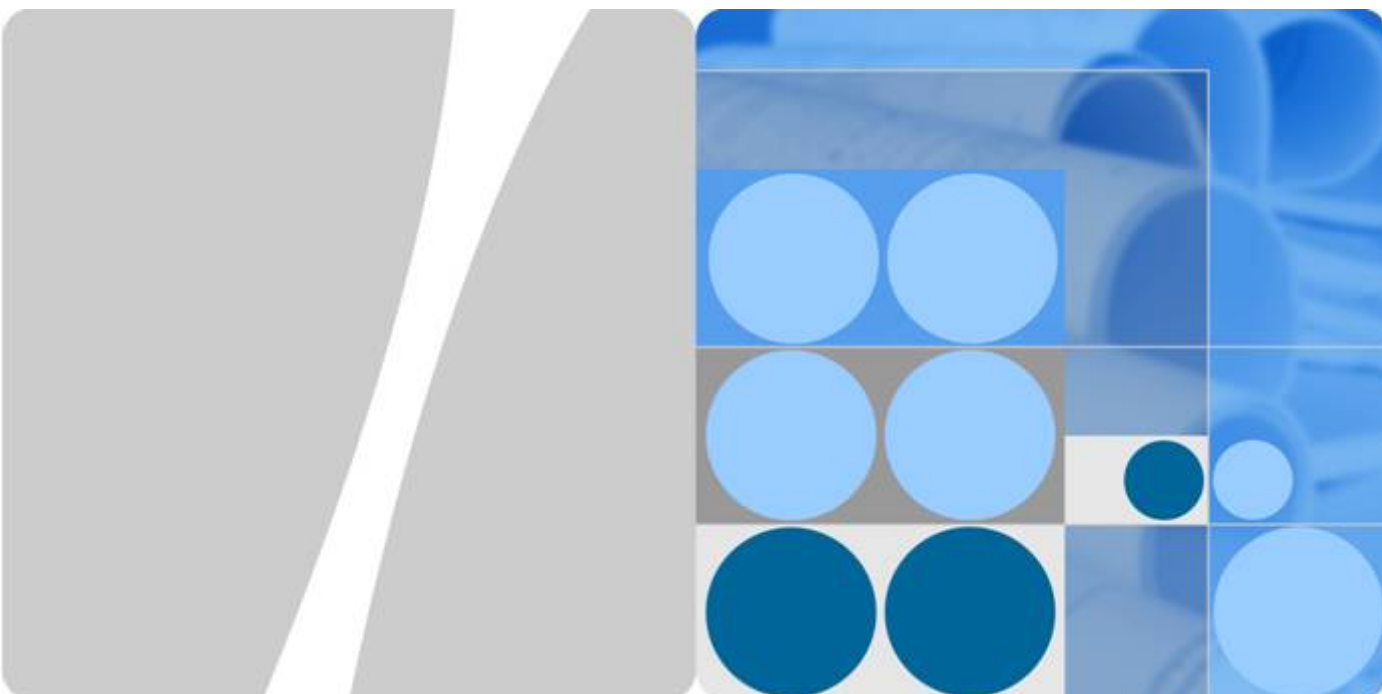




**SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-  
M3**

## **User Manual**

**Issue**      02  
**Date**      2020-11-20

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# About this Document

## Overview

This document describes the SUN2000-20KTL-M3, SUN2000-29.9KTL-M3, SUN2000-30KTL-M3, SUN2000-36KTL-M3, and SUN2000-40KTL-M3 (SUN2000 for short) in terms of their installation, electrical connections, commissioning, maintenance, and troubleshooting. Before installing and operating the SUN2000, ensure that you are familiar with the features, functions, and safety precautions provided in this document.

## Intended Audience

This document is applicable to:

- Installers
- Users

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol                                                                                             | Remarks                                                                                                        |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  <b>DANGER</b>  | Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.    |
|  <b>WARNING</b> | Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury. |
|  <b>CAUTION</b> | Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.   |

| Symbol                                                                                          | Remarks                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>NOTICE</b> | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.<br><br>NOTICE is used to address practices not related to personal injury. |
|  <b>NOTE</b>   | Supplements the important information in the main text.<br><br>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.                                                             |

## Change History

Changes between document issues are cumulative. The latest document issue contains all changes made in earlier issues.

### Issue 02 (2020-11-20)

Updated [2.3 Label Description](#).  
Updated [4.3 Selecting an Installation Position](#).  
Updated [5.2 Preparing Cables](#).  
Updated [5.7.1 Communication Modes](#).  
Updated [10 Technical Specifications](#).

### Issue 01 (2020-10-15)

This issue is the first official release.

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# 1 Safety Information

---

## 1.1 General Safety

### Statement

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

The "NOTICE", "CAUTION", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. Huawei will not be liable for any consequence caused by the violation of general safety requirements or design, production, and usage safety standards.

Ensure that the equipment is used in environments that meet its design specifications. Otherwise, the equipment may become faulty, and the resulting equipment malfunction, component damage, personal injuries, or property damage are not covered under the warranty.

Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

Huawei will not be liable for any consequences of the following circumstances:

- Operation beyond the conditions specified in this document
- Installation or use in environments which are not specified in relevant international or national standards
- Unauthorized modifications to the product or software code or removal of the product
- Failure to follow the operation instructions and safety precautions on the product and in this document
- Equipment damage due to force majeure, such as earthquakes, fire, and storms
- Damage caused during transportation by the customer
- Storage conditions that do not meet the requirements specified in this document

## General Requirements

---

** DANGER**

Do not work with power on during installation.

---

- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.
- In the case of a fire, immediately leave the building or the equipment area, and turn on the fire alarm bell or make an emergency call. Do not enter the building on fire in any case.
- Do not scrawl, damage, or block any warning label on the equipment.
- Tighten the screws using tools when installing the equipment.
- Understand the components and functioning of a grid-tied PV power system and relevant local standards.
- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed to an outdoor environment for a long period of time.
- Do not open the host panel of the equipment.

## Personal Safety

- If there is a probability of personal injury or equipment damage during operations on the equipment, immediately stop the operations, report the case to the supervisor, and take feasible protective measures.
- Use tools correctly to avoid hurting people or damaging the equipment.
- Do not touch the energized equipment, as the enclosure is hot.

## 1.2 Personnel Requirements

- Personnel who plan to install or maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.

- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

#### NOTE

- Professionals: personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, and maintenance
- Trained personnel: personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Operators: operation personnel who may come in contact with the equipment, except trained personnel and professionals

## 1.3 Electrical Safety

### Grounding

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Do not damage the ground conductor.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is securely grounded.

### General Requirements

---

#### DANGER

Before connecting cables, ensure that the equipment is intact. Otherwise, electric shocks or fire may occur.

---

- Ensure that all electrical connections comply with local electrical standards.
- Obtain approval from the local electric utility company before using the equipment in grid-tied mode.
- Ensure that the cables you prepared meet local regulations.
- Use dedicated insulated tools when performing high-voltage operations.

### AC and DC Power

---

#### DANGER

Do not connect or disconnect power cables with power on. Transient contact between the core of the power cable and the conductor will generate electric arcs or sparks, which may cause fire or personal injury.

---

- Before making electrical connections, switch off the disconnect on the upstream device to cut off the power supply if people may contact energized components.
- Before connecting a power cable, check that the label on the power cable is correct.
- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.

## Cabling

- When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
- Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- Ensure that the cables used in a grid-tied PV power system are properly connected and insulated and meet specifications.

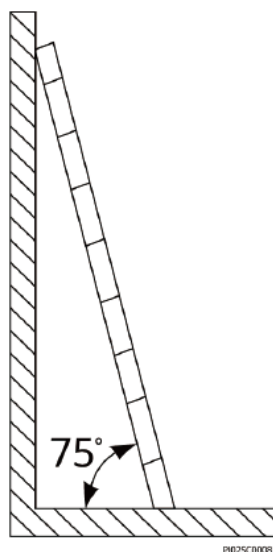
## 1.4 Installation Environment Requirements

- Ensure that the equipment is installed in a well ventilated environment.
- To prevent fire due to high temperature, ensure that the ventilation vents or heat dissipation system are not blocked when the equipment is running.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

## 1.5 Mechanical Safety

### Using Ladders

- Use wooden or fiberglass ladders when you need to perform live working at heights.
- When a step ladder is used, ensure that the pull ropes are secured and the ladder is held firm.
- Before using a ladder, check that it is intact and confirm its load bearing capacity. Do not overload it.
- Ensure that the wider end of the ladder is at the bottom, or protective measures have been taken at the bottom to prevent the ladder from sliding.
- Ensure that the ladder is securely positioned. The recommended angle for a ladder against the floor is 75 degrees, as shown in the following figure. An angle rule can be used to measure the angle.



- When climbing a ladder, take the following precautions to reduce risks and ensure safety:
  - Keep your body steady.
  - Do not climb higher than the fourth rung of the ladder from the top.
  - Ensure that your body's center of gravity does not shift outside the legs of the ladder.

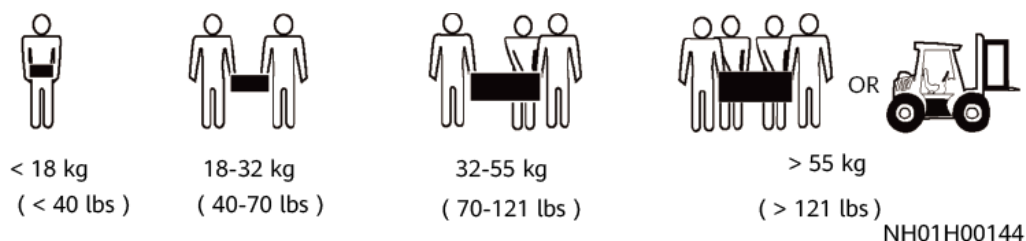
## Drilling Holes

When drilling holes into a wall or floor, observe the following safety precautions:

- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

## Moving Heavy Objects

- Be cautious to avoid injury when moving heavy objects.



- When moving the equipment by hand, wear protective gloves to prevent injuries.

## 1.6 Commissioning

When the equipment is powered on for the first time, ensure that professional personnel set parameters correctly. Incorrect settings may result in inconsistency with local certification and affect the normal operation of the equipment.

## 1.7 Maintenance and Replacement



### DANGER

High voltage generated by the equipment during operation may cause an electric shock, which could result in death, serious injury, or serious property damage. Prior to maintenance, power off the equipment and strictly comply with the safety precautions in this document and relevant documents.

- 
- Maintain the equipment with sufficient knowledge of this document and using proper tools and testing equipment.
  - Before maintaining the equipment, power it off and follow the instructions on the delayed discharge label to ensure that the equipment is powered off.
  - Place temporary warning signs or erect fences to prevent unauthorized access to the maintenance site.
  - If the equipment is faulty, contact your dealer.
  - The equipment can be powered on only after all faults are rectified. Failing to do so may escalate faults or damage the equipment.

# 2 Overview

## 2.1 Overview

### Function

The SUN2000 inverter is a three-phase grid-tied PV string inverter that converts the DC power generated by PV strings into AC power and feeds the power into the power grid.

### Model

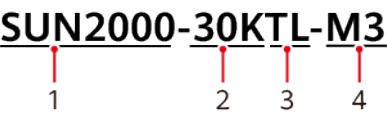
This document covers the following SUN2000 models:

- SUN2000-20KTL-M3
- SUN2000-29.9KTL-M3
- SUN2000-30KTL-M3
- SUN2000-36KTL-M3
- SUN2000-40KTL-M3

 **NOTE**

The SUN2000-20KTL-M3 supports 220 V (line voltage) power grids.

**Figure 2-1** Model description (SUN2000-30KTL-M3 is used as an example)



**Table 2-1** Model description

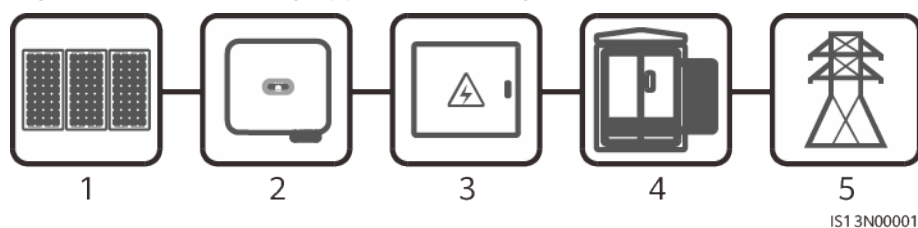
| ID | Meaning     | Value                                             |
|----|-------------|---------------------------------------------------|
| 1  | Series name | SUN2000: three-phase grid-tied PV string inverter |

| ID | Meaning      | Value                                                                                                                                                                                                                                 |
|----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2  | Power class  | <ul style="list-style-type: none"> <li>• 20K: rated power of 20 kW</li> <li>• 29.9K: rated power of 29.9 kW</li> <li>• 30K: rated power of 30 kW</li> <li>• 36K: rated power of 36 kW</li> <li>• 40K: rated power of 40 kW</li> </ul> |
| 3  | Topology     | TL: transformerless                                                                                                                                                                                                                   |
| 4  | Product code | M3: product series with an input voltage level of 1100 V DC                                                                                                                                                                           |

## Networking Application

The SUN2000 applies to the grid-tied systems of industrial and commercial rooftops and small ground PV plants. Typically, a grid-tied system consists of PV strings, grid-tied inverters, AC switches, and power distribution units.

**Figure 2-2** Networking application - single inverter scenario



(1) PV string

(2) SUN2000

(3) AC power distribution unit

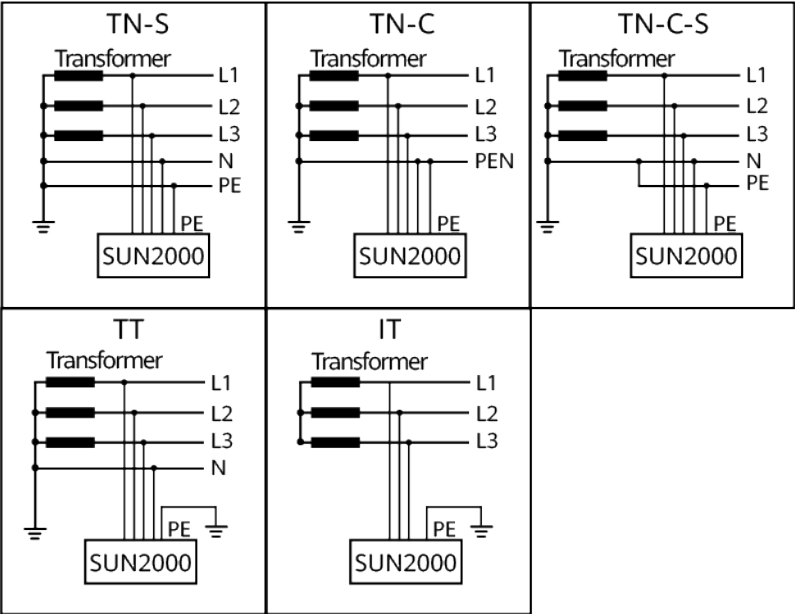
(4) Isolation transformer

(5) Power grid

## Supported Power Grid Types

The SUN2000 supports TN-S, TN-C, TN-C-S, TT, and IT power grids.

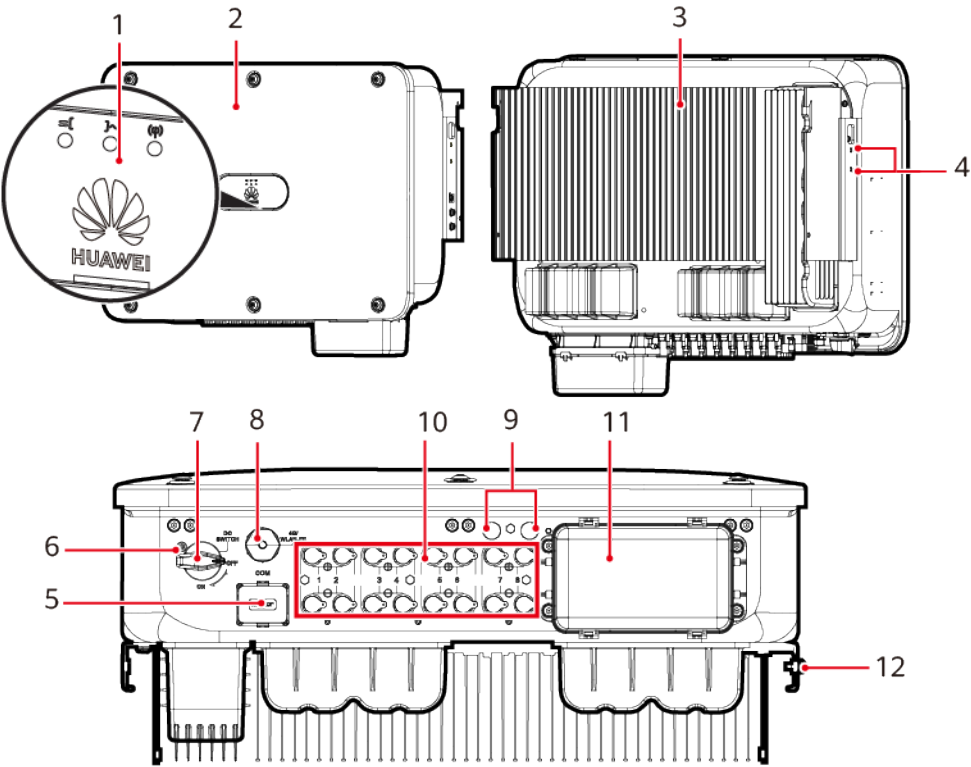
Figure 2-3 Power grid types



IS01S10001

## 2.2 Appearance

Figure 2-4 Appearance



IS13W00001

- (1) LED indicator

(3) Heat sink

(5) Communications port (COM)

(7) DC switch (DC SWITCH)

(9) Ventilation valve

(11) AC output port
- (2) Front panel

(4) Screws for fixing the awning

(6) Hole for the DC switch locking screw

(8) Smart Dongle port (4G/WLAN-FE)

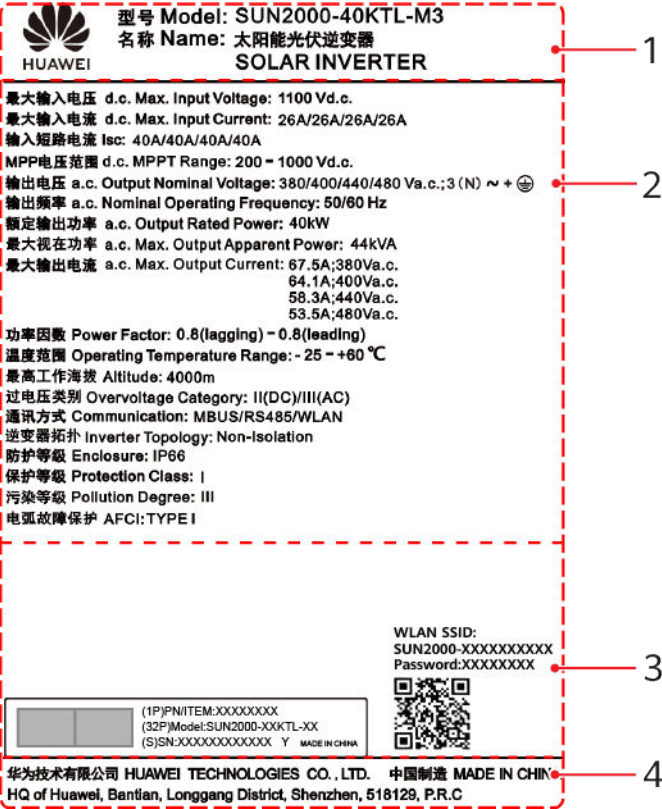
(10) DC input terminals (PV1-PV8)

(12) Ground point

2.3 Label Description

Nameplate

Figure 2-5 Nameplate



- (1) Trademark and product model

(3) Label information
- (2) Key technical parameters

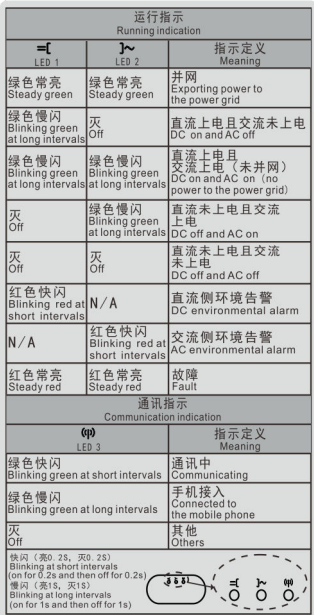
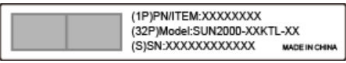
(4) Company name and country of origin

## NOTE

The nameplate figure is for reference only.

## Enclosure Labels

| Symbol                                                                                                                                                                                                                                                          | Name                   | Description                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Danger: High Voltage! 高压危险!</b><br/>Start maintaining the INVERTER at least 5 minutes after the INVERTER disconnects from all external power supplies.<br/>逆变器与外部所有电源断开后, 需要等待至少5分钟, 才可以进行维护。</p>                                                         | Delay discharge        | Residual voltage exists after the SUN2000 is powered off. It takes 5 minutes for the SUN2000 to discharge to the safe voltage.                                                                                                                                                                                                                               |
| <p><b>Warning: High Temperature! 高温危险!</b><br/>Never touch the enclosure of an operating INVERTER.<br/>逆变器工作时严禁触摸外壳。</p>                                                                                                                                        | Burn warning           | Do not touch a running SUN2000 because it generates high temperatures on the shell.                                                                                                                                                                                                                                                                          |
| <p><b>Danger: Electrical Hazard! 有电危险!</b><br/>Only certified professionals are allowed to install and operate the INVERTER.<br/>仅有资质的专业人员才可进行逆变器的安装和操作。<br/>High touch current, earth connection essential before connecting supply.<br/>大接触电流! 接通电源前须先接地。</p> | Electric shock warning | <ul style="list-style-type: none"> <li>High voltage exists after the SUN2000 is powered on. Only qualified and trained electrical technicians are allowed to perform operations on the SUN2000.</li> <li>High touch current exists after the SUN2000 is powered on. Before powering on the SUN2000, ensure that the SUN2000 is properly grounded.</li> </ul> |
| <p><b>CAUTION</b><br/>Read instructions carefully before performing any operation on the INVERTER.<br/>对逆变器进行任何操作前, 请仔细阅读说明书!</p>                                                                                                                               | Refer to documentation | Reminds operators to refer to the documents delivered with the SUN2000.                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                 | Grounding label        | Indicates the position for connecting the PE cable.                                                                                                                                                                                                                                                                                                          |
| <p><b>Do not disconnect under load!</b><br/>禁止带负荷断开连接!</p>                                                                                                                                                                                                      | Operation warning      | Do not remove the DC input connector or AC output connector with power on.                                                                                                                                                                                                                                                                                   |

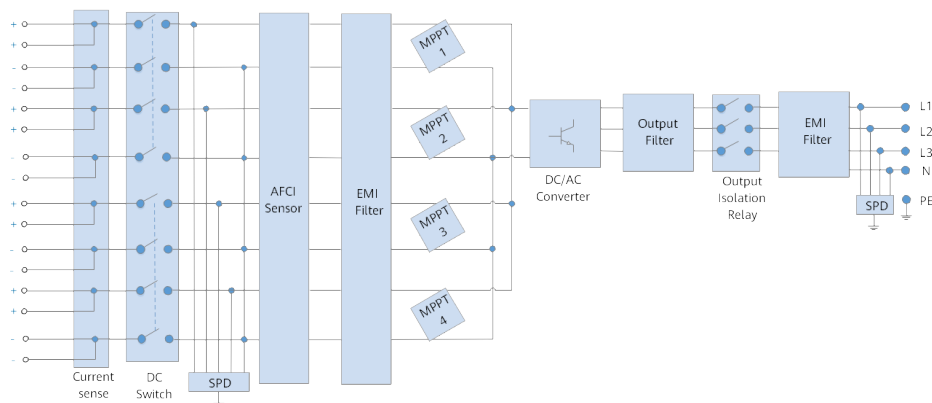
| Symbol                                                                                                                                                                                                                                                   | Name                             | Description                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|
|                                                                                                                                                                         | Weight label                     | The SUN2000 is heavy and needs to be carried by three persons.              |
|  <p>Do not touch the handles within 10 minutes after the inverter is shut down!<br/>Não toque pelo menos 10 minutos após o inversor ser desligado!<br/>关机10分钟后才能触碰!</p> | Burn warning on inverter handles | Do not touch the handles within 10 minutes after the inverter is shut down. |
|                                                                                                                                                                        | Indicator                        | Indicates the SUN2000 operating information.                                |
|                                                                                                                                                                       | SUN2000 serial number            | Indicates the serial number.                                                |
| <p><b>WLAN SSID:</b><br/><b>SUN2000-XXXXXXXXXX</b><br/><b>Password:XXXXXXXXXX</b></p>                                                                                 | SUN2000 WiFi login QR code       | Scan the QR code to connect to the Huawei SUN2000 WiFi network.             |

## 2.4 Working Principles

## 2.4.1 Circuit Diagram

A SUN2000 can connect to a maximum of eight PV strings and has four MPPT circuits inside. Each MPPT circuit tracks the maximum power point of two PV strings. The SUN2000 converts DC power into single-phase AC power through an inverter circuit. Surge protection is supported on both the DC and AC sides.

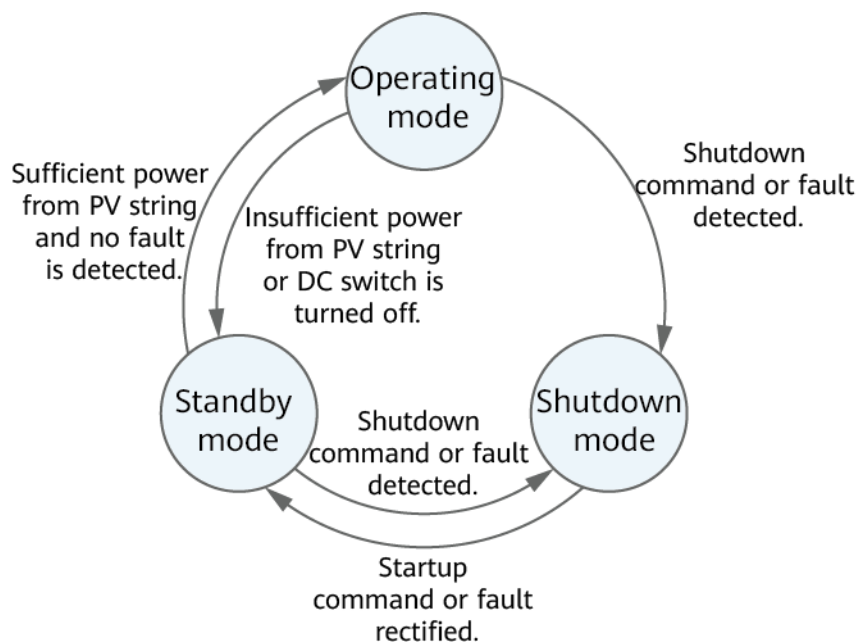
**Figure 2-6** Schematic diagram



## 2.4.2 Working Modes

The SUN2000 can work in Standby, Operating, or Shutdown mode.

**Figure 2-7** Working modes



IS07500001

**Table 2-2** Working mode description

| Working Mode | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standby      | <p>The SUN2000 enters Standby mode when the external environment does not meet the operating requirements. In Standby mode:</p> <ul style="list-style-type: none"><li>• The SUN2000 continuously performs status check and enters the Operating mode once the operating requirements are met.</li><li>• The SUN2000 enters Shutdown mode after detecting a shutdown command or a fault after startup.</li></ul>                                                                                                                     |
| Operating    | <p>In Operating mode:</p> <ul style="list-style-type: none"><li>• The SUN2000 converts DC power from PV strings into AC power and feeds the power to the power grid.</li><li>• The SUN2000 tracks the maximum power point to maximize the PV string output.</li><li>• If the SUN2000 detects a fault or a shutdown command, it enters the Shutdown mode.</li><li>• The SUN2000 enters Standby mode after detecting that the PV string output power is not suitable for connecting to the power grid for generating power.</li></ul> |
| Shutdown     | <ul style="list-style-type: none"><li>• In Standby or Operating mode, the SUN2000 enters Shutdown mode after detecting a fault or shutdown command.</li><li>• In Shutdown mode, the SUN2000 enters Standby mode after detecting a startup command or that the fault is rectified.</li></ul>                                                                                                                                                                                                                                         |

# 3 SUN2000 Storage

---

The following requirements should be met if the SUN2000 is not put into use directly:

- Do not unpack the SUN2000.
- Keep the storage temperature at  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  and the humidity at 5%–95% RH.
- Store the SUN2000 in a clean and dry place and protect it from dust and water vapor corrosion.
- A maximum of six SUN2000s can be stacked. To avoid personal injury or device damage, stack SUN2000s with caution to prevent them from falling over.
- During the storage period, check the SUN2000 periodically (recommended: every three months). If any rodent bites are found on the packing materials, replace the packing materials immediately.
- If the SUN2000 has been stored for more than two years, it must be checked and tested by professionals before being put into use.

# 4 Installation

---

## 4.1 Checking Before Installation

### Outer Packing Materials

Before unpacking the inverter, check the outer packing materials for damage, such as holes and cracks, and check the inverter model. If any damage is found or the inverter model is not what you requested, do not unpack the package and contact your supplier as soon as possible.

#### NOTE

You are advised to remove the packing materials within 24 hours before installing the inverter.

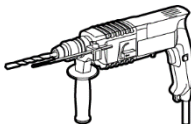
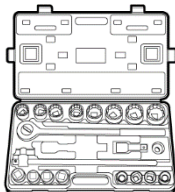
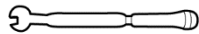
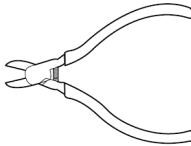
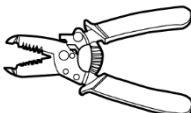
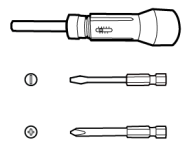
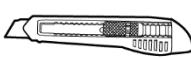
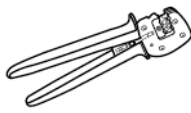
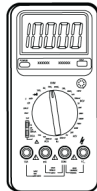
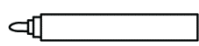
### Package Contents

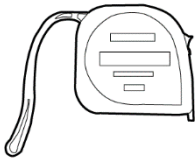
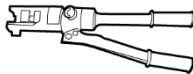
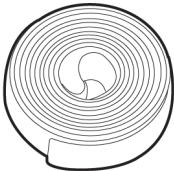
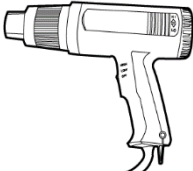
After unpacking the inverter, check that the contents are intact and complete. If any damage is found or any component is missing, contact your supplier.

#### NOTE

For details about the number of contents, see the *Packing List* in the packing case.

## 4.2 Tool Preparation

| Type         | Tools and Instruments                                                                                                                                                                    |                                                                                                                                                                  |                                                                                                               |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Installation |  <p>Hammer drill (with a <math>\Phi 14</math> mm drill bit and a <math>\Phi 16</math> mm drill bit)</p> |  <p>Torque socket and wrench</p>                                                |  <p>Torque wrench</p>      |
|              |  <p>Diagonal pliers</p>                                                                                 |  <p>Wire stripper</p>                                                           |  <p>Torque screwdriver</p> |
|              |  <p>Rubber mallet</p>                                                                                 |  <p>Utility knife</p>                                                         |  <p>Cable cutter</p>     |
|              |  <p>Crimping tool (model: PV-CZM-22100)</p>                                                           |  <p>Open-end wrench (model: PV-MS-HZ or PV-MS open-end wrench)</p>            |  <p>Cable tie</p>        |
|              |  <p>Vacuum cleaner</p>                                                                                |  <p>Multimeter (DC voltage measurement range <math>\geq 1100</math> V DC)</p> |  <p>Marker</p>           |

| Type                                | Tools and Instruments                                                               |                                                                                   |                                                                                      |
|-------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                     |    |  |   |
|                                     | Steel measuring tape                                                                | Level                                                                             | Hydraulic pliers                                                                     |
| Personal protective equipment (PPE) |    |  | -                                                                                    |
|                                     | Heat shrink tubing                                                                  | Heat gun                                                                          | -                                                                                    |
|                                     |    |  |  |
|                                     | Safety gloves                                                                       | Safety goggles                                                                    | Anti-dust mask                                                                       |
|                                     |  | -                                                                                 | -                                                                                    |
|                                     | Safety boots                                                                        | -                                                                                 | -                                                                                    |

## 4.3 Selecting an Installation Position

### Basic Requirements

- The SUN2000 is IP66-rated and can be installed indoors or outdoors.
- Do not install the SUN2000 in a place where a person can easily be exposed to its enclosure and heat sinks, because these parts are extremely hot during operation.
- Do not install the SUN2000 in areas with flammable or explosive materials.
- Do not install the SUN2000 in a place within children's reach.
- The SUN2000 will be corroded in salt areas, and the salt corrosion may cause fire. Do not install the SUN2000 outdoors in salt areas. A salt area refers to the region within 500 m from the coast or prone to sea breeze. The effect from sea breeze depends on weather conditions (such as typhoon and season wind) or terrains (such as dams and hills).

## Site Requirements

- The SUN2000 should be installed in a well-ventilated environment to ensure good heat dissipation.
- If the SUN2000 is installed in a place exposed to direct sunlight, the power may decrease as the temperature rises.
- You are advised to install the SUN2000 in a sheltered place or install an awning over it.

## Mounting Structure Requirements

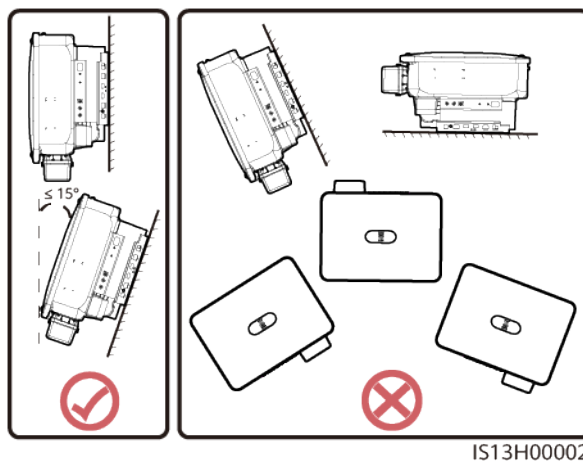
- The mounting structure where the SUN2000 is installed must be fire resistant.
- Do not install the SUN2000 on flammable building materials.
- The SUN2000 is heavy. Ensure that the installation surface is solid enough to bear the weight load.
- In residential areas, do not install the SUN2000 on drywalls or walls made of similar materials which have a weak sound insulation performance because the noise generated by the SUN2000 is noticeable.

## Installation Angle Requirements

The SUN2000 can be wall-mounted or support-mounted. Requirements for the installation angle:

- Install the SUN2000 vertically or at a maximum back tilt of 15 degrees to facilitate heat dissipation.
- Do not install the SUN2000 with a front tilt, excessive back tilt, side tilt, horizontally, or upside down.

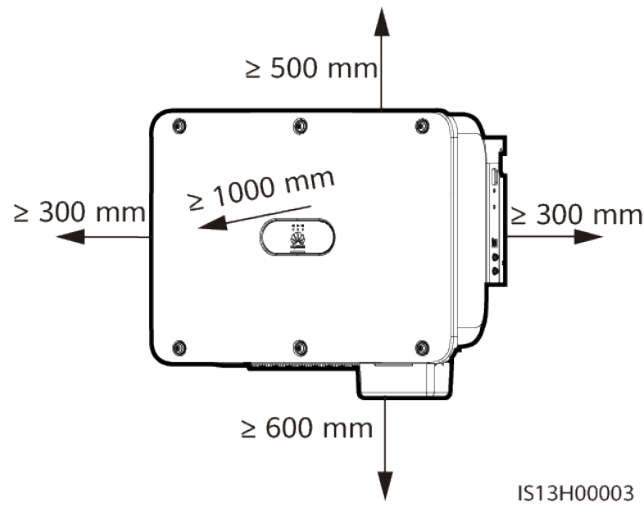
**Figure 4-1** Installation angle



## Installation Space Requirements

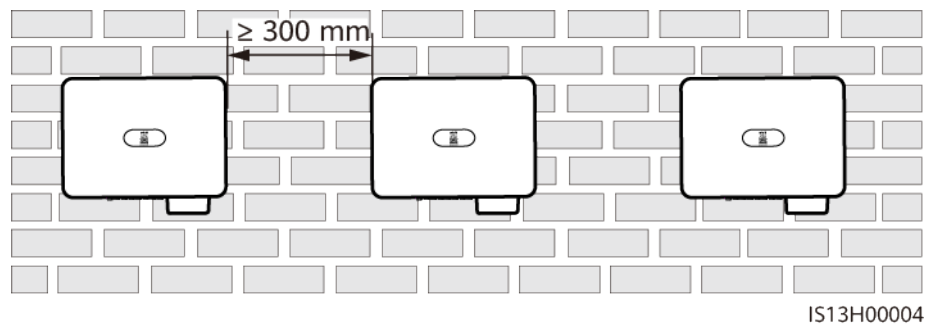
- Reserve enough clearance around the SUN2000 to ensure sufficient space for installation and heat dissipation.

**Figure 4-2** Installation space

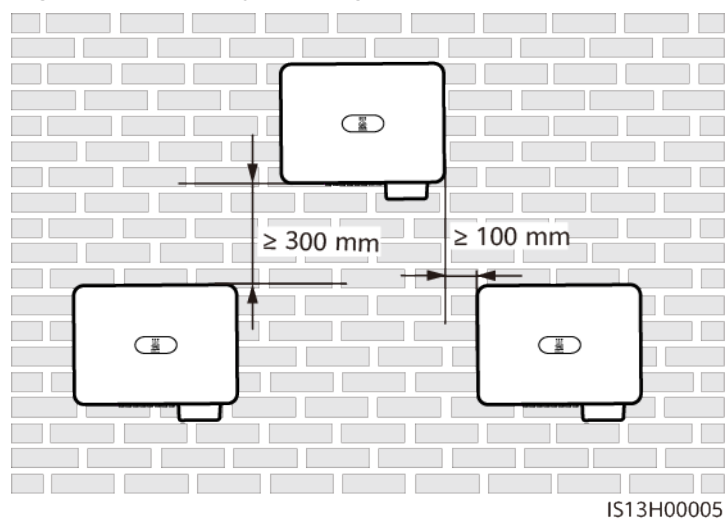


- When installing multiple SUN2000s, install them in horizontal mode if ample space is available and install them in triangle mode if no ample space is available. Stacked installation is not recommended.

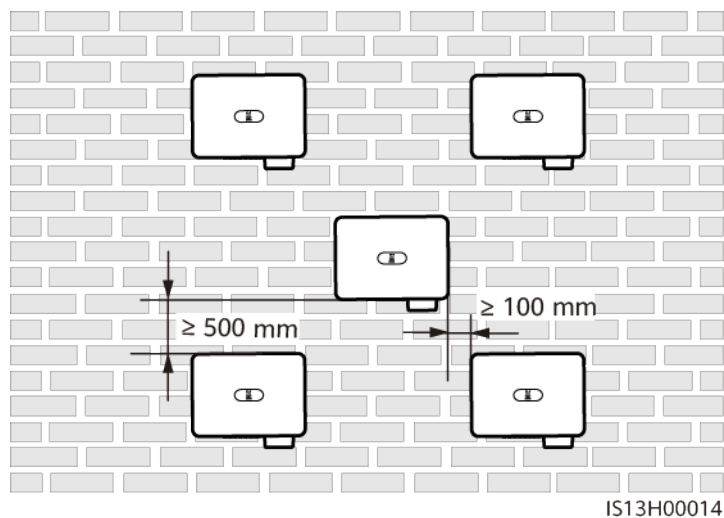
**Figure 4-3** Horizontal installation (recommended)



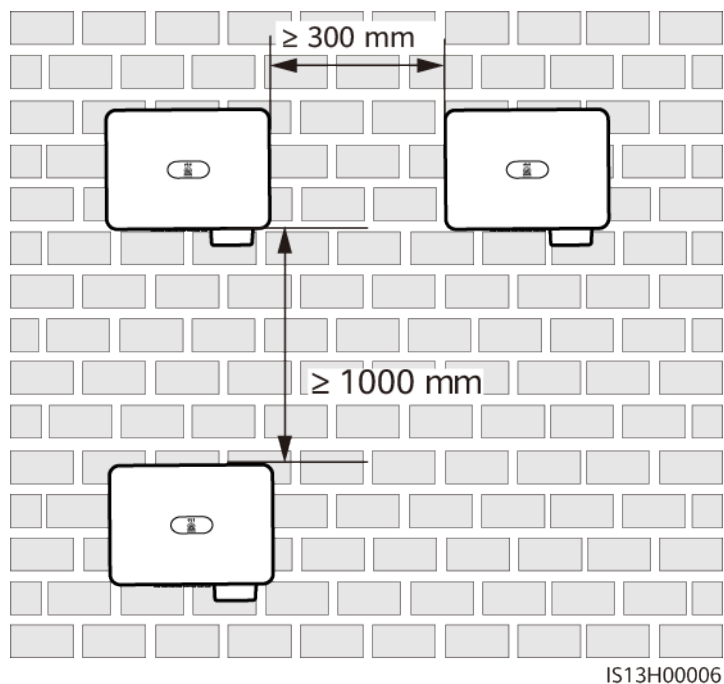
**Figure 4-4** Two-layer triangle installation (recommended)



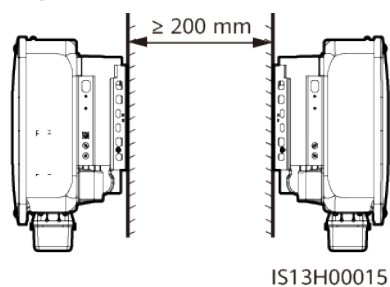
**Figure 4-5** Three-layer triangle installation (not recommended)



**Figure 4-6** Stacked installation (not recommended)



**Figure 4-7** Back-to-back installation (not recommended)



 **NOTE**

The installation diagrams are for reference only and are irrelevant to the SUN2000 cascading scenario.

## 4.4 Moving the SUN2000

### Procedure

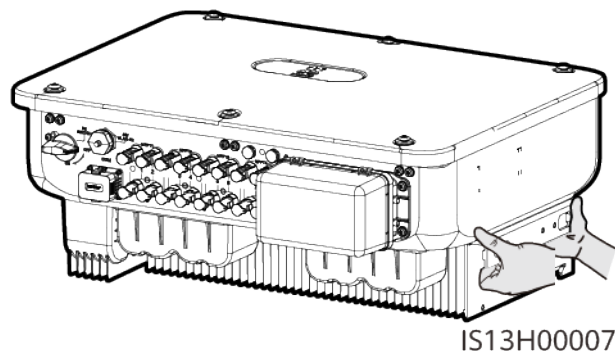
- Step 1** Lift the SUN2000 from the packing case and move it to the specified installation position.

---

 **CAUTION**

- Move the SUN2000 with care to prevent device damage and personal injury.
  - Do not use the wiring terminals and ports at the bottom to support any weight of the SUN2000.
  - Place a foam pad or cardboard under the SUN2000 to protect the SUN2000 enclosure from damage.
- 

**Figure 4-8** Moving the SUN2000



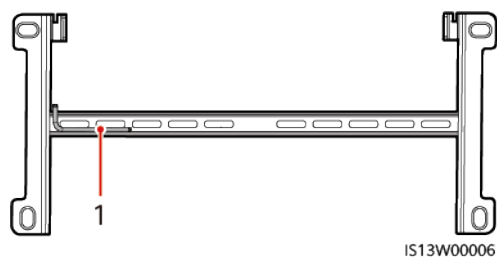
----End

## 4.5 Installing the Mounting Bracket

### Installation Precautions

Before installing the mounting bracket, remove the security Torx wrench and set it aside.

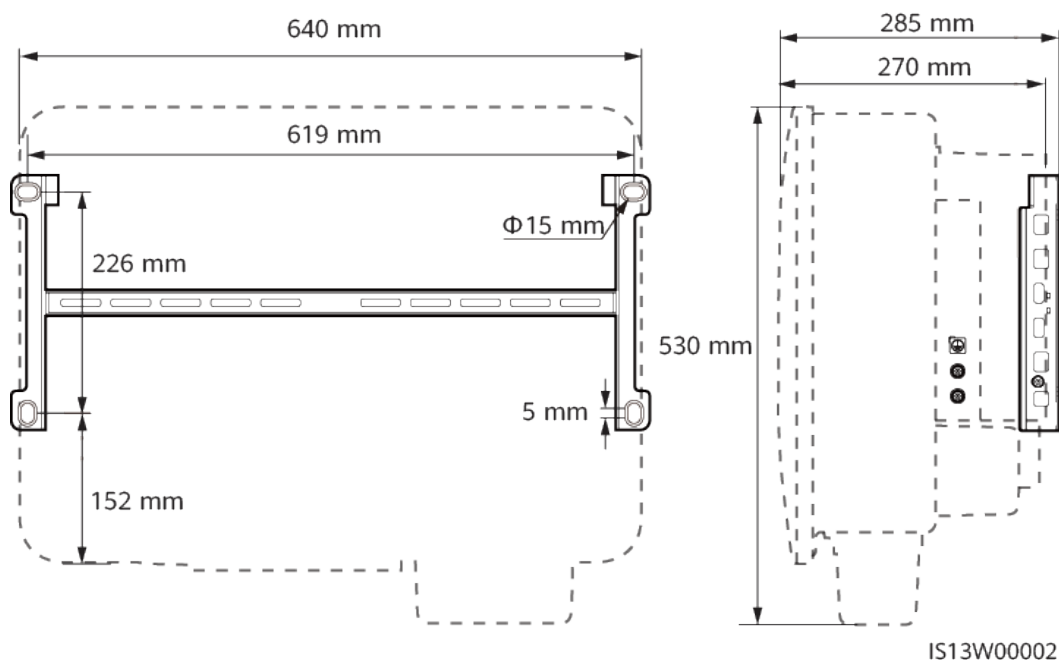
**Figure 4-9** Position for binding the security Torx wrench



(1) Security Torx wrench

**Figure 4-10** shows the dimensions of the mounting holes for the SUN2000.

**Figure 4-10** Mounting bracket dimensions

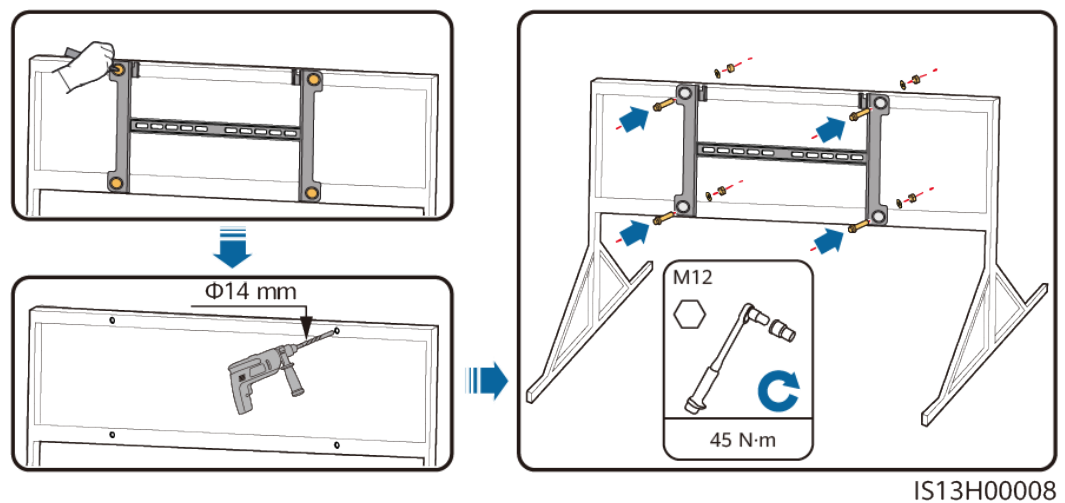


## 4.5.1 Support-mounted Installation

### Procedure

**Step 1** Secure the mounting bracket.

**Figure 4-11** Securing the mounting bracket



**NOTE**

You are advised to apply anti-rust paint on the hole positions for protection.

-----End

## 4.5.2 Wall-mounted Installation

### Prerequisites

To install the SUN2000, you need to prepare expansion bolts. M12x60 stainless steel expansion bolts are recommended.

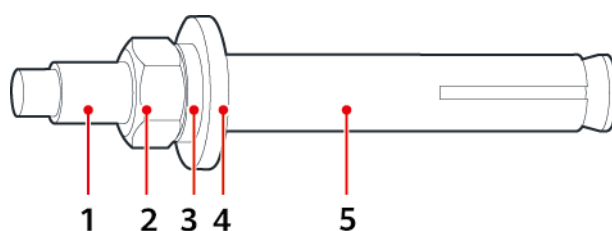
### Procedure

- Step 1** Determine the positions for drilling holes and mark the positions using a marker.
- Step 2** Secure the mounting bracket.

**⚠ DANGER**

Avoid drilling holes in the water pipes and cables buried in the wall.

**Figure 4-12** Expansion bolt composition



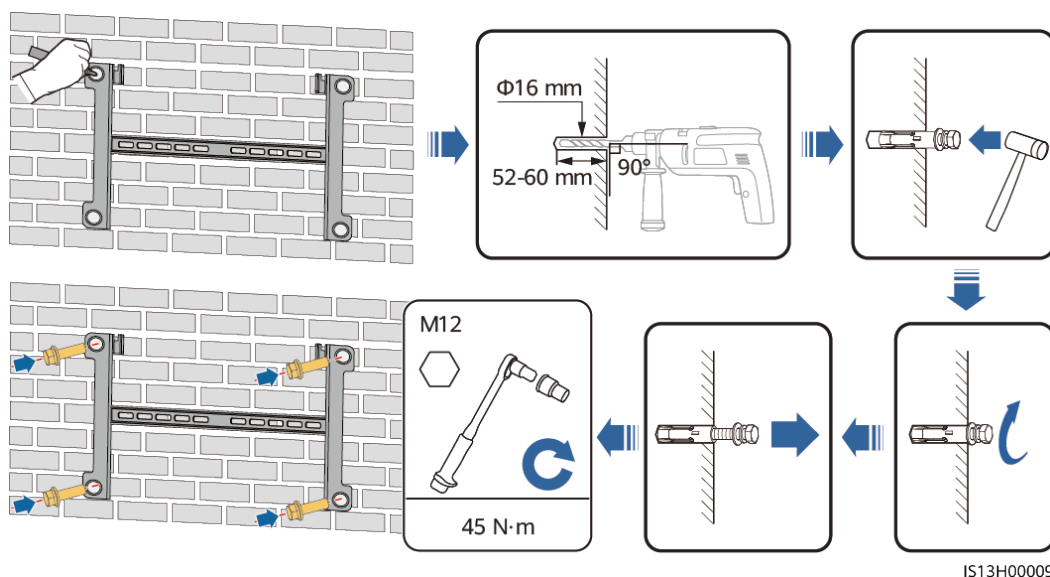
IS05W00018

- |                 |                      |                   |
|-----------------|----------------------|-------------------|
| (1) Bolt        | (2) Nut              | (3) Spring washer |
| (4) Flat washer | (5) Expansion sleeve |                   |

#### NOTICE

- To prevent dust inhalation or contact with eyes, wear safety goggles and an anti-dust mask when drilling holes.
- Clean up any dust in and around the holes using a vacuum cleaner and measure the distance between holes. If the holes are inaccurately positioned, drill holes again.
- Level the front of the expansion sleeve with the concrete wall after removing the bolt, spring washer, and flat washer. Otherwise, the mounting bracket will not be securely installed on the concrete wall.

**Figure 4-13** Installing expansion bolts



----End

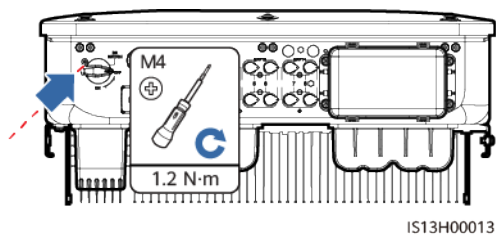
## 4.6 Installing a SUN2000

**Step 1** (Optional) Install the locking screw for the DC switch.

#### NOTE

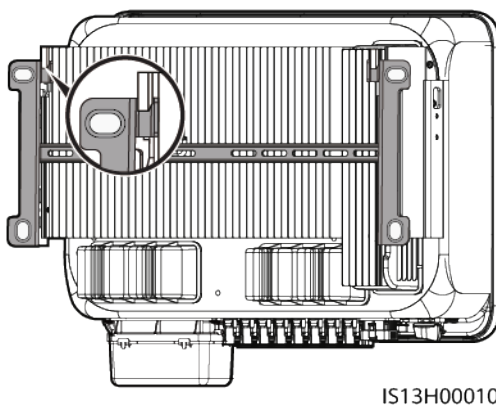
- The DC switch locking screw is used to lock the DC switch to prevent the switch from rotating.
- For models used in Australia, install the DC switch locking screw according to local standards. The DC switch locking screw is delivered with the SUN2000.

**Figure 4-14** Installing the locking screw for the DC switch



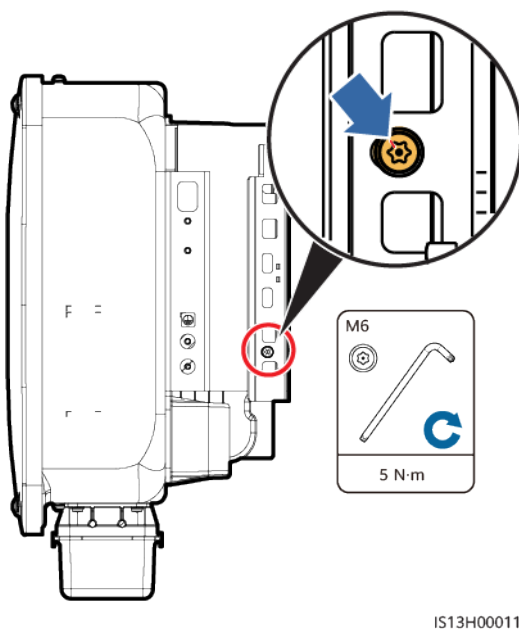
**Step 2** Install the SUN2000 onto the mounting bracket.

**Figure 4-15** Installing a SUN2000



**Step 3** Tighten the nuts on both sides of the SUN2000.

**Figure 4-16** Tightening the nut



---

**NOTICE**

Secure the screws on the sides before connecting cables.

---

----**End**

# 5 Electrical Connections

---

## 5.1 Precautions

---

### DANGER

When exposed to sunlight, the PV arrays supplies DC voltage to the SUN2000. Before connecting cables, ensure that the two DC switches on the SUN2000 are OFF. Otherwise, the high voltage of the SUN2000 may result in electric shocks.

---

---

### WARNING

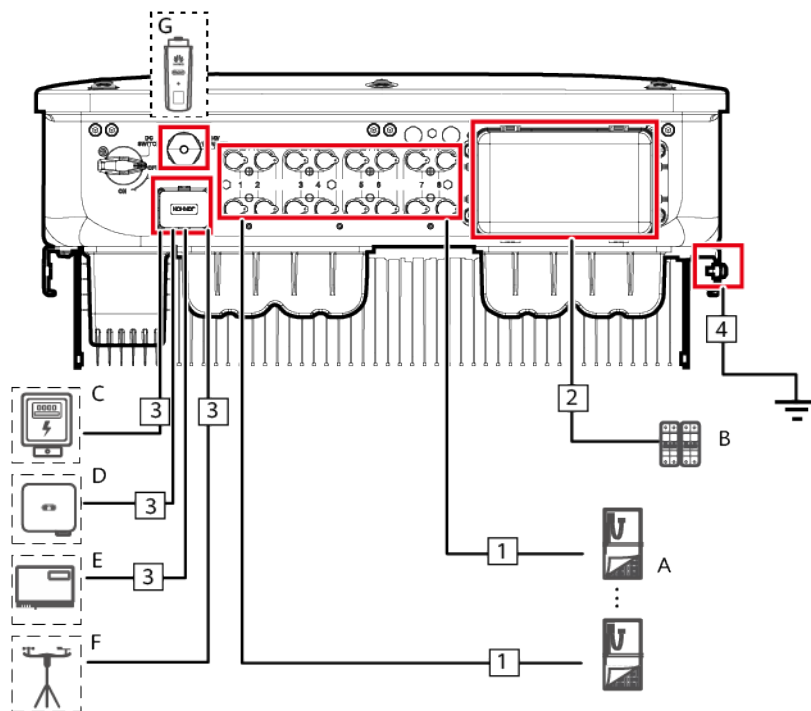
- The equipment damage caused by incorrect cable connections is beyond the warranty scope.
  - Only certified electrician can perform electrical terminations.
  - Wear proper PPE at all time when terminating cables.
  - To prevent poor cable connection due to overstress, it is recommended that the cables be bent and reserved, and then connected to the appropriate ports.
- 

### NOTE

The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only. Select cables in accordance with local cable specifications (green-and-yellow cables are only used for grounding).

## 5.2 Preparing Cables

**Figure 5-1** SUN2000 cable connections (dashed boxes indicate optional components)



IS13W00004

**Table 5-1** Components

| No. | Component   | Description                                                                                                                                                                                                                                                  | Source            |
|-----|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| A   | PV string   | <ul style="list-style-type: none"> <li>A PV string consists of PV modules connected in series.</li> <li>The SUN2000 supports the input from eight PV strings.</li> </ul>                                                                                     | Prepared by users |
| B   | AC switch   | Recommended: a three-phase AC circuit breaker with a rated voltage greater than or equal to 500 V AC and a rated current of: <ul style="list-style-type: none"> <li>80 A (SUN2000-20KTL/29.9KTL/30KTL-M3)</li> <li>100 A (SUN2000-36KTL/40KTL-M3)</li> </ul> | Prepared by users |
| C   | Power meter | The SUN2000 can connect to the DTSU666-H power meter.                                                                                                                                                                                                        | Prepared by users |

| No. | Component                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Source                |
|-----|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|     |                                           | <p>The following third-party power meters are supported:</p> <p>ABB-A44, Schneider-PM1200, Janitza-UMG604, Janitza-UMG103-CBM, Janitza-UMG104, GAVAZZI-EM340-DIN AV2 3 X S1 X, REAL ENERGY SYSTEM-PRISMA-310A, Algodue-UPM209, Mitsubishi-LMS-0441E, and WEG-MMW03-M22CH</p> <p>When the WEG-MMW03-M22CH power meter is connected, set <b>Baud rate</b> to <b>9600</b>. When the Mitsubishi-LMS-0441E power meter is connected, set <b>Parity mode</b> to <b>No parity</b>, and <b>Baud rate</b> to <b>9600</b>.</p> |                       |
| D   | SUN2000                                   | Select a proper model as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Purchased from Huawei |
| E   | SmartLogger                               | The SmartLogger1000A, SmartLogger2000, and SmartLogger3000 are supported.                                                                                                                                                                                                                                                                                                                                                                                                                                            | Purchased from Huawei |
| F   | Environmental monitoring instrument (EMI) | <ul style="list-style-type: none"> <li>When the SmartLogger is used, the EMI can be directly connected to the SmartLogger or connected to the last solar inverter cascaded over RS485.</li> <li>When the SDongle is used, the EMI is a cascaded device that needs to be connected to the solar inverter where the SDongle is installed. In this case, only the EMI with the baud rate of 9600 is supported.</li> </ul>                                                                                               | Prepared by users     |
| G   | Smart Dongle                              | Select a proper model as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Purchased from Huawei |

#### NOTE

In the SUN2000 cascading scenario, the master inverter model can be SUN2000-20KTL/29.9KTL/30KTL/36KTL/40KTL-M3, and the slave inverter model can be SUN2000-(3KTL-12KTL)-M0/M1, SUN2000-(12KTL-20KTL)-M0/M2, SUN2000-50KTL/60KTL/65KTL-M0, SUN2000-(100KTL, 110KTL, 125KTL) series, SUN2000-29.9KTL/36KTL/42KTL, or SUN2000-33KTL-A.

**NOTICE**

The cable specifications must comply with local standards.

**Table 5-2** Cable description

| No.                                                                                                                         | Cable                   | Type                                                                          | Recommended Specifications                                                                                                                                                                                                   | Source            |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1                                                                                                                           | DC input power cable    | Common PV cable in the industry<br>(Recommended model: PV1-F)                 | <ul style="list-style-type: none"> <li>Conductor cross-sectional area: 4–6 mm<sup>2</sup></li> <li>Cable outer diameter: 4.5–7.8 mm</li> </ul>                                                                               | Prepared by users |
| 2                                                                                                                           | AC output power cable   | Outdoor copper-core/aluminum-core cable                                       | <ul style="list-style-type: none"> <li>Conductor cross-sectional area: 16–50 mm<sup>2</sup> outdoor copper-core cable or 35–50 mm<sup>2</sup> outdoor aluminum-core cable</li> <li>Cable outer diameter: 16–38 mm</li> </ul> | Prepared by users |
| 3                                                                                                                           | (Optional) Signal cable | Two-core outdoor shielded twisted pair (recommended model: DJYP2VP2-2x2x0.75) | <ul style="list-style-type: none"> <li>Conductor cross-sectional area: 0.2–1 mm<sup>2</sup></li> <li>Cable outer diameter: 4–11 mm</li> </ul>                                                                                | Prepared by users |
| 4                                                                                                                           | PE cable                | Single-core outdoor copper-core cable                                         | Conductor cross-sectional area ≥ 16 mm <sup>2</sup>                                                                                                                                                                          | Prepared by users |
| Note a: Five-core cables with a cross-sectional area of 5 x 35 mm <sup>2</sup> or 5 x 50 mm <sup>2</sup> are not supported. |                         |                                                                               |                                                                                                                                                                                                                              |                   |

## 5.3 Connecting the PE Cable



### DANGER

- Ensure that the PE cable is securely connected. Otherwise, electric shocks may occur.
- Do not connect the neutral wire to the enclosure as a PE cable. Otherwise, electric shocks may occur.



### NOTE

- The PE point at the AC output port is used only as a PE equipotential point, not a substitute for the PE point on the enclosure.
- It is recommended that silica gel or paint be applied around the ground terminal after the PE cable is connected.

## Procedure

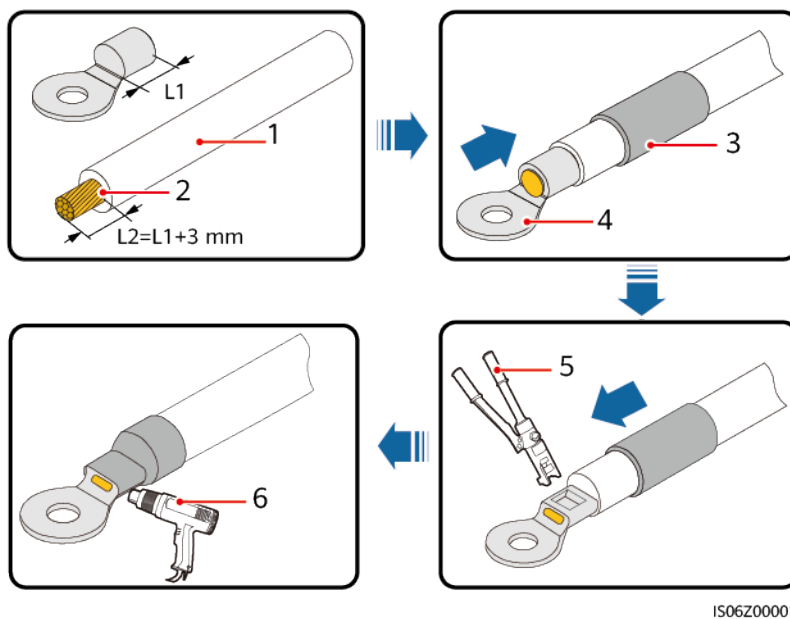
### Step 1 Crimp OT terminals.

---

### NOTICE

- Avoid scratching the core wire when stripping a cable.
  - The cavity formed after the conductor crimp strip of the OT terminal is crimped must wrap the core wires completely. The core wires must contact the OT terminal closely.
  - Wrap the wire crimping area with heat shrink tubing or PVC insulation tape. The heat shrink tubing is used as an example.
  - When using a heat gun, protect devices from being scorched.
-

**Figure 5-2** Crimping an OT terminal



(1) Cable

(2) Core

(3) Heat shrink tubing

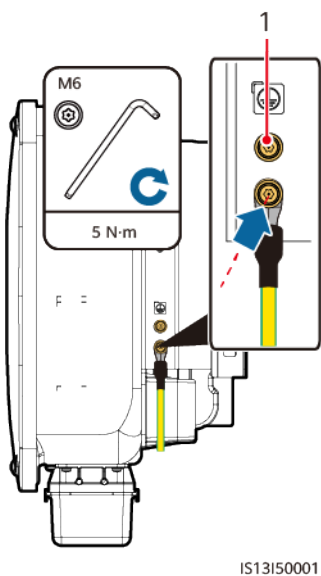
(4) OT terminal

(5) Crimping tool

(6) Heat gun

**Step 2** Connect the PE cable.

**Figure 5-3** Connecting the PE cable



(1) Standby protection ground point

----End

## 5.4 Connecting the AC Output Power Cable

### Precautions

An AC switch must be installed on the AC side of the SUN2000 to ensure that the SUN2000 can be safely disconnected from the power grid.

---

**WARNING**

Do not connect loads between the SUN2000 and the AC switch.

---

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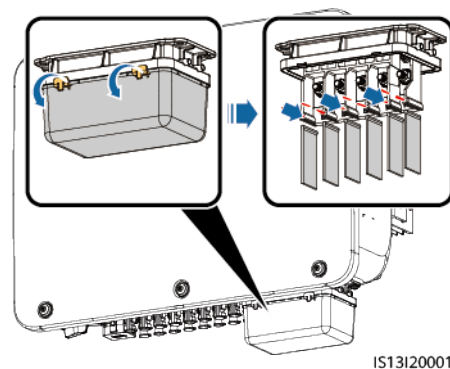
**NOTICE**

- Use a socket wrench and extension rod to connect the AC power cable. The extension rod must be longer than 100 mm.
  - Sufficient slack should be provided in the PE cable to ensure that the last cable bearing the force is the PE cable when the AC output power cable bears pulling force due to force majeure.
  - Do not install third-party devices in the AC connection box.
  - You need to prepare M8 OT terminals by yourself.
- 

### Procedure

**Step 1** Remove the AC terminal box and install partition boards.

**Figure 5-4** Removing the AC terminal box

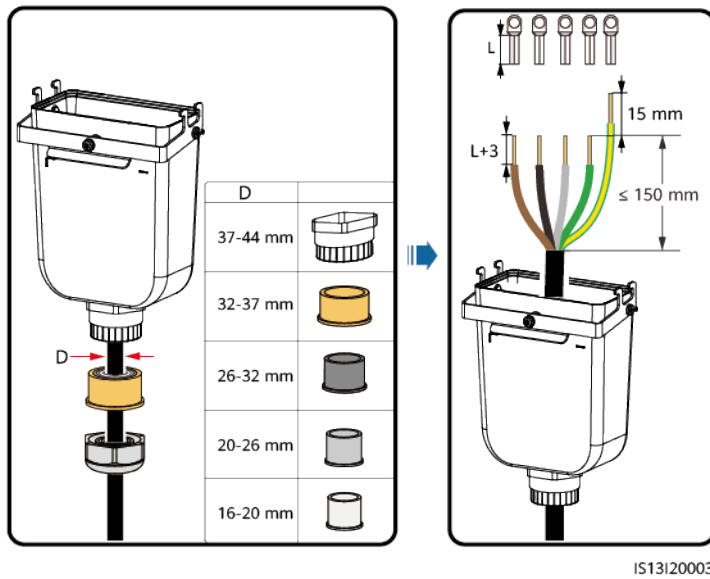


**Step 2** Connect the AC output power cable (using a five-core cable as an example).

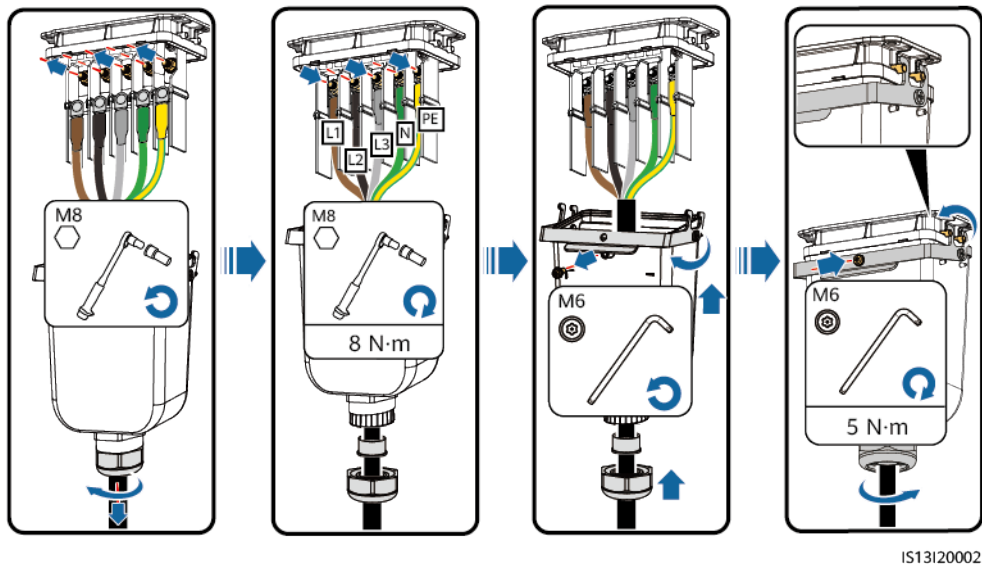
**NOTE**

- To avoid damaging the rubber liner, do not route a cable with a crimped OT terminal directly through it.
- It is recommended that the length of the PE cable to be stripped be 15 mm longer than the length of other cables.
- The cable colors in figures are for reference only. Select appropriate cables according to the local standards.

**Figure 5-5 Stripping the AC power cable**



**Figure 5-6 Connecting the AC power cable**



----End

## 5.5 Installing the DC Input Power Cable

### Precautions

---

#### DANGER

- Before connecting the DC input power cables, ensure that the DC voltage is within the safe range (lower than 60 V DC) and that the DC switch on the SUN2000 is OFF. Failing to do so may result in electric shocks.
  - When the SUN2000 is running, it is not allowed to work on the DC input power cables, such as connecting or disconnecting a PV string or a PV module in a PV string. Failing to do so may cause electric shocks.
  - If no PV string connects to a DC input terminal of the SUN2000, do not remove the watertight cap from the DC input terminals. Otherwise, the IP rating of the SUN2000 will be affected.
- 

---

#### WARNING

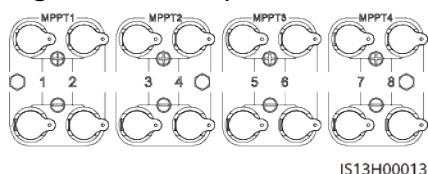
Ensure that the following conditions are met. Otherwise, the SUN2000 may be damaged, or even a fire could happen.

- PV modules connected in series in each PV string are of the same specifications.
  - The DC input voltage of the SUN2000-29.9KTL/30KTL/36KTL/40KTL-M3 shall not exceed 1100 V DC under any circumstance.
  - The DC input voltage of the SUN2000-20KTL-M3 shall not exceed 800 V DC under any circumstance.
  - The polarities of electric connections are correct on the DC input side. The positive and negative terminals of a PV string connect to corresponding positive and negative DC input terminals of the SUN2000.
  - If polarity of the DC input power cable is reversed and the DC switch is ON, do not turn off the DC switch immediately or remove positive and negative connectors. Wait until the solar irradiance declines at night and the PV string current reduces to below 0.5 A, and then turn off the DC switch and remove the positive and negative connectors. Correct the PV string polarity before reconnecting the PV string to the SUN2000.
-

### NOTICE

- The SUN2000 does not support power supplies other than PV strings. Since the output of the PV string connected to the SUN2000 cannot be grounded, ensure that the PV module output is well insulated to ground.
- During the installation of PV strings and the SUN2000, the positive or negative terminals of PV strings may be short-circuited to ground if the power cable is not properly installed or routed. In this case, an AC or DC short circuit may occur and damage the SUN2000. The caused device damage is not covered under any warranty.

**Figure 5-7** DC input terminals



When the DC input is not fully configured, the DC input terminals must meet the following requirements:

1. Distribute the DC input power cables evenly over four MPPT circuits, and connect them preferentially through MPPT1 and MPPT4.
2. Maximize the number of connected MPPT circuits.

| Number of PV Strings | Terminal Selection                   | Number of PV Strings | Terminal Selection                        |
|----------------------|--------------------------------------|----------------------|-------------------------------------------|
| 1                    | PV1                                  | 2                    | PV1 and PV7                               |
| 3                    | PV1, PV3 and PV7                     | 4                    | PV1, PV3, PV5 and PV7                     |
| 5                    | PV1, PV2, PV3, PV5 and PV7           | 6                    | PV1, PV2, PV3, PV5, PV7 and PV8           |
| 7                    | PV1, PV2, PV3, PV4, PV5, PV7 and PV8 | 8                    | PV1, PV2, PV3, PV4, PV5, PV6, PV7 and PV8 |

## Procedure

**Step 1** Connect the DC power cable.

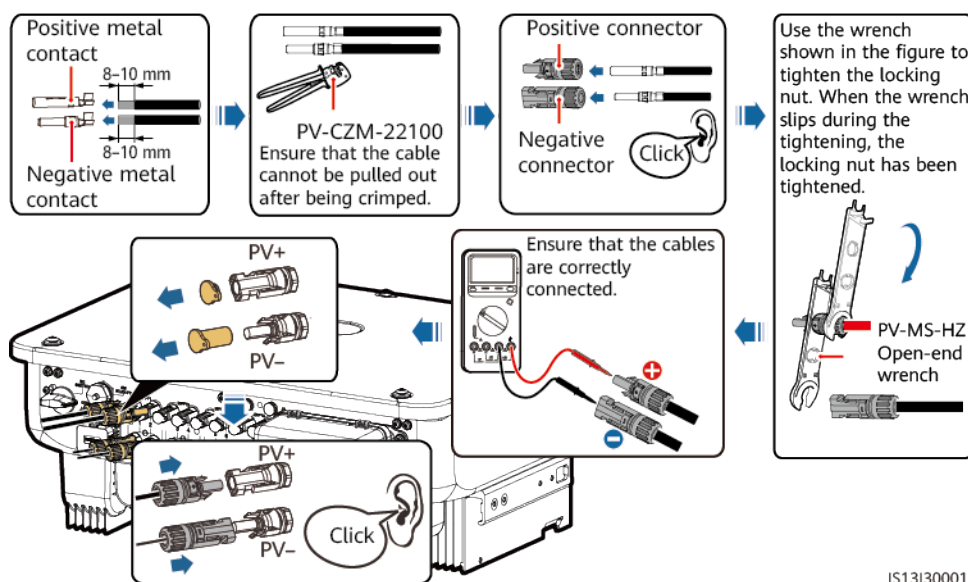
### CAUTION

Use the positive and negative Staubli MC4 metal terminals and DC connectors supplied with the SUN2000. Using incompatible positive and negative metal terminals and DC connectors may result in serious consequences. The caused device damage is not covered under warranty.

#### NOTICE

- You are advised to use the PV-CZM-22100 (Staubli) crimping tool and do not use it with the positioning block. Otherwise, the metal terminals may be damaged.
- The PV-MS (Staubli) or PV-MS-HZ (Staubli) open-end wrench is recommended.
- Cables with high rigidity, such as armored cables, are not recommended as DC input power cables, because poor contact may be caused by the bending of the cables.
- Before assembling DC connectors, label the cable polarities correctly to ensure correct cable connections.
- After the positive and negative connectors snap into place, pull the DC input cables back to ensure that they are connected securely.

Figure 5-8 Connecting the DC power cable



----End

## 5.6 (Optional) Installing the Smart Dongle

### Procedure

#### NOTE

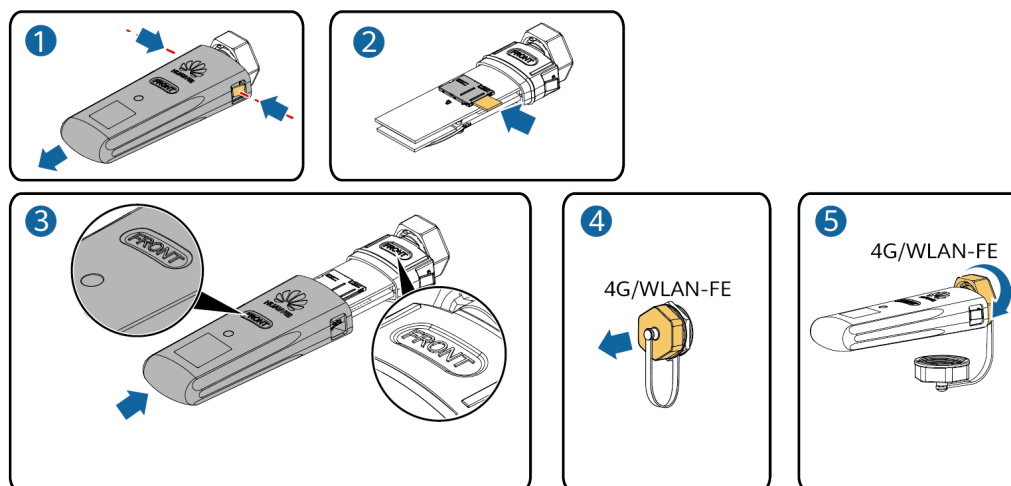
The WLAN-FE Smart Dongle is not provided in standard configuration.

- 4G Smart Dongle

#### NOTICE

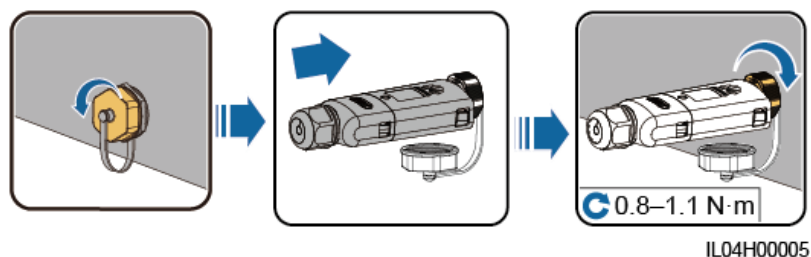
- If your Smart Dongle is not equipped with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) with the capacity greater than or equal to 64 KB.
- When installing the SIM card, determine its installation direction based on the silk screen and arrow on the card slot.
- Press the SIM card in place to lock it, indicating that the SIM card is correctly installed.
- When removing the SIM card, push it inwards to eject it.
- When reinstalling the cover of the Smart Dongle, ensure that the buckle springs back in place.

**Figure 5-9** Installing a 4G Smart Dongle



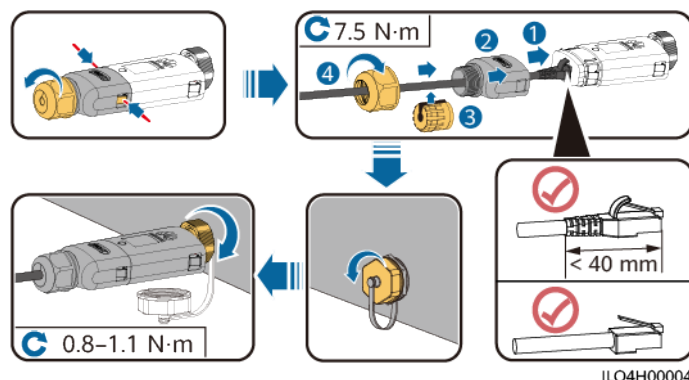
- WLAN-FE Smart Dongle (WLAN Communication)

**Figure 5-10** Installing a WLAN-FE Smart Dongle (WLAN communication)



- WLAN-FE Smart Dongle (FE Communication)

**Figure 5-11** Installing a WLAN-FE Smart Dongle (FE communication)



ILO4H00004

#### NOTICE

Install the network cable before installing the Smart Dongle on the solar inverter.

#### NOTE

- For details about how to operate the WLAN-FE Smart Dongle SDongleA-05, see [SDongleA-05 Quick Guide \(WLAN-FE\)](#). You can scan the QR code below to obtain the document.



- For details about how to operate the 4G Smart Dongle SDongleA-03, see [SDongleA-03 Quick Guide \(4G\)](#). You can scan the QR code below to obtain the document.



The quick guide is delivered with the Smart Dongle.

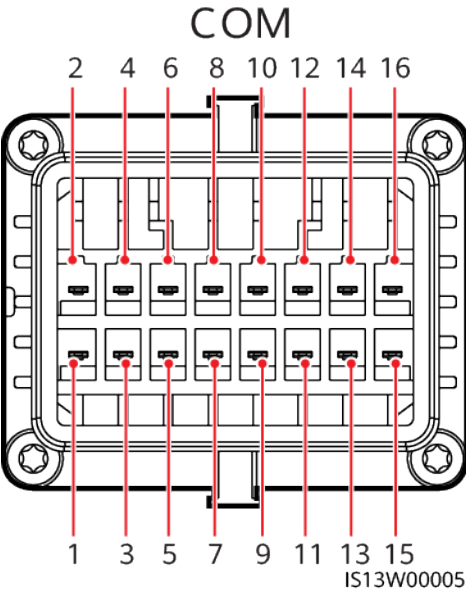
## 5.7 Connecting the Signal Cable

### COM Port Pin Definitions

#### NOTICE

When laying out a signal cable, separate it from power cables to avoid strong signal interference.

Figure 5-12 Pin definitions



| Pin | Definition | Function                         | Description                                                                               | Pin | Definition | Function                              | Description                                                                             |
|-----|------------|----------------------------------|-------------------------------------------------------------------------------------------|-----|------------|---------------------------------------|-----------------------------------------------------------------------------------------|
| 1   | 485A1_1    | RS485 differential signal +      | Used to cascade inverters or connect to the SmartLogger. It can also connect to an EMI.   | 2   | 485A1_2    | RS485 differential signal +           | Used to cascade inverters or connect to the SmartLogger. It can also connect to an EMI. |
| 3   | 485B1_1    | RS485 differential signal -      |                                                                                           | 4   | 485B1_2    | RS485 differential signal -           |                                                                                         |
| 5   | PE         | Ground point on the shield layer | -                                                                                         | 6   | PE         | Ground point on the shield layer      | -                                                                                       |
| 7   | 485A2      | RS485 differential signal +      | Connects to the RS485 signal port for controlling the power meter at the grid-tied point. | 8   | DIN1       | Dry contact for power grid scheduling | -                                                                                       |
| 9   | 485B2      | RS485 differential signal -      |                                                                                           | 10  | DIN2       |                                       |                                                                                         |
| 11  | -          | -                                | -                                                                                         | 12  | DIN3       |                                       |                                                                                         |
| 13  | GND        | GND                              | -                                                                                         | 14  | DIN4       |                                       |                                                                                         |

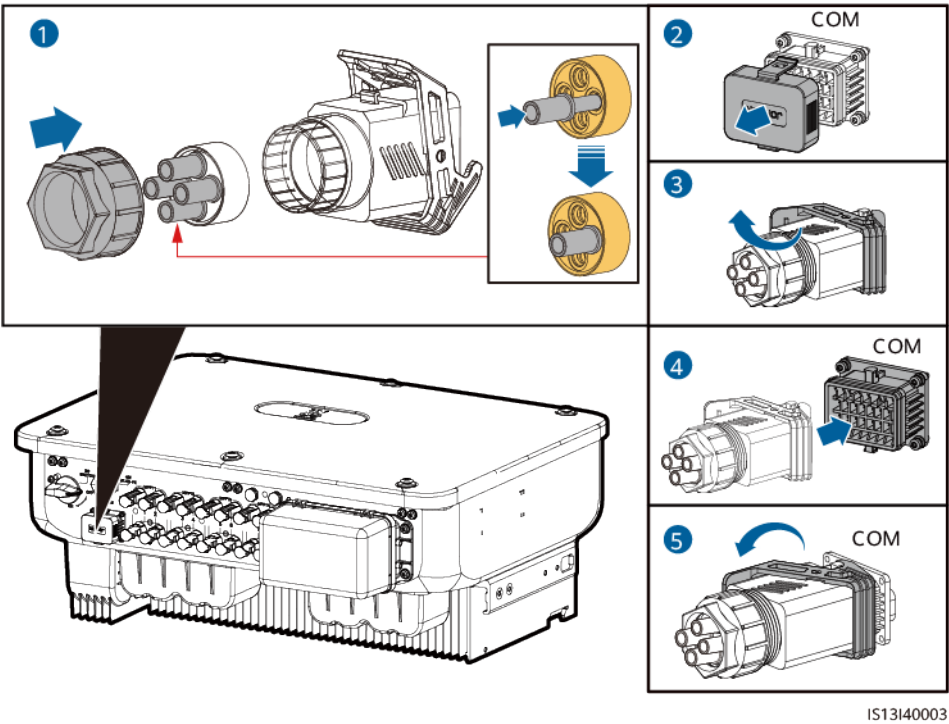
| Pin | Definition | Function       | Description                                                                                          | Pin | Definition | Function | Description |
|-----|------------|----------------|------------------------------------------------------------------------------------------------------|-----|------------|----------|-------------|
| 15  | DIN5       | Rapid shutdown | Supports AC NS protection shutdown, which can be used as a reserved port for rapid shutdown signals. | 16  | GND        |          |             |

Scenarios Where No Signal Cable Is Connected

NOTICE

If no signal cable is required for the SUN2000, use waterproof plugs to block the wiring holes on the signal cable connector and connect the signal cable connector to the communications port on the SUN2000 to improve the waterproof performance of the SUN2000.

Figure 5-13 Securing the signal cable connector



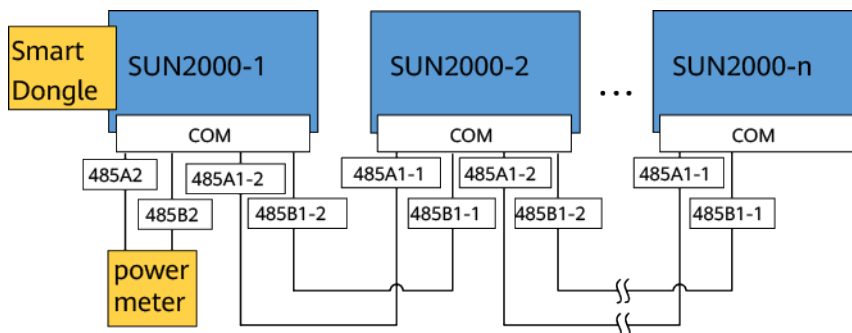
IS13140003

## 5.7.1 Communication Modes

### RS485 Communication

- Smart Dongle networking

Figure 5-14 Smart Dongle networking

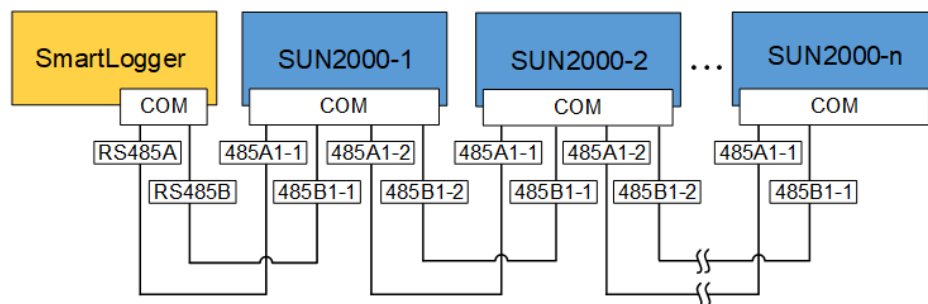


#### NOTE

If a SUN2000 is networked using a Smart Dongle, it cannot be connected to the SmartLogger.

- SmartLogger networking

Figure 5-15 SmartLogger networking



#### NOTE

- If a SUN2000 is networked using the SmartLogger, it cannot be connected to a Smart Dongle.
- It is recommended that the number of SUN2000s connected to each RS485 route be less than 30.

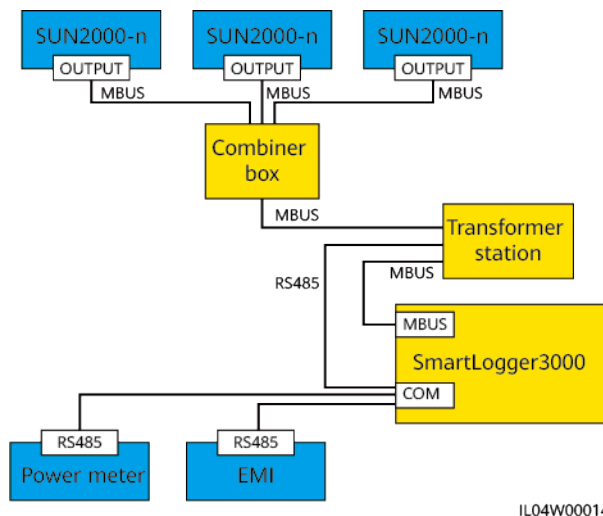
### MBUS Communication

The MBUS is a communication mode in which communication signals are loaded to power cables through the communications board for transmission.

#### NOTE

The built-in MBUS module in the SUN2000 does not need to be connected with cables.

**Figure 5-16** MBUS communication

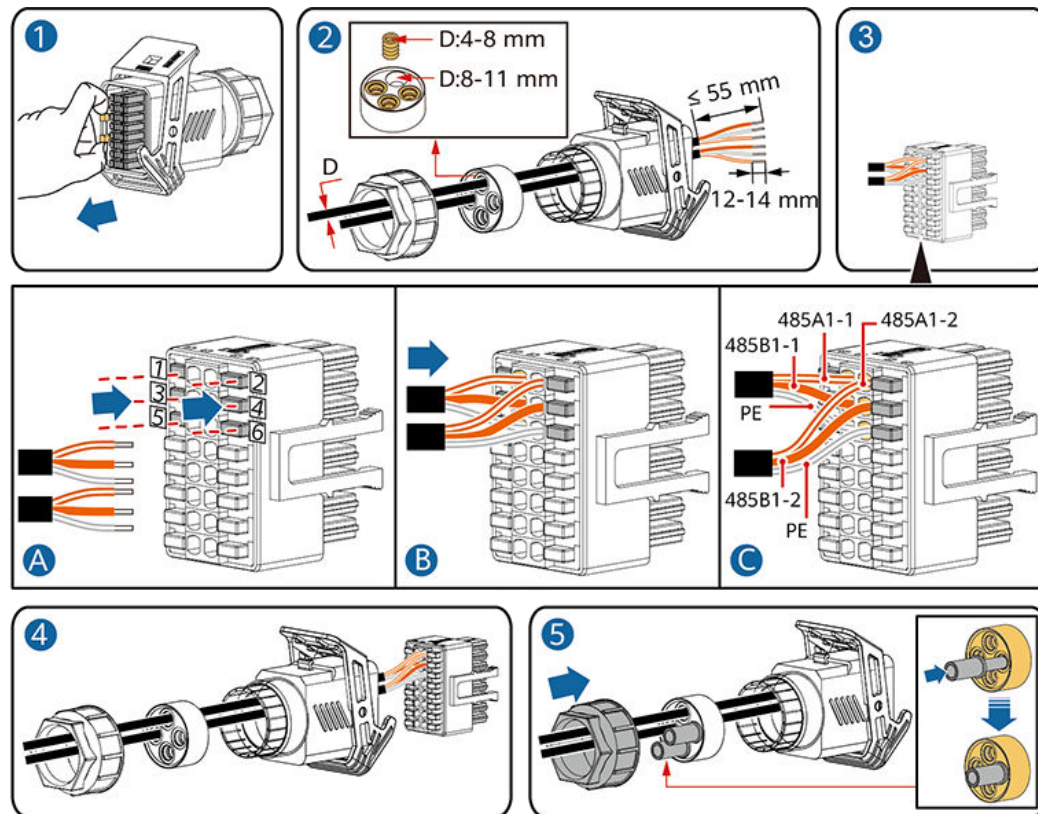


## 5.7.2 (Optional) Connecting the RS485 Communications Cable to the SUN2000

### Procedure

**Step 1** Connect the signal cable to the signal cable connector.

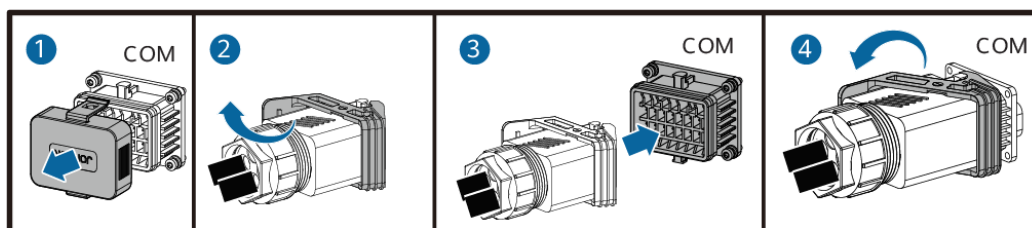
**Figure 5-17** Connecting the cable



IS10I20006

**Step 2** Connect the signal cable connector to the COM port.

**Figure 5-18** Securing the signal cable connector



IS13140001

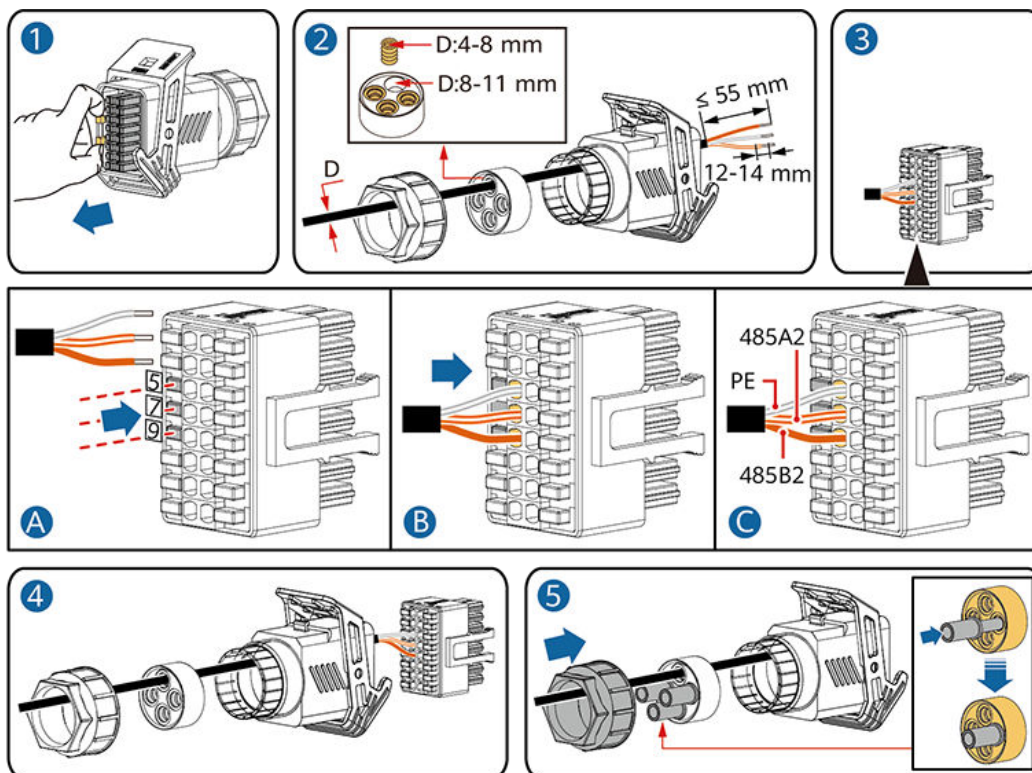
----End

### 5.7.3 (Optional) Connecting the RS485 Communications Cable to the Power Meter

#### Procedure

**Step 1** Connect the signal cable to the signal cable connector.

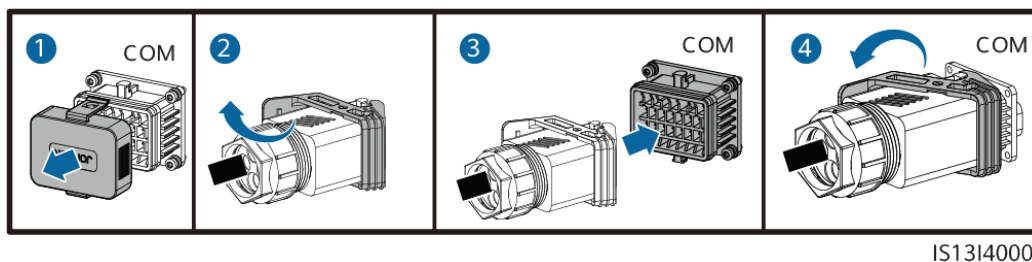
**Figure 5-19** Connecting the cable



IS10120008

**Step 2** Connect the signal cable connector to the COM port.

**Figure 5-20** Securing the signal cable connector



IS13I40001

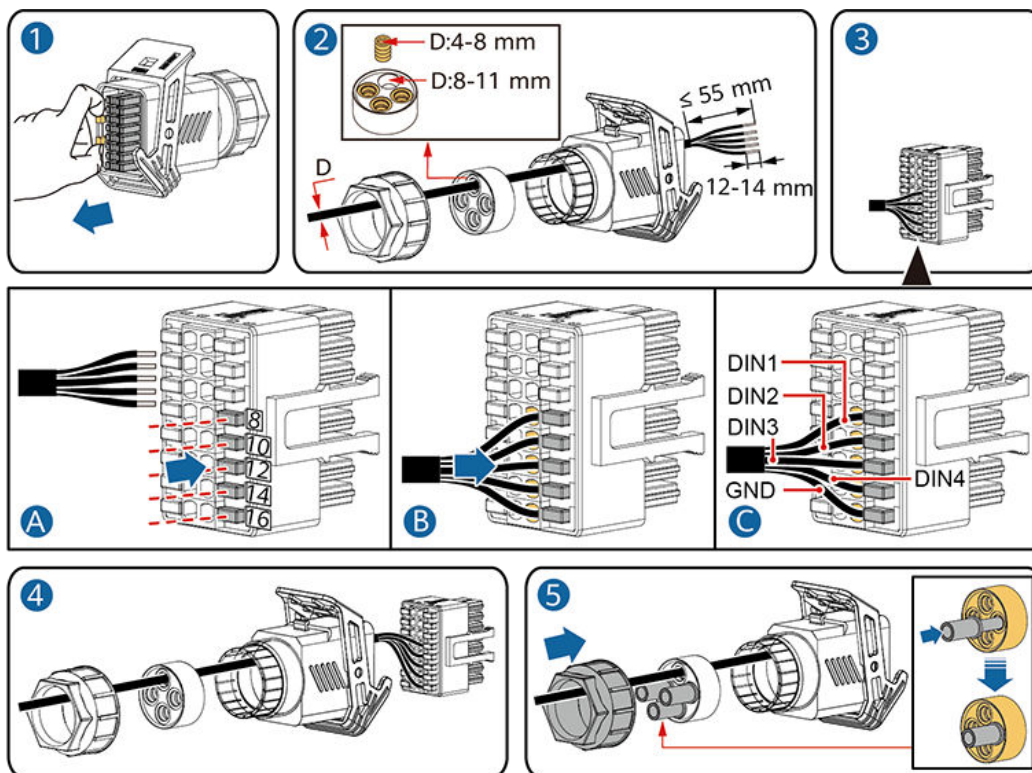
----End

## 5.7.4 (Optional) Connecting the Power Grid Scheduling Signal Cable

### Procedure

**Step 1** Connect the signal cable to the signal cable connector.

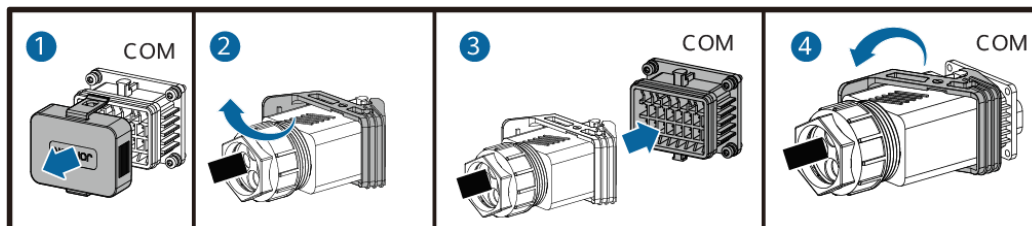
**Figure 5-21** Connecting the cable



IS10I20010

**Step 2** Connect the signal cable connector to the COM port.

**Figure 5-22** Securing the signal cable connector



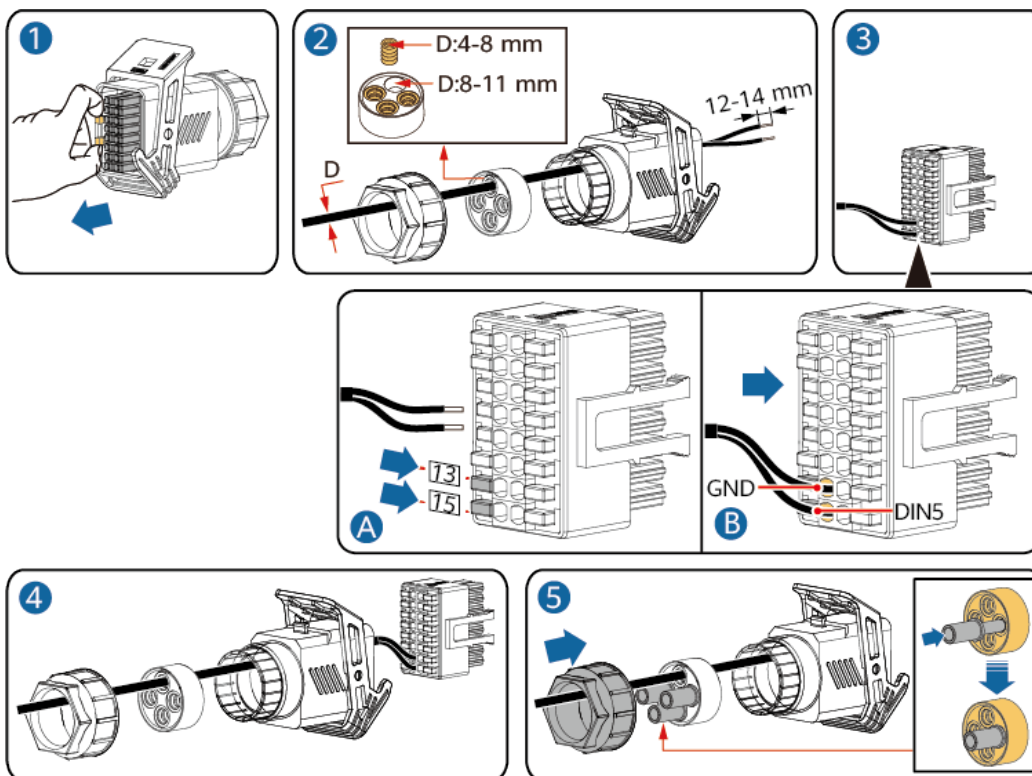
IS13I40001

----End

## 5.7.5 (Optional) Connecting the Rapid Shutdown Signal Cable

**Step 1** Connect the signal cable to the signal cable connector.

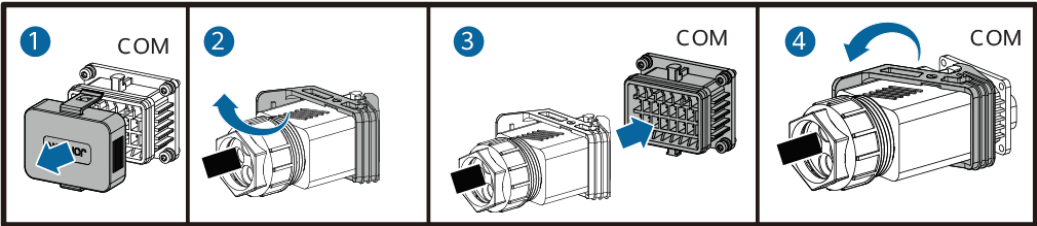
**Figure 5-23** Connecting the cable



IS13I40004

**Step 2** Connect the signal cable connector to the COM port.

Figure 5-24 Securing the signal cable connector



IS13I40001

----End

# 6 Commissioning

## 6.1 Checking Before Power-On

Table 6-1 Checklist

| No. | Check Item                 | Acceptance Criteria                                                                        |
|-----|----------------------------|--------------------------------------------------------------------------------------------|
| 1   | SUN2000 installation       | The SUN2000 is installed correctly and securely.                                           |
| 2   | Smart Dongle               | The Smart Dongle is installed correctly and securely.                                      |
| 3   | Cable routing              | The cables are routed properly as required by the customer.                                |
| 4   | Cable ties                 | Cable ties are evenly distributed and no burr exists.                                      |
| 5   | Reliable grounding         | The PE cable is connected correctly and securely.                                          |
| 6   | Switch                     | DC switches and all the switches connecting to the SUN2000 are OFF.                        |
| 7   | Cable connection           | The AC output power cable, and DC input power cables are connected correctly and securely. |
| 8   | Unused terminals and ports | Unused terminals and ports are locked by watertight caps.                                  |
| 9   | Installation environment   | The installation space is proper, and the installation environment is clean and tidy.      |

## 6.2 System Power-On

### Prerequisites

#### NOTICE

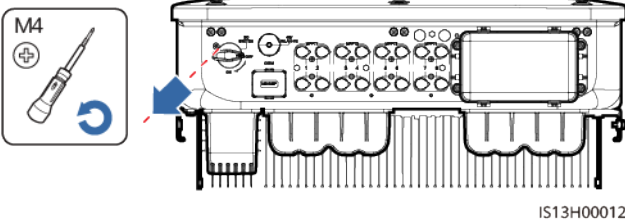
- Before turning on the AC switch between the SUN2000 and the power grid, check that the AC voltage is within the specified range using a multimeter.
- If the DC power supply is connected but the AC power supply is disconnected, the SUN2000 will report a **Grid Loss** alarm. The SUN2000 can start properly only after the power grid recovers.

### Procedure

**Step 1** Turn on the AC switch between the SUN2000 and the power grid.

**Step 2** (Optional) Remove the locking screw beside the DC switch.

**Figure 6-1** Removing the locking screw beside the DC switch



**Step 3** Turn on the DC switch at the bottom of the SUN2000.

**Step 4** Observe the LED indicators to check the operating status of the SUN2000.

**Table 6-2** Indicator description

| Category                                               | Status                                           |              | Description                                 |
|--------------------------------------------------------|--------------------------------------------------|--------------|---------------------------------------------|
| <p>Running indicator</p> <p>⎓ ⎓ ⎓</p> <p>LED1 LED2</p> | <b>LED1</b>                                      | <b>LED2</b>  | –                                           |
|                                                        | Steady green                                     | Steady green | The SUN2000 is operating in grid-tied mode. |
|                                                        | Blinking green slowly (on for 1s and off for 1s) | Off          | The DC is on and the AC is off.             |

| Category                                                                                                                                                                                                                                   | Status                                                  |                                                  | Description                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                            | Blinking green slowly (on for 1s and off for 1s)        | Blinking green slowly (on for 1s and off for 1s) | Both the DC and AC are on, and the SUN2000 is not supplying power to the power grid. |
|                                                                                                                                                                                                                                            | Off                                                     | Blinking green slowly                            | The DC is off and the AC is on.                                                      |
|                                                                                                                                                                                                                                            | Off                                                     | Off                                              | Both the DC and AC are off.                                                          |
|                                                                                                                                                                                                                                            | Blinking red fast (on for 0.2s and off for 0.2s)        | –                                                | DC environment alarm                                                                 |
|                                                                                                                                                                                                                                            | –                                                       | Blinking red fast (on for 0.2s and off for 0.2s) | AC environment alarm                                                                 |
|                                                                                                                                                                                                                                            | Steady red                                              | Steady red                                       | Faulty                                                                               |
| <div>Communications indicator</div> <div><div><div>≡[</div><div>]</div><div>~</div></div><div><div>Ⓢ</div><div>Ⓜ</div><div>Ⓣ</div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div>LED3</div></div></div> | LED3                                                    |                                                  | –                                                                                    |
|                                                                                                                                                                                                                                            | Blinking green fast (on for 0.2s and then off for 0.2s) |                                                  | Communication is in progress.                                                        |
|                                                                                                                                                                                                                                            | Blinking green slowly (on for 1s and off for 1s)        |                                                  | A mobile phone is connected.                                                         |
|                                                                                                                                                                                                                                            | Off                                                     |                                                  | No communication                                                                     |
| Note: If LED1, LED2, and LED3 are steady red, the SUN2000 is faulty and needs to be replaced.                                                                                                                                              |                                                         |                                                  |                                                                                      |

----End

# 7 Man-Machine Interaction

## NOTE

- If the SUN2000 is connected to the FusionSolar Smart PV Management System, the FusionSolar app is recommended. In areas (such as the UK) where the FusionSolar app is not available, or when a third-party management system is used, only the SUN2000 app can be used for commissioning.
- Access the Huawei app store (<http://appstore.huawei.com>), search for FusionSolar or SUN2000, and download the app installation package. You can also scan the QR codes below to download the apps.



FusionSolar App



SUN2000 App

## NOTICE

- The screenshots are for reference only. The actual screens prevail.
- Obtain the initial password for connecting to the solar inverter WLAN from the label on the side of the solar inverter.
- Set the password at the first login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- Set the correct grid code based on the application area and scenario of the SUN2000.

## 7.1 Scenario in Which SUN2000s Are Connected to the FusionSolar Smart PV Management System

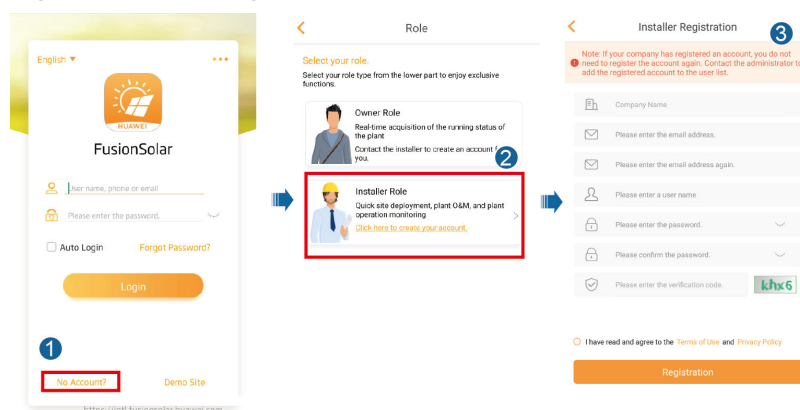
### 7.1.1 (Optional) Registering an Installer Account

#### NOTE

- If you have an installer account, skip this step.
- You can register an account only using a mobile phone only in China.
- The mobile number or email address used for registration is the user name for logging in to the FusionSolar app.

Create the first installer account and create a domain named after the company name.

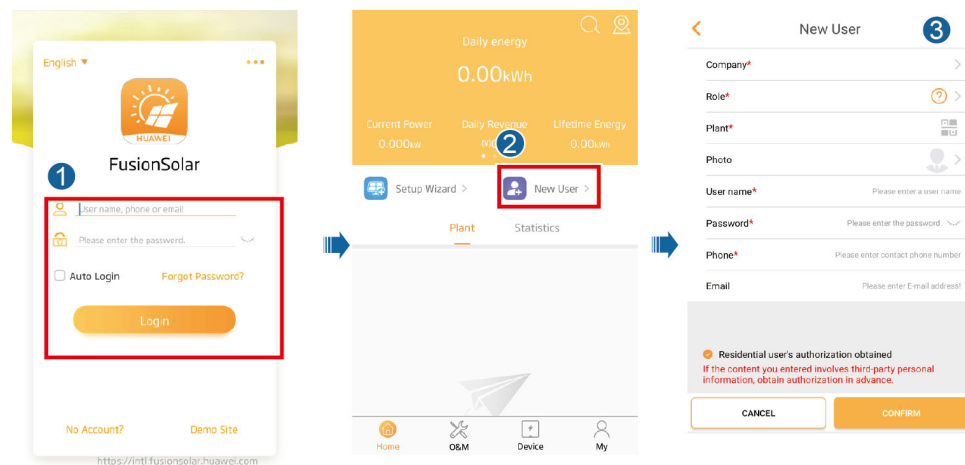
Figure 7-1 Creating the first installer account



#### NOTICE

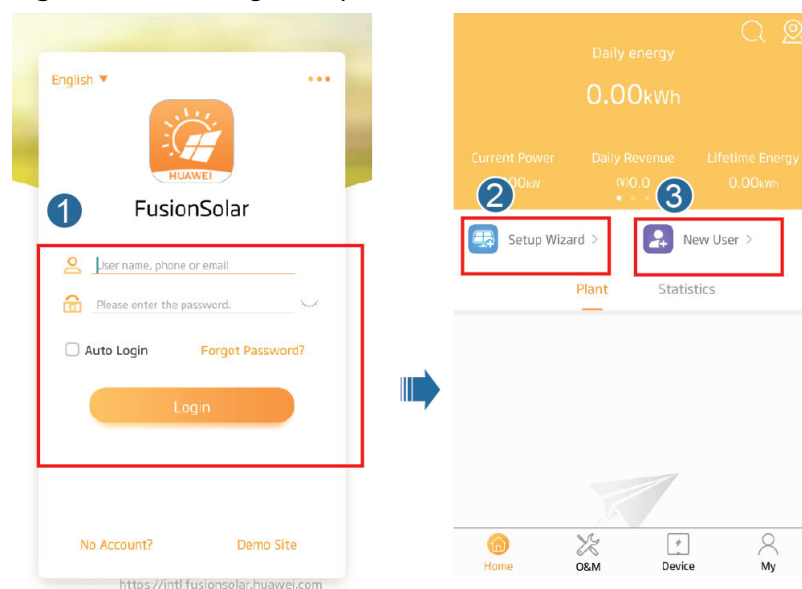
To create multiple installer accounts for a company, log in to the FusionSolar app and tap **New User** to create an installer account.

Figure 7-2 Creating multiple installer accounts for the same company



## 7.1.2 Creating a PV Plant and a User

Figure 7-3 Creating a PV plant and a user



### NOTE

For details about how to use the site deployment wizard, see [FusionSolar App Quick Guide](#). During the FusionSolar app upgrade, scan the QR code to download the corresponding quick guide according to the downloaded app version.



## 7.1.3 SmartLogger Networking Scenario

For details, see [PV Plants Connecting to Huawei Hosting Cloud Quick Guide \(Inverters + SmartLogger3000\)](#).

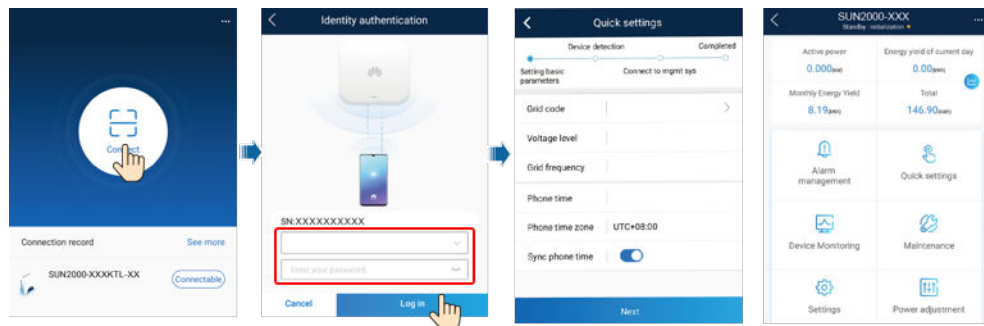
You can scan the QR code below to obtain the document.



## 7.2 Scenario in Which SUN2000s Are Connected to Other Management Systems

- Step 1** Open the SUN2000 app, scan the QR code of the SUN2000 or manually connect to the WLAN hotspot to access the device commissioning screen.
- Step 2** Select **installer** and enter the login password.
- Step 3** Tap **Log in** to access the quick settings screen or SUN2000 home screen.

**Figure 7-4** Logging In to the app



----End

# 8 Maintenance

## 8.1 System Power-Off

### Precautions

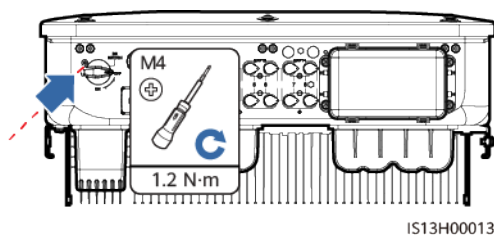
#### WARNING

After the SUN2000 powers off, the remaining electricity and heat may still cause electric shocks and body burns. Therefore, put on protective gloves and begin operating the SUN2000 five minutes after the power-off.

### Procedure

- Step 1** Send a shutdown command on the app.
- Step 2** Turn off the AC switch between the SUN2000 and the power grid.
- Step 3** Turn off the DC switch at the bottom of the SUN2000.
- Step 4** (Optional) Install the locking screw for the DC switch.

**Figure 8-1** Installing the locking screw for the DC switch



- Step 5** Turn on the DC switch between the PV string and the SUN2000 if there is any.

----End

## 8.2 Routine Maintenance

To ensure that the SUN2000 can operate properly for a long term, you are advised to perform routine maintenance on it as described in this chapter.

### CAUTION

Before cleaning the system, connecting cables, and ensuring the grounding reliability, power off the system.

**Table 8-1** Maintenance checklist

| Check Item              | Check Method                                                                                                                                                                                                                                           | Maintenance Interval                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| System cleanliness      | Check periodically that the heat sinks are free from obstacles and dust.                                                                                                                                                                               | Once every 6 to 12 months                                                                                           |
| System operating status | <ul style="list-style-type: none"><li>• Check that the SUN2000 is not damaged or deformed.</li><li>• Check that the SUN2000 operates with no abnormal sound.</li><li>• Check that all SUN2000 parameters are correctly set during operation.</li></ul> | Once every 6 months                                                                                                 |
| Electrical connection   | <ul style="list-style-type: none"><li>• Check that cables are secured.</li><li>• Check that cables are intact, and that in particular, the parts touching the metallic surface are not scratched.</li></ul>                                            | The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months. |
| Grounding reliability   | Check that ground cables are securely connected.                                                                                                                                                                                                       | The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months. |
| Air tightness           | Check that all terminals and ports are properly sealed.                                                                                                                                                                                                | Once a year                                                                                                         |

## 8.3 Troubleshooting

Alarm severities are defined as follows:

- Major: The inverter is faulty. As a result, the output power decreases or the grid-tied power generation is stopped.
- Minor: Some components are faulty without affecting the grid-tied power generation.
- Warning: The inverter works properly. The output power decreases or some authorization functions fail due to external factors.

**Table 8-2** Common fault alarm list

| ID   | Name                      | Severity | Cause                                                                                                                                                                                                                                                                                                                                                                                                                            | Solution                                                                                                                                                                                                                                             |
|------|---------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2001 | High string input voltage | Major    | <p>The PV array is not properly configured. Excessive PV modules are connected in series to the PV string, and therefore the PV string open-circuit voltage exceeds the maximum inverter operating voltage.</p> <ul style="list-style-type: none"> <li>• Cause ID 1: PV strings 1 and 2</li> <li>• Cause ID 2: PV strings 3 and 4</li> <li>• Cause ID 3: PV strings 5 and 6</li> <li>• Cause ID 4: PV strings 7 and 8</li> </ul> | Reduce the number of PV modules connected in series to the PV string until the PV string open-circuit voltage is less than or equal to the maximum inverter operating voltage. After the PV string configuration is corrected, the alarm disappears. |
| 2002 | DC arc fault              | Major    | <p>The PV string power cables arc or are in poor contact.</p> <ul style="list-style-type: none"> <li>• Cause ID 1: PV strings 1 and 2</li> <li>• Cause ID 2: PV strings 3 and 4</li> <li>• Cause ID 3: PV strings 5 and 6</li> <li>• Cause ID 4: PV strings 7 and 8</li> </ul>                                                                                                                                                   | Check whether the PV string cables arc or are in poor contact.                                                                                                                                                                                       |
| 2003 | DC arc fault              | Major    | <p>The PV string power cables arc or are in poor contact.</p> <p>Cause ID 1–8: PV strings 1–8</p>                                                                                                                                                                                                                                                                                                                                | Check whether the PV string cables arc or are in poor contact.                                                                                                                                                                                       |

| ID   | Name                             | Severity | Cause                                                                                                                                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------|----------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2011 | String reverse connection        | Major    | The PV string polarity is reversed.<br>Cause ID 1–8: PV strings 1–8                                                                                                                   | Check whether the PV string is reversely connected to the inverter. If yes, wait until the solar irradiance declines at night and the PV string current drops to below 0.5 A. Then, turn off the two DC switches and correct the PV string connection.                                                                                                                                                                                                  |
| 2012 | String current backfeed          | Warning  | The number of PV modules connected in series to the PV string is insufficient. As a result, the terminal voltage is lower than that of other strings.<br>Cause ID 1–8: PV strings 1–8 | <ol style="list-style-type: none"> <li>1. Check whether the number of PV modules connected in series to the PV string is less than that of other PV strings. If yes, wait until the PV string current drops below 0.5 A, turn off all DC switches, and adjust the number of PV modules in the PV string.</li> <li>2. Check whether the open-circuit voltage of the PV string is abnormal.</li> <li>3. Check whether the PV string is shaded.</li> </ol> |
| 2021 | AFCI self-check failure          | Major    | Cause ID = 1, 2<br>The AFCI self-check fails.                                                                                                                                         | Turn off the AC output switch and DC input switch, and then turn them on after 5 minutes. If the alarm persists, contact Huawei technical support.                                                                                                                                                                                                                                                                                                      |
| 2031 | Phase wire short-circuited to PE | Major    | Cause ID = 1<br>The impedance of the output phase wire to PE is low or the output phase wire is short-circuited to PE.                                                                | Check the impedance of the output phase wire to PE, locate the position with low impedance, and rectify the fault.                                                                                                                                                                                                                                                                                                                                      |
| 2032 | Grid loss                        | Major    | Cause ID = 1 <ul style="list-style-type: none"> <li>• Power grid outage occurs.</li> <li>• The AC circuit is disconnected or the AC switch is off.</li> </ul>                         | <ol style="list-style-type: none"> <li>1. The alarm is cleared automatically after the power grid recovers.</li> <li>2. Check whether the AC circuit is disconnected or the AC switch is off.</li> </ol>                                                                                                                                                                                                                                                |

| ID   | Name              | Severity | Cause                                                                                                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|-------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2033 | Grid undervoltage | Major    | Cause ID = 1<br>The power grid voltage is below the lower threshold or the low-voltage duration has lasted for more than the value specified by LVRT. | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid voltage is within the acceptable range. If not, contact the local power operator. If yes, modify the grid undervoltage protection threshold through the app, SmartLogger, or NMS with the consent of the local power operator.</li> <li>3. If the alarm persists for a long time, check the AC circuit breaker and AC output power cable.</li> </ol>                                                      |
| 2034 | Grid overvoltage  | Major    | Cause ID = 1<br>The power grid voltage exceeds the upper threshold or the high voltage duration has lasted for more than the value specified by HVRT. | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid frequency is within the acceptable range. If not, contact the local power operator. If yes, modify the grid overfrequency protection threshold through the app, SmartLogger, or NMS with the consent of the local power operator.</li> <li>3. Check whether the peak voltage of the power grid is too high. If the alarm persists and lasts for a long time, contact the local power operator.</li> </ol> |

| ID   | Name                 | Severity | Cause                                                                                                                                | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|----------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2035 | Grid volt. Imbalance | Major    | Cause ID = 1<br>The difference between power grid phase voltages exceeds the upper threshold.                                        | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid voltage is within the acceptable range. If not, contact the local power operator.</li> <li>3. If the alarm lasts for a long time, check the AC output power cable connection.</li> <li>4. If the AC output power cable is correctly connected, yet the alarm persists and affects the energy yield of the PV plant, contact the local power operator.</li> </ol> |
| 2036 | Grid overfrequency   | Major    | Cause ID = 1<br>Power grid exception: The actual power grid frequency is higher than the requirements for the local power grid code. | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid frequency is within the acceptable range. If not, contact the local power operator. If yes, modify the grid overfrequency protection threshold through the app, SmartLogger, or NMS with the consent of the local power operator.</li> </ol>                                                                                                                     |

| ID   | Name                    | Severity | Cause                                                                                                                                                                                                        | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|-------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2037 | Grid underfrequency     | Major    | Cause ID = 1<br>Power grid exception: The actual power grid frequency is lower than the requirements for the local power grid code.                                                                          | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid frequency is within the acceptable range. If not, contact the local power operator. If yes, modify the grid underfrequency protection threshold through the app, SmartLogger, or NMS with the consent of the local power operator.</li> </ol> |
| 2038 | Unstable grid frequency | Major    | Cause ID = 1<br>Power grid exception: The actual change rate of the power grid frequency does not meet the requirements for the local power grid code.                                                       | <ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The inverter automatically recovers after detecting that the power grid becomes normal.</li> <li>2. If the alarm persists, check whether the power grid frequency is within the acceptable range. If not, contact the local power operator.</li> </ol>                                                                                                                                                |
| 2039 | Output overcurrent      | Major    | Cause ID = 1<br>The power grid voltage drops dramatically or the power grid is short-circuited. As a result, the inverter transient output current exceeds the upper threshold, and protection is triggered. | <ol style="list-style-type: none"> <li>1. The inverter monitors its external operating conditions in real time and automatically recovers after the fault is rectified.</li> <li>2. If the alarm persists and affects the energy yield of the PV plant, check whether the output is short-circuited. If the fault cannot be rectified, contact your dealer or Huawei technical support.</li> </ol>                                                                                                                            |

| ID   | Name                         | Severity | Cause                                                                                                                                                                                                                           | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------|------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2040 | Output DC component overhigh | Major    | Cause ID = 1<br>The DC component of the inverter output current exceeds the upper threshold.                                                                                                                                    | <ol style="list-style-type: none"> <li>1. The inverter monitors its external operating conditions in real time and automatically recovers after the fault is rectified.</li> <li>2. If the alarm persists and affects the energy yield of the PV plant, contact your dealer or Huawei technical support.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                             |
| 2051 | Abnormal residual current    | Major    | Cause ID = 1<br>The insulation impedance of the input side to PE decreases when the inverter is operating.                                                                                                                      | <ol style="list-style-type: none"> <li>1. If the alarm occurs accidentally, the external power cable may be abnormal temporarily. The inverter automatically recovers after the fault is rectified.</li> <li>2. If the alarm persists or lasts a long time, check whether the impedance between the PV string and ground is too low.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                 |
| 2061 | Abnormal grounding           | Major    | Cause ID = 1 <ul style="list-style-type: none"> <li>• The neutral wire or PE cable of the inverter is not connected.</li> <li>• The output mode set for the inverter is inconsistent with the cable connection mode.</li> </ul> | Power off the inverter (turn off the AC output switch and DC input switch, and wait for a period of time. For details about the wait time, see the description on the device safety warning label), and then perform the following operations: <ol style="list-style-type: none"> <li>1. Check whether the PE cable for the inverter is connected properly.</li> <li>2. If the inverter is connected to a TN power grid, check whether the neutral wire is properly connected and whether the voltage of the neutral wire to ground is normal.</li> <li>3. After the inverter is powered on, check whether the output mode set for the inverter is consistent with the output cable connection mode.</li> </ol> |

| ID   | Name                               | Severity | Cause                                                                                                                                                                                                                                     | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------|------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2062 | Low insulation resistance          | Major    | Cause ID = 1 <ul style="list-style-type: none"> <li>The PV array is short-circuited with PE.</li> <li>The PV string has been in a moist environment for a long time and the circuit is not well insulated to ground.</li> </ul>           | <ol style="list-style-type: none"> <li>Check the impedance between the PV string and the PE cable. If a short circuit occurs, rectify the fault.</li> <li>Check whether the PE cable of the inverter is correctly connected.</li> <li>If you have confirmed that the impedance is lower than the specified protection threshold in a cloudy or rainy environment, log in to the app, SmartLogger, or NMS and set <b>Insulation resistance protection threshold</b>.</li> </ol> |
| 2063 | Cabinet overtemperature            | Minor    | Cause ID = 1 <ul style="list-style-type: none"> <li>The inverter is installed in a place with poor ventilation.</li> <li>The ambient temperature exceeds the upper threshold.</li> <li>The inverter is not operating properly.</li> </ul> | <ol style="list-style-type: none"> <li>Check the ventilation and ambient temperature at the inverter installation position.</li> <li>If the ventilation is poor or the ambient temperature exceeds the upper threshold, improve the ventilation and heat dissipation.</li> <li>If both the ventilation and ambient temperature meet requirements yet the alarm persists, contact your dealer or Huawei technical support.</li> </ol>                                           |
| 2064 | Device fault                       | Major    | Cause ID = 1-15<br>An unrecoverable fault occurs on a circuit inside the inverter.                                                                                                                                                        | Turn off the AC output switch and DC input switch, and then turn them on after 5 minutes. If the alarm persists, contact your dealer or Huawei technical support.<br><br><b>NOTICE</b><br>Cause ID = 1: Perform the preceding operations when the PV string current is less than 1 A.                                                                                                                                                                                          |
| 2065 | Upgrade failed or version mismatch | Minor    | Cause ID = 1-6<br>The upgrade is not completed normally.                                                                                                                                                                                  | <ol style="list-style-type: none"> <li>Perform an upgrade again.</li> <li>If the upgrade fails several times, contact your dealer or Huawei technical support.</li> </ol>                                                                                                                                                                                                                                                                                                      |

| ID    | Name                     | Severity | Cause                                                                                                                                                                 | Solution                                                                                                                                                                                                                                                                                                                                                                     |
|-------|--------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2066  | License expired          | Warning  | Cause ID = 1 <ul style="list-style-type: none"> <li>The privilege license has entered the grace period.</li> <li>The privilege feature is about to expire.</li> </ul> | 1. Apply for a new license.<br>2. Load a new certificate.                                                                                                                                                                                                                                                                                                                    |
| 2067  | Faulty power collector   | Major    | Cause ID = 1<br>The power meter is disconnected.                                                                                                                      | 1. Check whether the configured power meter model is the same as the actual model.<br>2. Check whether the communications parameters of the power meter are the same as the RS485 configurations of the inverter.<br>3. Check whether the power meter is powered on and whether the RS485 communications cable is connected.                                                 |
| 61440 | Faulty monitoring unit   | Minor    | Cause ID = 1 <ul style="list-style-type: none"> <li>The flash memory is insufficient.</li> <li>The flash memory has bad sectors.</li> </ul>                           | Turn off the AC output switch and DC input switch, and then turn them on after 5 minutes. If the alarm persists, replace the monitoring board or contact your dealer or Huawei technical support.                                                                                                                                                                            |
| 2072  | Transient AC overvoltage | Major    | Cause ID = 1<br>The inverter detects that the phase voltage exceeds the transient AC overvoltage protection threshold.                                                | 1. If the voltage at the grid connection point is too high, contact the local power operator.<br>2. If you have confirmed that the voltage at the grid connection point exceeds the upper threshold and obtained consent from the local power operator, modify the overvoltage protection thresholds.<br>3. Check whether the peak grid voltage exceeds the upper threshold. |

| ID   | Name                                         | Severity | Cause                                                                                                                                                                    | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|----------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2085 | Built-in PID operation abnormal              | Minor    | Cause ID = 1, 2 <ul style="list-style-type: none"> <li>The output resistance of PV arrays to ground is low.</li> <li>The system insulation resistance is low.</li> </ul> | <ul style="list-style-type: none"> <li>Cause ID = 1               <ol style="list-style-type: none"> <li>Turn off the AC output switch and DC input switch, wait for a period of time (for details about the wait time, see the description on the device safety warning label), and then turn on the DC input switch and AC output switch.</li> <li>If the alarm persists, contact your dealer or Huawei technical support.</li> </ol> </li> <li>Cause ID = 2               <ol style="list-style-type: none"> <li>Check the impedance between the PV array output and the ground. If a short circuit occurs or the insulation is insufficient, rectify the fault.</li> <li>If the alarm persists, contact your dealer or Huawei technical support.</li> </ol> </li> </ul> |
| 2090 | Abnormal active power scheduling instruction | Major    | Cause ID = 1 <ul style="list-style-type: none"> <li>The DI input is abnormal.</li> <li>The DI input is inconsistent with the configuration.</li> </ul>                   | <ol style="list-style-type: none"> <li>Check whether the cables are connected correctly to the DI ports.</li> <li>On the <b>DI active scheduling</b> screen under the dry contact scheduling settings, view the DI signal configuration mapping table. Contact the power grid company to check whether the configurations in the mapping table are complete and meet the requirements.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                           |

| ID   | Name                                           | Severity | Cause                                                                                                                                                          | Solution                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2091 | Abnormal reactive power scheduling instruction | Major    | <p>Cause ID = 1</p> <ul style="list-style-type: none"><li>• The DI input is abnormal.</li><li>• The DI input is inconsistent with the configuration.</li></ul> | <ol style="list-style-type: none"><li>1. Check whether the cables are connected correctly to the DI ports.</li><li>2. On the <b>DI reactive power scheduling</b> screen under the dry contact scheduling settings, view the DI signal configuration mapping table. Contact the power grid company to check whether the configurations in the mapping table are complete and meet the requirements.</li></ol> |

 **NOTE**

Contact your dealer or Huawei technical support if all troubleshooting procedures listed above are completed and the fault still exists.

# 9 Handling the Inverter

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## 9.1 Removing the SUN2000

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### NOTICE

Before removing the SUN2000, disconnect both AC and DC connections.

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Perform the following operations to remove the SUN2000:

1. Disconnect all cables from the SUN2000, including RS485 communications cables, DC input power cables, AC output power cables, and PGND cables.
2. Remove the SUN2000 from the mounting bracket.
3. Remove the mounting bracket.

## 9.2 Packing the SUN2000

- If the original packing materials are available, put the SUN2000 inside them and then seal them by using adhesive tape.
- If the original packing materials are not available, put the SUN2000 inside a suitable cardboard box and seal it properly.

## 9.3 Disposing of the SUN2000

If the SUN2000 service life expires, dispose of it according to the local disposal rules for electrical equipment waste.

# 10 Technical Specifications

## Efficiency

| Technical Specifications | SUN2000-20KTL-M3 | SUN2000-29.9KTL-M3               | SUN2000-30KTL-M3                 | SUN2000-36KTL-M3                 | SUN2000-40KTL-M3                 |
|--------------------------|------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Peak efficiency          | 97.1%            | 98.65%/400 Vac<br>98.75%/480 Vac | 98.65%/400 Vac<br>98.75%/480 Vac | 98.65%/400 Vac<br>98.75%/480 Vac | 98.65%/400 Vac<br>98.75%/480 Vac |
| European efficiency      | 96.7%            | 98.4%/400 Vac<br>98.45%/480 Vac  | 98.4%/400 Vac<br>98.45%/480 Vac  | 98.4%/400 Vac<br>98.5%/480 Vac   | 98.4%/400 Vac<br>98.5%/480 Vac   |

## Input

| Technical Specifications           | SUN2000-20KTL-M3 | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|------------------------------------|------------------|--------------------|------------------|------------------|------------------|
| Maximum input DC power             | 30,000 W         | 44,850 W           | 45,000 W         | 54,000 W         | 60,000 W         |
| Maximum input voltage <sup>a</sup> | 800 V            | 1100 V             |                  |                  |                  |
| Maximum input current (per MPPT)   | 26 A             |                    |                  |                  |                  |

| Technical Specifications                                                                                                                                               | SUN2000-20KTL-M3 | SUN2000-29.9KTL-M3                     | SUN2000-30KTL-M3                                                             | SUN2000-36KTL-M3                                                             | SUN2000-40KTL-M3                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Maximum short-circuit current (per MPPT)                                                                                                                               | 40 A             |                                        |                                                                              |                                                                              |                                                                              |
| Minimum startup voltage                                                                                                                                                | 200 V            |                                        |                                                                              |                                                                              |                                                                              |
| MPP voltage range                                                                                                                                                      | 200–750 V        | 200–1000 V                             |                                                                              |                                                                              |                                                                              |
| Full power MPPT voltage range                                                                                                                                          | 300–550 V        | 500–800 V/400 Vac<br>625–850 V/480 Vac | 500–800 Vdc/(380 Vac, 400 Vac)<br>625–850 Vdc/400 Vac<br>625–850 Vdc/480 Vac | 520–800 Vdc/(380 Vac, 400 Vac)<br>625–850 Vdc/400 Vac<br>625–850 Vdc/480 Vac | 540–800 Vdc/(380 Vac, 400 Vac)<br>625–850 Vdc/400 Vac<br>625–850 Vdc/480 Vac |
| Rated input voltage                                                                                                                                                    | 350 V            | 600 V (400 Vac)<br>720 V (480 Vac)     | 600 V (380 Vac, 400 Vac)<br>650 V (440 Vac)<br>720 V (480 Vac)               | 600 V (380 Vac, 400 Vac)<br>650 V (440 Vac)<br>720 V (480 Vac)               | 600 V (380 Vac, 400 Vac)<br>650 V (440 Vac)<br>720 V (480 Vac)               |
| Maximum number of inputs                                                                                                                                               | 8                |                                        |                                                                              |                                                                              |                                                                              |
| Number of MPPTs                                                                                                                                                        | 4                |                                        |                                                                              |                                                                              |                                                                              |
| Note a: The maximum input voltage is the maximum DC input voltage that the SUN2000 can withstand. If the input voltage exceeds this value, the SUN2000 may be damaged. |                  |                                        |                                                                              |                                                                              |                                                                              |

## Output

| Technical Specifications                      | SUN2000-20KTL-M3                                         | SUN2000-29.9KTL-M3                                     | SUN2000-30KTL-M3                                                                                                   | SUN2000-36KTL-M3                                                                                                 | SUN2000-40KTL-M3                                                                                                 |
|-----------------------------------------------|----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Rated output power                            | 20,000 W                                                 | 29,900 W                                               | 30,000 W                                                                                                           | 36,000 W                                                                                                         | 40,000 W                                                                                                         |
| Maximum apparent power                        | 22,000 VA                                                | 29,900 VA                                              | 33,000 VA <sup>a</sup>                                                                                             | 40,000 VA                                                                                                        | 44,000 VA                                                                                                        |
| Maximum active power (cosφ = 1)               | 22,000 W                                                 | 29,900 W                                               | 33,000 W <sup>a</sup>                                                                                              | 40,000 W                                                                                                         | 44,000 W                                                                                                         |
| Rated output voltage                          | 127 Vac (220 Vac), 3W/N+PE<br>230 Vac (400 Vac), 3W/N+PE | 230 Vac (400 Vac), 3W/N+PE<br>277 Vac (480 Vac), 3W+PE | 220 Vac (380 Vac), 3W/N+PE<br>230 Vac (400 Vac), 3W/N+PE<br>254 Vac (440 Vac), 3W/N+PE<br>277 Vac (480 Vac), 3W+PE | 220 Vac (380 Vac), 3W/N+PE<br>230 Vac (400 Vac), 3W/N+PE<br>254 Vac (440 Vac), 3W+PE<br>277 Vac (480 Vac), 3W+PE | 220 Vac (380 Vac), 3W/N+PE<br>230 Vac (400 Vac), 3W/N+PE<br>254 Vac (440 Vac), 3W+PE<br>277 Vac (480 Vac), 3W+PE |
| Maximum output voltage at long-term operation | See standards about the local power grid.                |                                                        |                                                                                                                    |                                                                                                                  |                                                                                                                  |
| Rated output current                          | 52.5 A (220 Vac)<br>28.9 A (400 Vac)                     | 43.2 A (400 Vac)<br>36.0 A (480 Vac)                   | 45.6 A (380 Vac)<br>43.3 A (400 Vac)<br>39.4 A (440 Vac)<br>36.1 A (480 Vac)                                       | 54.7 A (380 Vac)<br>52.0 A (400 Vac)<br>47.3 A (440 Vac)<br>43.3 A (480 Vac)                                     | 60.8 A (380 Vac)<br>57.8 A (400 Vac)<br>52.5 A (440 Vac)<br>48.1 A (480 Vac)                                     |

| Technical Specifications                                                                                                                                                                                               | SUN2000-20KTL-M3                                                             | SUN2000-29.9KTL-M3  | SUN2000-30KTL-M3    | SUN2000-36KTL-M3                | SUN2000-40KTL-M3                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------|---------------------|---------------------------------|---------------------------------|
| Maximum output current                                                                                                                                                                                                 | 58.0 A<br>(220 Vac)                                                          | 43.2 A<br>(400 Vac) | 50.4 A<br>(380 Vac) | 61.1 A<br>(380 Vac)             | 67.2 A<br>(380 Vac)             |
|                                                                                                                                                                                                                        | 31.9 A<br>(400 Vac)                                                          | 36.0 A<br>(480 Vac) | 47.9 A<br>(400 Vac) | 58.0 A<br>(400 Vac)             | 63.8 A<br>(400 Vac)             |
|                                                                                                                                                                                                                        |                                                                              |                     | 43.5 A<br>(440 Vac) | 52.8 A<br>(440 Vac)             | 58.0 A<br>(440 Vac)             |
|                                                                                                                                                                                                                        |                                                                              |                     | 39.9 A<br>(480 Vac) | (Mexico)<br>48.4 A<br>(480 Vac) | (Mexico)<br>53.2 A<br>(480 Vac) |
| Output voltage frequency                                                                                                                                                                                               | 50 Hz/60 Hz                                                                  |                     |                     |                                 |                                 |
| Power factor                                                                                                                                                                                                           | 0.8 leading–0.8 lagging                                                      |                     |                     |                                 |                                 |
| Output DC component DCI                                                                                                                                                                                                | < 0.5% of the rated output                                                   |                     |                     |                                 |                                 |
| Maximum total harmonic distortion (THD)<br>AC THDi                                                                                                                                                                     | < 3% under rated conditions. Single harmonic meets the VDE4105 requirements. |                     |                     |                                 |                                 |
| Note a: Under the Germany VDE-AR-N-4105, Belgium C10/11, and Austria TOR gird codes, the maximum apparent power and the maximum active power (cosΦ=1) of the SUN2000-30KTL-M3 are 30,000 VA and 30,000 W respectively. |                                                                              |                     |                     |                                 |                                 |

## Protection

| Technical Specifications | SUN2000-20KTL-M3 | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|--------------------------|------------------|--------------------|------------------|------------------|------------------|
| Overvoltage category     | PV II/AC III     |                    |                  |                  |                  |
| Input DC switch          | Supported        |                    |                  |                  |                  |
| Islanding protection     | Supported        |                    |                  |                  |                  |

| Technical Specifications                | SUN2000-20KTL-M3 | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|-----------------------------------------|------------------|--------------------|------------------|------------------|------------------|
| Output overcurrent protection           | Supported        |                    |                  |                  |                  |
| Input reverse connection protection     | Supported        |                    |                  |                  |                  |
| String fault detection                  | Supported        |                    |                  |                  |                  |
| DC surge protection                     | Type II          |                    |                  |                  |                  |
| AC surge protection                     | Type II          |                    |                  |                  |                  |
| Insulation resistance detection         | Supported        |                    |                  |                  |                  |
| Residual current monitoring unit (RCMU) | Supported        |                    |                  |                  |                  |

## Display and Communication

| Technical Specifications | SUN2000-20KTL-M3        | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|--------------------------|-------------------------|--------------------|------------------|------------------|------------------|
| Display                  | LED indicator; WLAN+app |                    |                  |                  |                  |
| RS485                    | Supported               |                    |                  |                  |                  |
| Built-in WLAN            | Supported               |                    |                  |                  |                  |
| AC MBUS                  | Supported               |                    |                  |                  |                  |
| DC MBUS                  | Supported               |                    |                  |                  |                  |
| AFCI                     | Supported               |                    |                  |                  |                  |
| PID                      | Supported               |                    |                  |                  |                  |

## General Specifications

| Technical Specifications   | SUN2000-20KTL-M3                                             | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|----------------------------|--------------------------------------------------------------|--------------------|------------------|------------------|------------------|
| Dimensions (W x H x D)     | 640 mm x 530 mm x 270 mm                                     |                    |                  |                  |                  |
| Net Weight                 | 43 kg                                                        |                    |                  |                  |                  |
| Operating temperature      | -25°C to +60°C (derated when the temperature is above +45°C) |                    |                  |                  |                  |
| Humidity                   | 0%–100%                                                      |                    |                  |                  |                  |
| Cooling mode               | Natural cooling                                              |                    |                  |                  |                  |
| Maximum operating altitude | 0–4000 m                                                     |                    |                  |                  |                  |
| Storage temperature        | -40°C to +70°C                                               |                    |                  |                  |                  |
| IP rating                  | IP66                                                         |                    |                  |                  |                  |
| Topology                   | Transformerless                                              |                    |                  |                  |                  |

## Standards Compliance

| Technical Specifications | SUN2000-20KTL-M3                                | SUN2000-29.9KTL-M3 | SUN2000-30KTL-M3 | SUN2000-36KTL-M3 | SUN2000-40KTL-M3 |
|--------------------------|-------------------------------------------------|--------------------|------------------|------------------|------------------|
| Standards                | EN/IEC 62109-1, EN/IEC 62109-2, NB/T 32004-2018 |                    |                  |                  |                  |

# A Grid Code

## NOTE

The grid codes are subject to change. The listed codes are for reference only.

| No. | Grid Code         | Description                            |
|-----|-------------------|----------------------------------------|
| 1   | VDE-AR-N-4105     | Germany low-voltage (LV) power grid    |
| 2   | NB/T 32004        | China Golden Sun LV power grid         |
| 3   | UTE C 15-712-1(A) | France mainland power grid             |
| 4   | UTE C 15-712-1(B) | France island power grid               |
| 5   | UTE C 15-712-1(C) | France island power grid               |
| 6   | VDE4110-MV        | Germany medium-voltage (MV) power grid |
| 7   | G99-England       | England 230 V power grid (I > 16 A)    |
| 8   | G99-Scotland      | Scotland 240 V power grid (I > 16 A)   |
| 9   | CEI0-21           | Italy power grid                       |
| 10  | RD1699/661        | Spain LV power grid                    |
| 11  | RD1699/661-MV480  | Spain MV power grid                    |
| 12  | C10/11            | Belgium power grid                     |
| 13  | AS4777            | Australia power grid                   |
| 14  | AS4777-ACT        | Australia power grid                   |
| 15  | AS4777-NSW-ESS    | Australia power grid                   |
| 16  | AS4777-NSW-AG     | Australia power grid                   |

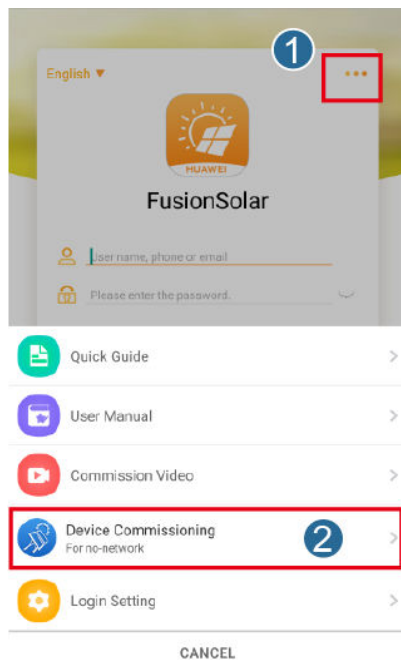
| No. | Grid Code            | Description                                 |
|-----|----------------------|---------------------------------------------|
| 17  | AS4777-QLD           | Australia power grid                        |
| 18  | AS4777-SA            | Australia power grid                        |
| 19  | AS4777-VIC           | Australia power grid                        |
| 20  | IEC61727             | IEC 61727 LV power grid (50 Hz)             |
| 21  | CEI0-16              | Italy power grid                            |
| 22  | CHINA-MV480          | China MV standard power grid                |
| 23  | CHINA-MV             | China MV standard power grid                |
| 24  | TAI-PEA              | Thailand grid-tied standard power grid      |
| 25  | TAI-MEA              | Thailand grid-tied standard power grid      |
| 26  | VDE4110-MV480        | Germany MV standard power grid              |
| 27  | G99-England-MV480    | UK 480 V MV grid-tied power grid (I > 16 A) |
| 28  | IEC61727-MV480       | IEC 61727 MV grid-tied power grid (50 Hz)   |
| 29  | UTE C 15-712-1-MV480 | France island power grid                    |
| 30  | TAI-PEA-MV480        | Thailand MV grid-tied power grid (PEA)      |
| 31  | TAI-MEA-MV480        | Thailand MV grid-tied power grid (MEA)      |
| 32  | C11/C10-MV480        | Belgium MV power grid                       |
| 33  | Philippines          | Philippines LV power grid                   |
| 34  | Philippines-MV480    | Philippines MV power grid                   |
| 35  | NRS-097-2-1          | South Africa standard power grid            |
| 36  | IEC61727-60Hz        | IEC 61727 LV grid-tied power grid (60 Hz)   |
| 37  | IEC61727-60Hz-MV480  | IEC 61727 MV grid-tied power grid (60 Hz)   |
| 38  | CHINA_MV500          | China MV standard power grid                |
| 39  | PO12.3-MV480         | Spain MV power grid                         |
| 40  | EN50549-LV           | Ireland power grid                          |
| 41  | EN50549-MV480        | Ireland MV power grid                       |

| No. | Grid Code              | Description                      |
|-----|------------------------|----------------------------------|
| 42  | ABNT NBR 16149         | Brazil power grid                |
| 43  | ABNT NBR 16149-MV480   | Brazil MV power grid             |
| 44  | SA_RPPs                | South Africa LV power grid       |
| 45  | SA_RPPs-MV480          | South Africa MV power grid       |
| 46  | INDIA                  | India LV power grid              |
| 47  | INDIA-MV500            | India MV power grid              |
| 48  | G99-TYPEA-LV           | UK G99_TypeA_LV power grid       |
| 49  | G99-TYPEB-LV           | UK G99_TypeB_LV power grid       |
| 50  | G99-TYPEB-HV           | UK G99_TypeB_HV power grid       |
| 51  | G99-TYPEB-HV-MV480     | UK G99_TypeB_HV MV power grid    |
| 52  | G99-TYPEA-HV           | UK G99_TypeA_HV power grid       |
| 53  | EN50549-MV400          | Ireland new standard power grid  |
| 54  | VDE-AR-N4110           | Germany 230 V MV power grid      |
| 55  | VDE-AR-N4110-MV480     | Germany MV standard power grid   |
| 56  | NTS                    | Spain power grid                 |
| 57  | NTS-MV480              | Spain MV power grid              |
| 58  | CEA                    | India LV power grid (CEA)        |
| 59  | CEA-MV480              | India MV power grid (CEA)        |
| 60  | C10/11-MV400           | Belgium MV power grid            |
| 61  | ABNT NBR 16149-LV127   | Brazil LV power grid             |
| 62  | Mexico-LV220           | Mexico LV power grid             |
| 63  | Philippines-LV220-50Hz | Philippines LV power grid (50Hz) |
| 64  | Philippines-LV220-60Hz | Philippines LV power grid (60Hz) |
| 65  | TAIPOWER-LV220         | Taiwan LV power grid             |

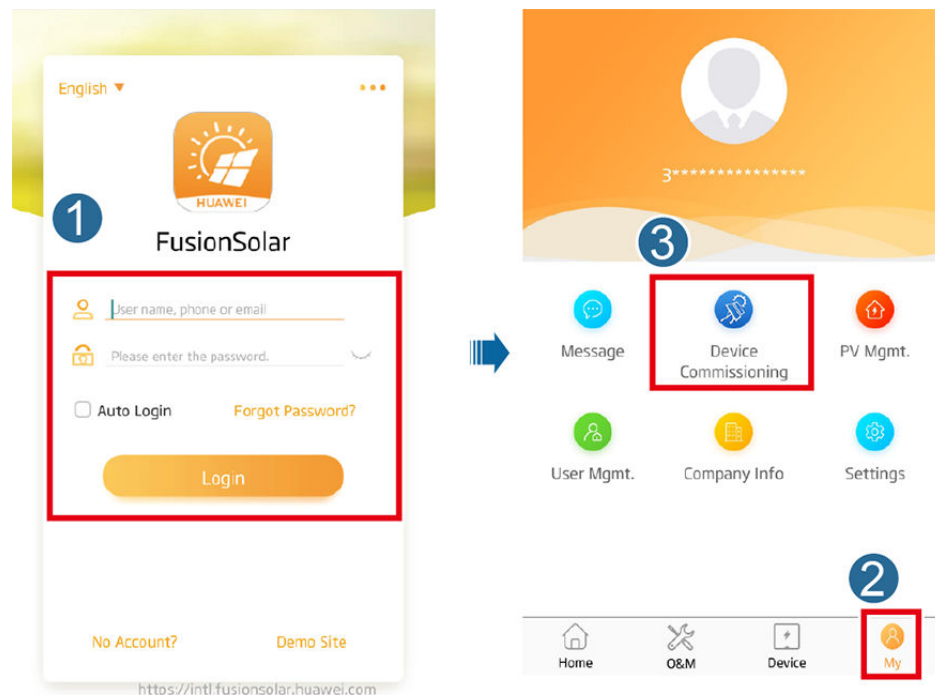
# B Device Commissioning

**Step 1** Access **Device Commissioning** screen.

**Figure B-1** Method 1: before login (not connected to the Internet)



**Figure B-2** Method 2: after login (connected to the Internet)



**Step 2** Connect to the solar inverter WLAN and log in to the device commissioning screen as the **installer** user.

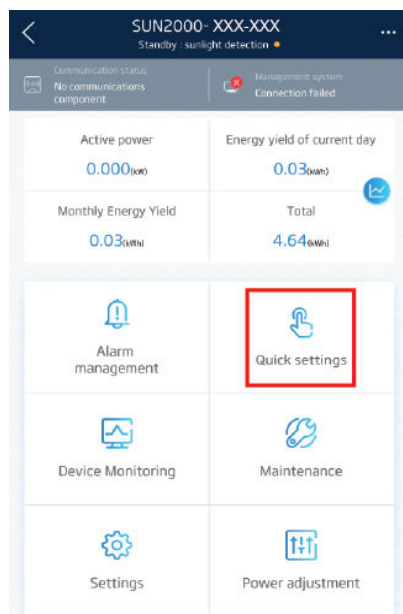
#### NOTICE

- If the mobile phone is directly connected to the SUN2000, the visible distance between the SUN2000 and the mobile phone must be less than 3 m when a built-in antenna is used and less than 50 m when an external antenna is used to ensure the communication quality between the app and the SUN2000. The distances are for reference only and may vary with mobile phones and shielding conditions.
- When connecting the SUN2000 to the WLAN over a router, ensure that the mobile phone and SUN2000 are in the WLAN coverage of the router and the SUN2000 is connected to the router.
- The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz) and the WLAN signal reaches the SUN2000.
- The WPA, WPA2, or WPA/WPA2 encryption mode is recommended for routers. Enterprise-level encryption is not supported (for example, public hotspots requiring authentication such as airport WLAN). WEP and WPA TKIP are not recommended because these two encryption modes have serious security defects. If the access fails in WEP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.

 **NOTE**

- Obtain the initial password for connecting to the solar inverter WLAN from the label on the side of the solar inverter.
- Use the password at the first login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- When you access the **Device Commissioning** screen of the SUN2000 for the first time, you need to manually set the login password because the SUN2000 does not have an initial login password.

**Figure B-3 Quick settings**



----End

# C Setting Power Adjustment Parameters

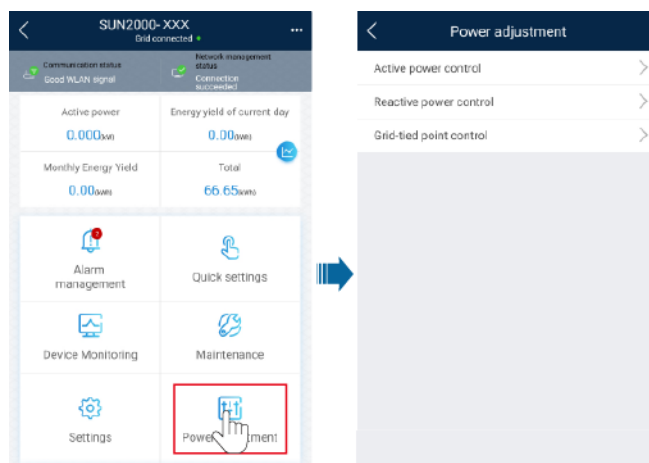
## Prerequisites

You have logged in to the app as **installer**.

## Procedure

- Step 1** On the home screen, tap **Power Adjustment** and set power parameters as required.

**Figure C-1** Setting Power Adjustment Parameters



----End

# D Built-in PID Recovery

## NOTICE

Ensure that the inverter ground cable is securely connected. Otherwise, the built-in PID repair function will be affected and electric shocks may occur.

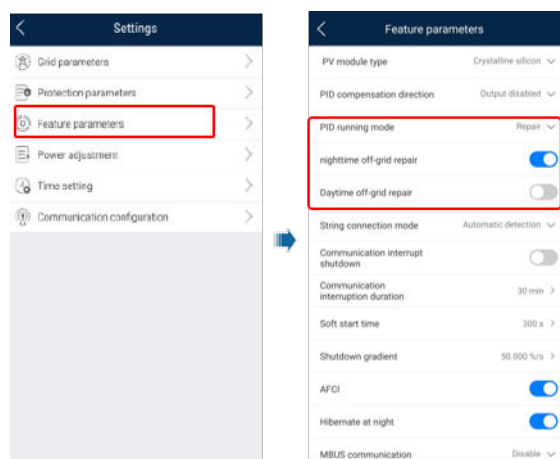
## Prerequisites

You have logged in to the app as **installer**.

## Procedure

- Step 1** On the home screen, choose **Settings** > **Feature Parameters** and set related parameters.

**Figure D-1** Setting PID suppression parameters



 NOTE

- Set **PID running mode** to **Repair** (disabled by default).
- Set **Nighttime off-grid repair** to  (this parameter is displayed when **Built-in PID running mode** is set to **Repair**).

----End

# E Rapid Shutdown

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If all PV modules are equipped with optimizers, the PV system can perform a rapid shutdown, reducing the output voltage of the optimizers to below 30 V within 30s. The rapid shutdown is not supported if optimizers are configured for some PV modules.

Triggering methods of rapid shutdown:

- Method 1 (recommended): Turn off the AC switch between the inverter and the power grid.
- Method 2: Turn off the DC switch at the bottom of the inverter.
- Method 3: If the DIN5 port (port 15) of the inverter communications terminal is connected to a rapid shutdown button, press the button to trigger rapid shutdown.

# F Resetting Password

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- Step 1** Check that the AC and DC power supplies to the solar inverter are connected simultaneously, and that the  and  indicators are steady green or blink slowly for more than 3 minutes.
- Step 2** Turn off the AC switch, set the DC switch at the bottom of the solar inverter to OFF, and wait until all indicators on the solar inverter panel turn off.
- Step 3** Complete the following operations within 3 minutes:
1. Turn on the AC switch and wait until the  indicator blinks.
  2. Turn off the AC switch and wait until all indicators on the solar inverter panel turn off.
  3. Turn on the AC switch and wait until all LED indicators on the inverter panel blink and turn off after about 30s.
- Step 4** Wait until the three indicators on the inverter panel blink green quickly and then blink red quickly, indicating that the password has been restored.
- Step 5** Reset the password within 10 minutes. (If no operation is performed within 10 minutes, all parameters of the solar inverter remain the same as those before the reset.)
1. Wait until the  indicator blinks.
  2. Obtain the initial WLAN hotspot name (SSID) and initial password (PSW) from the label on the side of the solar inverter to connect to the app.
  3. On the login page, set a new login password and log in to the app.
- Step 6** Set router and management system parameters to implement remote management.

----End

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## NOTICE

You are advised to reset the password in the morning or at night when the solar irradiance is low.

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# G Setting Dry Contact Scheduling Parameters

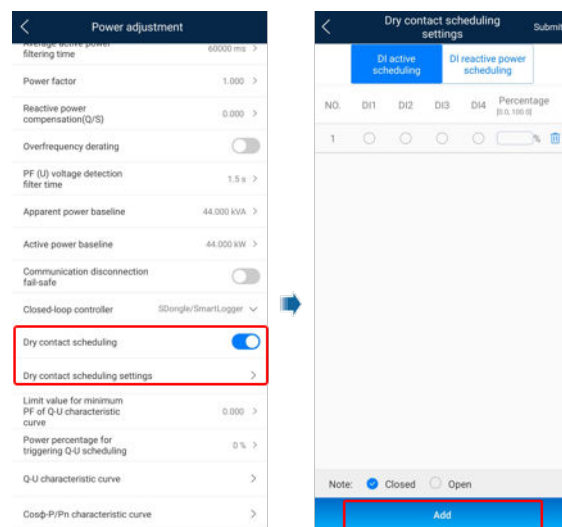
## Prerequisites

You have logged in to the app as **installer**.

## Procedure

- Step 1** On the home screen, choose **Settings** > **Power adjustment** and set **Dry contact scheduling** to .

**Figure G-1** Setting dry contact scheduling parameters



-----End



## Function

If PV modules or cables are not properly connected or damaged, electric arcs may occur, which may cause fire. Huawei SUN2000s provide unique arc detection in compliance with UL 1699B-2018 to ensure the safety of users' lives and property.

This function is enabled by default. The SUN2000 automatically detects arc faults. To disable this function, log in to the FusionSolar app, enter the **Device Commissioning** screen, choose **Settings > Feature parameters**, and disable **AFCI**.

## Clearing Alarms

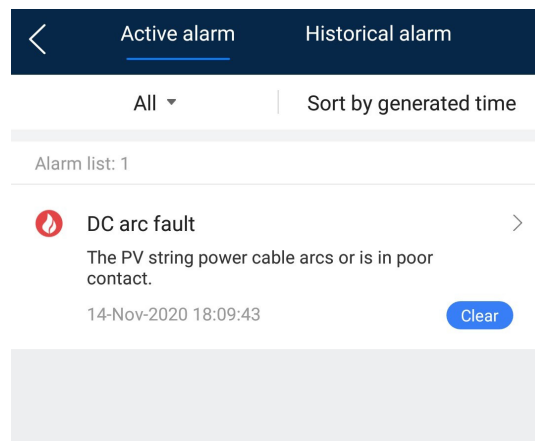
The AFCI function involves the **DC arc fault** alarm.

The SUN2000 has the AFCI alarm automatic clearance mechanism. If an alarm is triggered for less than five times within 24 hours, the SUN2000 automatically clears the alarm. If the alarm is triggered for five times or more within 24 hours, the SUN2000 locks for protection. You need to manually clear the alarm on the SUN2000 so that it can work properly.

You can manually clear the alarm as follows:

- **Method 1: FusionSolar App**  
Log in to the FusionSolar app and choose **My > Device Commissioning**. On the **Device Commissioning** screen, connect and log in to the SUN2000 that generates the AFCI alarm, tap **Alarm management**, and tap **Clear** on the right of the **DC arc fault** alarm to clear the alarm.

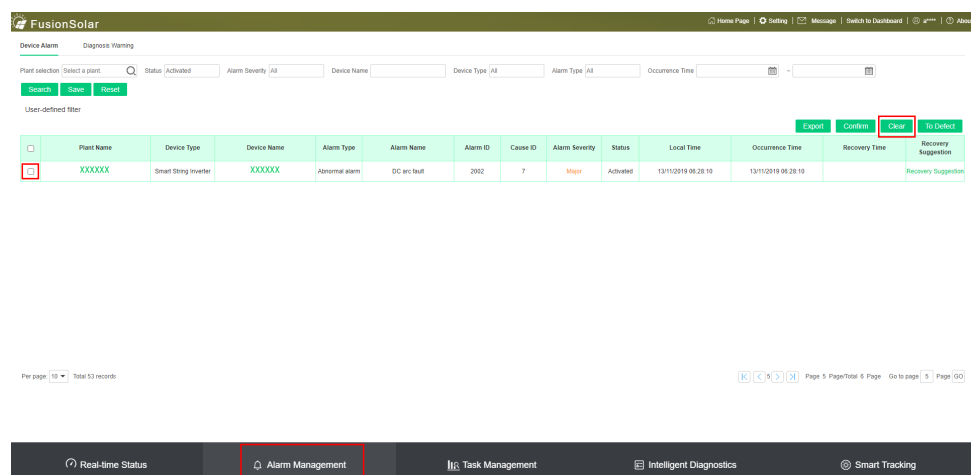
**Figure H-1 Alarm management**



- **Method 2:** FusionSolar Smart PV Management System

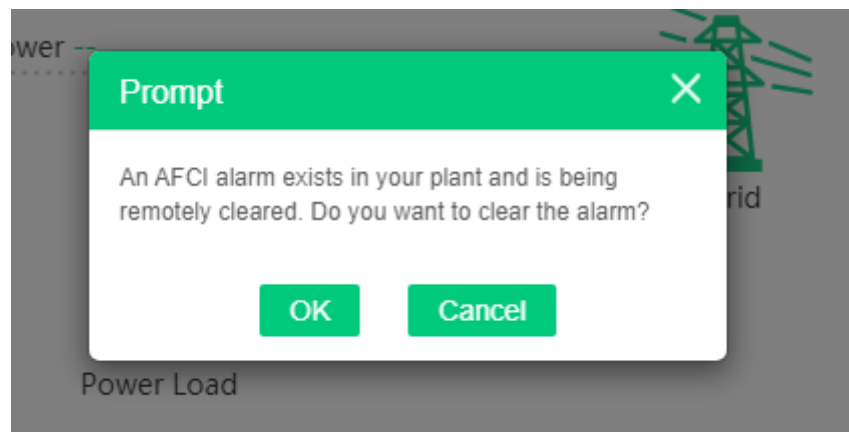
Log in to the FusionSolar Smart PV Management System using a non-owner account, choose **Intelligent O&M > Alarm Management**, select the **DC arc fault** alarm, and click **Clear** to clear the alarm.

**Figure H-2 Clearing alarms**



Switch to the owner account with PV plant management rights. On the home page, click the PV plant name to go to the PV plant page, and click **OK** as prompted to clear the alarm.

**Figure H-3** Owner confirmation



# Smart I-V Curve Diagnosis

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For details, see [FusionSolar 6.0 Smart PV Management System Smart I-V Curve Diagnosis User Manual](#).

# J Acronyms and Abbreviations

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## A

**AFCI** arc-fault circuit interrupter

## L

**LED** light emitting diode

## M

**MBUS** monitoring bus

**MPP** maximum power point

**MPPT** maximum power point tracking

## P

**PE** protective earthing

**PID** potential induced degradation

**PV** photovoltaic

## R

**RCD** residual current device