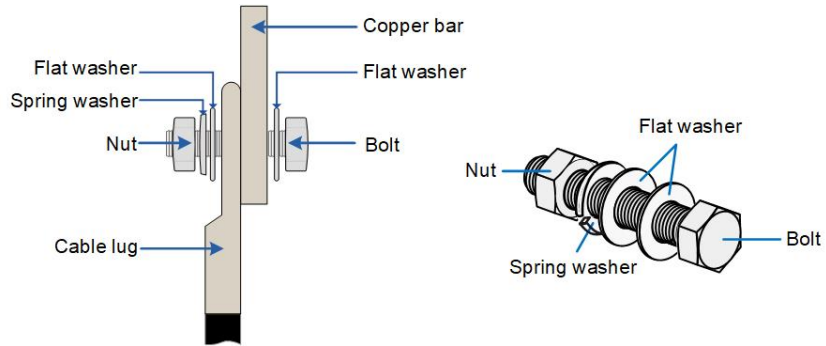


figure 6-8 Copper Wire Connection

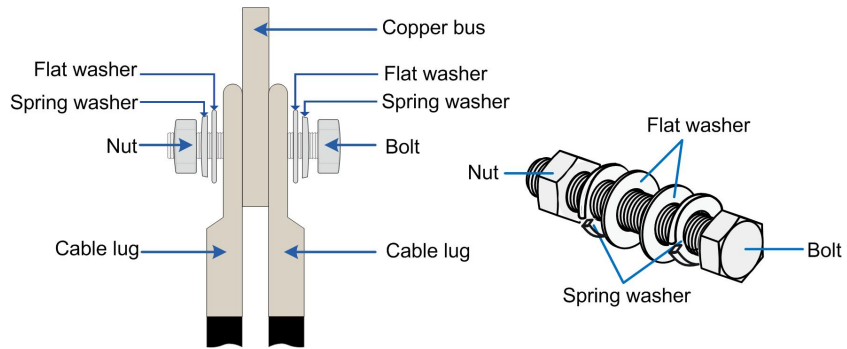


figure 6-9 Double Side Copper Wire Connection

* The length of bolts used for double-sided wiring should be determined based on the actual conditions at the project site.

NOTICE

To implement double-sided wiring, please contact SUNGROW and provide relevant details to assess the feasibility first.

- If aluminum wires are used, fasten the bolt assembly as shown below.

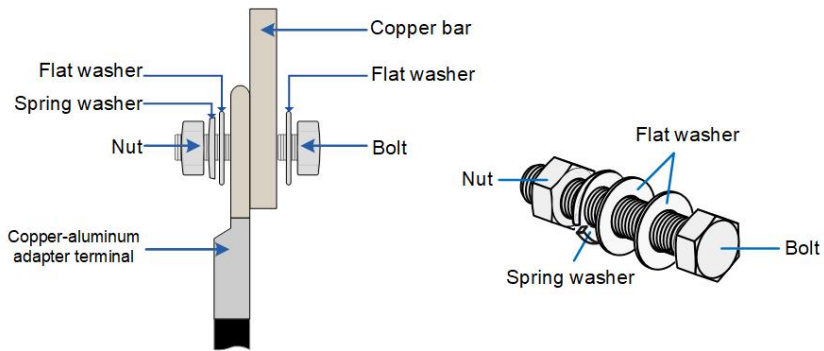


figure 6-10 Aluminum Wire Connection

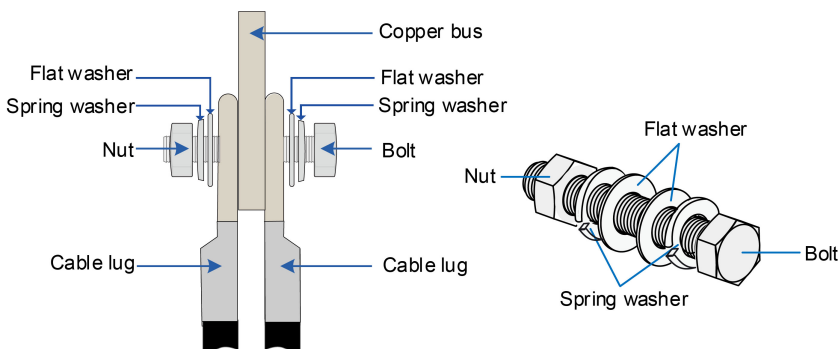


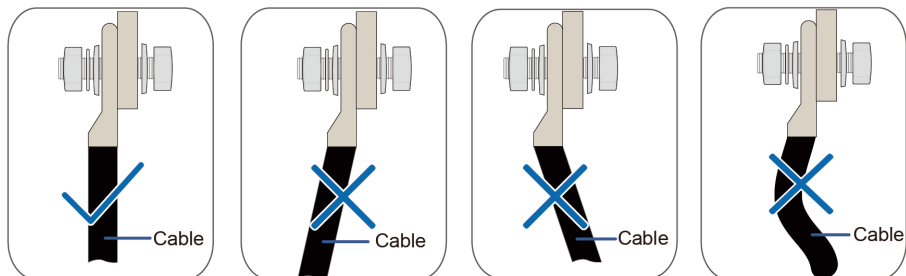
figure 6-11 Double Side Aluminum Wire Connection

* The length of bolts used for double-sided wiring should be determined based on the actual conditions at the project site.

NOTICE

To implement double-sided wiring, please contact SUNGROW and provide relevant details to assess the feasibility first.

When performing DC wiring, make sure the cables remain vertical to the ground without inclination, to prevent the copper bar from getting deformed due to stress in other directions.



Step 5 Pull the cable back slightly after wiring to ensure that the cable is long enough.

NOTICE

- Ensure that the selected terminal can directly contact 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 the electrical connections.



- Please ensure the upper and lower copper bars are kept in the same plane with a deviation of less than 10mm while performing DC wiring.
- Fix the cable after wiring, and reserve a certain length to avoid damage caused by excessive force on the wiring copper bar due to foundation sinking and other problems.

-- End

6.5.4 Securing Cables

Secure the cables after wiring, to avoid damage caused by excessive stress on the wiring copper bar.

- If the product comes with cable clips, follow the steps below to secure the cables.
- If the product does not come with cable clips, or it is not feasible to use cable clips (e.g. cables are connected to both sides of the copper bar), secure the cables with proper devices within 500mm under the cover plate for AC/DC cable inlet, based on the routing of the cables.

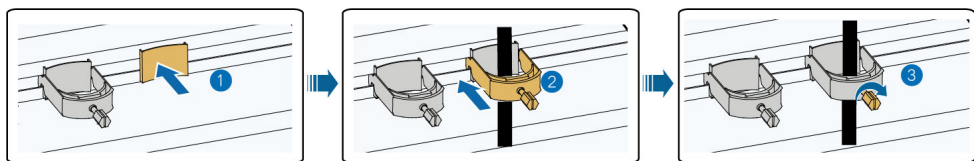
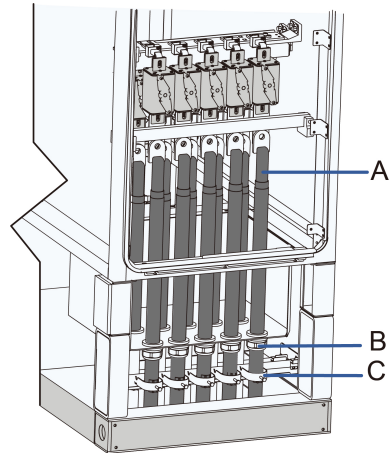


figure 6-12 Cable Clip Installation

Note: The cable clip is an optional accessory.

Follow-up Operation

The figure below shows the DC side of the inverter after the wiring is completed.



* The figure is for illustration only and the actual product on site may be different.

No.	Description
A	Cable
B	Waterproof connector *
C	Cable clip

* Cables can be secured in different ways. In this figure, cables are secured with waterproof connectors, which is for illustration only. The way to secure the cables depends on the actual conditions on site.

6.6 AC Side Connection

6.6.1 Inspection Before Wiring

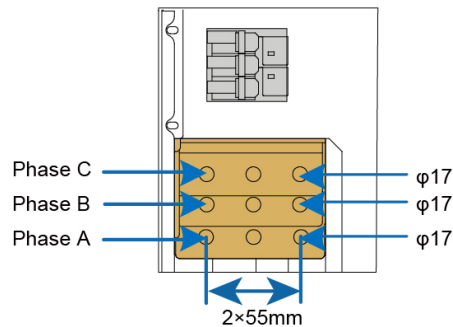
- Check and ensure that the AC side of the inverter unit is disconnected.

Refer to the transformer manual and use the special lever to disconnect the load switch of the transformer.

- Open the outer and inner doors of the HV compartment of the transformer. Check and ensure that the indicator on the inner door is off.
- Check and ensure that the sleeves and copper bars in the wiring area in the HV compartment are free from damage, deformation, and fracture.

6.6.2 AC Connection Area at the Bottom

AC Connection Area



Procedure

Step 1 Lead the cable into the wiring area through the inlet hole, and mark the cable polarity.



The three-phase wires (Phase A, Phase B, and Phase C) of a cable should be led through the same inlet hole.

Step 2 Strip the protective layer of the cable to expose the copper core of the wire with strippers.

Step 3 Install the OT/DT terminal to the wire and crimp them with a crimping tool. Install a heat shrink tubing to the terminal and heat it with a heat gun.

Both copper wire and aluminum wire can be used.

- If copper wire is used, use copper terminals.
- If the aluminum wire is used, use copper-aluminum transition terminals.

Each AC wiring copper bar can be connected with up to three output wires. Select the number of cables and wiring scheme reasonably according to the actual on-site conditions.

-- End

Follow-up Operations

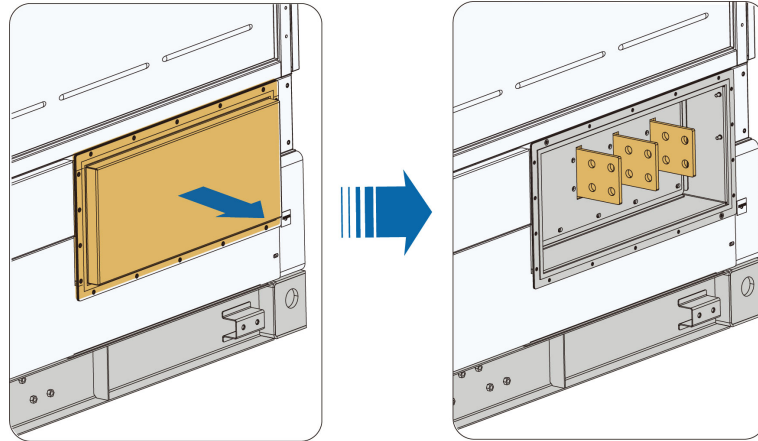
Fix the cable to the copper bar after wiring referring to the fixing of DC cables.

Use fire-proof mud to seal the bottom cable inlet holes, keep the DC cabinet compartment uncluttered, and lock the door.

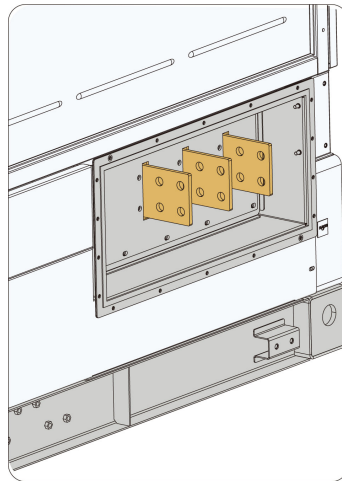
6.6.3 AC Connection Area on the Side

Preparation before Wiring

- 1 Remove the protective cover and the ventilation cover of the wiring area on the right side of the inverter.
- 2 Expose the copper bars on the cabinet.



AC Connection Area



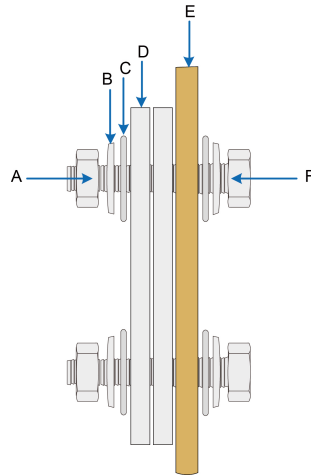
* The specific size of the copper bars should be based on the actual product.

Procedure

Fix the AC copper bars to the transformer side copper bars by fitting the fasteners in the proper order, as shown below.



- Use M12 bolts for connection on the SG1100UD inverter. The recommended torque is 60–70N.m.
- Use M16 bolts for connection on the SG1100UD×2~SG1100UD×4 inverters. The recommended torque is 119–140N.m.



No.	Name	No.	Name
A	Nut	D	AC copper bar
B	Spring washer	E	Copper bar of the transformer
C	Flat washer	F	Bolt

6.7 Communication Wiring

The inverter communication wiring is implemented within the bottom Smart Unit Board. The Smart Unit Board can be configured with an ISO100 insulation monitoring device.

Composition of Smart Unit Board

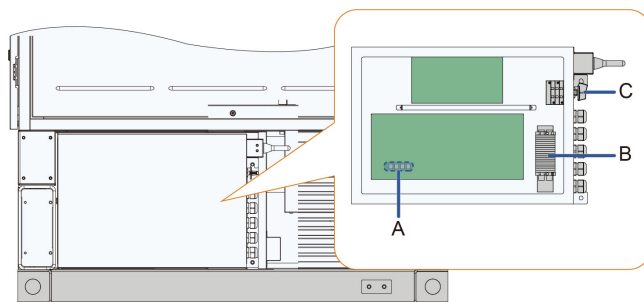


figure 6-13 Typical Composition of Smart Unit Board

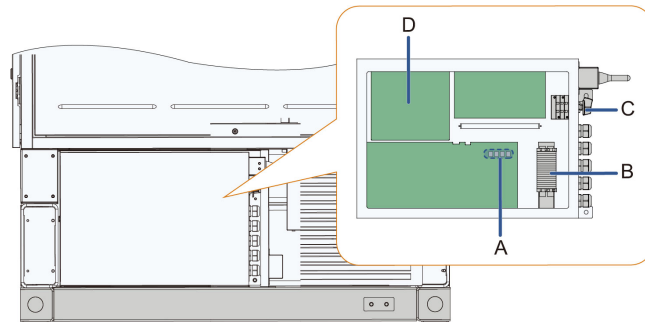


figure 6-14 Composition of Smart Unit Board with ISO100 Insulation Monitoring Device

table 6-2 Composition of Smart Unit Board

Mark	Description
A	Ethernet port
B	RS485 port
C	Smart Unit switch QS3
D	ISO100 insulation monitoring device

6.7.1 RS485 Communication

table 6-3 Port Mark and Definition (Example)

Marks	Plug-compatible Devices
Reserved RS485	PVS, meteo station, electricity meter, transformer, etc.

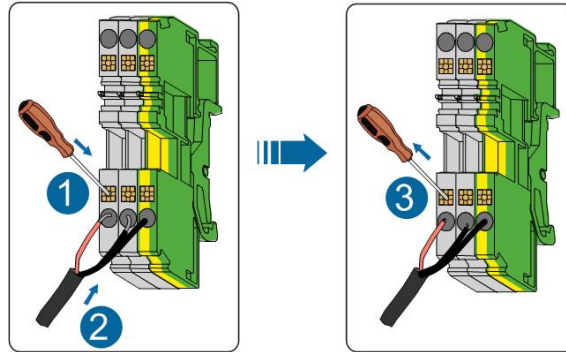
Take one cable as an example.

Step 1 Use a wire stripper to strip off the RS485 shielded twisted pair.

Step 2 Press the metal plate above the terminal with a screwdriver.

Step 3 Insert the cable into the corresponding wiring hole.

Step 4 Loosen the screwdriver, the metal plate returns and compresses the cable.



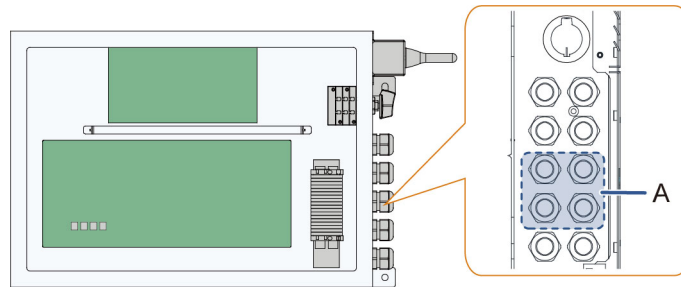
* The figure is for reference only. The product received may differ.

-- End

6.7.2 Ethernet Communication

Overview

Ethernet communication port located at the lower part of the main inverter unit, as indicated by A in the following figure.



Procedure

Connect external monitoring devices to the Ethernet port by a CAT-5e cable.

6.8 Check After Wiring

6.8.1 Inspection

Check the wiring thoroughly and carefully when all electrical connections have been completed.

- Seal the gap between cables and the wiring holes with fireproof and waterproof materials.
- Put all protective covers back in place firmly.

⚠ WARNING

When the wiring is completed, check for the wiring correctness and then seal the gap between cables and 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 MV Grid-connected PV Inverter.

⚠ WARNING

Put up highly visible warning signs near the product's upstream and downstream switches, to prevent safety incidents caused by accidental switching on.

6.8.2 Locking Cabinet Door

Step 1 Release the fixing doors of the inverter unit cabinet and the power distribution cabinet. Unfix in reverse of the fixing method , refer to "6.3.2 Open the Product Door".

NOTICE

It is forbidden to close the door forcibly when the door is fixed.

Step 2 Lock the cabinet door and pull out the key.

⚠ DANGER

Electric shock hazard!

Be sure to lock the cabinet door. Otherwise, non-professionals may be exposed to the running machine, and it may cause casualties.

-- End

7 Powering up and Powering down

7.1 Safety Instructions

DANGER

When the product is working:

- It is strictly forbidden to touch the live parts of the product. Otherwise, an electric shock may occur.
- It is strictly prohibited to disassemble any parts of the product. Otherwise, an electric shock may occur.
- It is strictly prohibited to touch any hot parts of the product (such as the heat sink). Otherwise, it may cause burns.

DANGER

Even if the MV Grid-connected PV Inverter is shut down, it may still be hot and cause burns. Operating the MV Grid-connected PV Inverter with protective gloves after it cools down.

WARNING

Press the emergency stop button only when the product fails or an emergency occurs to ensure that the product responds quickly.

WARNING

The product can only be put into operation after confirmed by a professional and approved by the local power department.

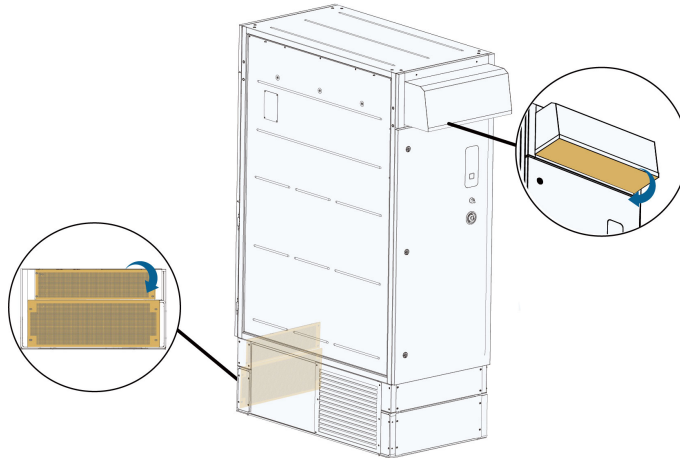
WARNING

For the product with a long shutdown time, it must be checked thoroughly and carefully to ensure all indexes are acceptable before being powered on.

7.2 Powering Up Operations

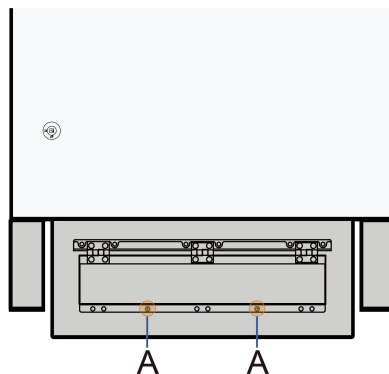
7.2.1 Removing Film on Product

The highlighted parts of the inverter unit in the figure below are covered with films. Be sure to remove the film before the product is officially put into operation.



7.2.2 Removing Pressure Relief Screw

Be sure to remove the pressure relief screws at the bottom of the inverter unit (marked as A in the figure below) before the product is officially put into operation.

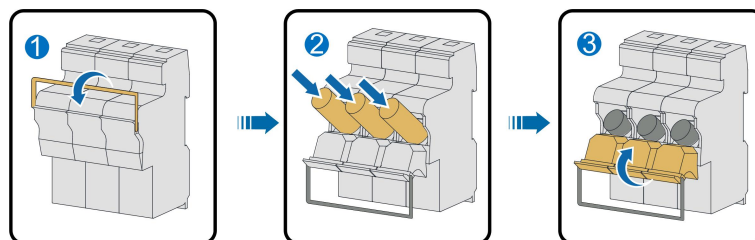


7.2.3 Installing Fuse in AC SPD

Step 1 Open the fuse holder in the AC side. (SPD fuse position, see "3.3.2 .")

Step 2 Insert fuses.

Step 3 Close the fuse holder in the AC side SPD.



-- End

7.3 Inspection Before Powering Up

7.3.1 Inverter Unit

- Ensure that the AC and DC switches and all internal miniature circuit breakers are disconnected.
- Check and ensure that the emergency stop button is released .
- Check various upstream and downstream electrical switches and buttons, as well as those on the inverter unit, to make sure that they can be operated flexibly and meet the requirements.
- Check whether the film at the air inlet and outlet are removed.
- Check whether the pressure relief screw has been removed.
- Check whether the fuse is installed in the AC SPD.

7.3.2 PV Array

The DC side voltage shall not exceed the maximum DC voltage allowed for the MV Grid-connected PV Inverter. Otherwise, the MV Grid-connected PV Inverter may be damaged and even cause safety accidents.

To ensure the stable and efficient operation of the whole system, it is recommended that batteries connected to an the MV Grid-connected PV Inverter should be of the same type and from the same manufacturer, and the number of batteries connected in series should be the same.

7.3.3 Checking Grid Voltage

- Measure accurately the grid 3-phase line-to-line voltages: L1-L2, L1-L3, and L2-L3. The voltages should not exceed the grid permissible voltage and the three phases are in balance.



Adjust the transfer ratio of the transformer by qualified personnel if the grid voltage deviation is large.

- Measure and record the grid frequency. Measured data should not exceed the grid permissible frequency.
- Measure the THD and check the curve if possible. the MV Grid-connected PV Inverter will stop running if the THD is serious.
- Record accurately all the measured data.

7.4 Powering Up Steps

Step 1 Turn on the maintenance switch QS2 of all inverter units, the maintenance switch QS3 at the bottom of the inverter unit.

Step 2 Click “**Overview**” → “**General Information**” and click “**Shutdown**” in the “**Shortcut Menu**” on the Web page to shut down the inverter.

Step 3 Check and ensure that the “**Access Protection Enabling**” switch is off on the Web page.

Step 4 Turn on the output switch of the upstream PVS.

Step 5 Turn on the DC load switch QS1 inside all inverter units, and close the cabinet doors.

Step 6 Rotate the “**Start/Stop**” knob to the “**Start**” position.

Step 7 Start the inverter on the Web page, and the inverter begins to enter the grid-connected operation state.



For the position of the above switches, please see "[3.3.2 Internal Structure of Inverter Unit](#)"

-- End

7.5 Powering Down Operations

7.5.1 Planned Powering Down

WARNING

After the equipment stops running, wait at least 20 minutes, and then check and ensure that the voltage is within a safe range. Then, perform maintenance or overhaul by following the instructions on the warning signs on the equipment.

Step 1 Click “**Overview**” → “**General Information**” and click “**Shutdown**” in the “**Shortcut Menu**” on the Web page to shut down the inverter.

Step 2 Rotate the “**Start/Stop**” knob to the “**Stop**” position.

Step 3 Disconnect the output switch of downstream and upstream.

Step 4 Open the AC cabinet door, check and ensure that the AC circuit breakers QF1 of all inverter units are all in the open state.

Step 5 Turn off the maintenance switch QS2 of all inverter units, the maintenance switch QS3 at the bottom of the inverter unit.

Step 6 Open the DC cabinet door, turn off the DC load switch QS1 inside all inverter units.

Step 7 Inverter stops running.



For the position of the above switches, please see "[3.3.2 Internal Structure of Inverter Unit](#)"

-- End

7.5.2 Unplanned (Emergency) Powering Down

Step 1 Press the emergency button.

DANGER

Upon pressing the emergency stop button, only the AC circuit breaker and DC load switch will open. The internal auxiliary power supply and PCB board will still carry voltage. Do not touch them!

Step 2 Rotate the **Start/Stop** knob to the **Stop** position.

Step 3 Disconnect the output switch of downstream and upstream.

Step 4 Open the AC cabinet door, check and ensure that the AC circuit breakers QF1 of all inverter units are all in the open state.

Step 5 Turn off the maintenance switch QS2 of all inverter units, and the maintenance switch QS3 at the bottom of the inverter unit.

Step 6 Check and ensure that the DC side load switch QS1 of all inverters is disconnected.

Step 7 Inverter stops running.



For the position of the above switches, please see "[3.3.2 Internal Structure of Inverter Unit](#)".

WARNING

- In case of an emergency, be sure to press the emergency stop button directly to make the equipment stop immediately.
- After the emergency stop button is pressed, the AC circuit breaker and the DC load switch will switch off. However, the internal auxiliary power supply and the PCB board will still carry voltage. Do not touch!
- The emergency stop button will be locked once it is pressed. It can be unlocked using the dedicated key.

-- End

8 O&M on WEB

It is recommended to perform O&M on the WEB interface after the device is powered on.

8.1 Communications Diagram

The wiring between the internal devices of the MV grid-connected inverter has been completed before delivery. Connect the laptop with the switch inside the power distribution cabinet with the CAT-5e cable on site. After that, the Web interface can be accessed on a laptop.

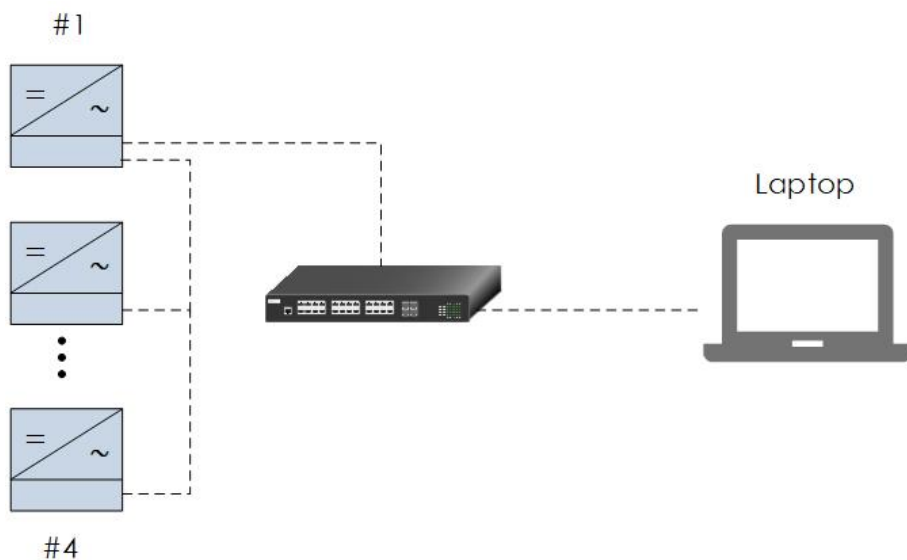


figure 8-1 Wired Communication Diagram

A wireless communication module is embedded inside the inverter, and the Web interface can also be accessed through mobile devices such as mobile phones.

Note: Ensure that the distance d between the front of the #1 inverter and the mobile device meets the requirements:

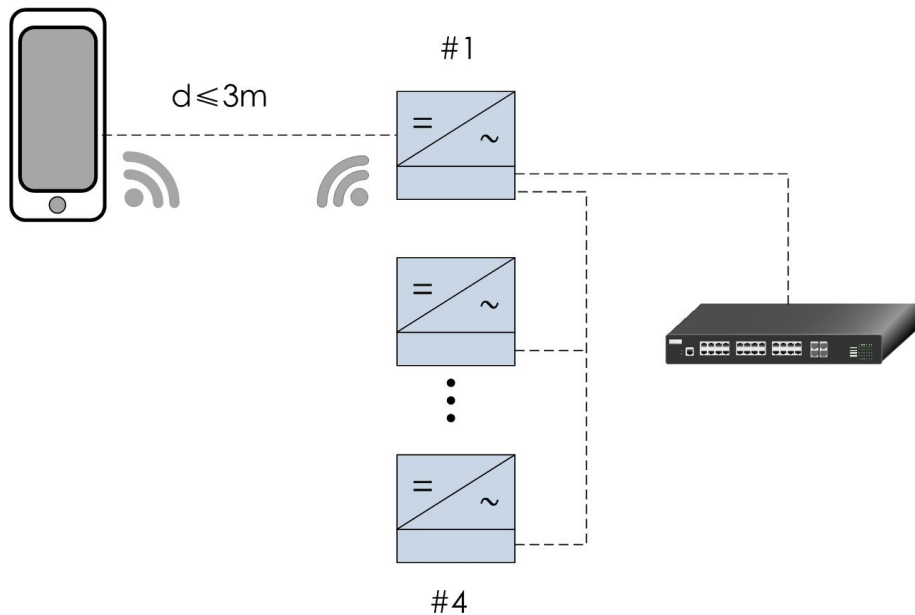


figure 8-2 Wireless Communication Diagram

8.2 Preparation Before Login

8.2.1 Login (Laptop)

Step 1 To connect the laptop to the product, connect the network cable to the network port of the PMD switch.

Step 2 Configure the IP address of the laptop. Set the IP address of the laptop to the same network segment as the NET1 address of the smart unit board.



Default IP address of the NET1 port: 12.12.12.12.

Default IP address of the NET2 port: 14.14.14.14.

-- End

8.2.2 Login (Mobile Device)

Step 1 Enable WiFi on the mobile device (such as a mobile phone), search for the hotspot, such as SG-xxx (xxx represents the device SN), and enter the password. The password is **ESPWifi@123**.

Step 2 Open a browser on the mobile phone and enter the address (11.11.11.1) or domain (sungrow.net) to access the WEB interface.

-- End

8.3 Login Steps

Step 1 Enter the server address to enter the homepage as a visitor by default.

Laptop:

- NET1 port, URL: 12.12.12.12.
- NET2 port, URL: 14.14.14.14.



Mobile device:

URL:11.11.11.1.

Step 2 Click and select the desired language in the upper right corner of the interface.

Step 3 Click to enter the login interface.

Step 4 Enter the password and click **Login** to enter the interface as a general user.

Laptop password: pw8888.

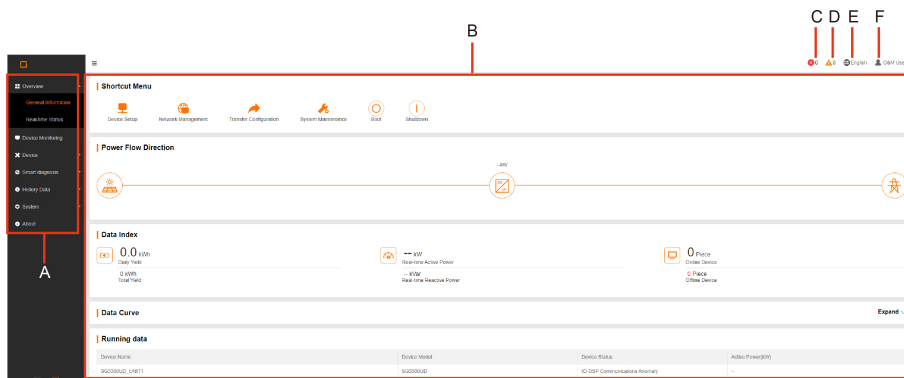


After the initial login, please change the password in a timely manner to avoid pop-up modify password prompts.

-- End

8.4 Interface Introduction

8.4.1 Homepage




No.	Description
A	Navigation bar
B	Function display area
C	Fault number
D	Alarm number

No.	Description
E	Language switching options
F	User center

8.4.2 Viewing Fault Information


Step 1 Click “**Overview**” → “**General Information**” on the left navigation bar to enter the homepage.

Step 2 Click  in the upper-right corner of the interface to view information such as the name and time of the fault event.

-- End

8.4.3 Viewing Alarm Information

Step 1 Click “**Overview**” → “**General Information**” on the left navigation bar to enter the homepage.

Step 2 Click  in the upper-right corner of the interface to view information such as the name and time of the fault event.

-- End

8.4.4 Boot/Shutdown

WARNING

Do not restart the equipment through the WEB system if there is a fault in the DSP or the module. In such cases, perform an inspection after powering off the equipment, ensure there is nothing abnormal, and then power it on again. Otherwise, the equipment may be damaged.

Step 1 Click “**Overview**” → “**General Information**” on the left navigation bar to enter the homepage.

Step 2 Click **Boot** or **Shutdown** in the **Shortcut Menu** , taking SG4400UD as an example.

- If an inverter unit needs to be started, e.g., Unit 1, check **SG4400UD_Unit1** and click **Save** to turn on the unit. If the whole inverter needs to be started, check the inverter model, e.g., **SG4400UD** and click **Save** to turn on the inverter.
- If an inverter unit needs to be shut down, e.g., Unit 1, check **SG4400UD_Unit1** and click **Save** to shut down the unit. If the whole inverter needs to be shut down, check the inverter model, e.g., **SG4400UD** and click **Save** to shut down the inverter.

-- End

8.4.5 Setting Initial Parameters

Step 1 Click “**Device Monitoring**” in the left navigation bar.

Step 2 Pull down “**Country /Region**” to set according to the product location, and pull down “**Machine Choose**” to set according to the actual product model. Click “**Settings**” to complete the initial parameter setting.



The above parameters have been configured before the product leaves the factory.

-- End

8.4.6 Setting Operation Parameters

Step 1 Click “**Device Monitoring**” in the left navigation bar.

Step 2 Select a device in the left device list in the function display area. Click “**Operation Parameters**” on the right. enter a value in “**Current Value**”, and then click “**Settings**”



Click “**Configure Synchronization**”to synchronize the settings to other devices of the same type.

-- End

8.4.7 Setting Protection Parameters

Step 1 Click “**Monitoring**” in the left navigation bar.

Step 2 Select a device in the left device list in the function display area. Click “**Protection Parameters**” on the right. enter a value in “**Current Value**”, and then click “**Settings**”




Click “**Configure Synchronization**”to synchronize the settings to other devices of the same type

-- End

8.5 Modifying Password

Laptop

Click  in the upper-right corner of the interface, select **Modify Password**, enter the original password and new password, and click **Save**.

Mobile Device

Through the laptop interface, select **System** → **WLAN** → **Password**, delete the original password, and enter the new password, click **Save** to complete the password modification.




The password should be a combination of 6 to 32 letters and digits.
Reconnect and log in after password change.

8.6 Logout

To protect the account security, it is recommended to log out in time after the operation is completed.

Exit Method

Click  and select **Logout** in the upper right corner of any interface.

9 O&M on iSolarCloud App

After the device is powered on, except on the Web interface, you can also perform simple O&M of devices on the iSolarCloud App.

9.1 About iSolarCloud

With iSolarCloud App, communication between the inverter and the mobile device can be established via WLAN, thus allowing for mobile maintenance of inverters. Users can then view the information and alarm messages of the inverter and set its parameters on the App.



User interfaces presented in this manual come from V2.1.6 iSolarCloud App intended for Android devices, which may be different from those actually shown on your screen.

9.2 Function Overview

You can check and set relevant parameters on the iSolarCloud App. Functional modules of the App are shown as follows.

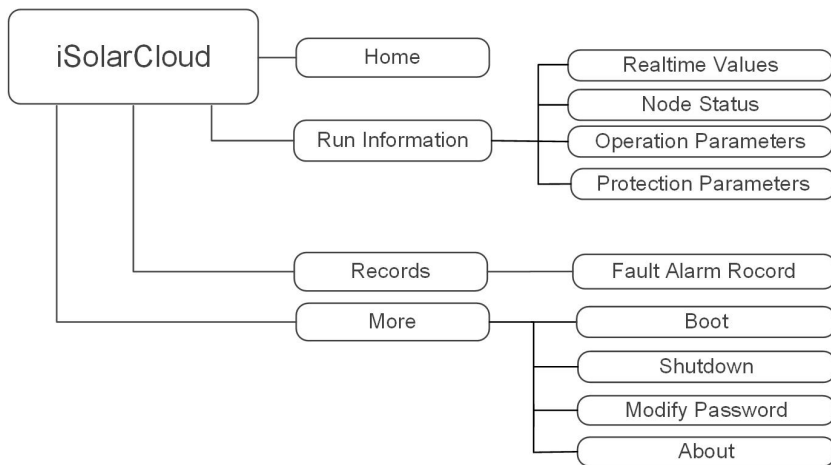


figure 9-1 Functional Tree of the iSolarCloud App

9.3 Download and Installation

Option 1

Search for "iSolarCloud" in the following app stores, and download and install the App.

- MyApp/Yingyongbao (Android, mainland China users)

- Google Play (Android, users outside mainland China)
- App Store (iOS)

Option 2

Scan the QR code below, and download and install the App by following the onscreen instructions.



Once installed successfully, the iSolarCloud icon will appear on the screen.



9.4 Login

9.4.1 Requirements

Before logging in to the App, please make sure:

- The AC and DC side of the inverter are powered on.
- WLAN is enabled on your mobile device (e.g., mobile phone).
- WLAN has been turned on for the SCU inside the inverter. Method: Log in to the SCU Web system, choose “**System**→**Port Parameter**→**WLAN**”, and confirm that the **AP hot-spot enable switch** is set to **Enable**.



Up to 5 mobile devices can be paired with the inverter over WLAN.

9.4.2 Login Steps

Step 1 Turn on WLAN on your phone, search for the WLAN hotspot named “**SG-A1234567890**”, and enter the password to connect to the WLAN network. The default password is **ESPWifi@123**.



- The hotspot name “**SG-A1234567890**” is for illustration only. Please refer to the actual S/N of the product.
- You can change the hotspot name as needed.

Step 2 Open the iSolarCloud App. On the login screen, tap **Local Access** at bottom left.

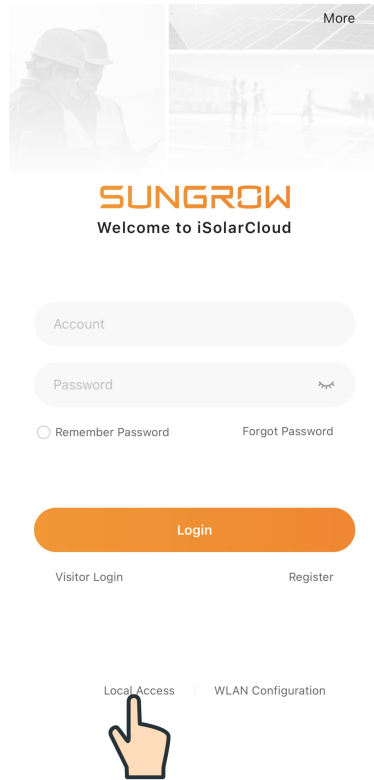


figure 9-2 Local Access

Step 3 A confirmation dialog will pop up on the screen, which is shown below. Tap **Confirm** to connect to the device.

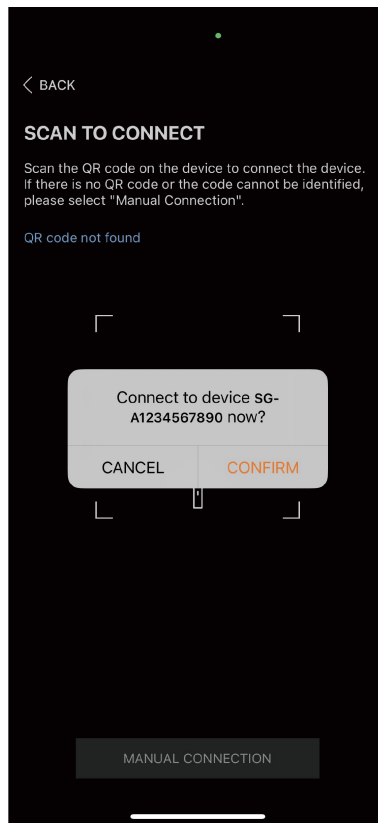


figure 9-3 Login Confirmation

Step 4 Tap **More**, and enter the account name and password to log in. The default account name is “user” and password is **pw8888**. Then, tap **Verification**.

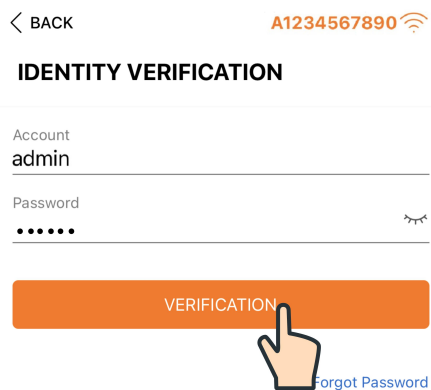


figure 9-4 Identity Verification



To keep your account secure, please change the password as soon as possible.

Step 5 Once logged in, you will go to the Home screen of the App.

-- End

9.5 Home

Once logged in, you will go to the **Home** screen, as shown below.

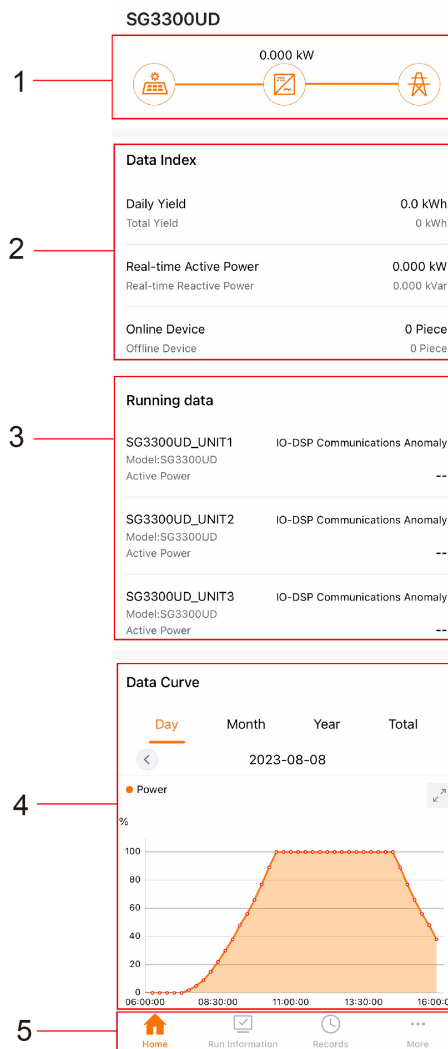


figure 9-5 Home Screen

table 9-1 Description of Modules on the Home Screen

No.	Item	Description
1	Power Flow	Displays information such as generated output and feed-in power of the PV system are shown here. Arrows between the icons indicate that there is energy flowing between the devices. The direction in which the arrow points indicates the direction of the energy flow.
2	Data Index	“Daily Yield”, “Real-time Active Power”, “Online Device”, etc.
3	Running Data	Displays information such as the model, active power, and faults of the device/inverter unit.

No.	Item	Description
4	Data Curve	Shows the daily yield curve by default. You can also switch to check the monthly, yearly, or total yield curve. The curves shown here are based on power.
5	Navigation Bar	Includes "Home", "Run Information", "Records", and "More".

9.6 Run Information

Tap **Run Information** in the navigation bar. You will then see the screen below.

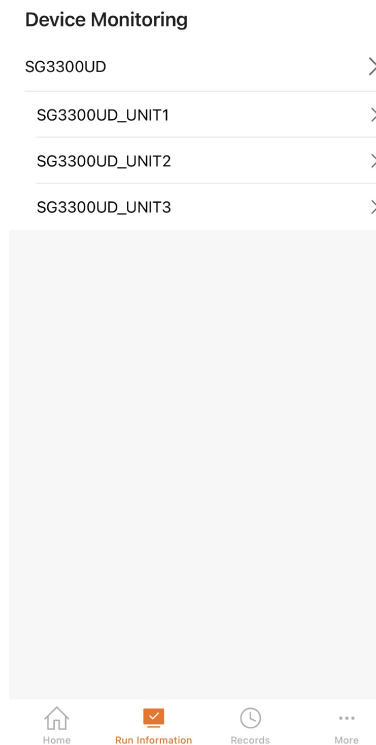


figure 9-6 Run Information

Run information includes "Realtime Values", "Node Status", "Operation Parameters", and "Protection Parameters". You can tap the drop-down arrow on the right to check the detailed parameter information.

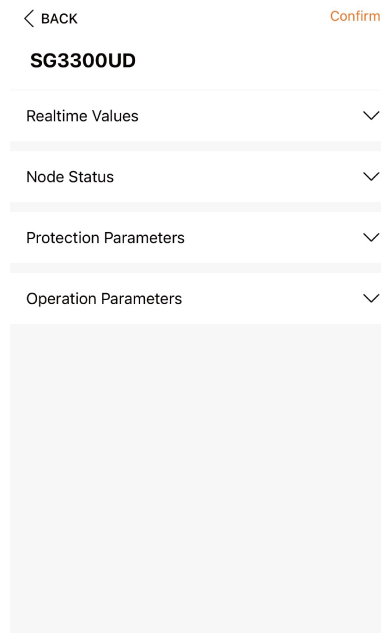


table 9-2 Description of Run Information

Item	Description
Realtime Values	Data such as daily/monthly/annual yield, and DC/active/reactive power.
Node Status	Information related to Local Emergency Stop and MV node status, etc.
Operation Parameters	Information such as the time of startup, and MPPT voltage upper and lower limits.
Protection Parameters	Information related to Active Island and Passive Island Detection, etc.

9.7 Records

Tap **Records** in the navigation bar to go to “Records”, as shown below:

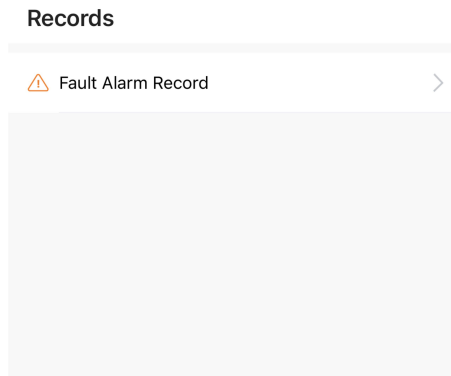


figure 9-7 Records

Fault Alarm Record

Tap **Fault Alarm Record** to check the fault alarm history, which is shown as follows. You can tap the drop-down arrow to the right of **SG3300UD_UNIT1** and check the fault alarm records of the inverter unit, whole inverter, or SCU as you want.

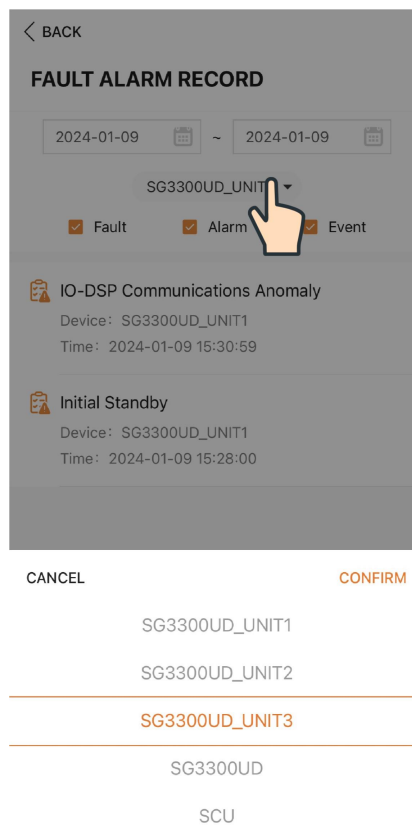



figure 9-8 Fault Alarm Record



Tap  to view the record within a specific period of time.

You can choose an item from the record list, and tap it to view its detailed information.

9.8 More

Tap **More** in the bottom navigation bar. Functions such as “Boot”, “Shutdown”, and “Modify Password” are available on this screen.

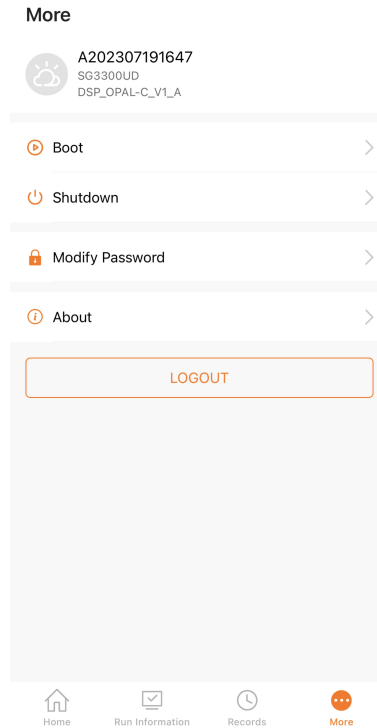


figure 9-9 More

9.8.1 Boot/Shutdown

You can choose Boot/Shutdown, and select a device to start/stop it. The user interface is shown as follows.

< BACK

BOOT

SG3300UD

SG3300UD_UNIT1

SG3300UD_UNIT2

SG3300UD_UNIT3

Select All

Continue to boot


S


9.8.2 Modify Password


You can choose “**More**→**Modify Password**” to change your password. The user interface is shown as follows.

< BACK

MODIFY PASSWORD

Old Password 

New Password 

Confirm New Password 

OK

10 LCD Menu Operation (Optional)

10.1 LCD TouchScreen

The eye-level LCD touchscreen inside the monitoring window on the front side of the product is used by the user to view data and set parameters.

i For user convenience, there are a large number of pictures of the LCD interface are provided in this chapter. The parameters and other details in those pictures are indicative only. The actual product you receive may differ.

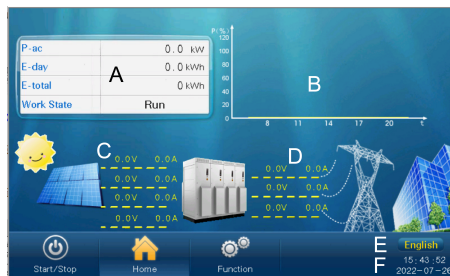
i If the time shown on the LCD panel is different from the actual local time after time calibration, check the button cells on the back of the LCD panel and replace them if necessary.

10.2 Default Screen

10.2.1 Initialization

After the product is powered on, the LCD screen will enter the initialization screen by default. After initialization, the default screen will appear.

10.2.2 Default Screen Introduction



No.	Description
A	Yield data. The first line on the top indicates the present active power, and the work state is the transient state of the MV Station.
B	Today's active power curve indicating the power percentage (power value/the MV Station nominal power value).
C	DC side voltage and current of the MV Station.
D	AC side line-to-line voltage and phase current.

No.	Description
E	Language selection button. Click it to switch languages in multiple languages.
F	Present date and time.

Enter the following submenus from the default menu.

10.2.3 Backlight and Screensaver

If no operation has been performed on the screen for more than 5 minutes, the backlight will go off. Tap the screen to activate the backlight so that the latest interface reappears.

10.3 Overview of Submenu and Icon

There are three buttons on the lower left side of the touch panel: for the user to operate

“Start/Stop” , “Home”,  , “Function”  . The user can perform related operations via these buttons. The logical structures of these menus are shown below:

Main Menu	First sub-menu	Second sub-menu	Third sub-menu
Start/Stop	Start	-	-
	Stop	-	-
Home	-	-	-
Function	Set-parameter	Control Mode	SG1100UD
			SG2200UD
			SG3300UD
			SG4400UD

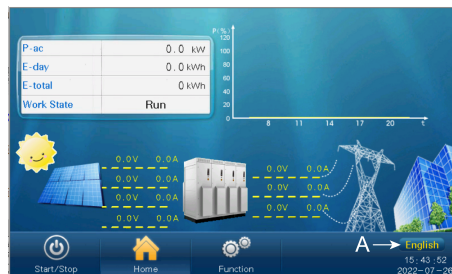
The control mode is subject to the actual product.

10.4 Setting Language

The language setting shortcut (shown by A) is at the lower right corner of the Home menu. Select either language by tapping the language button.

By tapping the button, the language will switch among English, Chinese and the like.

The language displayed on the button is the present display language.

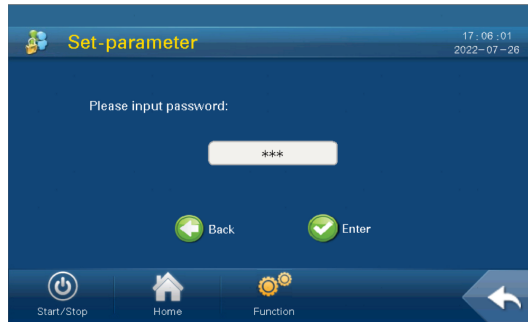


10.5 Setting Control Mode

Product control mode are protected by password.

Proceed as follows to enter the password:

Step 1 Tap "Function" from the default menu, and the password entering window pops up.



Step 2 Tap the white edit box and a keypad pops up.

Step 3 Enter the password 1111 through the keypad.

Button	Function
←	Backspace key, delete the digit input
Clr	Clear the digitals input
Esc	Escape and close the keypad
Enter	Confirm the password entered
Max./Min.	The maximum and minimum value can be input; digital outside this range is invalid

If the input password is correct, the parameter setting page pops up, and the user can set the control mode.

-- End

11 Troubleshooting

If the inverter fails to output as expected or the power yield changes abnormally, check the following items before consulting SUNGROW:

- The open-circuit voltage of PV arrays
- Whether the emergency stop button is pressed
- Whether the inverter limits the output of active power

If the problem still persists or there are any other questions, please contact SUNGROW. It would be helpful if the following information is provided during a call:

- Model and S/N of the inverter and internal equipment
- Manufacturer and model of the upstream PVS and PV modules that connected to the inverter
- Communication and connection scheme of the inverter
- Fault information and a brief description of the fault
- Pictures of the fault occurrence site (if on-site conditions permit)

11.1 MV Grid-connected PV Inverter Troubleshooting

11.1.1 Viewing Fault/Alarm Information

View the fault and alarm information referring to ["8.4.2 Viewing Fault Information"](#) and ["8.4.3 Viewing Alarm Information"](#).

11.1.2 Check Method

There are three levels of anomalies:

- Important fault: The inverter fails, shuts down, and stops grid-connected power generation.
- Secondary fault: Some parts of the inverter fail, but the inverter can still generate power in a grid-connected state.
- Prompt for fault: The inverter works normally, but its output power decreases due to external factors.

Fault Name	Fault Cause	Fault Level	Corrective Method
Module fault	The drive board generates a fault signal or a hardware over-current occurs.	Important	<ol style="list-style-type: none"> 1. Check whether a short circuit occurs on the AC or DC sides of the inverter. 2. Check the grid for any exceptions. 3. Check whether the appearance of the internal module is normal. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NOTICE</p> <p>The inverter has a protection logic that in case of failure of 5 attempts to perform self-tests, it enters in a non-selfrecovery state (it is recommended to wait for 15 minutes for this purpose; meanwhile the power is not cut off on control boards). In this case, do not attempt to power it off and try to restore the inverter, instead, contact SUNGROW personnel for the support.</p> </div>
Contactor fault	The contactor is faulty.	Important	Disconnect the AC and DC side switches of the inverter, and check whether the appearance of the AC contactor is obviously abnormal after the inverter is completely discharged.
AC imbalance	AC current is unbalanced.	Important	<p>Check the grid for anomalies.</p> <p>Check if there is a phase loss.</p>

Fault Name	Fault Cause	Fault Level	Corrective Method
Reactor over-temperature	The temperature of the reactor is excessively high.	Important	<ol style="list-style-type: none"> 1. Use a thermometer to check whether the current ambient temperature is within the temperature range advertised by the inverter. 2. Check whether the air inlet of the inverter and the inverter unit is normal. Make sure that the air inlet is not blocked, and replace the filter screen if necessary. 3. In the shutdown state, check whether the internal cooling fan of the inverter is stopped by foreign objects.
Control cabinet temperature fault	The temperature inside the control cabinet is excessively high	Important	<ol style="list-style-type: none"> 1. Check whether the grid voltage is normal. 2. Check whether the control fan is normal. 3. Check the AC filter system. Check whether there are abnormalities on the surface of the AC filter capacitor, such as cracking. If necessary, check whether the three-phase current of the capacitor is balanced.
DC under-voltage	DC input voltage is excessively low.	Important	<ol style="list-style-type: none"> 1. In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value. 2. If not, check whether the DC side cables are shorted or wrongly connected.
DC (Bus) under-voltage	DC bus voltage is excessively low.	Important	Please refer to the troubleshooting method of "DC under-voltage".

Fault Name	Fault Cause	Fault Level	Corrective Method
Neutral point shift	Voltage exists between the positive and negative poles of the DC side of the inverter and the neutral point potential.	Important	<p>1. Check whether the DC side voltage of the inverter is short-circuited, whether the input voltage exceeds the allowable range, and whether the grid voltage is abnormal.</p> <p>2. Check whether DC over-voltage, DC under-voltage, module fault, AC over-current, and other faults exist at the same time in the historical fault interface. If so, refer to the troubleshooting methods of related faults.</p>
Abnormal temperature	If the temperature at the inverter inlet exceeds the protection threshold, this fault is triggered.	Important	<p>1. Check whether the ambient temperature is normal; Use a thermometer to check whether the current ambient temperature is within the temperature range advertised by the inverter.</p> <p>2. Check whether the air inlet of the inverter and the inverter unit is normal; Make sure that the air inlet is not blocked, and replace the filter screen if necessary.</p> <p>3. In the shutdown state, check whether the cooling fan inside the inverter/inverter unit is stopped by foreign objects.</p>
DC cabinet over-temperature	The temperature inside the DC cabinet is excessively high	Important	Refer to the troubleshooting method of “Abnormal Temperature”.

Fault Name	Fault Cause	Fault Level	Corrective Method
Grid over-voltage	The grid voltage is higher than the set protection value.	Important	<p>1 Check whether the protection parameters in Parameter Settings -> Protection Parameters meet the grid standards of the location where the inverter is installed.</p> <p>2 Disconnect the AC switch and measure whether the actual grid voltage is within the normal range.</p> <p>3 In the shutdown state, check whether the grid voltage displayed on the inverter is consistent with the measured value.</p>
Grid under-voltage	The grid voltage is lower than the set protection value.	Important	Refer to the troubleshooting method of "Grid over-voltage".
Frequency fault	The grid frequency is abnormal.	Important	<p>1 Check whether the protection parameters on the interface meet the grid standards of the location where the inverter is installed.</p> <p>2 In the shutdown state, check whether the grid frequency displayed on the inverter is consistent with the actual value.</p>
Islanding protection	The power grid fails or the AC instantaneous voltage exceeds the protection threshold.	Important	<p>1. Check the grid for any exceptions.</p> <p>2. Check whether a short circuit occurs on the AC side of the inverter.</p> <p>3. Check whether the AC circuit breaker of the inverters is disconnected.</p>

Fault Name	Fault Cause	Fault Level	Corrective Method
Control power exception	The control power is abnormal.	Important	<p>1 Check whether the internal and external power supply control switches of the inverter are closed or disconnected at the same time.</p> <p>If they are closed at the same time, please disconnect one of the switches.</p> <p>If they are disconnected at the same time, please close one of the switches.</p> <p>2 Check whether the internal and external power supply terminals are loose or poorly contacted. Tighten them if necessary.</p>
DC voltage sampling fault	The DC voltage sampling is abnormal.	Important	<p>In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value.</p>
Soft start fault	The inverter fails to start.	Important	<p>Check whether the power grid is abnormal, such as harmonics and voltage balance.</p>
DC SPD fault	The DC side SPD of the inverter fails.	Important	<p>Check the status indicator of the SPD.</p> <p>1. If the indicator changes from green to red, the SPD is damaged. It may be caused by local thunderstorms. Measure the AC and DC voltage and current. If voltages between the positive and negative poles to the ground are normal, replace the SPD.</p> <p>2. If the indicator is normal, the SPD may be in poor contact with its holder. Replug the SPD and tighten it.</p>

Fault Name	Fault Cause	Fault Level	Corrective Method
AC SPD fault	The AC side SPD of the inverter fails.	Important	<ol style="list-style-type: none"> 1. Refer to the troubleshooting method of "DC SPD fault" to conduct preliminary troubleshooting. 2. Check whether the miniature circuit breaker is connected in series with the SPD trips. 3. If not, measure the AC and DC voltage and current. Ensure that there is no exception, and close the miniature circuit breaker again.
DC over-voltage	The DC side voltage of the inverter exceeds the protection threshold.	Important	<p>Disconnect the DC switch of the inverter and check whether the open-circuit voltage of the PV arrays is normal; If not, the PV array configuration may be faulty.</p> <ol style="list-style-type: none"> 2. Check and ensure that the AC side transformer is connected in a "Y" shape, and that the neutral point is not grounded. 3. In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value.
PV polarity reversal	The polarity of the positive and negative poles of the PV strings is reversed.	Important	Check whether the DC side cables of the inverter are connected reversely.
Hardware fault	Inverter internal hardware fault	Important	Measure the DC voltage of the inverter and check whether a short circuit occurs in the inverter.
AC over-current	AC side current of the inverter is excessively high.	Important	<ol style="list-style-type: none"> 1. Check whether cables on the AC and DC sides of the inverter are loose. 2. Check whether the insulation layer of cables is damaged. 3. Check whether terminals are short-circuited and grounded.

Fault Name	Fault Cause	Fault Level	Corrective Method
Overload protection	The output of the inverter exceeds the load limit.	Important	Refer to the troubleshooting method of "AC over-current".
AC leakage current protection	The leakage current sampling value on the AC side of the inverter exceeds the protection threshold.	Important	<ol style="list-style-type: none"> 1. Check whether the AC cable is damaged. 2. If the LV side of the transformer is connected in a "Y" shape, ensure that the neutral point is not connected.
Module over-temperature	The temperature of modules inside the inverter is excessively high.	Important	<ol style="list-style-type: none"> 1. Check the air inlet. 2. Check whether the air outlet of the inverter is blocked. Replace the air filter screen if necessary. 3. Check whether the cooling fan is running during the operation of the inverter.
Fan/ Fan 2 exception	Fan/fan 2 inside the inverter fails.	Important	<ol style="list-style-type: none"> 1. Check whether the grid voltage is normal. Use a multimeter to measure the grid voltage and check for phase loss. 2. Check whether the power supply of the cooling fan is normal. Use a multimeter to measure the three-phase power supply to ensure that the rated input voltage is 400 Vac.

Fault Name	Fault Cause	Fault Level	Corrective Method
Grounding fault	A grounding fault occurs.	Important	<p>1 Check the DC cables.</p> <p>Check whether the positive grounding cable of each DC branch is damaged.</p> <p>Check whether the DC cable resistance to the ground is normal.</p> <p>2 Check AC cables.</p> <p>Measure the three-phase voltage to ground and observe whether the voltage value is the same. Check the inverter and the box-type substation side SPD for damage.</p>
AC switch fault	AC switch fails.	Important	<p>1. Check whether the AC switch trips.</p> <p>2. Check whether the appearance of the switch is normal.</p> <p>3. Check whether the AC switch can be normally closed/disconnected.</p> <p>4. Use a multimeter to measure whether the AC switch normally controls the on/off of the circuit.</p>
Heat sink over-temperature	The temperature of the heat sink inside the inverter is excessively high.	Important	Check whether the cooling fan is normal. If so, check the air duct for blockage.
GFDI-pro	The DC grounding protection fails.	Important	<p>1. The negative terminal of the inverter is not reliably grounded.</p> <p>2. Check whether the negative grounding fuse is blown.</p>
AC fuse fault	The fuse on the AC side of the inverter fails.	Important	Check whether the AC fuse is normal.
Grid voltage imbalance	Grid voltage is unbalanced.	Important	Measure the grid voltage and check for any imbalance.

Fault Name	Fault Cause	Fault Level	Corrective Method
Current Imbalance 2/Current Imbalance 3	The alternating current is unbalanced.	Important	Measure the grid voltage and check for phase loss.
AC cabinet over-temperature	The temperature of the AC cabinet exceeds the protection threshold.	Important	<ol style="list-style-type: none"> 1. Check whether the fans inside the AC cabinet work normally. 2. Check whether the air inlet of the AC cabinet is blocked. 3. Check whether there is dust in the air inlet of the AC cabinet. Clean it if necessary.
DC fuse anomaly	The fuse on the DC side of the inverter fails.	Secondary	<p>Check whether the DC fuse is blown.</p> <p>If so, please contact SUNGROW to replace the fuse.</p>
Anti-PID power abnormality	The anti-PID power is abnormal.	Secondary	<ol style="list-style-type: none"> 1. Check the insulation of AC cables. 2. Check the AC SPD. 3. Check and make sure that the neutral point on the LV side of the box-type substation is not grounded.
External power supply abnormal	The external power supply is abnormal.	Secondary	Use a multimeter to measure and check whether the voltage of the external power supply is abnormal.
Branch air switch abnormal	The air switch of the DC branch of the inverter is abnormal.	Secondary	Check whether the branch air switches are all closed, and check whether the state of them is Closed on the interface.
CT imbalance	The three-phase grid current is out of balance.	Secondary	Check whether the three-phase AC current is balanced on the interface.

Fault Name	Fault Cause	Fault Level	Corrective Method
Grounding fuse anomaly	The grounding fuse is abnormal.	Secondary	Remove the negative grounding fuse after the inverter is fully discharged. Check whether this fuse is blown. If so, check whether the neutral point of the transformer is not connected and whether the neutral point of PT/CT on the LV side of the box-type substation is grounded.
Meter communication abnormal alarm	The meter communication is abnormal.	Secondary	1. Check whether the communication cable of the meter is damaged. 2. Check the communication terminal of the meter is loose.
DC fuse fault	The fuse on the DC side of the inverter fails.	Secondary	Check whether the DC fuse is blown. If so, please contact SUNGROW to replace the fuse.
Branch fuse abnormal	The branch fuse of the inverter is abnormal.	Secondary	Please refer to the troubleshooting method of "DC fuse fault".
Low insulation resistance	The insulation resistance is low.	Secondary	Please refer to the troubleshooting method of "Insulation resistance".
DC switch anomaly	The DC switch of the inverter is abnormal.	Secondary	Check whether the branch air switches are all closed, and check whether the state of them is Closed on the interface.
Frequency deviation active power regulation	The active power of the inverter is regulated according to the change of the grid frequency.	Prompt	Check whether the power reduction at over-frequency is enabled on the interface. If so, it indicates that over-frequency occurs during operation.

Fault Name	Fault Cause	Fault Level	Corrective Method
Voltage deviation reactive power regulation	The reactive power of the inverter is regulated according to the change of the grid voltage.	Prompt	Check whether the reactive power regulation is set to QU Mode on the interface.
GFRT operation	The inverter runs through high voltage and low voltage.	Prompt	Check whether the grid voltage exceeds the set threshold of HVRT or LVRT.

If the fault/alarm cannot be cleared following the above corrective methods and still persists, please contact SUNGROW directly.

Fault Name	Fault Cause	Fault Level	Corrective Method
AC switch off	The AC switch is disconnected.	Important	Please contact SUNGROW.
Carrier sync flt	The carrier signal transmission is abnormal.	Important	Please contact SUNGROW.
Drive board fault	The drive board inside the inverter fails.	Important	Please contact SUNGROW.
Parallel machine communication failure	The communication inside the inverter is abnormal.	Important	Please contact SUNGROW.
Machine code repetition fault	The addresses of the inverter units inside the inverter are the same.	Important	Please contact SUNGROW.
Temperature and humidity board communication abnormal	The communication of the temperature and humidity board is abnormal.	Secondary	Please contact SUNGROW.
Branch reverse over-current	The branch reverse current is excessively large.	Secondary	Please contact SUNGROW.
DSP communication exception	The communication between inverter internal control board and smart unit board is abnormal.	Secondary	Please contact SUNGROW.

11.2 Other Faults

Fault Detail	Possible Cause	Corrective Method
The MV Grid-connected PV Inverter shuts down shortly after startup	The DC input voltage is just enough to start the MV Grid-connected PV Inverter. If the MV Grid-connected PV Inverter is connected to loads, and the voltage cannot meet the requirements, causing the MV Grid-connected PV Inverter to shut down.	Design and connect the battery panel series based on the recommended open-circuit voltage, increase the DC voltage input, and avoid applying the critical voltage value.
Upper computer communication failure	There are many possible reasons, please check one by one according to the description of "Corrective Method".	<p>Check whether the local address, baud rate, and other parameters on the interface are consistent with those on the host computer.</p> <p>Check whether all wiring is good. If RS485 communication is adopted, check whether the A and B terminals are connected reversely.</p> <p>Replace the communication adapter and try again if the communication adapter does not match.</p> <p>If the fault is not caused by the foregoing reasons and still persists, please contact SUNGROW as soon as possible.</p>
WiFi connection unresponsive/failed	Equipment is not compatible.	<ol style="list-style-type: none"> 1. Refresh the Web page manually. 2. Restart or replace the mobile device and try connecting again. 3. Power off and restart the MV Grid-connected PV Inverter to connect again.

Fault Detail	Possible Cause	Corrective Method
<p>Failed is displayed on the operation or protection parameter setting interfaces</p>	<p>There are many possible reasons, please check one by one according to the description of "Corrective Method".</p>	<ol style="list-style-type: none"> 1. Check whether an the MV Grid-connected PV Inverter unit cannot work normally. 2. Check whether the MV Grid-connected PV Inverter unit that works normally can normally accept instructions. 3. Please refer to the troubleshooting method of "DSP communication fault". <p>If the fault is not caused by the foregoing reasons and still persists, please contact SUNGROW as soon as possible.</p>
<p>Fail to export measuring point logs in batches</p>	<p>The amount of data exported at a single time is too large.</p>	<ol style="list-style-type: none"> 1. Export data in batches multiple times. 2. The time interval for exporting data shall not exceed 7 days.

12 Routine Maintenance

12.1 Safety Instructions

⚠ DANGER

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

- **Disconnect the switches between the product and all power supplies before maintenance.**
- **After the inverter is powered off for 20 minutes, measure the voltage and current with measuring equipment. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.**

⚠ DANGER

The devices inside the inverter carry high voltage. Touching these devices may lead to fatal electric shock.

Therefore,

- **Live line measurement can only be performed by professional personnel who know the PV system well. Before measurement, be sure to take proper protection methods (e.g., wear insulating gloves, etc.).**
- **During live line measurement, the operator must be accompanied by others to ensure personal safety.**

⚠ DANGER

Electric shock or fire may occur due to device damage or system fault.

- **Visually inspect for device damages or other hazards before the operation**
- **Check whether other external devices or circuit connections are in a safe state.**
- **Make sure the device is in a safe state before operating.**

⚠ WARNING

If some devices need to be replaced during operation and maintenance, please contact SUNGROW.

Do not open the door to maintain the product on rainy, humid, or windy days. SUNGROW shall not be held liable for any damage caused by a violation of the notice. For products with long downtime, a comprehensive and detailed inspection of the products must be carried out before powering up the product. First, the product and internal equipment as well as the film at the air inlet and outlet need to be checked for intactness. Then the product should be checked and tested by professionals before commissioning.

⚠ WARNING

Do not open the door to maintain the product on rainy, humid, or windy days. SUNGROW shall not be held liable for any damage caused by a violation of the notice.

⚠ WARNING

Wait for at least 20 minutes after shutdown and then open the cabinet door. Make sure that the inside of the product is completely uncharged before maintaining the product.

NOTICE

Do not leave screws, washers, or other metal parts in the inverter after the maintenance work. Otherwise, damage may be caused to 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 SUNGROW for maintenance. Otherwise, the losses caused are not covered by the warranty.

⚠ CAUTION

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

12.2 Inspection After Power Off



While the product is operating, do not turn off any AC- or DC-side switches directly. Otherwise, an electrical arc may occur, which may then damage the switch or even the inverter.



During the installation and operation of the product, ensure the positive or negative of the PV string is not short-circuited to ground. Otherwise, an AC or DC short-circuit may occur, hence damaging the product. The damage caused therefrom will not be covered by warranty.



Even after the product has stopped running, it may still be hot and cause burns. Wait for it to cool down, then, perform operations on it wearing safety gloves.



Some components of the product (mainly the inverter units) may contain heat-generating parts that remain hot even after the components have stopped operating. Be sure to wear burn-proof gloves or other protective equipment when working on such parts.

- After the equipment is powered off, wait at least 20 minutes before opening its cabinet door.
- Put up highly visible warning signs near the switches that have been switched off, to prevent accidental switching-on.
- Check the insulation.
 - 1 Disconnect all external connections to the inverter and the connections to the internal power supplies.
 - 2 Make sure the points of disconnection will not be reconnected to power accidentally.
 - 3 Test using a multimeter and make sure the equipment is completely voltage-free inside.
 - 4 Make necessary grounding and short-circuiting connections.
 - 5 For the potentially live parts near the area where the operation is performed, cover them with insulated cloth for insulation shielding.
- Do not leave any screw, washer, or other metal part in the inverter during maintenance. Otherwise, the inverter may be damaged.
- In most cases, the protective covers inside the equipment need to be removed before the maintenance work. After completing the maintenance work, mount back all protective covers in their original positions, and make sure the screws are all tightened properly.

12.3 Maintenance Period

12.3.1 Maintenance (Every two years)

Item	Check method
System status and cleaning	<p>Check the following items, and correct immediately those failing to meet the relevant requirements:</p> <ul style="list-style-type: none"> • Check whether there is any damage or deformation of the MV Grid-connected PV Inverter and internal equipment. • Check if there is abnormal noise during the operation of internal equipment. • Check whether the temperature inside the MV Grid-connected PV Inverter is excessively high. • Check whether the humidity and the amount of dust inside the MV Grid-connected PV Inverter are within the normal range. Clean it if necessary. • Check whether the air inlet and outlet of the MV Grid-connected PV Inverter are blocked.
Warning marks	Check whether the warning labels and marks are clearly visible and free of stains and damage. Replace them if necessary.
Ground of the shielded layer of cables	Check whether the cable shielding layer is in good contact with the insulation sleeve and whether the copper bus bar is firmly fixed.
Wiring between the terminal box and switch *	Check whether the terminal box and the switch are connected correctly.
SPD and fuse	Check whether the SPD and fuse are properly fastened.
Corrosion	Check whether there is oxidation or rust inside the MV Grid-connected PV Inverter.

Note: * means optional.

12.3.2 Maintenance (Once A Year)

Item	Check method
Exterior of the inverter	<p>Check the following items, and correct immediately those failing to meet relevant requirements:</p> <ul style="list-style-type: none"> • Check whether there are flammable objects on the top of the inverter. • Check whether the welding points between the inverter and foundation steel plate are firm and if there is corrosion. • Check whether the enclosure of the inverter is damaged, painted, or oxidized. • Check whether the monitoring window and cabinet door can be opened flexibly. • Check whether the sealing strip is fixed properly.
Interior of the inverter	<p>Check whether there are foreign objects, dust, dirt, and condensed water inside the inverter.</p>
Wiring and cable layout	<p>Start to inspect after completely powering down the internal devices of the inverter. For any non-conformances found during the inspection, correct them immediately.</p> <ul style="list-style-type: none"> • Check whether the cable layout is normal and whether there is a short circuit. For any non-conformances found during the inspection, correct them immediately. • Check whether all inlet and outlet holes of the inverter are well sealed. • Check whether water leaks into the inverter. • Check whether the power cables are loose, and fasten them again by the torque specified previously. • Check whether the power cables and control cables are damaged, especially the part in contact with the metal enclosure. • Check whether the insulation tapes on the power cable terminals fell off.
Ground connection and equipotential connection	<ul style="list-style-type: none"> • Check whether the ground connection is correct and the grounding resistance meet the requirements of local standards and regulations. • Check whether the internal equipotential connection is correct.

Item	Check method
Fan	<ul style="list-style-type: none"> • Check the running status of fans. • Check whether the fan blade rotates smoothly. • Check whether there is abnormal noise during the operation of the fans.
Screw	Check whether internal screws fell off.
Exterior of the inverter	<p>Check the following items, and correct immediately those failing to meet relevant requirements:</p> <ul style="list-style-type: none"> • Check whether there are flammable objects on the top of the inverter. • Check whether the welding points between the inverter and foundation steel plate are firm and if there is corrosion. • Check whether the enclosure of the inverter is damaged, painted, or oxidized. • Check whether the monitoring window and cabinet door can be opened flexibly. • Check whether the sealing strip is fixed properly.

12.3.3 Maintenance (Every half a year to once a year)

Item	Check method
Safety function	<ul style="list-style-type: none"> • Check whether the shutdown key on the touchscreen and the e-stop button work normally. • Simulate shutdown. • Check the warning marks and other device marks, and replace them timely if they are fuzzy or damaged.
Software maintenance	Check the settable parameters on the touchscreen.
Internal components inspection	<ul style="list-style-type: none"> • Check whether the circuit board and other components are clean. • Check the temperature of the heat sink and the amount of dust accumulated. Clean heat-dissipation modules with a vacuum cleaner if necessary. • Replace the air filter screen if necessary. <p>Note! Be sure to check the ventilation of the air inlet. Otherwise, the fault may be caused due to overheating if the module cannot be cooled effectively.</p>

Item	Check method
Air inlet and outlet	Check the temperature of the heat sink and the amount of dust accumulated. Clean heat-dissipation modules with a vacuum cleaner if necessary.
Device maintenance	<ul style="list-style-type: none"> • Carry out regular inspection for corrosion of all metal components. • Check the contactor to ensure a normal mechanical operation. • Check the operation parameters (especially voltage and insulation).



The recommended routine maintenance periods in the table are only for reference. The actual maintenance period shall be determined reasonably in consideration of the specific installation environment of the product.

Power plant scale, location, site environment, and other factors also affect the maintenance period of the product. It is necessary to shorten the maintenance period and increase the maintenance frequency in the event of a heavy sandstorm or dust in the operating environment.

12.4 Common Maintenance Items

It is recommended to clean the MV Grid-connected PV Inverter once every six months. If the MV Grid-connected PV Inverter works in harsh environments, such as desert areas, the maintenance cycle should be shortened.

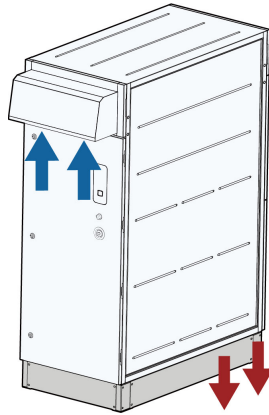
DANGER

Maintenance work on any part of the MV Grid-connected PV Inverter must only be performed when the whole system is voltage-free. Failure to do so may result in electrical shocks!

12.4.1 Cleaning Air Inlet of Inverter

Overview

The following figure shows the heat dissipation mode of the inverter. The air inlet is located at the higher parts of the DC cabinet while the air outlet is located at the lower parts of the AC cabinet.

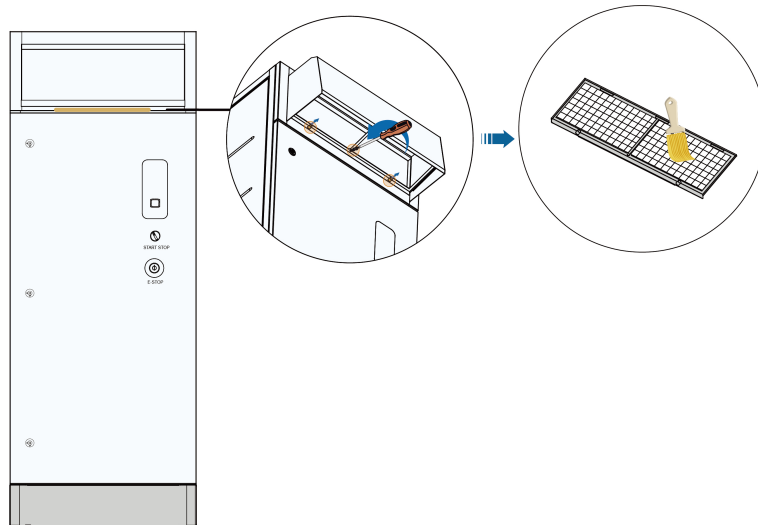


Procedure

Step 1 Use a screwdriver to remove the M5 fixing screws for the first maintenance.

Step 2 Pull the spring plunger at both ends of the filter at the air inlet outward and tilt the filter downward to remove it.

Step 3 Clean and install the filter.



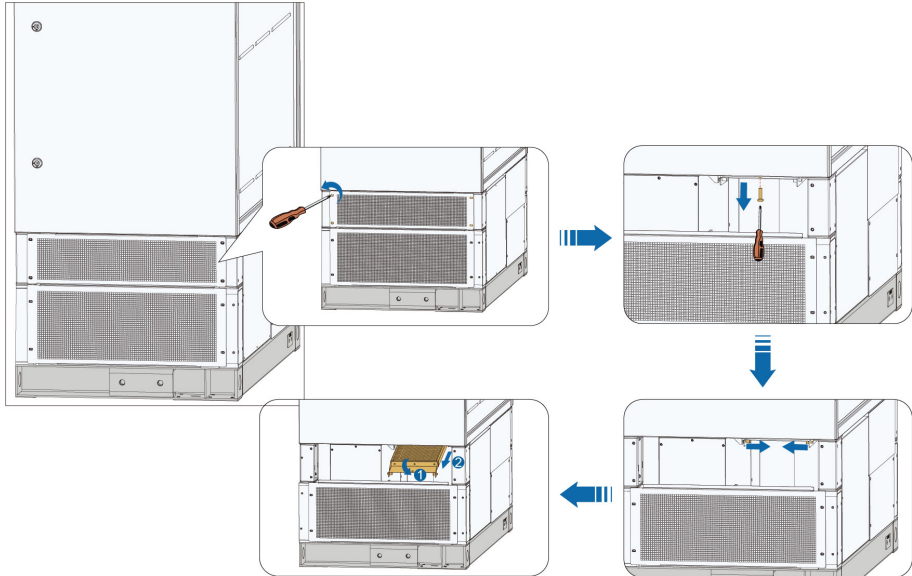
The M5 fixing screw does not need to be reinstalled.

-- End

12.4.2 Cleaning Air Outlet of Inverter

12.4.2.1 With Connection Area at the Bottom

Step 1 Remove the M6 bolts on the sealing plate at the bottom of the AC side of the inverter, and remove the sealing plate.



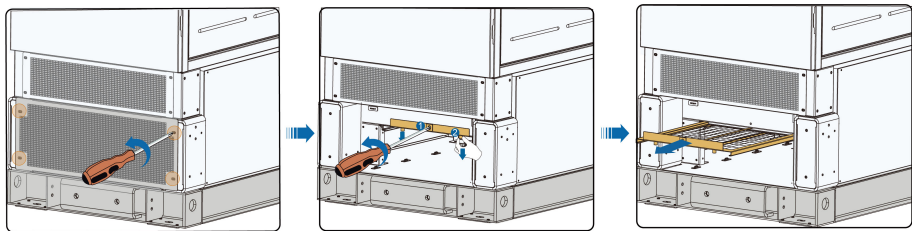
Step 2 Remove the M6 nut on the air outlet filter, take out and clean it.

Step 3 After cleaning, install the filter in reverse steps.

-- End

12.4.2.2 With Connection Area on the Side

The following figure shows the cleaning steps for the air outlet under the sealing plate .



For the cleaning steps , please see "12.4.2.1 With Connection Area at the Bottom"

12.4.3 Appearance Repair

Check the appearance of the product:

Check the appearance of the product:

Case 1: Erasable traces

Case 2: Indelible traces

Case 3: Broken primer



- Check whether the protective paint sprayed on the casing of the product fell off or peeled off. If so, repair it timely.
- Spray a special protective paint to the exterior of the product every 5 years.

12.4.3.1 Erasable Traces

Tools

No.	Name	Source
1	Cleaning cloth	
2	Water	Beyond the scope of supply
3	Alcohol or other non-corrosive detergents	

Step 1 Wet the cleaning cloth (or other scrubbing tools) with water, and scrub the dirty parts on the surface.

Step 2 If the dirt cannot be cleaned with water, scrub with 97% alcohol till the surface is acceptable. (Or try to use non-corrosive detergents that are generally used locally)

-- End

12.4.3.2 Indelible Traces

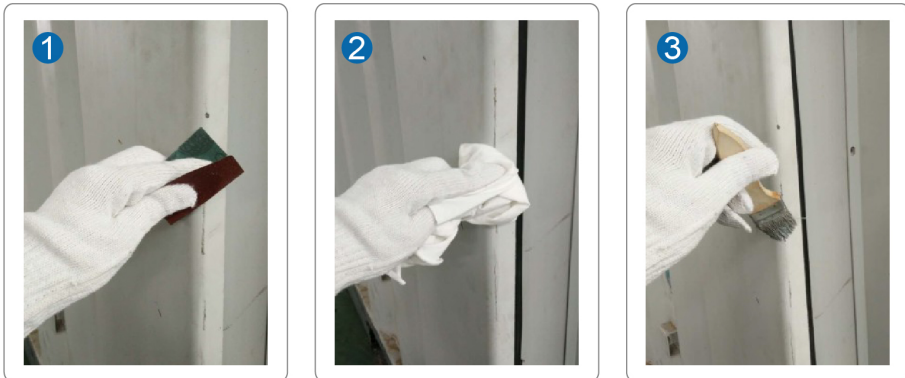
Tools

No.	Name	Source
1	Abrasive paper	
2	Cleaning cloth	
3	Water	Beyond the scope of supply
4	Alcohol	
5	Brush	
6	RAL7035 oil paint	

Step 1 Polish the paint surface with blistering or scratches with abrasive paper for a smooth surface.

Step 2 Wet the cleaning cloth with water or 97% alcohol, and scrub the damaged parts to remove surface stains.

Step 3 Perform paint repair for the scratched parts with a soft brush after the surface is dried; brush the paint as uniform as possible.



-- End

12.4.3.3 Broken Primer

Tools

No.	Name	Source
1	Abrasive paper	
2	Cleaning cloth	
3	Water	
4	Alcohol	Beyond the scope of supply
5	Zinc primer	
6	Brush	
7	RAL7035 oil paint	

Step 1 Polish the damaged parts with abrasive paper to remove rust and other burrs for a smooth surface.

Step 2 Wet the cleaning cloth with water or 97% alcohol, and scrub the damaged parts to remove surface stains and dust.

Step 3 Spray the parts with base material exposed with zinc primer for protection after drying the surface. Ensure to spray to cover the bare base material completely.

Step 4 Perform paint repair for the damaged parts with a soft brush after the primer is dried, and brush the paint uniformly.



-- End

12.4.4 Checking Door Locks and Hinges

Check if the door locks and hinges of the MV Grid-connected PV Inverter can be used normally after cleaning. Lubricate the door lock holes and hinges properly if necessary.

12.4.5 Checking Sealing Strips

If the sealing strip is in good condition, it can effectively prevent water seepage inside the product. Therefore, carefully check the sealing strip and replace it immediately if there is any damage.

12.5 Replacing Fuse



Before replacing the fuse, ensure that the product is de-energized.

12.5.1 Replacing DC Side Fuse

Step 1 Power off the product according to the normal shutdown steps, refer to "7.5.1 Planned Powering Down".

⚠ DANGER

Make sure the PVS is disconnected from the inverter unit.

Step 2 Wait for 20 minutes for the internal capacitors to be completely discharged.

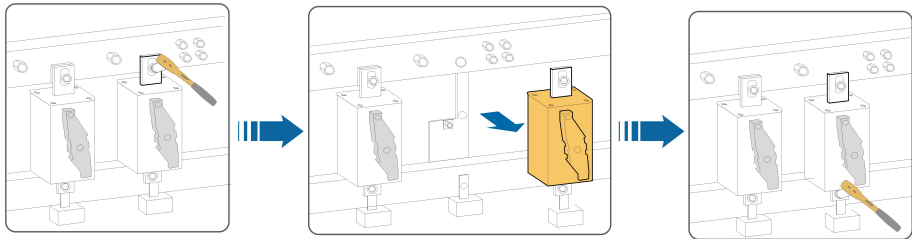
Step 3 Unlock the DC cabinet door and remove the protective cover on the DC fuse.

Step 4 Use a multimeter with a range of 1500 Vdc to measure the DC side voltage of the inverter. Check and ensure that the positive voltage, negative voltage, positive to ground voltage, and negative to ground voltage are all zero.

Step 5 Use a multimeter to measure each DC input voltage and ensure that the terminals are uncharged before performing the next operation.

Step 6 Identify the faulty fuse, use a socket wrench to unscrew the fastening bolt of the fuse to be replaced, and remove the faulty fuse.

Step 7 Secure the new fuse with M10×30 * bolts with a tightening torque of 34 - 40 N.m.



-- End

* When the DC input of the inverter is equipped with MPLC, the bolts specifications used are M8×30 and M10×30.

13 Appendix

13.1 Technical Parameters

SG1100UD/SG1100UD-20

Type designation	SG1100UD	SG1100UD-20
Input (DC)		
Max. PV input voltage	1500 V	
Min. PV input voltage / Startup input voltage	895 V / 905 V	938V / 950 V
MPP voltage range	895 – 1500 V	938 – 1500 V
No. of independent MPP inputs	1	
No. of DC inputs	5(optional: 6/7 inputs negative grounding)	
Max. PV input current	1435 A	
Max. DC short-circuit current	3528 A	
PV array configuration	Negative grounding or floating	
Output (AC)		
AC output power	1100 kVA @ 45 °C, 1133 kVA @ 40 °C, 1265 kVA @ 22.5 °C	1100 kVA @ 51 °C, 1320 kVA @ 23 °C
Max. AC output current	1160 A	1155 A
Nominal AC voltage	630 V	660 V
AC voltage range	536 – 693 V	561 – 726 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
Harmonic (THD)	< 3% (at nominal power)	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	

Feed-in phases / AC connection	3 / 3	
Efficiency		
Max. efficiency / European efficiency	99.0 % / 98.8 %	99.0 % / 98.7 %
Protection & Function		
DC input protection	Load break switch + fuse	
AC output protection	Circuit breaker	
Overvoltage protection	DC Type II / AC Type II	
Grid monitoring/ Grounding fault protection	Yes / Yes	
Insulation monitoring	Yes	
Surge protection	Yes	
Q at night function	Optional	
General Data		
Dimensions (width x height x depth) *	700 * 2290 * 1525 mm	
Weight *	850 kg	
Topology	Transformerless	
Degree of protection	IP65	
Night power consumption	< 200 W	
Operating ambient temperature range	-35 °C to 60 °C (> 45 °C derating)	-35 °C to 60 °C (> 51 °C derating)
Allowable relative humidity range	0 - 100%	
Cooling method	Temperature controlled forced air cooling	
Max. operating altitude	4000 m (> 2000 m derating)	
Display	LED Indicators, WLAN+WebHMI	
Communication	Standard: RS485, Ethernet; Optional: optical fiber; MPLC	
Grid support	Q at night function (optional), L/HVRT, active & reactive power control and power ramp rate control, Q-U control, P-f control	

*: If parameters marked with * are different from those on the nameplate, parameters on the nameplate shall prevail.

SG3300UD/SG3300UD-20

Type designation	SG3300UD	SG3300UD-20
Input (DC)		
Max. PV input voltage	1500 V	
Min. PV input voltage / Startup input voltage	895 V / 905 V	938V / 950 V
MPP voltage range	895 – 1500 V	938 – 1500 V
No. of independent MPP inputs	3	
No. of DC inputs	15(optional: 18/21 inputs negative grounding)	
Max. PV input current	3 × 1435 A	
Max. DC short-circuit current	3 × 3528 A	
PV array configuration	Negative grounding or floating	
Output (AC)		
AC output power	3300 kVA @ 45 °C 3399 kVA @ 40 °C 3795 kVA @ 22.5 °C	3300 kVA @ 51 °C, 3960 kVA @ 23 °C
Max. AC output current	3×1160 A	3 × 1155 A
Nominal AC voltage	630 V	660 V
AC voltage range	536 – 693 V	561 – 726 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
Harmonic (THD)	< 3% (at nominal power)	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / AC connection	3 / 3	
Efficiency		
Max. efficiency / European efficiency	99.0 % / 98.8 %	99.0 % / 98.7 %
Protection & Function		
DC input protection	Load break switch + fuse	

AC output protection	Circuit breaker	
Overvoltage protection	DC Type II / AC Type II	
Grid monitoring/ Grounding fault protection	Yes / Yes	
Insulation monitoring	Yes	
Surge protection	Yes	
Q at night function	Optional	
General Data		
Dimensions (width x height x depth) *	2340 * 2300 * 1550 mm	
Weight *	2.5 T	
Topology	Transformerless	
Degree of protection	IP65	
Night power consumption	< 200 W	
Operating ambient temperature range	-35 °C to 60 °C (> 45 °C derating)	-35 to 60 °C (> 51 °C derating)
Allowable relative humidity range	0 - 100%	
Cooling method	Temperature controlled forced air cooling	
Max. operating altitude	4000 m (> 2000 m derating)	
Display	LED Indicators, WLAN+WebHMI	
Communication	Standard: RS485, Ethernet; Optional: optical fiber; MPLC	
Grid support	Q at night function (optional), L/HVRT, active & reactive power control and power ramp rate control, Q-U control, P-f control	

*: If parameters marked with * are different from those on the nameplate, parameters on the nameplate shall prevail.

SG4400UD/SG4400UD-20

Type designation	SG4400UD	SG4400UD-20
Input (DC)		
Max. PV input voltage	1500 V	
Min. PV input voltage / Startup input voltage	895 V / 905 V	938 V / 950 V

MPP voltage range	895 – 1500 V	938 – 1500 V
No. of independent MPP inputs	4	
No. of DC inputs	20(optional: 24/28 inputs negative grounding)	
Max. PV input current	4×1435 A	
Max. DC short-circuit current	4×3528 A	
PV array configuration	Negative grounding or floating	
Output (AC)		
AC output power	4400 kVA @ 45 °C, 4532 kVA @ 40 °C, 5060 kVA @ 22.5 °C	4400 kVA @ 51 °C, 5280 kVA @ 23 °C
Max. AC output current	4×1160 A	4×1155 A
Nominal AC voltage	630 V	660 V
AC voltage range	536 – 693 V	561 – 726 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
Harmonic (THD)	< 3% (at nominal power)	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / AC connection	3 / 3	
Efficiency		
Max. efficiency / European efficiency	99.0 % / 98.8 %	99.0 % / 98.7 %
Protection & Function		
DC input protection	Load break switch + fuse	
AC output protection	Circuit breaker	
Overvoltage protection	DC Type II / AC Type II	
Grid monitoring/ Grounding fault protection	Yes / Yes	

Insulation monitoring	Yes	
Surge protection	Yes	
Q at night function	Optional	
General Data		
Dimensions (width x height x depth) *	2900 * 2300 * 1550 mm	
Weight *	3.3 T	
Topology	Transformerless	
Degree of protection	IP65	
Night power consumption	< 200 W	
Operating ambient temperature range	-35 °C to 60 °C (> 45 °C derating)	-35 °C to 60 °C (> 51 °C derating)
Allowable relative humidity range	0 - 100%	
Cooling method	Temperature controlled forced air cooling	
Max. operating altitude	4000 m (> 2000 m derating)	
Display	LED Indicators, WLAN+WebHMI	
Communication	Standard: RS485, Ethernet; Optional: optical fiber; MPLC	
Grid support	Q at night function (optional), L/HVRT, active & reactive power control and power ramp rate control, Q-U control, P-f control	

*: If parameters marked with * are different from those on the nameplate, parameters on the nameplate shall prevail.

13.2 Tightening Torques

To avoid poor contact caused by the loosening of copper cable lugs due to stress, and to prevent heat or even fire due to increased contact resistance, make sure to tighten the screws on the cable lugs at the recommended torques:

Bolt	Torque(N·m)	Bolt	Torque(N·m)
M3	0.7–1	M8	18–23
M4	1.8–2.4	M10	34–40
M5	4–4.8	M12	60–70
M6	7–8	M16	119–140

*Torque values listed in the table are intended for the bolt and nut assembly, and do not apply to riveted nuts or riveted screws, etc. The torque to be adopted should depend on the actual situation.

**Secure the cable at a proper point to reduce the stress on the cable lug.

13.3 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.

13.4 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>

