SUN2000L-(2KTL-5KTL)

User Manual

HUAWEI

About This Document

Purpose

This document describes the SUN2000L-(2KTL-5KTL) in terms of its installation, electrical connections, commissioning, maintenance, and troubleshooting. SUN2000L-(2KTL-5KTL) is abbreviated as SUN2000L. Before installing and operating the SUN2000L, ensure that you are familiar with the features, functions, and safety precautions provided in this document.

Intended Audience

This document is intended for:

- Installers
- Users

Symbol Conventions

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

Symbol	Description
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
⚠ NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
☐ NOTE	Calls attention to important information, best practices and tips.
	NOTE is used to address information not related to personal injury, equipment damage, or environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all updates made in previous issues.

Issue 01 (2017-09-27)

This issue is used for first office application (FOA).

Contents

1 Safety Precautions

General Safety

⚠ **NOTICE**

- Before performing operations, read through this manual and follow all the precautions to prevent accidents. The "DANGER", "WARNING", "CAUTION", and "NOTICE" marks in this document do not represent all the safety instructions. They are only supplements to the safety instructions.
- Only certified electricians are allowed to install, connect cables for, commission, maintain, and troubleshoot Huawei products, and they must understand basic safety precautions to avoid hazards.

When operating Huawei equipment, in addition to following the general precautions in this document, follow the specific safety instructions given by Huawei. Huawei will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.

Disclaimer

Huawei shall not be liable for any consequence caused by any of the following events:

- Transportation damage
- The storage conditions do not meet the requirements specified in this document.
- Incorrect storage, installation, or use
- Installation or use by unqualified personnel
- Failure to obey the operation instructions and safety precautions in this document
- Operation in extreme environments which are not covered in this document
- Operation beyond specified ranges.
- Unauthorized modifications to the product or software code or removal of the product
- Device damage due to force majeure (such as lightning, earthquake, fire, and storm)
- The warranty expires and the warranty service is not extended.
- Installation or use in environments which are not specified in related international standards

Personnel Requirements

Only certified electricians are allowed to install, connect cables for, commission, maintain, troubleshoot, and replace the SUN2000L.

- Operation personnel should receive professional training.
- Operation personnel should read through this document and follow all the precautions.
- Operation personnel should be familiar with the safety specifications about the electrical system.
- Operation personnel should understand the composition and working principles of the grid-tied PV system and local regulations.
- Operation personnel must wear proper personal protective equipment (PPE).

Protect Labels

- Do not scrawl or damage any labels on the SUN2000L enclosure because these labels contain important information about safe operation.
- Do not scrawl or damage the nameplate on the SUN2000L enclosure because it contains important product information.
- Do not remove the warranty label from the SUN2000L enclosure. Otherwise, product warranty will be voided.

Installation

 DANGER

Never operate the SUN2000L under power during installation.

- Ensure that the SUN2000L is not connected to a power supply or powered on before finishing installation.
- To allow proper heat dissipation and installation, maintain appropriate clearances between the SUN2000L and other objects, as shown in Figure 1-1. If you have any questions about the clearances, consult local technical support engineers.

Figure 1-1 Installation space

IS05W00019
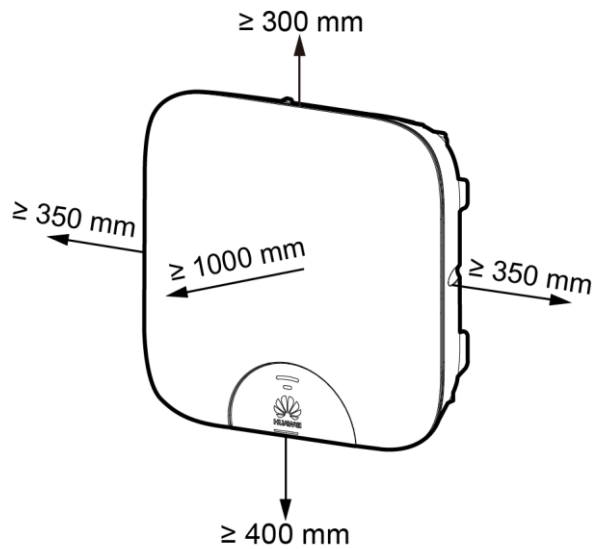
- Ensure that the SUN2000L is installed in a well-ventilated environment.
- Ensure that the SUN2000L heat sinks are free from blockage.
- Do not open the front panel of the SUN2000L.
- Do not remove the terminals and ports at the bottom of the SUN2000L.

Electrical Connections

⚠ **DANGER**

Before connecting cables, ensure that the SUN2000L is secured in position and not damaged in any way. Otherwise, electric shocks or fire may occur.

- Ensure that all electrical connections comply with local electrical standards.
- Obtain approval from the local utility company before using the SUN2000L to generate electricity in grid-tied mode.
- Ensure that the cables used in a grid-tied PV system are properly connected and insulated and meet all specification requirements.

Operation

⚠ **DANGER**

High voltage may cause an electric shock, which results in serious injury, death, or serious property damage from the SUN2000L in operation. Strictly comply with the safety precautions in this document and associated documents when operating the SUN2000L.

- When the SUN2000L is powered on for the first time, only certified electricians are allowed to perform quick setting. Incorrect settings may affect the normal SUN2000L operation and cause the SUN2000L to conflict with the country certification.
- When the SUN2000L is operating, do not disconnect under load.
- Do not touch an energized SUN2000L because the heat sink has a high temperature.
- Follow local laws and regulations when operating the equipment.

Maintenance and Replacement

 DANGER

High voltage may cause an electric shock, which results in serious injury, death, or serious property damage from the SUN2000L in operation. Prior to maintenance, power off the SUN2000L and strictly comply with the safety precautions in this document and associated documents to operate the SUN2000L.

- Maintain the SUN2000L with sufficient knowledge of this document, proper tools, and testing equipment.
- Before performing maintenance tasks, power off the SUN2000L and wait at least 5 minutes.
- Temporary warning signs or fences must be placed to prevent unauthorized people from entering the site.
- If the SUN2000L is faulty, contact your supplier.
- The SUN2000L can be powered on only after all faults are rectified. Failing to do so may escalate faults or damage the device.
- Observe ESD precautions and wear ESD gloves during maintenance.

2 Product Overview

2.1 Product Introduction

Function

The SUN2000L is a single-phase grid-tied PV string inverter that converts the DC power generated by PV strings into AC power and feeds the electricity into the power grid.

Models

This document involves the following product models:

- SUN2000L-2KTL
- SUN2000L-3KTL
- SUN2000L-3.68KTL
- SUN2000L-4KTL
- SUN2000L-4.6KTL
- SUN2000L-5KTL

Figure 2-1 Designation explanation of the SUN2000L-5KTL

SUN2000L-5KTL

1   2 3
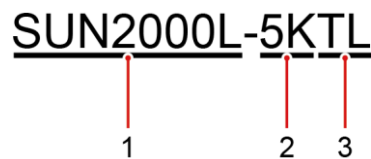
Table 2-1 Designation explanation of the SUN2000L-5KTL

No.	Meaning	Description
1	Series name	SUN2000L: single-phase grid-tied PV string inverter

No.	Meaning	Description
2	Power level	• 2K: The power level is 2K. • 3K: The power level is 3K. • 3.68K: The power level is 3.68K. • 4K: The power level is 4K. • 4.6K: The power level is 4.6K. • 5K: The power level is 5K.
3	Topology	TL: transformerless

Networking Application

The SUN2000L applies to a residential rooftop grid-tied system. Typically, a grid-tied system consists of the PV string, grid-tied inverter, AC switch, and power distribution unit.

Figure 2-2 Network diagram (optional in dashed boxes)
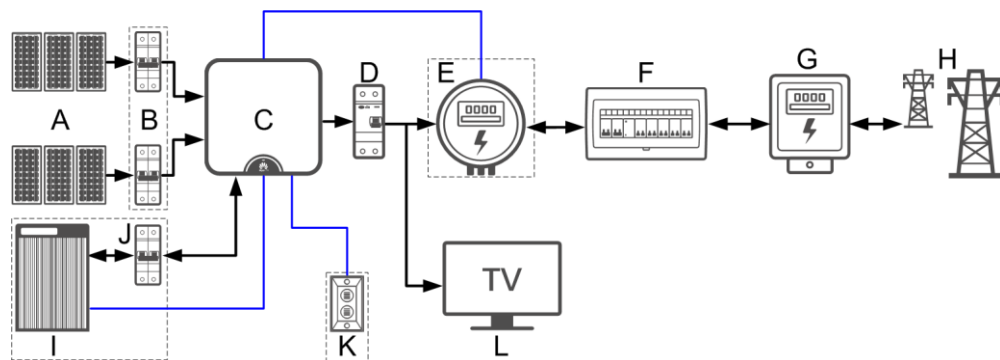
📖 **NOTE**

—— indicates a power cable, → indicates the power flow direction, and —— indicates a signal cable.

(A) PV string	(B) DC switch	(C) SUN2000L
(D) AC switch	(E) Power collector	(F) Residential power distribution unit
(G) Residential power meter	(H) Power grid	(I) Battery
(J) Battery switch	(K) Alarm beacon	(L) Residential load

Supported Power Grid

Power grid types supported by the SUN2000L include TN-S, TN-C, TN-C-S, and TT. In a TT power grid, the N-PE voltage should be lower than 30 V.

Figure 2-3 Power grid types
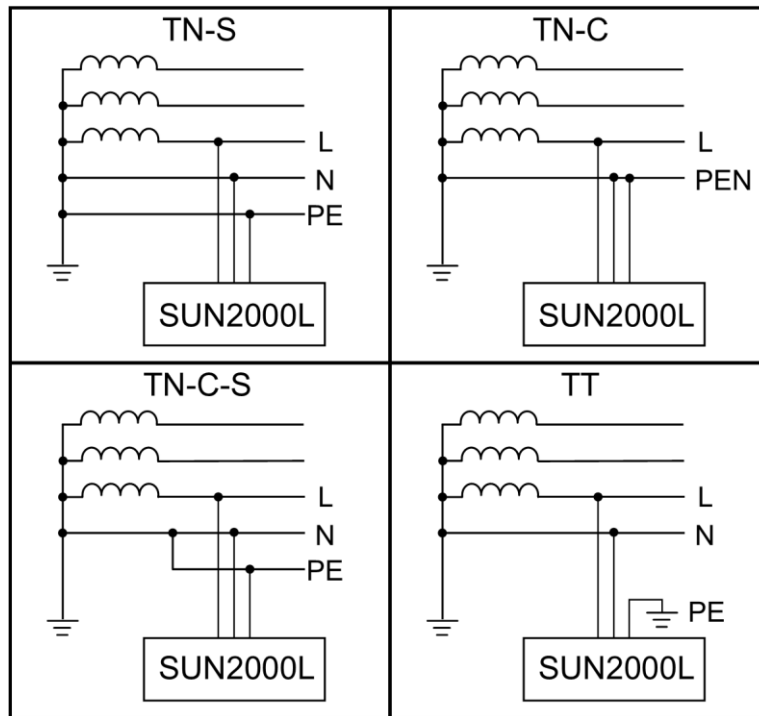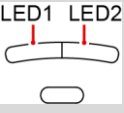
2.2 Appearance

Front View

Figure 2-4 Front view

| (1) LED 1 | (2) LED 2 | (3) LED 3 | (4) Front panel |
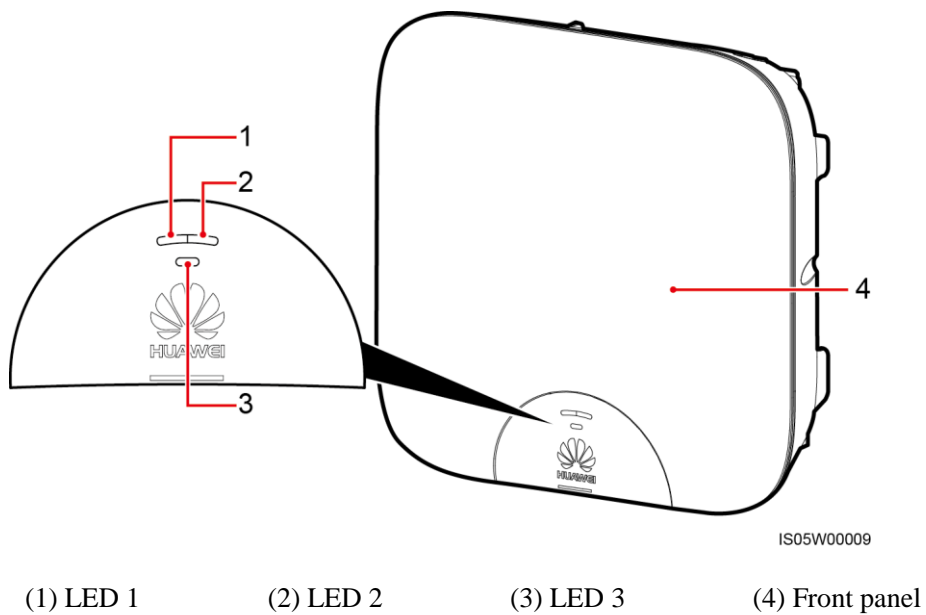
Table 2-2 LED description

Type	Status		Meaning
Running indication	**LED 1**	**LED 2**	N/A
	Steady green	Steady green	The SUN2000L is exporting power to the power grid.
	Blinking green at long intervals (on for 1s and then off for 1s)	Off	The DC is on and the AC is off.
	Off	Blinking green at long intervals (on for 1s and then off for 1s)	The DC is off and the AC is on.
	Blinking green at long intervals (on for 1s and then off for 1s)	Blinking green at long intervals (on for 1s and then off for 1s)	The DC is on, the AC is on, and the SUN2000L is not exporting power to the power grid.
	Off	Off	Both the DC and AC are off, or the SUN2000L is in Low Power Consumption mode. Low Power Consumption mode means that the monitoring system of the SUN2000L hibernates.
	Steady red	Steady red	The SUN2000L is faulty.
Communication indication	**LED 3**		N/A
	Blinking green at short intervals (on for 0.2s and then off for 0.2s)		Communicating (Communicating refers to that the communication with the upper-level management unit is in progress. However, if a mobile phone accesses the SUN2000L, the LED indicates the "mobile phone access status: blinking green at long intervals" first.)
	Blinking green at long intervals (on for 1s and then off for 1s)		The mobile phone has connected to the SUN2000L.
	Off		Others

Rear View

Figure 2-5 Rear view
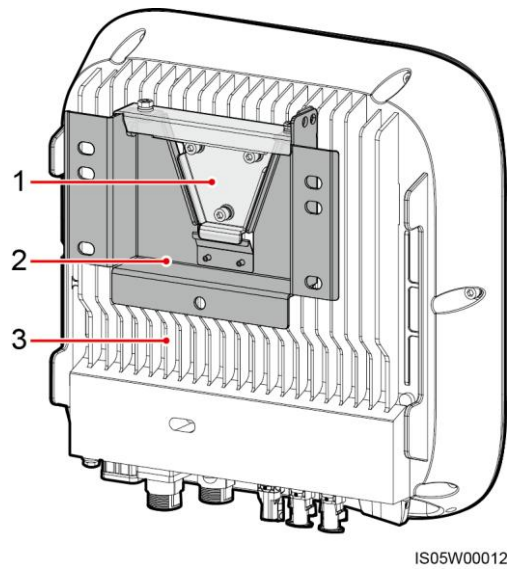
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(1) Mounting plate   (2) Mounting bracket   (3) Heat sink

Bottom View

Figure 2-6 Bottom view
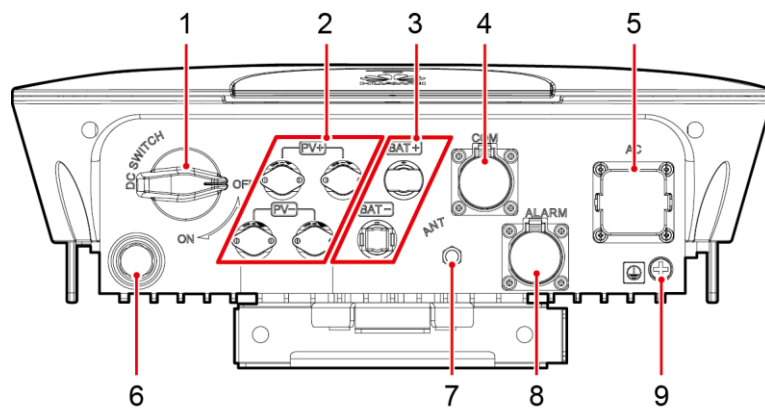
IS05W00010

No.	Component	Silk Screen
1	DC switch	DC SWITCH
2	DC input terminal	PV+/PV−
3	Battery terminal	BAT+/BAT−

No.	Component	Silk Screen
4	COM port	COM
5	AC output port	AC
6	Ventilation valve	N/A
7	Antenna port	ANT
8	Alarm port	ALARM
9	Ground point	N/A

Dimensions

Figure 2-7 Enclosure dimensions
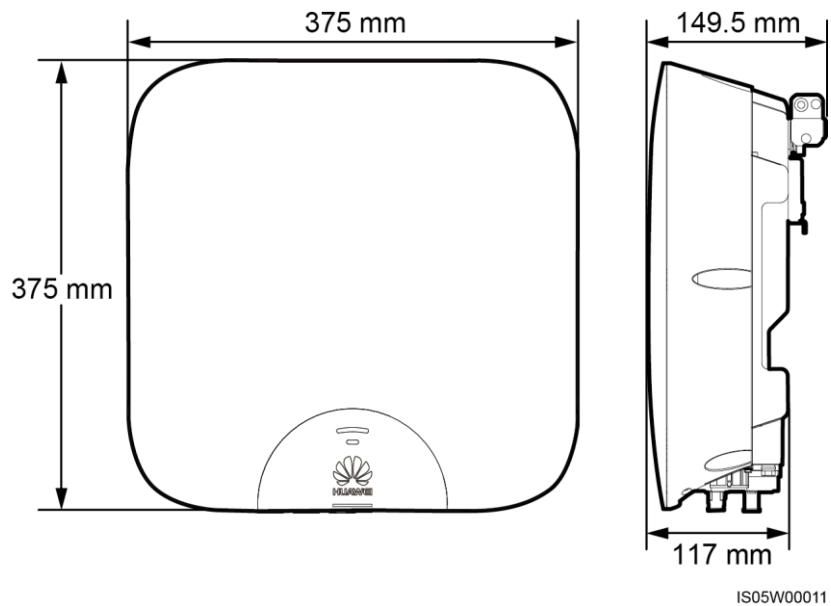
Figure 2-8 Mounting bracket dimensions
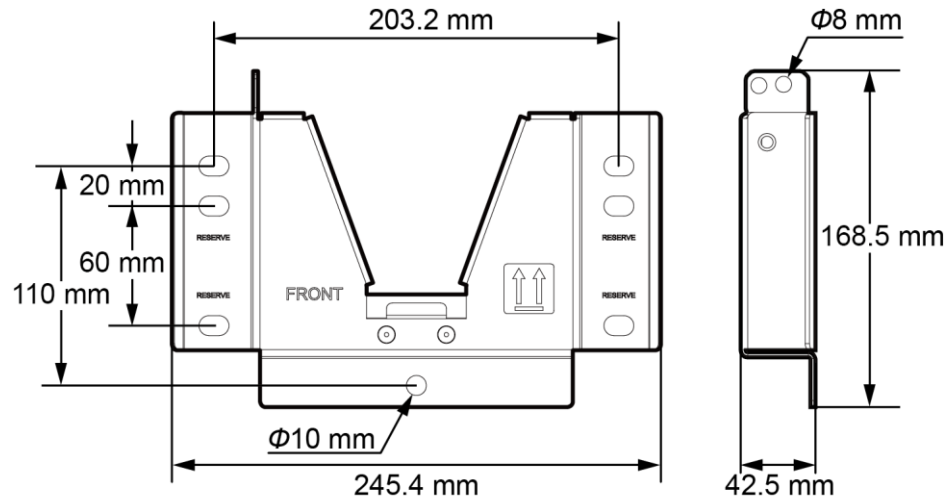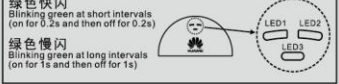
2.3 Label Description

Symbols

Table 2-3 Label description

Symbol	Name	Meaning
	Burn warning	Do not touch a running SUN2000L because the shell is hot when the SUN2000L is running.
	Delay discharge	• High voltage exists after the SUN2000L is powered on. Only qualified and trained electrical technicians are allowed to perform operations on the SUN2000L. • Residual voltage exists after the SUN2000L is powered off. It takes 5 minutes for the SUN2000L to discharge to the safe voltage.

Symbol	Name	Meaning
	Refer to documentation	Reminds operators to refer to the documents shipped with the SUN2000L.
	Grounding	Indicates the position for connecting the protective earthing (PE) cable.
	Operation warning	Do not remove the connector or antenna when the SUN2000L is running.
	Indicator status description label	Describes the indicator status.
	Warranty label	Never open the front panel of the SUN2000L.
	SUN2000L serial number (SN) label	Indicates the SUN2000L SN.
	SUN2000L MAC address label	Indicates the MAC address.
	QR code for SUN2000L WiFi connection	Scan the QR code to connect to Huawei SUN2000L WiFi network (Android) or obtain the WiFi password (iOS).

📖 **NOTE**

The labels are for reference only.

Nameplate

Figure 2-9 Nameplate
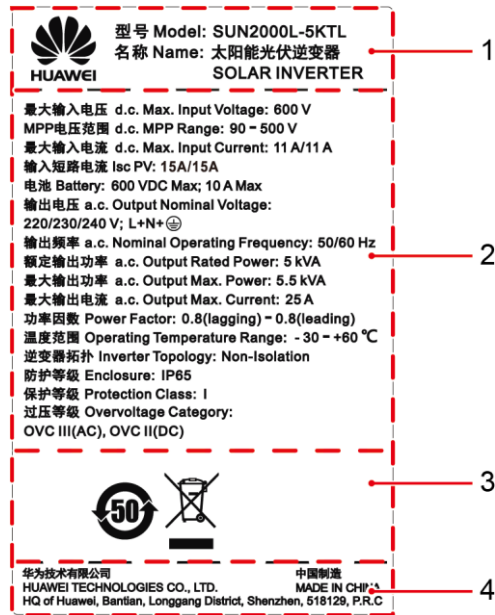
(1) Trademark and product model   (2) Important technical specifications

(3) Compliance symbols   (4) Company name and country of manufacture

☐ NOTE

The nameplate figure is for reference only.

Table 2-4 Compliance symbols

Symbol	Name	Meaning
(50)	Environment friendly use period (EFUP) mark	The product does not pollute the environment during the specified period.
⊠	EU waste electrical and electronic equipment (WEEE) mark	Do not dispose of the product as household garbage.

2.4 Working Principles

Conceptual Diagram

The SUN2000L receives inputs from up to two PV strings. Then the inputs are grouped into two MPPT routes inside the SUN2000L to track the maximum power point of the PV strings. The DC power is then converted into single-phase AC power through an inverter circuit. Surge protection is supported on both the DC and AC sides.

The SUN2000L reserves a battery port to connect to batteries which are used to store the surplus power produced by PV strings and not required by residential loads. The power stored in batteries can be exported to the power grid based on the load condition to meet peak power consumption requirements and maximize the benefits.

Figure 2-10 Conceptual diagram
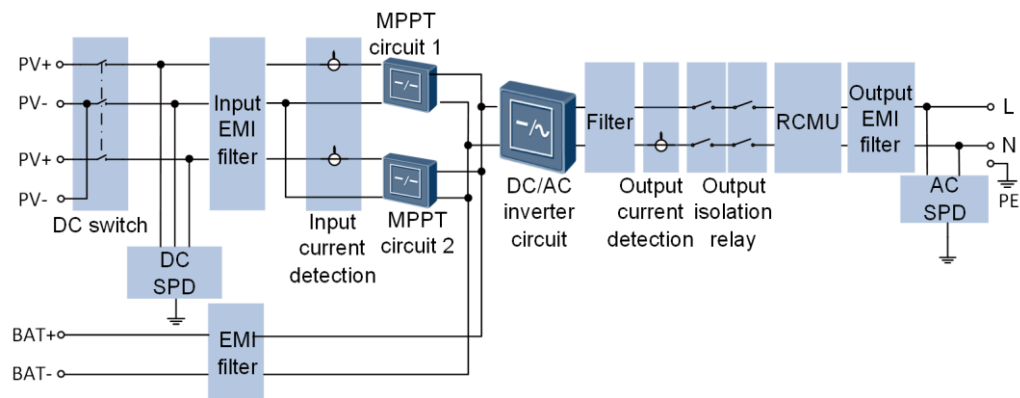
Working Modes

Figure 2-11 Working modes
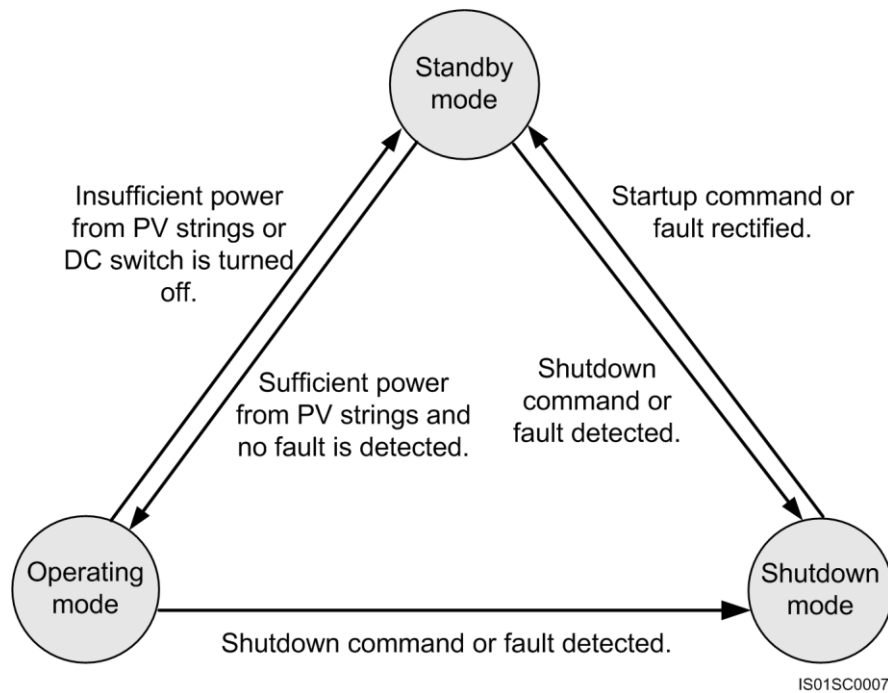
Table 2-5 Working mode description

Working Mode	Description
Standby	The SUN2000L enters Standby mode when the external environment does not meet the requirements for starting the SUN2000L. In Standby mode: ● The SUN2000L continuously checks its status and enters Operating mode once the operating requirements are met. ● The SUN2000L enters Shutdown mode after detecting a shutdown command or a fault after startup.
Operating	In Operating mode: ● The SUN2000L converts DC power from PV strings into AC power and feeds the energy to the power grid. ● The SUN2000L tracks the maximum power point to maximize the PV string output. ● The SUN2000L enters Shutdown mode after detecting a fault or a shutdown command, and enters Standby mode after detecting that the PV string output power is not suitable for connecting to the power grid and producing power.

Working Mode	Description
Shutdown	• In Standby or Operating mode, the SUN2000L enters Shutdown mode after detecting a fault or shutdown command. • In Shutdown mode, the SUN2000L enters Standby mode after detecting a startup command or that the fault is rectified.

3 Storage

The following requirements should be met when the SUN2000L needs to be stored prior to installation:

- Do not unpack the SUN2000L.
- Keep the storage temperature at –40 ℃ to +70 ℃ and the humidity at 5%–95% RH.
- The SUN2000L should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
- A maximum of 10 SUN2000Ls can be stacked. To avoid personal injury or device damage, stack SUN2000Ls with caution to prevent them from falling over.
- Regular inspection is required during the storage. Replace the packing materials when necessary.
- After long-term storage, an inspection and test conducted by qualified persons are necessary before the SUN2000L is put into use.

4 System Installation

4.1 Checking Before Installation

Outer Packing Materials

Before unpacking the SUN2000L, check the outer packing materials for damage, such as holes and cracks, and check the SUN2000L model. If any damage is found or the SUN2000L model is not what you requested, do not unpack the package and contact your supplier as soon as possible.

⚠ **NOTICE**

You are advised to remove the packing materials within 24 hours before installing the SUN2000L.

Package Contents
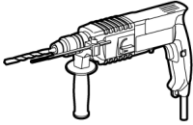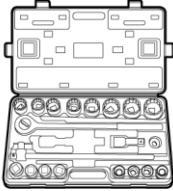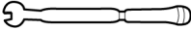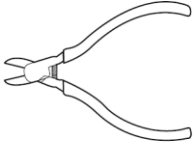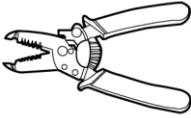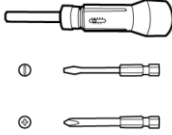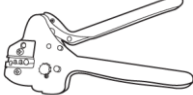
After unpacking the SUN2000L, check that the contents are intact and complete. If any damage is found or any component is missing, contact your supplier.
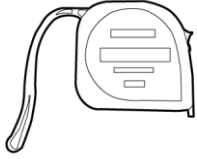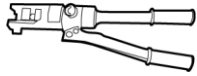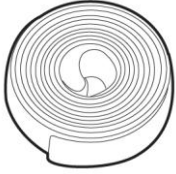
📖 **NOTE**

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

4.2 Tools and Instruments

Category	Tools and Instruments		
Installation	Hammer drill (with a Φ10 mm drill bit)	Torque socket wrench (open end: 13 mm, applicable for M8 bolts; torque range: 0–15 N•m)	Torque wrench (open end: 13 mm; torque range: 0–1.5 N•m)
	Diagonal pliers	Wire stripper	Torque screwdriver (head: M4 or M6; torque range: 0–5 N•m)
	Rubber mallet	Utility knife	Cable cutter
	Crimping tool (model: H4TC0001; manufacturer: Amphenol)	Open-end wrench (model: H4TW0001; manufacturer: Amphenol)	Cable tie
	Vacuum cleaner	Multimeter (DC voltage measurement range ≥ 600 V DC)	Marker

Category	Tools and Instruments		
	Measuring tape	Bubble or digital level	Hydraulic pliers
	Heat shrink tubing	Heat gun	N/A
PPE	Safety gloves	Safety goggles	Anti-dust respirator
	Safety shoes	N/A	N/A

4.3 Determining the Installation Position

Basic Requirements

- The SUN2000L is protected to IP65 and can be installed indoors or outdoors.
- Do not install the SUN2000L in a place where a person can be easy to come into contact with its enclosure and heat sinks, because these parts are extremely hot during operation.
- Do not install the SUN2000L in areas with flammable or explosive materials.
- Do not install the SUN2000L at a place within children's reach.
- The SUN2000L will be corroded in salt areas, and the salt corrosion may cause fire. Do not install the SUN2000L outdoors in salt areas. A salt area refers to the region within 500 meters from the coast or prone to sea breeze. The regions prone to sea breeze vary depending on weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills).

Installation Environment Requirements

- The SUN2000L must be installed in a well-ventilated environment to ensure good heat dissipation.
- When installed under direct sunlight, performance de-rate may be initiated due to additional temperature rise.
- Install the SUN2000L in a sheltered place or install an awning over the SUN2000L.

Mounting Structure Requirements

- The mounting structure where the SUN2000L is installed must be fireproof.
- Do not install the SUN2000L on flammable building materials.
- Ensure that the installation surface is solid enough to bear the weight load.
- In residential areas, do not install the SUN2000L on drywalls or walls made of similar materials which have a weak sound insulation performance because the noise generated by the SUN2000L is noticeable.

Installation Angle Requirements

The SUN2000L can be wall-mounted or pole-mounted. The installation angle requirements are as follows:

- Install the SUN2000L vertically or at a maximum back tilted angle of 15 degrees to facilitate heat dissipation.
- Do not install the SUN2000L at forward tilted, excessive back tilted, side tilted, horizontal, or upside down positions.

Figure 4-1 Installation angle
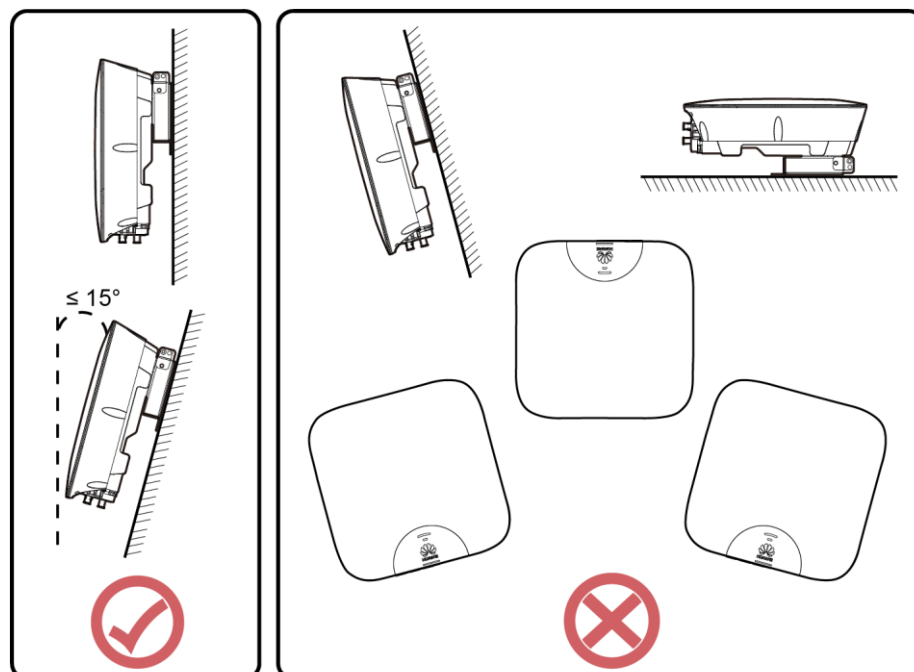
Installation Space Requirements

- Reserve enough clearance around the SUN2000L to ensure sufficient space for installation and heat dissipation.

Figure 4-2 Installation space requirements
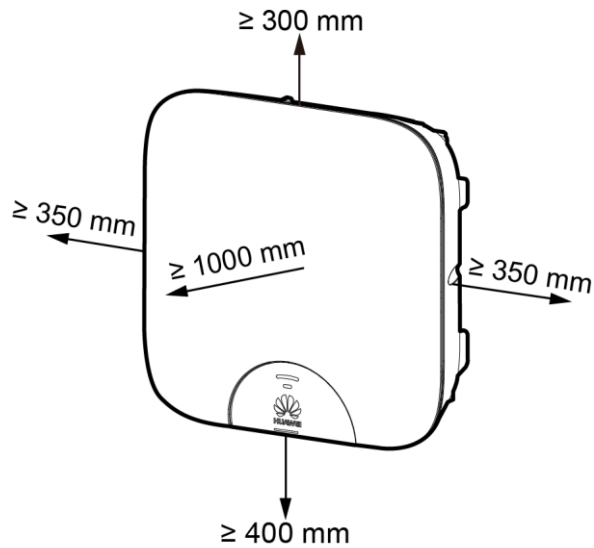
- When installing multiple SUN2000Ls, install them in horizontal mode if sufficient space is available and install them in triangle mode if no sufficient space is available. Stacked installation is not recommended.

Figure 4-3 Horizontal installation mode (recommended)
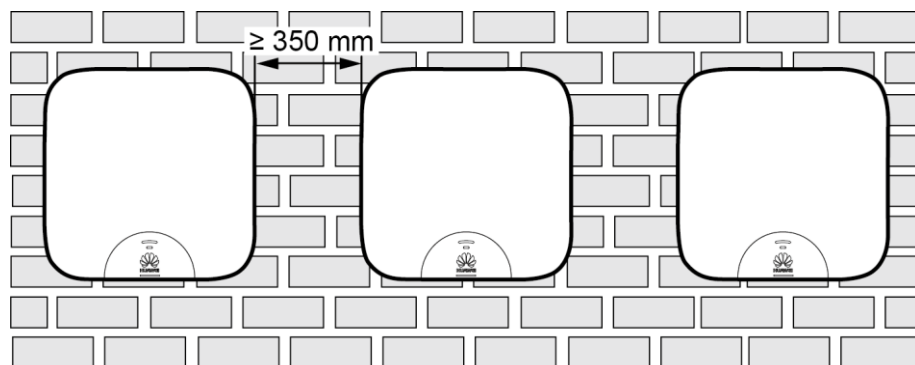
Figure 4-4 Triangle installation mode (recommended)
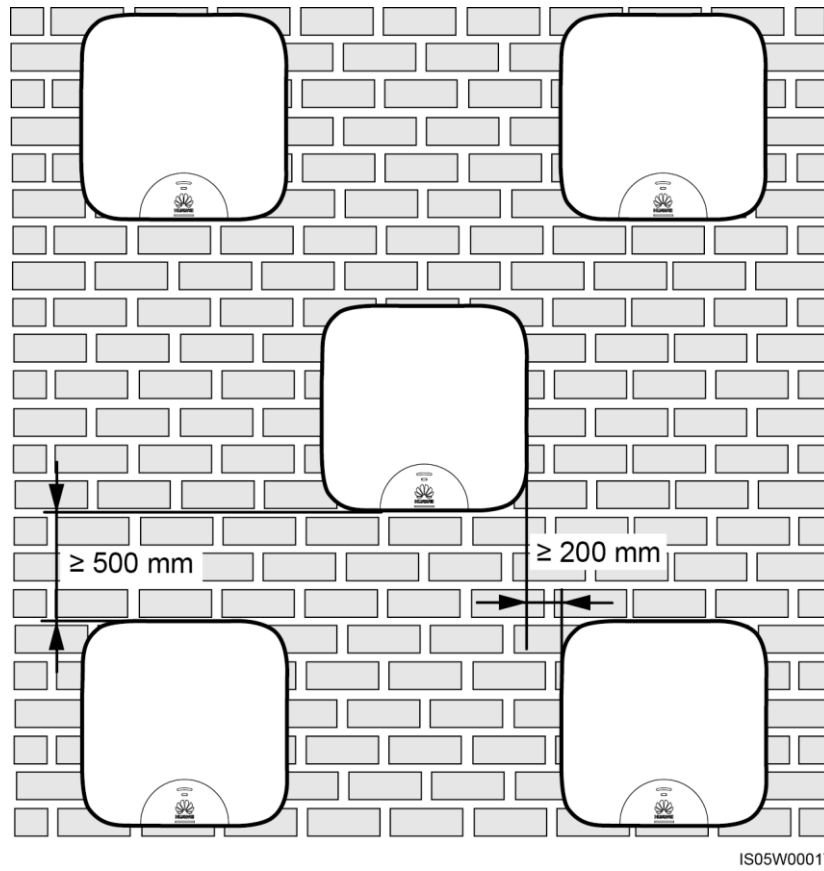
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Figure 4-5 Stacked installation mode (not recommended)
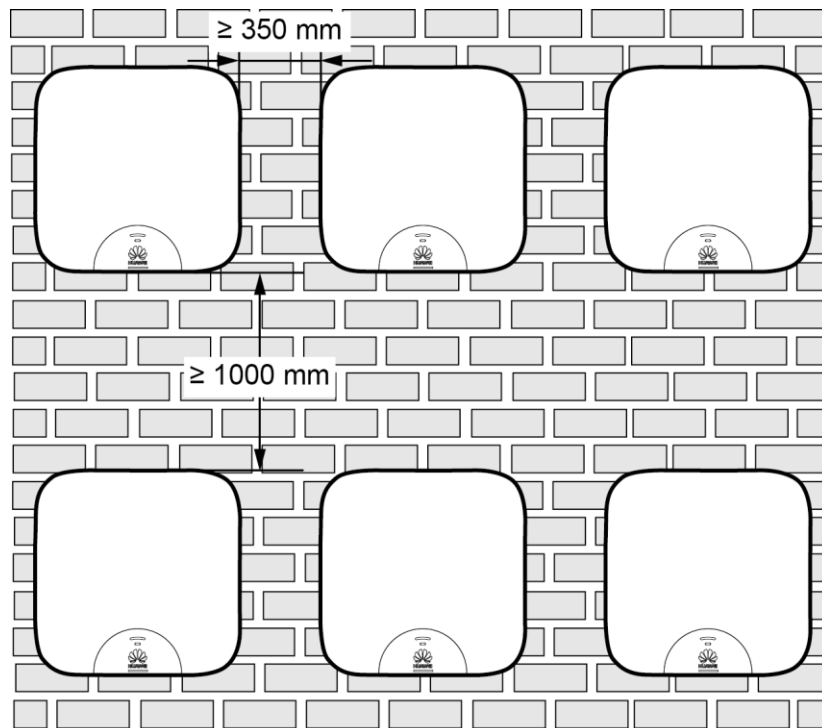
4.4 Installing the Mounting Bracket

Fixing holes can be used in three combinations. Select a hole combination based on site requirements. Combination A is preferred.

Figure 4-6 Hole combinations
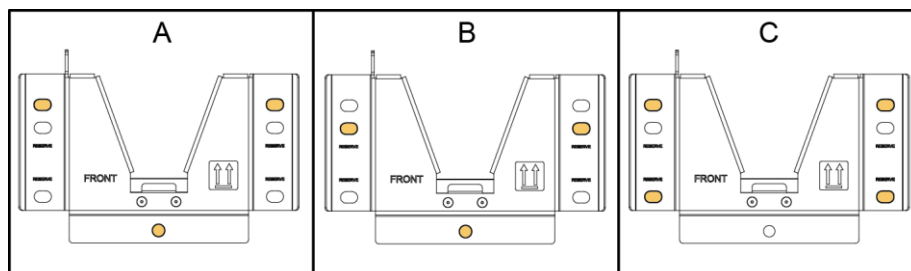
Figure 4-7 Hole distances
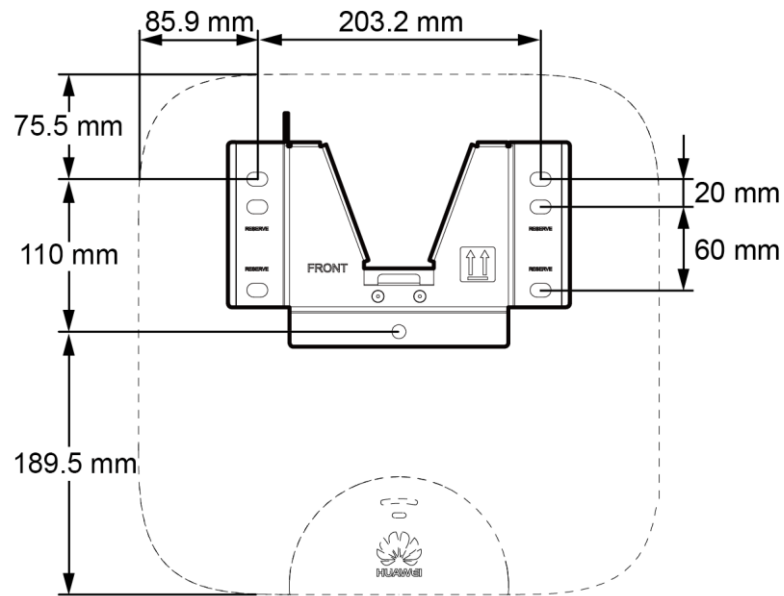
4.4.1 Wall-Mounted Installation

Procedure

Step 1 Determine the positions for drilling holes using the mounting bracket. Level the positions of mounting holes using a bubble or digital level, and mark the positions with a marker.

Figure 4-8 Determining hole positions
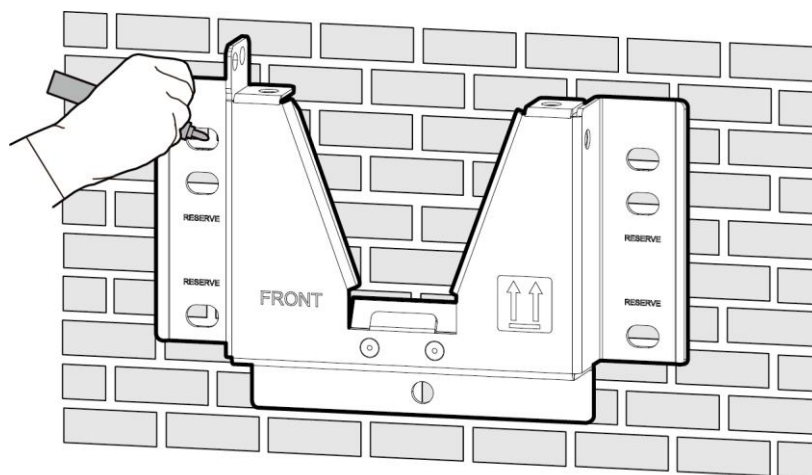
Step 2 Install expansion bolts.

> **⚠ DANGER**
>
> Avoid drilling holes in the utility pipes and/or cables attached to back of the wall.

> **📖 NOTE**
>
> If the length or number of M8x80 expansion bolts supplied with the SUN2000L is not enough, prepare M8 stainless steel expansion anchor bolts.

Figure 4-9 Expansion bolt composition
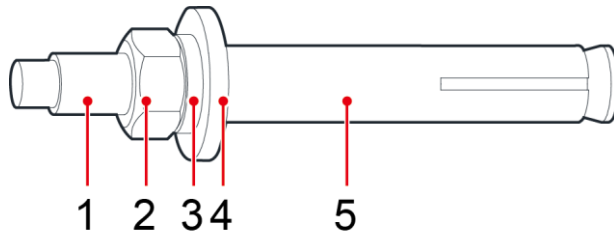
(1) Bolt	(2) Nut	(3) Spring washer
(4) Flat washer	(5) Expansion sleeve	

> **⚠ NOTICE**
>
> - To prevent dust inhalation or contact with eyes, wear safety goggles and an anti-dust respirator 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 new set of the holes.
> - Level the head 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 4-10 Installing an expansion bolt
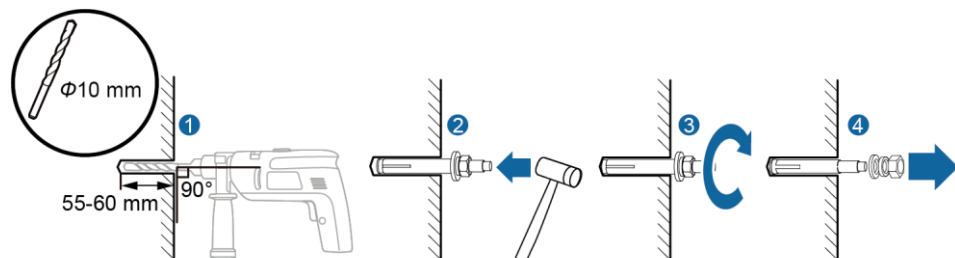
Step 3 Secure the mounting bracket.

Figure 4-11 Securing a mounting bracket
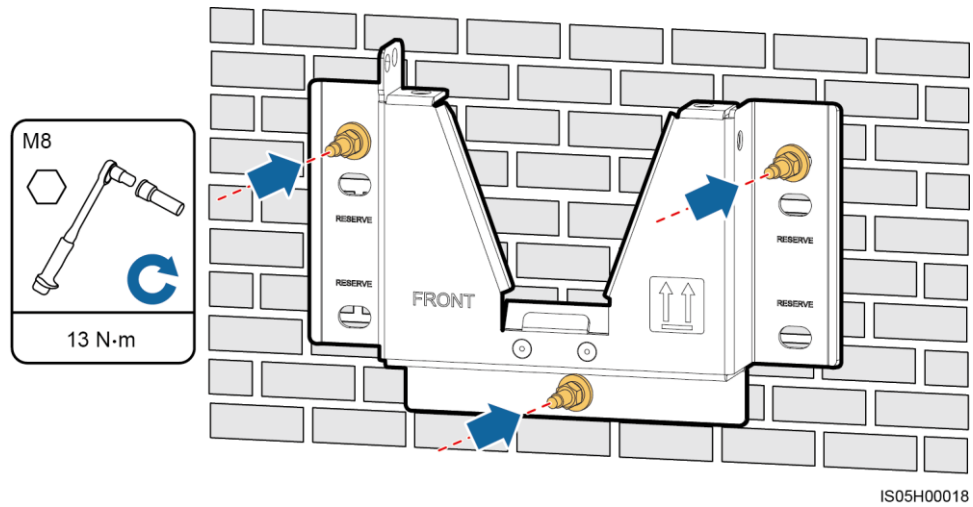
                ----End

4.4.2 Support-mounted Installation

Prerequisites

Prepare M8 stainless bolt assemblies (including flat washers, spring washers, and M8 bolts) with appropriate lengths as well as matched flat washers and nuts based on the support specifications.

Procedure

Step 1 Determine the positions for drilling holes using the mounting bracket. Level the positions of mounting holes using a bubble or digital level, and mark the positions with a marker.

Figure 4-12 Determining hole positions
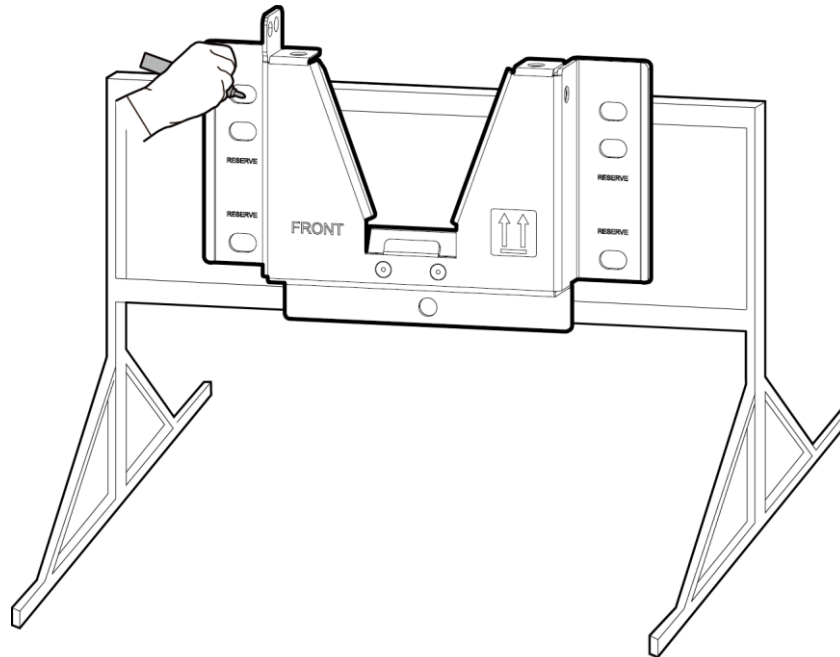
IS05H00020

Step 2 Drill holes using a hammer drill.

📖 NOTE

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

Figure 4-13 Drilling holes

Φ10 mm
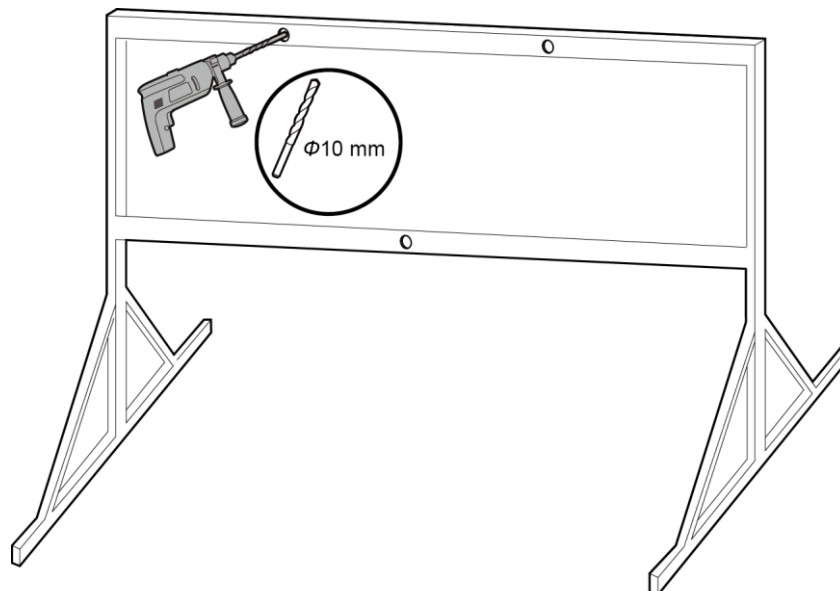
IS05H00022

Step 3 Secure the mounting bracket.

Figure 4-14 Securing a mounting bracket
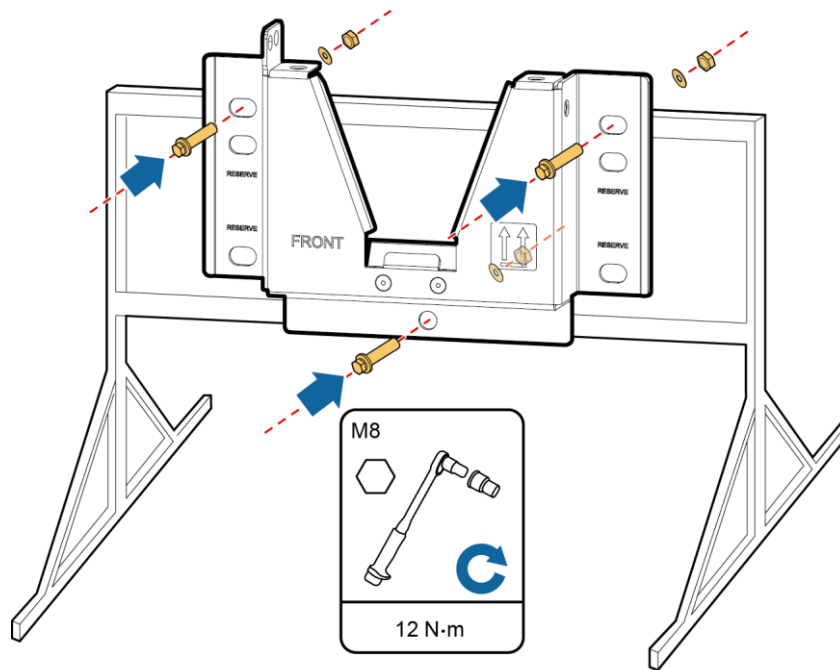
----**End**

4.5 Installing the SUN2000L

Procedure

Step 1 Hold the handles on both sides of the SUN2000L, lift the SUN2000L from the packing case, and move it to the installation position.

⚠ **CAUTION**

- To prevent device damage and personal injury, keep balance when moving the SUN2000L.
- Do not use the wiring terminals and ports at the bottom to support any weight of the SUN2000L.
- When you need to temporally place the SUN2000L on the ground, use foam, paper or other protection material to prevent damage to its cover.

Figure 4-15 Moving a SUN2000L
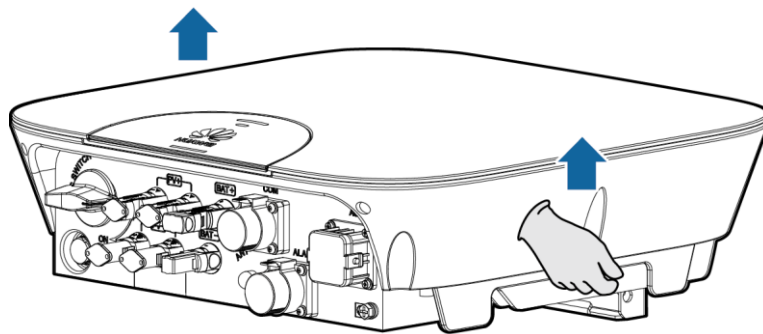
Step 2 Install the SUN2000L on the mounting bracket and align the SUN2000L enclosure with the mounting bracket.

⚠ **NOTICE**

If the bottom of the mounting plate does not snap into place, push the SUN2000L from the front until the bottom of the mounting plate snaps into the mounting bracket.

Figure 4-16 Mounting a SUN2000L
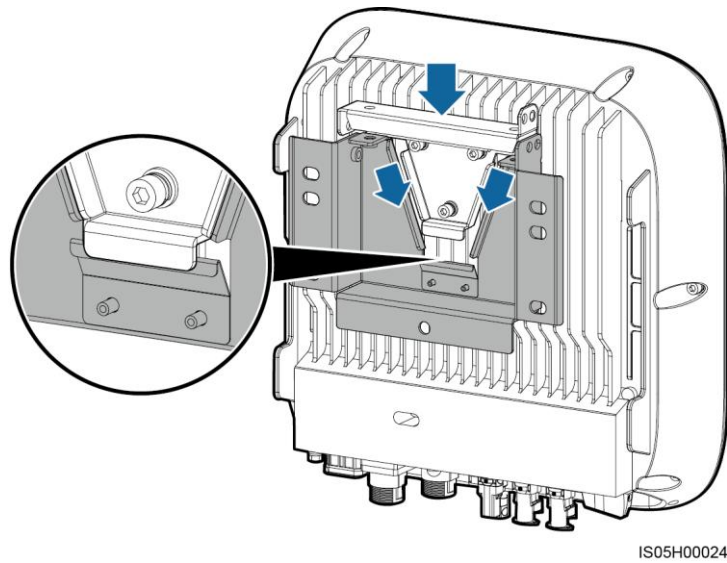
Step 3 Tighten screw assemblies.

Fixing holes can be used in three combinations. Select a hole combination based on site requirements. Combination A is preferred.

Figure 4-17 Fixing holes
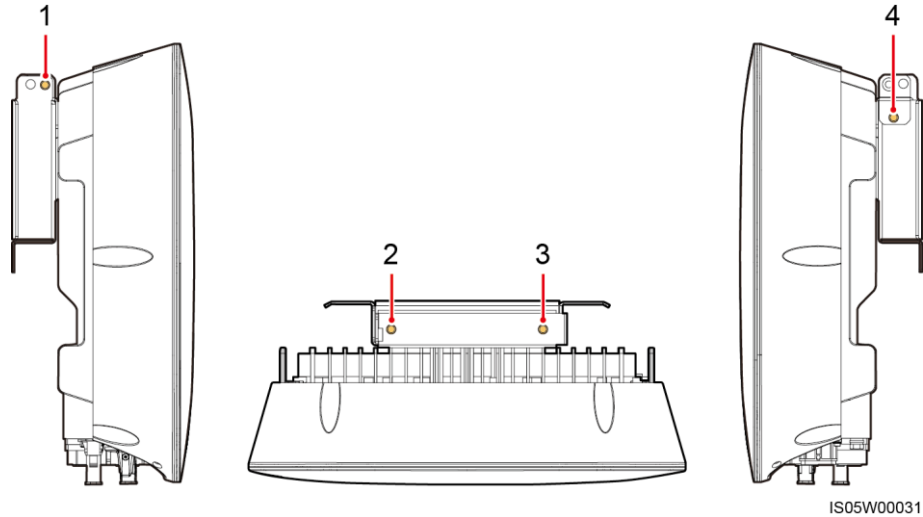
Combination A: holes 2 and 3   Combination B: holes 1 and 3

Combination C: holes 1 and 4   Combination D: holes 2 and 4

Figure 4-18 Tightening screw assemblies

IS05H00072
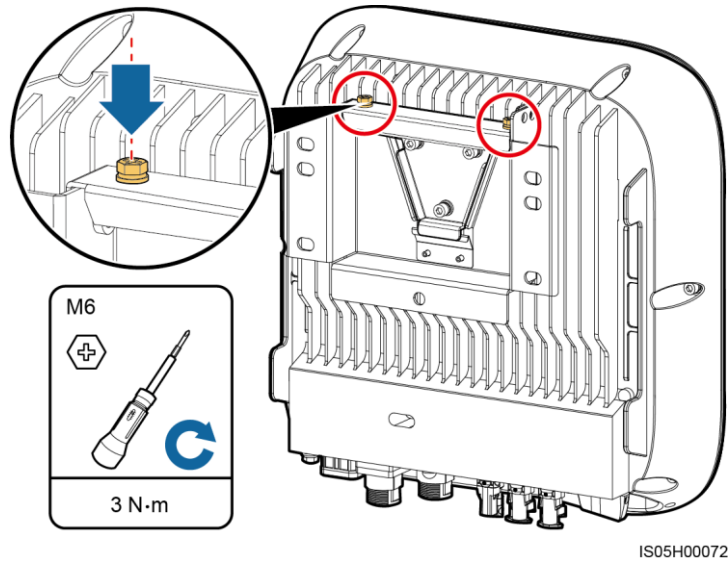
Step 4 (Optional) Install an anti-theft lock.

The function of an anti-theft lock is to secure the SUN2000L to the mounting bracket and protect it from stealing.

⚠ **NOTICE**

- Prepare an anti-theft lock suitable for the lock hole diameter (Φ8 mm) by yourself.
- Keep the key to the anti-theft lock safe.

Figure 4-19 Installing an anti-theft lock

IS05H00073
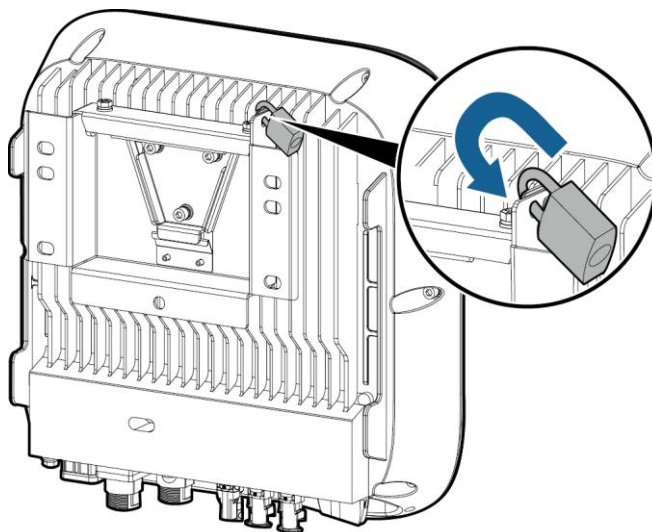
----End

4.6 Installing the WiFi Antenna

Procedure

Step 1 Remove the watertight cap from the ANT port.

Step 2 Remove the release paper of the double-sided tape and attach the washer to the enclosure.

Step 3 Install the WiFi antenna.

⚠ **NOTICE**

Ensure that the WiFi antenna is installed securely.

Figure 4-20 Installing a WiFi antenna
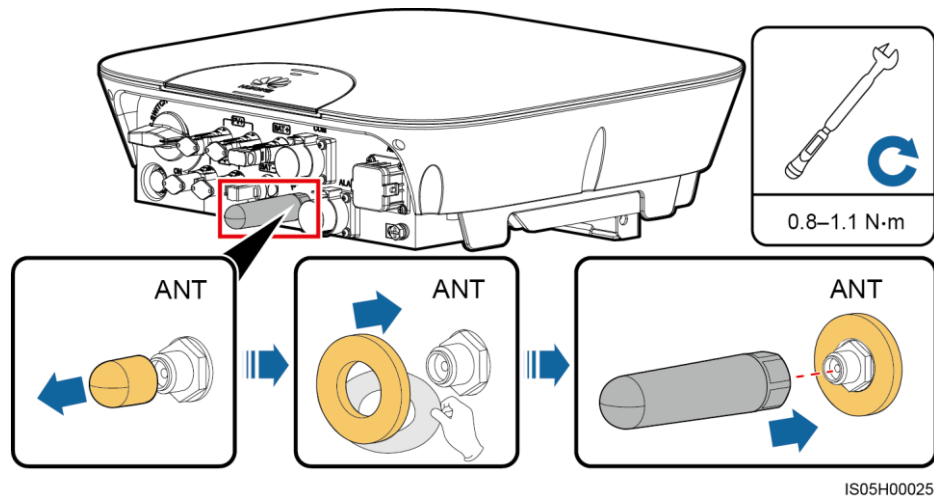
----End

5 Electrical Connections

Precautions

![DANGER]

Before connecting cables, ensure that the DC switch on the SUN2000L and all the switches connecting to the SUN2000L are OFF. Otherwise, the high voltage of the SUN2000L may result in electric shocks.

![WARNING]

- The equipment damage caused by incorrect cable connections is beyond the warranty scope.
- Only certified electricians are allowed to connect cables.
- Operation personnel must wear proper PPE all the time when connecting cables.

📖 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 PE).

5.1 Preparing Cables

Figure 5-1 Network diagram (optional in dashed boxes)
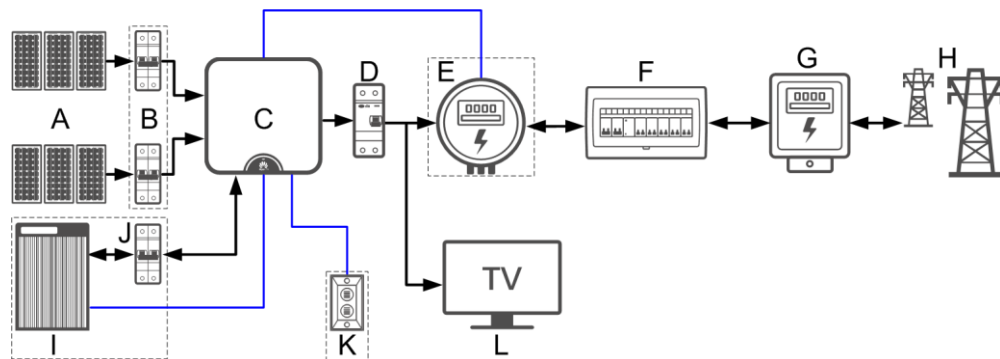
📖 **NOTE**

— indicates a power cable, → indicates the power flow direction, and — indicates a signal cable.

(A) PV string	(B) DC switch	(C) SUN2000L
(D) AC switch	(E) Power collector	(F) Residential power distribution unit
(G) Residential power meter	(H) Power grid	(I) Battery
(J) Battery switch	(K) Alarm beacon	(L) Residential load

Figure 5-2 SUN2000L cable connections (optional in dashed boxes)
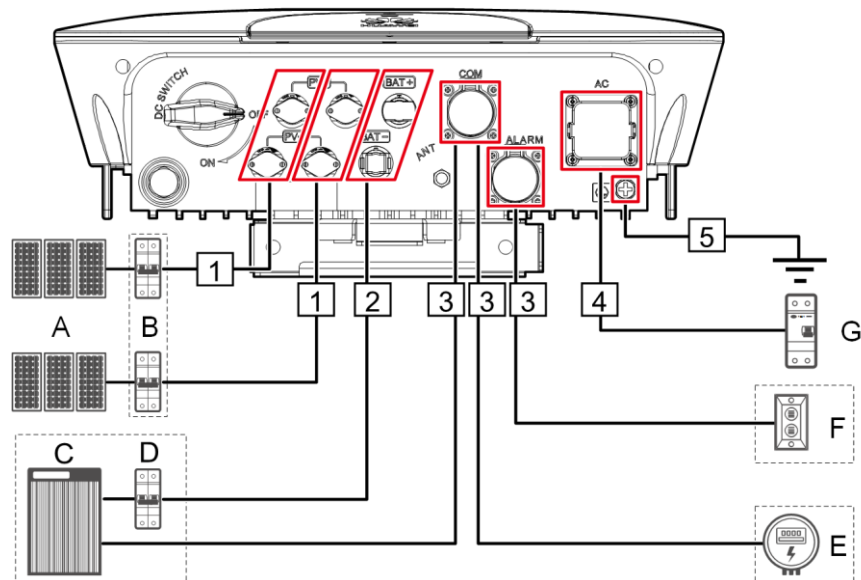
Table 5-1 Component description

No.	Component	Description	Source
A	PV string	- A PV string is composed of the PV modules connected in series and works with an optimizer. - The SUN2000L supports the input from two PV strings.	Prepared by the customer
B	DC switch	Recommended: a DC circuit breaker with a rated voltage greater than or equal to 600 V DC and a rated current of 20 A	Prepared by the customer
C	Battery	The batteries that can connect to the SUN2000L are LG-RESU (LG RESU7H and RESU10H).	Prepared by the customer
D	Battery switch	Recommended: a DC circuit breaker with a rated voltage greater than or equal to 600 V DC and a rated current of 20 A	Prepared by the customer
E	Power collector	The power collectors that can connect to the SUN2000L are CHINT-DDSU666, WNC-3Y, and EASTRON-SDM230.	Prepared by the customer
F	Alarm beacon	The rated voltage is 12 V and the power is less than or equal to 3 W.	Prepared by the customer
G	AC switch	Recommended: a single-phase AC circuit breaker with a rated voltage greater than or equal to 250 V AC and a rated current of 16 A (SUN2000L-2KTL) 25 A (SUN2000L-3KTL and SUN2000L-3.68KTL) 32 A (SUN2000L-4KTL, SUN2000L-4.6KTL, and SUN2000L-5KTL)	Prepared by the customer

⚠ **NOTICE**

- The SUN2000L is embedded with a residual current monitoring unit (RCMU). Only a single-phase circuit breaker or a similar AC load breaking device is required to function as the external AC switch (shown by G in Figure 5-2) to ensure that the SUN2000L can be safely disconnected from the power grid.
- If the external AC switch can perform earth leakage protection, the rated leakage action current should be greater than or equal to 100 mA.
- If multiple SUN2000Ls connect to the general residual current device (RCD) through their respective external AC switches, the rated leakage action current of the general RCD should be greater than or equal to the number of SUN2000Ls multiplied by 100 mA.
- A knife switch cannot be used as an AC switch.

Table 5-2 Cable description

No.	Cable	Type	Conductor Cross-sectional Area Range	Outer Diameter	Source
1	DC input power cable	Standard PV cable in the industry (recommended model: PV1-F)	4–6 mm^2	4.5–7.8 mm	Prepared by the customer
2	Battery cable	Standard PV cable in the industry (recommended model: PV1-F)	4–6 mm^2	4.5–7.8 mm	Prepared by the customer
3	Signal cable	Four-core outdoor shielded twisted pair	0.25–1 mm^2	4–11 mm	Prepared by the customer
4	AC output power cable	• Not using the PE equipotential point at the AC output port: two-core (L and N) outdoor copper cable • Using the PE equipotential point at the AC output port: three-core (L, N, and PE) outdoor copper cable	4–6 mm^2	10–21 mm	Prepared by the customer
5	PE cable	Single-core outdoor copper cable with an M6 OT terminal	4–10 mm^2	N/A	Prepared by the customer

⚠ **NOTICE**

The PE point at the AC output port is used only as a PE equipotential point, and cannot substitute for the PE point on the enclosure.

5.2 Installing the PE Cable

Context

![DANGER icon]

DANGER

Do not connect the neutral wire to the enclosure as a PE cable. Otherwise, electric shocks will be caused.

Procedure

Step 1 Crimp the OT terminal.

![NOTICE icon]

NOTICE

● Pay attention not to damage 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 following figure uses heat shrink tubing as an example.

● When using the heat gun, protect devices from being scorched.

Figure 5-3 Crimping an OT terminal
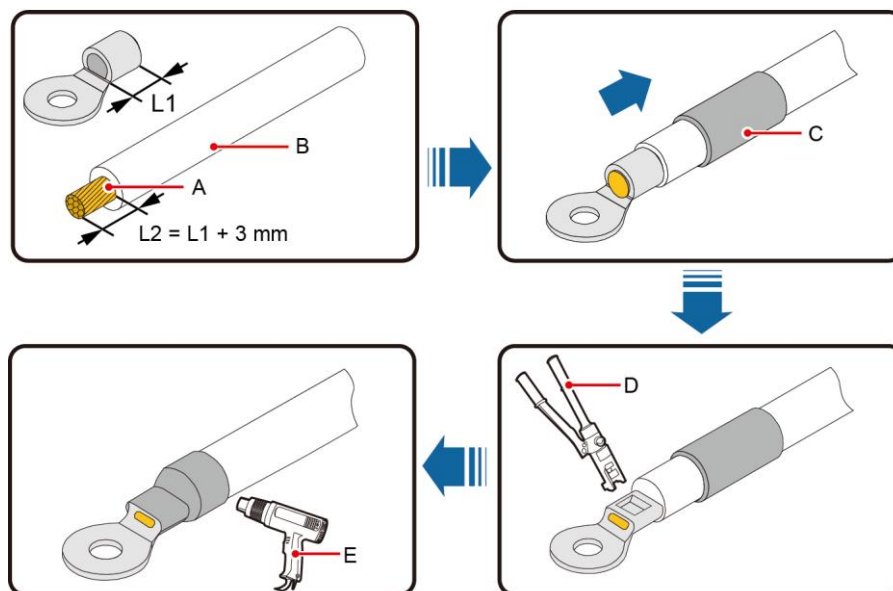
(A) Core wire   (B) Insulation layer   (C) Heat shrink tubing

(D) Hydraulic pliers   (E) Heat gun

Step 2   Connect the PE cable.

⚠️ **NOTICE**

Ensure that the PE cable is connected securely.

Figure 5-4 Connecting a PE cable

IS05H00043
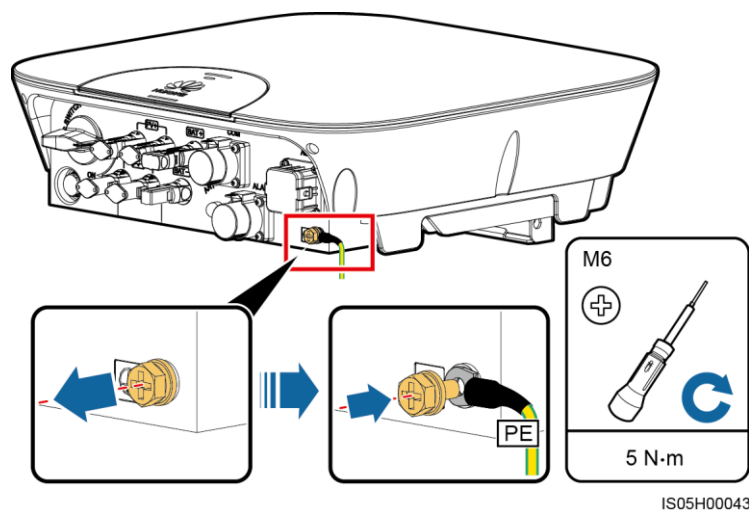
📖 **NOTE**

- The PE point at the AC output port is used only as a PE equipotential point, and cannot substitute for the PE point on the enclosure.
- To enhance the corrosion resistance of a ground terminal, apply silica gel or paint around the terminal after connecting the ground cable.

----End

5.3 Installing the AC Output Power Cable

Prerequisites

An AC switch must be installed on the AC side of the SUN2000L to ensure that the SUN2000L can be safely disconnected from the power grid.

⚠ WARNING

Do not connect any load between the SUN2000L and the AC switch.

Context

The SUN2000L can detect the grounding. This function is used to detect whether the SUN2000L is properly grounded before starting the SUN2000L, or to detect whether the PE cable is disconnected when the SUN2000L is working. This function is available only under limited conditions. To ensure the safe operation of the SUN2000L, properly ground the SUN2000L in strict accordance with the connection requirements for PE cables. For certain types of power grids, if an isolation transformer connects to the output side of the SUN2000L, you need to set **OFF due to abnormal grounding** to **Disable** (see 7.4.5.3 Feature parameters for details) after checking that the SUN2000L is properly grounded. Then the SUN2000L can start normally. If you are not sure whether the SUN2000L connects to such a power grid, confirm it with your dealer or Huawei technical support.

📖 NOTE

- According to IEC62109, to ensure the safe operation of the SUN2000L in the case of PE cable damage or disconnection, connect the SUN2000L PE cable according to the requirements described in 5.2 Installing the PE Cable and ensure that the SUN2000L PE cable meets at least one of the following requirements before disabling the grounding detection function.

  The SUN2000L PE cable is a copper cable with a cross-sectional area of at least 10 mm^2.

  Use two cables that have the same diameter as the AC output power cable to ground the PE terminal on the AC connector and the ground screw on the enclosure respectively (see 5.2 Installing the PE Cable and 5.3 Installing the AC Output Power Cable for details).

- Certain countries require an additional PE cable for the SUN2000L. In this case, use two cables that have the same diameter as the AC output power cable to ground the PE terminal on the AC connector and the ground screw on the enclosure respectively (see 5.2 Installing the PE Cable and 5.3 Installing the AC Output Power Cable for details).

Procedure

Step 1 Connect the AC output power cable to the AC connector.

⚠ **NOTICE**

- Ensure that the cable jacket is inside the connector.
- Ensure that the exposed core wire is totally inserted into the cable hole.
- Ensure that AC terminations provide firm and solid electrical connections. Failing to do so may cause SUN2000L malfunction and damage to its AC connectors.
- Ensure that the cable is not twisted.

Figure 5-5 Assembling an AC connector (three-core wire)
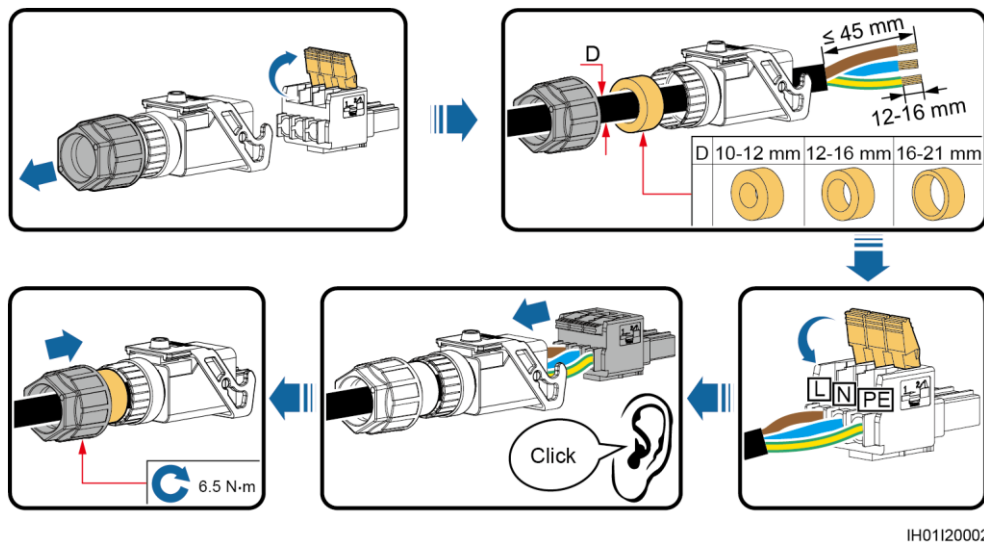
Figure 5-6 Assembling an AC connector (two-core wire)
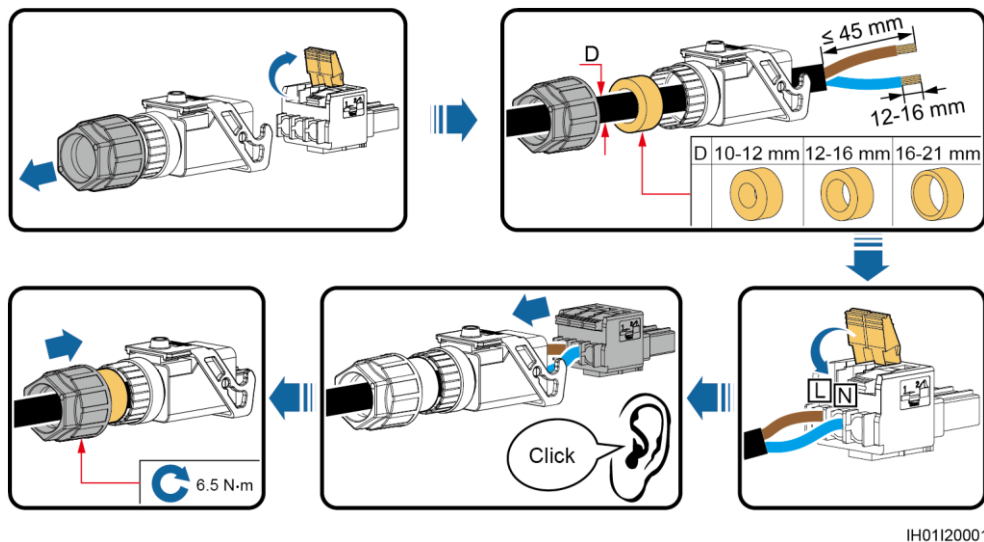
📖 **NOTE**

- The cable colors shown in figures are for reference only. Select an appropriate cable according to the local standards.
- For the core wire installation method and stripped length, see the instructions on the side of the plug insert.

Figure 5-7 Stripped length
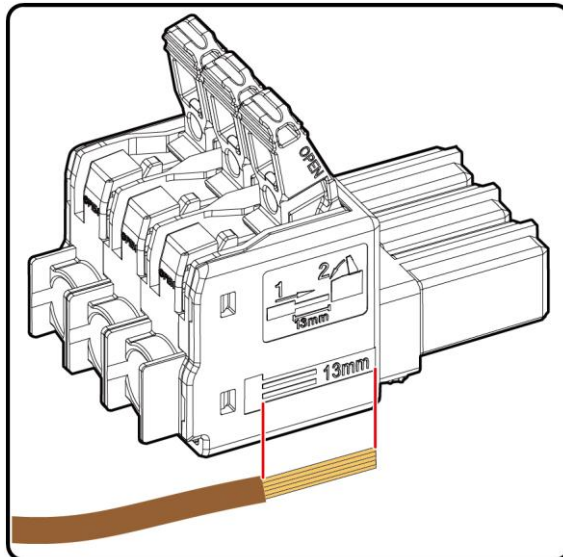
IS05W00036

Step 2 Connect the AC connector to the AC output port.

⚠️ **NOTICE**

Ensure that the AC connector is connected securely.

Figure 5-8 Securing an AC connector

IS05H00046
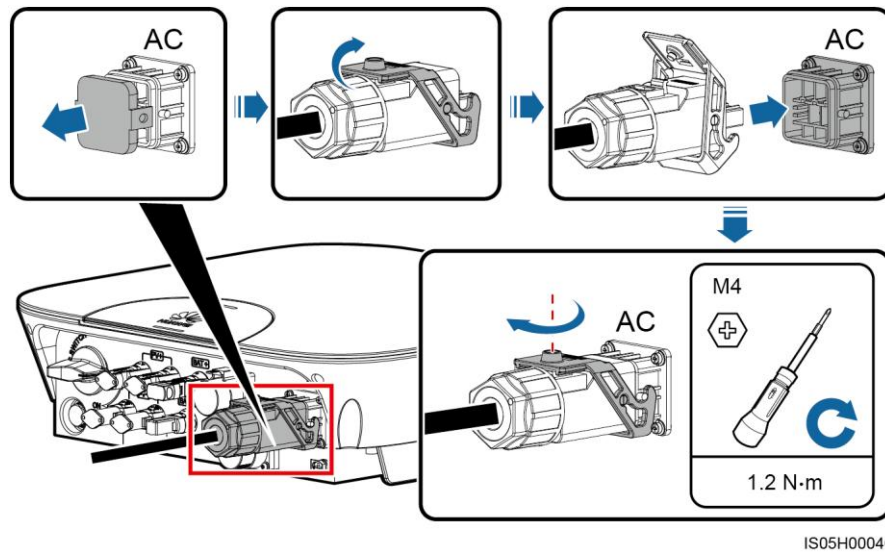
Step 3 Check the route of the AC output power cable.

Figure 5-9 Cable route

IP13I00020

----End
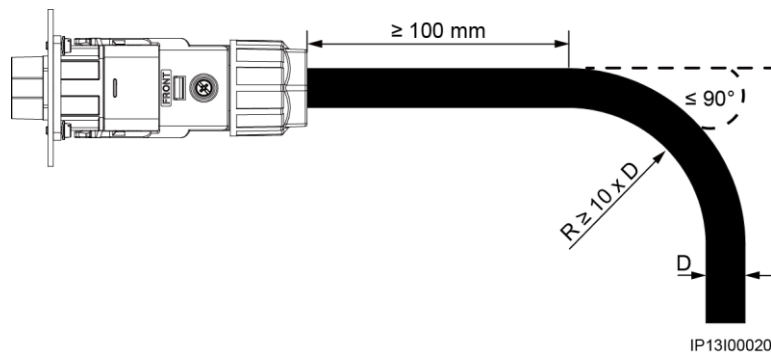
Follow-up Procedure

⚠️ **WARNING**

Before removing the AC connector, ensure that the DC switch at the bottom of the SUN2000L and all the switches connecting to the SUN2000L are OFF.

To remove the AC connector from the SUN2000L, perform the operations in reverse order.

Figure 5-10 Removing a plug insert
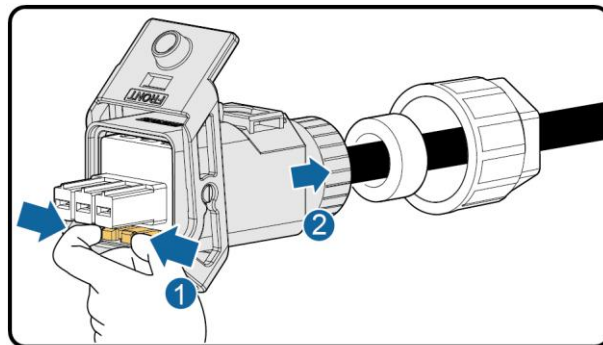
IS05H00031

5.4 Installing the DC Input Power Cable

Prerequisites

DANGER

- Before connecting the DC input power cable, ensure that the DC voltage is within the safe range (lower than 60 V DC) and that the DC switch on the SUN2000L is OFF. Failing to do so may result in electric shocks.

- When the SUN2000L is operating, it is not allowed to work on DC circuit, such as connecting or disconnecting a PV string or a PV module in a PV string. Failing to do so may cause electric shocks.

WARNING

Ensure that the following conditions are met. Otherwise, the SUN2000L will be damaged, or even become a fire hazard.

- The open-circuit voltage of each PV string is always lower than or equal to 600 V DC.

- The positive and negative terminals of a PV string connect to corresponding positive and negative DC input terminals of the SUN2000L.

- 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 unplug 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 string polarity before reconnecting the string to the SUN2000L.

⚠ **NOTICE**

● Since the output of the PV string connected to the SUN2000L cannot be grounded, ensure that the PV module output is well insulated to ground.

● During the installation of PV strings and SUN2000L, the positive or negative terminals of PV strings may be grounded if power cables are not properly installed or routed. In this case, an AC or DC short circuit may occur and damage the SUN2000L. This damage is not covered under any warranty or service agreement.

Context

Figure 5-11 DC input terminals
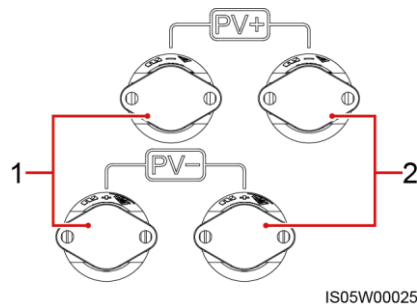
(1) The first set of DC input terminals   (2) The second set of DC input terminals

Procedure

Step 1 Assemble the black positive and negative connectors.

⚠ **CAUTION**

Use the positive and negative metal terminals and DC connectors supplied with the SUN2000L. Using incompatible positive and negative metal terminals and DC connectors may result in serious consequences. The caused device damage is not covered under any warranty or service agreement.

⚠️ **NOTICE**

- 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 input connectors, label the cable polarities correctly to ensure correct cable connections.
- After crimping the positive and negative metal terminals, pull the DC input power cables back to ensure that they are connected securely.
- Insert the crimped metal terminals of the positive and negative power cables into the appropriate positive and negative connectors. Then pull back the DC input power cables to ensure that they are connected securely.

Figure 5-12 Assembling a DC connector
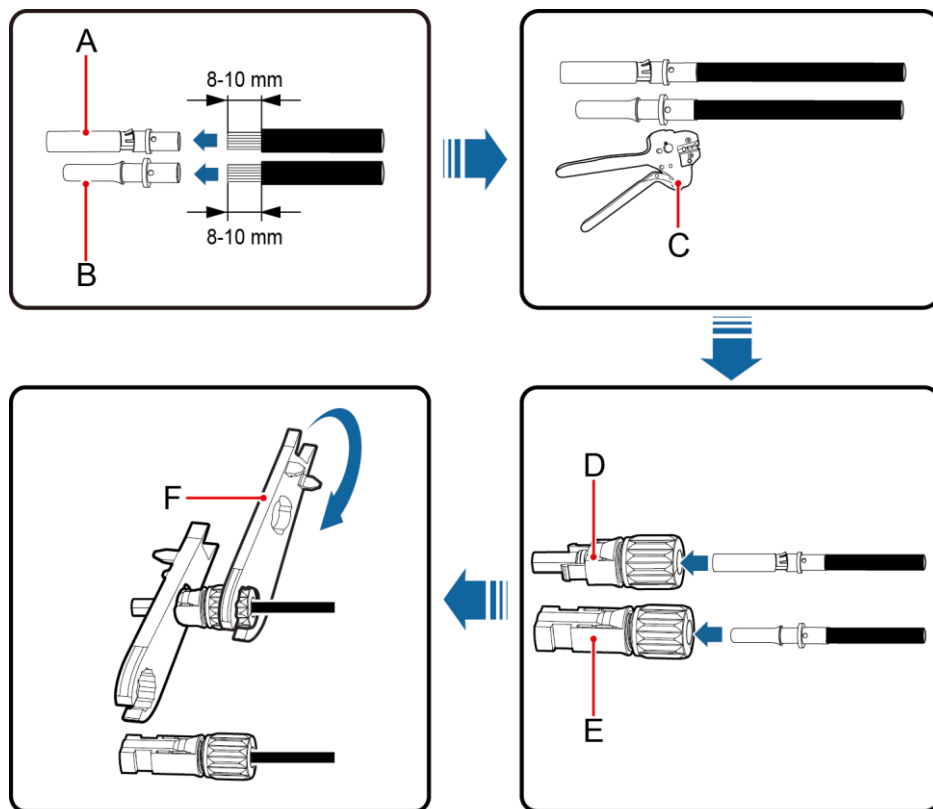
(A) Positive metal terminal	(B) Negative metal terminal	(C) H4TC0001 crimping tool
(D) Positive connector	(E) Negative connector	(F) H4TW0001 open-end wrench

⚠️ **NOTICE**

Ensure that the core wires can be seen through the hole on the terminal both before and after the positive and negative metal terminals are crimped.

Figure 5-13 Observing core wires through the hole on the terminal

IS05H00101
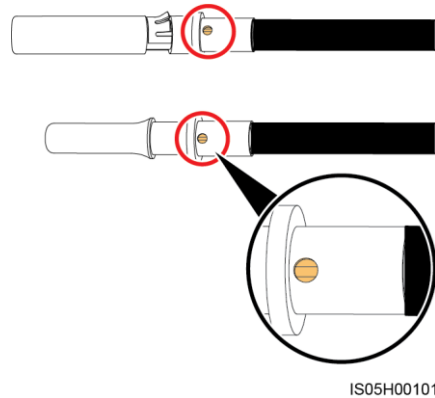
Step 2 Ensure that the DC input voltage of each PV string is within the specified range of the SUN2000L using a multimeter and check that the polarities of DC input power cables are correct.

Figure 5-14 Measuring the DC input voltage

IS03H00014
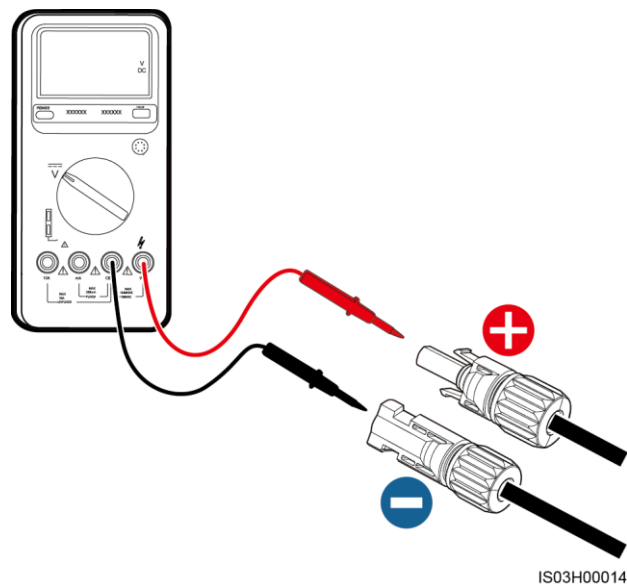
⚠️ **WARNING**

Before performing Step 3, ensure that the DC switch is OFF.

Step 3 Insert the positive and negative connectors into corresponding DC input terminals on the SUN2000L.

⚠ **NOTICE**

After the positive and negative connectors snap into place, pull the DC input power cables back to ensure that they are connected securely.

Figure 5-15 Connecting DC input power cables
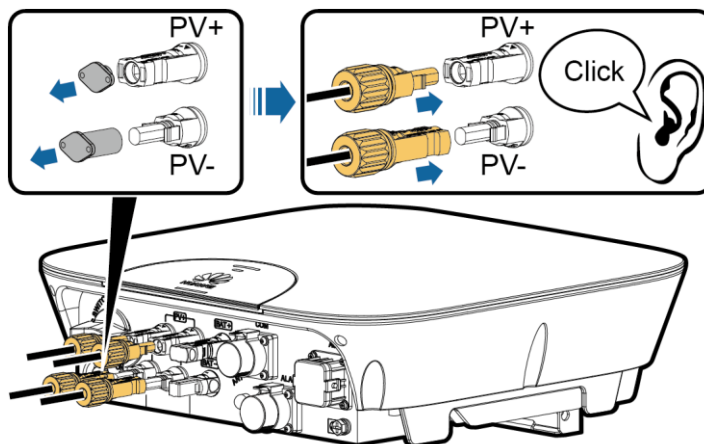
⚠ **NOTICE**

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 unplug positive and negative connectors. The device may be damaged if you do not follow the instruction. This damage is not covered under any warranty or service agreement. 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 string polarity before reconnecting the string to the SUN2000L.

----End

Follow-up Procedure

⚠ **WARNING**

Before removing the positive and negative connectors, ensure that the DC switch is OFF.

To remove the positive and negative connectors from the SUN2000L, insert an open-end wrench into the notch and press the wrench with an appropriate force.

Figure 5-16 Removing a DC connector
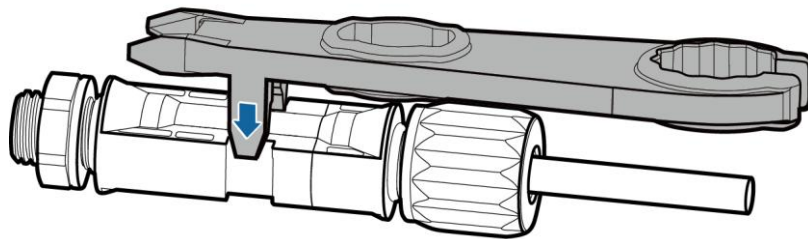
5.5 Installing the Battery Cable

Prerequisites

⚠ **DANGER**

- Battery short circuits may cause personal injury. The high transient current generated by a short circuit will release a surge of power and may even cause fire.
- Do not connect or disconnect battery cables when the SUN2000L is running. Failing to do so may cause electric shocks.
- Before connecting battery cables, ensure that the DC switch on the SUN2000L and all the switches connecting to the SUN2000L are OFF, and the SUN2000L has no residual electricity. Otherwise, the high voltage of the SUN2000L and battery may result in electric shocks.
- If no battery connects to the SUN2000L, do not remove the watertight cap from the battery terminal. Otherwise, the SUN2000L will not comply with its Ingress Protection Rating. If a battery connects to the SUN2000L, set aside the watertight cap. Reinstall the watertight cap immediately after removing the connector. The high voltage of the battery terminal may result in electric shocks.

A battery switch can be configured between the SUN2000L and the battery to ensure that the SUN2000L can be safely disconnected from the battery.

⚠ **WARNING**

Do not connect any load between the SUN2000L and the battery.

Ensure that the following conditions are met. Otherwise, the SUN2000L will be damaged, or even become a fire hazard.

- The battery open-circuit voltage should always be lower than or equal to 600 V DC.
- The battery cable is connected correctly. That is, the positive and negative terminals of the battery connect to the positive battery terminal and negative battery terminal on the SUN2000L respectively.

![NOTICE icon] **NOTICE**

- During the installation of the SUN2000L and battery, the positive or negative terminal of the battery will be short-circuited to ground if power cables are not installed or routed as required. In this case, an AC or DC short circuit may occur and damage the SUN2000L. This damage is not covered under any warranty or service agreement.
- The cable between the battery and the SUN2000L should be less than or equal to 10 meters, and within 5 meters is recommended.

Procedure

Step 1 Assemble the blue positive and negative connectors by following the instructions in 5.4 Installing the DC Input Power Cable.

![DANGER icon] **DANGER**

- The battery voltage will result in serious injury. Use dedicated insulation tools to connect cables.
- Ensure that cables are correctly connected between the battery terminal and the battery switch, and between the battery switch and the SUN2000L battery terminal.

![NOTICE icon] **NOTICE**

Cables with high rigidity, such as armored cables, are not recommended, because poor contact may be caused by the bending of the cables.

Step 2 Insert the positive and negative connectors into corresponding battery terminals on the SUN2000L.

![NOTICE icon] **NOTICE**

After the positive and negative connectors snap into place, pull test to the battery cables is recommended.

Figure 5-17 Connecting battery cables
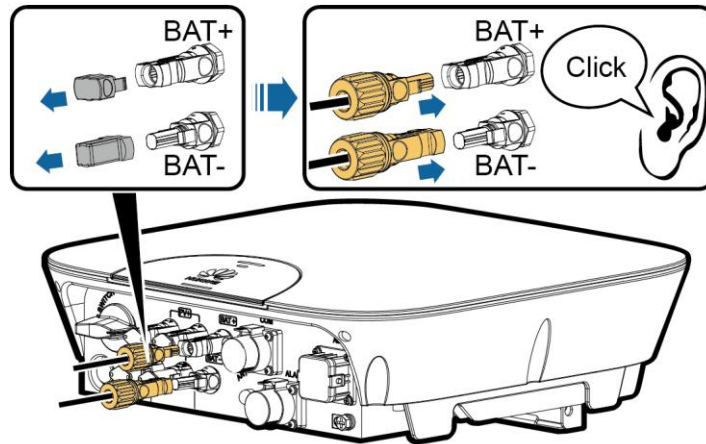
----**End**

5.6 Installing the Signal Cable

Context

⚠️ **NOTICE**

When laying out signal cables, separate them from power cables to avoid strong signal interference sources.

Figure 5-18 COM and ALARM ports
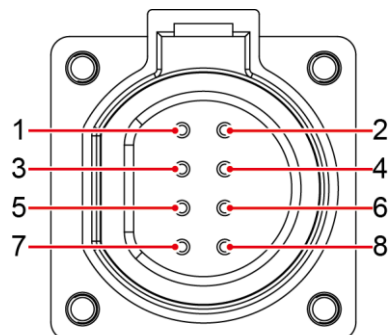
The COM port provides two RS485 communications ports and one enable signal port to connect to power collectors, batteries, and so on.

Table 5-3 COM port pin definitions

No.	Label	Definition	Description
1	485B1	RS485B, RS485 differential signal–	Reserved, can connect to the RS485 signal port on the power collector.
2	485A1	RS485A, RS485 differential signal+	
3	485B2	RS485B, RS485 differential signal–	Reserved, can connect to the RS485 signal port and enable signal port on a battery.
4	485A2	RS485A, RS485 differential signal+	
5	EN–	Enable signal–	
6	EN+	Enable signal+	
7	N/A	N/A	N/A
8	PE	Shielding ground	Connects to the shield layer of the cable.

The ALARM port provides an alarm signal port to connect to an alarm beacon, which reminds the user to handle the Low Insulation Resistance, Abnormal Residual Current, or Faulty Residual Current Sensor alarm. The ALARM port reserves an RS485/12 V signal port.

⚠ **NOTICE**

- The alarm beacon should be installed within 2 meters away from the SUN2000L.
- The Faulty Residual Current Sensor alarm is the Abnormal Device alarm with a cause ID of 5.

Table 5-4 ALARM port pin definitions

No.	Label	Definition	Description
1	ALARM–	Alarm signal–	Reserved, can connect to the power port on an alarm beacon
2	ALARM+	Alarm signal+	
3	485B3	RS485B, RS485 differential signal–	Reserved RS485/12 V signal port, output power of the 12 V power supply ≤ 3 W
4	485A3	RS485A, RS485 differential signal+	
5	12 V–	Negative of the 12 V power supply	
6	12 V+	Positive of the 12 V power supply	
7	N/A	N/A	N/A

No.	Label	Definition	Description
8	PE	Shielding ground	Connects to the shield layer of the cable.

Procedure

Step 1 Connect signal cables to appropriate signal connectors.

⚠ **NOTICE**

- The protection layer of the cable is in the connector. Surplus core wires are cut off from the protection layer.
- Ensure that the exposed core wire is totally inserted into the cable hole.
- Ensure that the signal cables are connected securely.
- Ensure that the cable is not twisted.
- If a connector needs to connect to only one signal cable, block the unused cable hole on the seal using a cap and tighten the cable gland.
- If a connector needs to connect to two signal cables, ensure that the cables have the same outer diameter.

Figure 5-19 Assembling a signal connector (COM port)
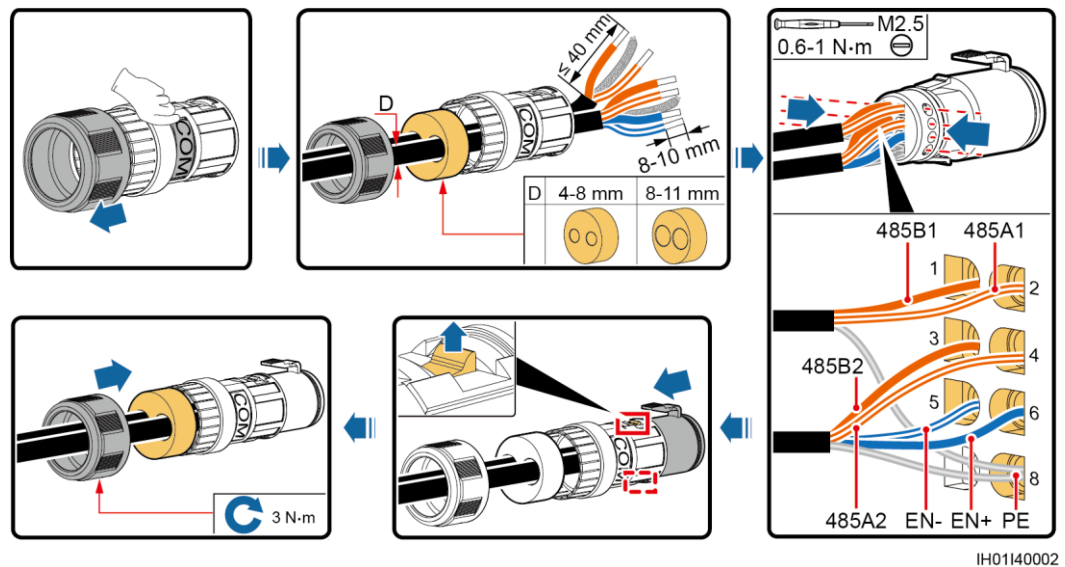
Figure 5-20 Assembling a signal connector (ALARM port)
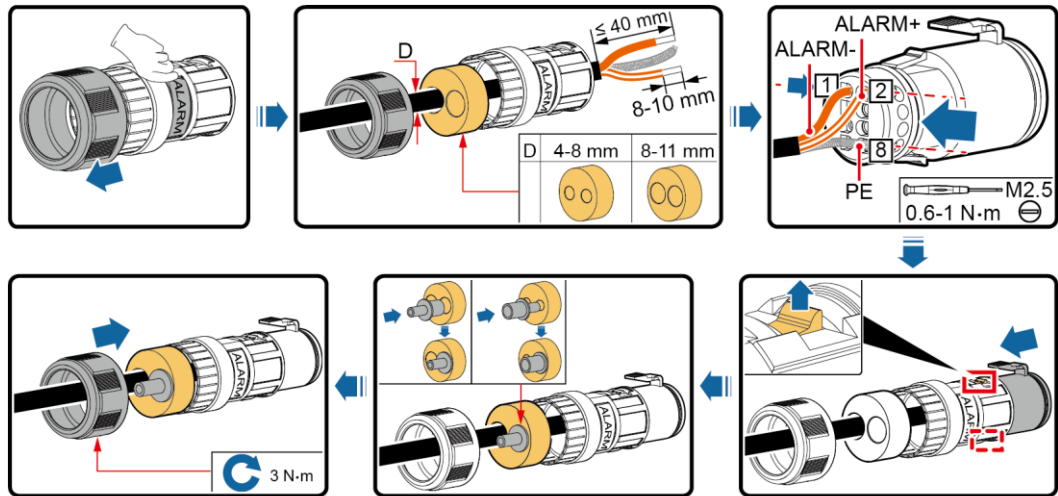
IH01I40009

Step 2 Connect the signal connector to the corresponding port.

⚠ **NOTICE**

● Do not confuse the connectors to the COM port and ALARM port.

● Ensure that the signal connector is connected securely.

Figure 5-21 Securing a connector (COM port)

IS05H00044

Figure 5-22 Securing a connector (ALARM port)

IS05H00099

----End
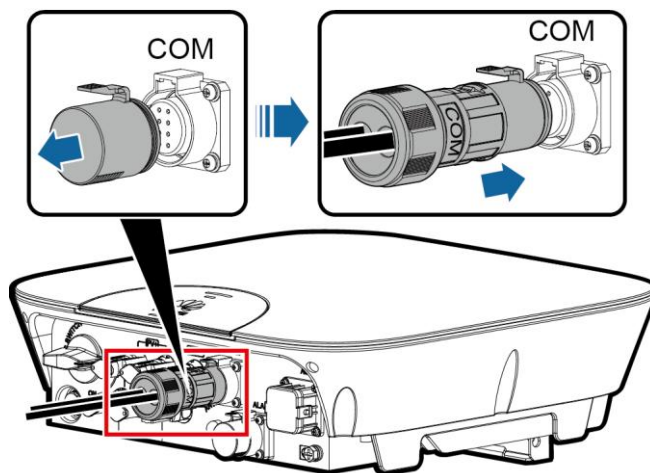
6 System Commissioning

6.1 Checking Before Power-On

Table 6-1 Installation checklist

No.	Check Item	Acceptance Criteria
1	SUN2000L installation	The SUN2000L is installed correctly, securely, and reliably.
2	WiFi antenna installation	The WiFi antenna is installed correctly, securely, and reliably.
3	Cable layout	Cables are routed properly as required by the customer.
4	Cable tie	Cable ties are secured evenly and no burr exists.
5	Grounding	The ground cable is connected correctly, securely, and reliably.
6	DC switch	The DC switch and all the switches connecting to the SUN2000L are OFF.
7	Cable connections	The AC output power cable, DC input power cable, battery cable, and signal cable are connected correctly, securely, and reliably.
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, without foreign matter.

6.2 Powering On the System

Prerequisites

Before turning on the AC switch between the SUN2000L and the power grid, check that the AC voltage on the power grid side of the AC switch is within the specified range.

⚠️ **NOTICE**
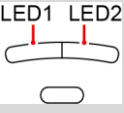
If the DC is on and the AC is off, the SUN2000L reports a Grid Failure alarm. The SUN2000L starts normally only after the fault is rectified.

Procedure

Step 1 Turn on the AC switch between the SUN2000L and the power grid.

Step 2 Turn on the DC switch between the PV string and the SUN2000L if there is any.

Step 3 Turn on the DC switch at the bottom of the SUN2000L.

Step 4 If a battery connects to the battery terminals, turn on the power switch on the battery, and then turn on the battery switch.

Step 5 Set the SUN2000L parameters on the app. For details, see 7 Operations on the Local FusionHome App.

Step 6 (Optional) Measure the temperatures at DC terminals and battery terminals using a point-test thermometer.

Under normal operation conditions of the SUN2000L, the temperature rise at DC terminals should remain below 30 ℃ at all time.

Step 7 Observe the LEDs to check the SUN2000L operating status.

Table 6-2 LED description

Type	Status		Meaning
Running indication LED1 LED2	**LED 1**	**LED 2**	N/A
	Steady green	Steady green	The SUN2000L is exporting power to the power grid.
	Blinking green at long intervals (on for 1s and then off for 1s)	Off	The DC is on and the AC is off.
	Off	Blinking green at long intervals (on for 1s and then off for 1s)	The DC is off and the AC is on.
	Blinking green at long intervals (on for 1s and then off for 1s)	Blinking green at long intervals (on for 1s and then off for 1s)	The DC is on, the AC is on, and the SUN2000L is not exporting power to the power grid.
	Off	Off	Both the DC and AC are off, or the SUN2000L is in Low Power Consumption mode. Low Power Consumption mode means that the monitoring system of the SUN2000L hibernates.
	Steady red	Steady red	The SUN2000L is faulty.
Communication indication LED3	**LED 3**		N/A
	Blinking green at short intervals (on for 0.2s and then off for 0.2s)		Communicating (Communicating refers to that the communication with the upper-level management unit is in progress. However, if a mobile phone accesses the SUN2000L, the LED indicates the "mobile phone access status: blinking green at long intervals" first.)
	Blinking green at long intervals (on for 1s and then off for 1s)		The mobile phone has connected to the SUN2000L.
	Off		Others

----End

6.3 Powering Off the System

Context

⚠ **WARNING**

After the SUN2000L powers off, the remaining electricity and heat may still cause electric shocks and body burns. Therefore, put on protective gloves and begin servicing the SUN2000L 5 minutes after the power-off.

Procedure

Step 1 Send a shutdown command from the app. Perform operations by referring to 7.4.3.3 Starting or Shutting Down the SUN2000L if you log in as **installer**; perform operations by referring to 7.5.6 Settings if you log in as **user**.

Step 2 Turn off the AC switch between the SUN2000L and the power grid.

Step 3 Turn off the DC switch at the bottom of the SUN2000L.

Step 4 Turn off the DC switch between the PV string and the SUN2000L if there is any.

Step 5 If a battery connects to the battery port, turn off the battery switch.

----End

7 Operations on the Local FusionHome App

7.1 App Overview

Function

The local FusionHome app (app for short) is a mobile phone app that locally communicates with the SUN2000L over WiFi to allow for querying alarms, configuring parameters, and performing routine maintenance, and commissioning.

Connection Method

After the DC or AC side of the SUN2000L is energized, the app can connect to the SUN2000L in either of the following ways:

- **Method 1:** The mobile phone connects to the SUN2000L directly.

  Figure 7-1 Mobile phone connecting to the SUN2000L directly
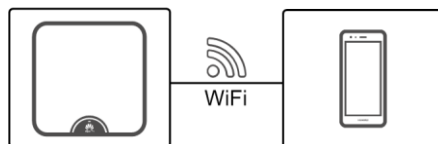
- **Method 2:** The mobile phone connects to the SUN2000L over a router. Do not use this method for the first login and ensure that the SUN2000L has connected to the router.

  Figure 7-2 Mobile phone connecting to the SUN2000L over a router

⚠ **NOTICE**

- Mobile phone operating system: Android 4.4 or later, iOS 8.0 or later.
- Recommended brands: Huawei, Samsung, and iPhone
- The mobile phone supports the access to the Internet over a web browser.
- The mobile phone supports WiFi.
- The router supports WiFi (IEEE 802.11 b/g/n, 2.4 GHz) and the WiFi signal reaches the SUN2000L.

Disclaimer

The app screen snapshots provided in this document correspond to FusionHome V1.1.0.100. The figures are for reference only.

User Operation Permissions

The app users are classified into the installer and user.

Figure 7-3 Operation permissions of the installer
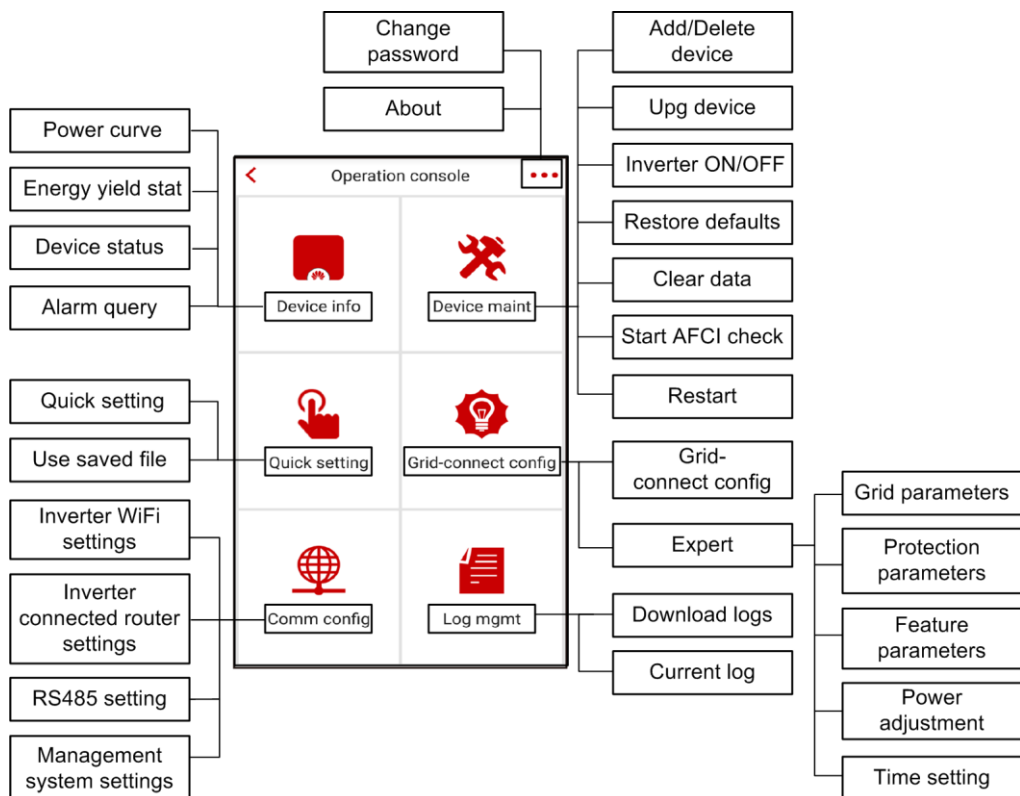
Figure 7-4 Operation permissions of the user
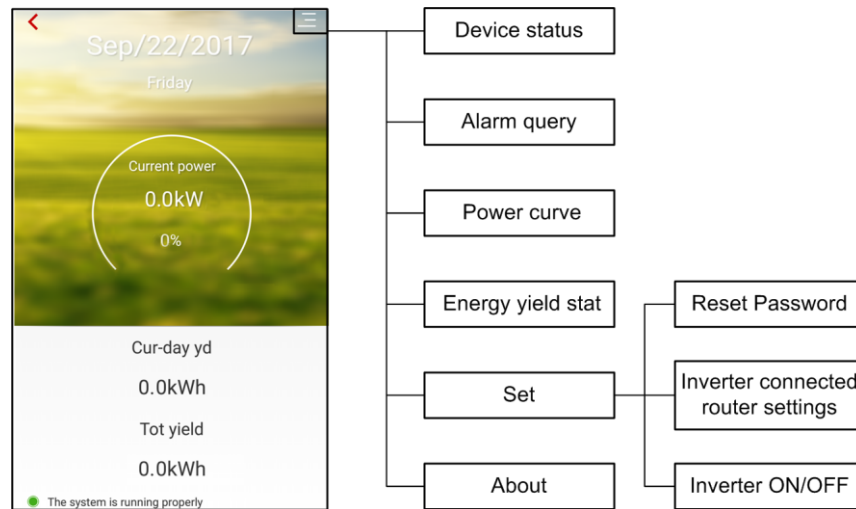
7.2 Downloading and Installing the App

Search for **FusionHome** from the following app stores, download the installation package, and install the FusionHome app by following the instructions.

- Google Play (Android)
- Huawei App Store (Android)
- App Store (iOS)

After the app is installed, the **FusionHome** icon is displayed on the home screen.

7.3 Connecting to a SUN2000L WiFi network

Prerequisites

- The DC or AC side of the SUN2000L has been energized.
- The WiFi function is enabled on the mobile phone.
- When connecting the SUN2000L to the app directly, keep the mobile phone within 5 meters of the SUN2000L with no barrier in between to ensure the communication quality between them.
- When connecting the SUN2000L to the app over a router, ensure that the mobile phone and SUN2000L are in the WiFi coverage of the router and the SUN2000L has connected to the router.

NOTICE

The way of connecting the SUN2000L to the router is as follows:

- The installer taps **Quick setting** (see 7.4.4 Quick Setting for details) or **Comm config** (see 7.4.6 Comm config for details).
- The user taps **Set** (see 7.5.6 Settings for details).

NOTE

- If the WiFi signal is weak, you will be prompted to try again multiple times. Follow the instructions.
- To exit the app, tap **Exit** on the **Inverter list** screen.

Procedure on the Android System

The app allows for connecting to the SUN2000L in the following two ways. Select either way based on site requirements. After the connection succeeds, the **Inverter list** screen is displayed. If connecting to the SUN2000L or router WiFi network from the app fails, try to connect to the WiFi network from your mobile phone.

- **Method 1:** The mobile phone connects to the SUN2000L directly.

  Run the app, tap the WiFi name corresponding to the SUN2000L, and enter the WiFi password to connect to the WiFi network. Use the initial password **Changeme** upon first login. To ensure account security, change the password immediately after login.

NOTE

The name of the connected SUN2000L WiFi network is represented by **SUN2000L-***its serial number (SN)*. The SN is available on the label attached to the side of the SUN2000L.

Figure 7-5 Mobile phone connecting to the SUN2000L directly
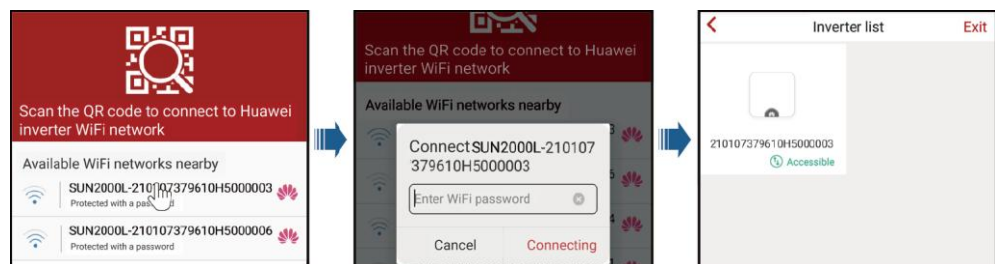
If you log in for the first time and the initial SUN2000L WiFi password is not changed, you can scan the WiFi login QR code on the side of the SUN2000L to connect to the SUN2000L WiFi network.

Figure 7-6 Scanning the QR code to connect the mobile phone to the SUN2000L directly

- **Method 2:** The mobile phone connects to the SUN2000L over a router. Do not use this method for the first login and ensure that the SUN2000L has connected to the router.

  Run the app. If the SUN2000L WiFi network has connected to the router, tap the WiFi name corresponding to the router for connection. After the connection succeeds, the **Inverter list** screen displays all the Huawei SUN2000Ls that have connected to the router.

Figure 7-7 Mobile phone connecting to the SUN2000L over a router
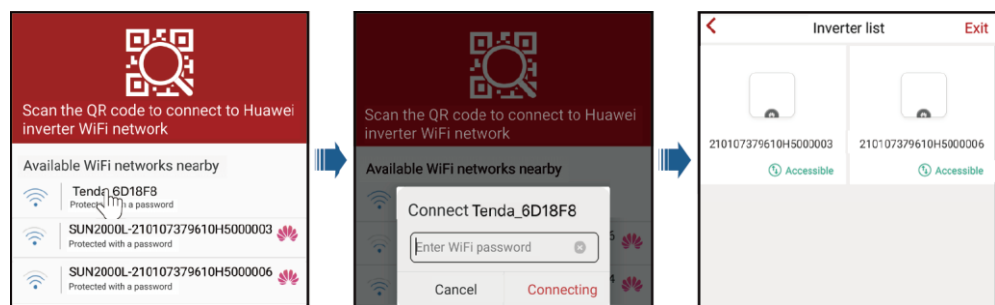
----End

Procedure on the iOS System

The app allows for connecting to the SUN2000L in the following two ways. Select either way based on site requirements. After the connection succeeds, the **Inverter list** screen is displayed.

- **Method 1:** The mobile phone connects to the SUN2000L directly.

  a. Choose **Settings** > **WLAN** on your mobile phone and tap the WiFi name corresponding to the SUN2000L.

📕 NOTE

The name of the connected SUN2000L WiFi network is represented by **SUN2000L-***its serial number (SN)*. The SN is available on the label attached to the side of the SUN2000L.

  b. Enter the SUN2000L WiFi password for connection. Use the initial password **Changeme** upon first login. To ensure account security, change the password immediately after login.

📕 NOTE

If you log in for the first time and the initial SUN2000L WiFi password is not changed, you can run the app, tap **Scan**, and scan the WiFi login QR code on the side of the SUN2000L to obtain the WiFi login password.

c. Run the app. After the connection succeeds, the **Inverter list** screen is displayed.

Figure 7-8 Mobile phone connecting to the SUN2000L directly
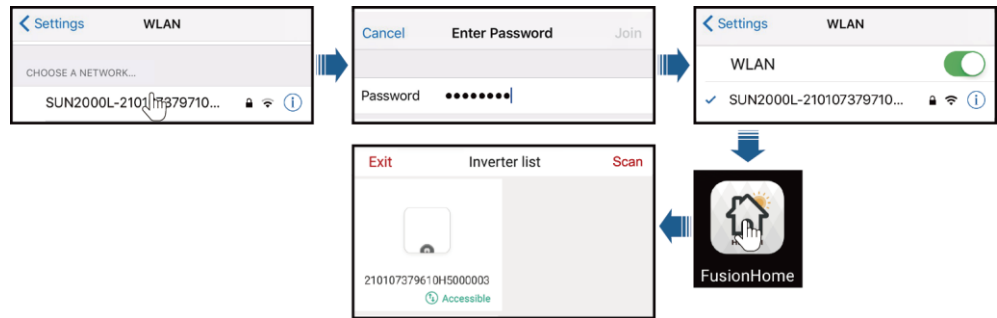
- **Method 2:** The mobile phone connects to the SUN2000L over a router. Do not use this method for the first login and ensure that the SUN2000L has connected to the router.

  a. If the SUN2000L WiFi network has connected to the router, Choose **Settings** > **WLAN** on the mobile phone and tap the WiFi name corresponding to the router.

  b. Enter the router WiFi password for connection.

  c. Run the app. The **Inverter list** screen displays all the Huawei SUN2000Ls that have connected to the router.

Figure 7-9 Mobile phone connecting to the SUN2000L over a router
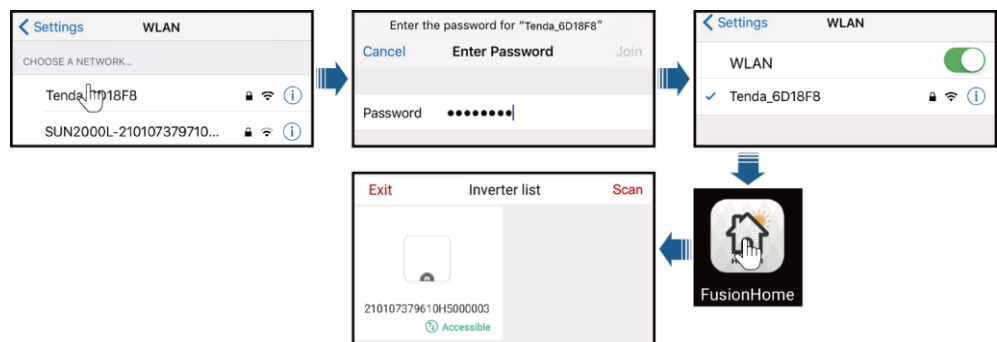
----End

⚠ **NOTICE**

The following text describes the operations on Android screens. The operations on iOS screens are the same as those on Android screens, except that the screens are somewhat different. The actual screens prevail.

7.4 App Operations by the Installer

7.4.1 Logging In to the App

Prerequisites

The corresponding SUN2000L is displayed on the **Inverter list** screen.

Procedure

Step 1 On the **Inverter list** screen, tap the corresponding SUN2000L, select **installer**, enter the password, and log in to the app.

📖 **NOTE**

- The name of the connected SUN2000L is represented by its serial number (SN), which is available on the SN label attached to the side of the SUN2000L.
- The login password is the same as that for the SUN2000L connected to the app and is used only when the SUN2000L connects to the app.
- The initial password is **00000a**. Use the initial password upon first login. To ensure account security, change the password immediately after login.
- If you enter wrong passwords for five consecutive times and the interval between two consecutive passwords is within 2 minutes, your account will be locked out for 5 minutes.

Figure 7-10 Identity authentication
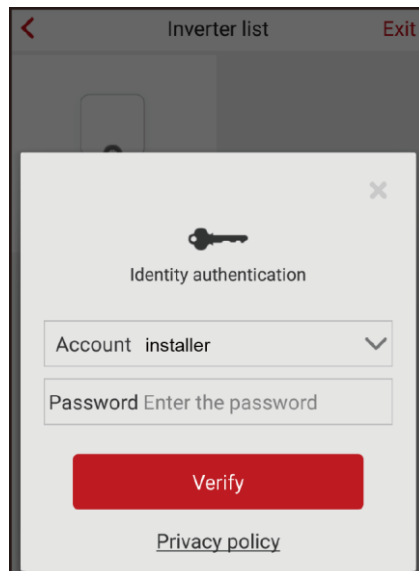
Step 2 If you log in successfully, the **Quick setting** or **Operation console** screen is displayed.

📖 **NOTE**

- The **Quick setting** screen is displayed only when the SUN2000L connects to the app for the first time or the factory defaults of the SUN2000L are restored.
- If you do not follow the deployment wizard, the **Quick setting** screen is still displayed when you log in next time.
- To exit the deployment, press the **Back** button on the mobile phone or tap **Exit** on the screen. To enter the **Quick setting** screen again, choose **Quick setting** from the **Operation console** screen.

The **Quick setting** screen provides two deployment modes. Select either of them based on site requirements.

- **Method 1:** quick setting

Figure 7-11 Quick setting

⚠ **NOTICE**

- Set the grid code that applies to the country or region where the PV plant is located and the SUN2000L model.

- If there is no need to connect to the router or management system, skip relevant steps. After the connected router is configured, the configuration takes effect after you log out of the app and then log in again.

- After the management system is successfully connected, the SUN2000L will report the SN and installer CD Key number. If the connection fails, another connection attempt will start after 10 seconds. The installer CD Key number is generated by the SUN2000L automatically and is used for the installer to register with the management system and manage the inverter.

- For the operations about how to add devices, see 7.4.3.1 Adding/Deleting Devices.

- After following all the instructions on the **Quick setting** screen, tap **Save settings** to store the configurations or tap **Return to home** to return to the **Operation console** screen.

- **Method 2:** use the saved file

Before choosing **Use saved file** for quick setting, ensure that the corresponding configuration file is saved in your mobile phone. To generate a configuration file, tap **Save settings** on the **Quick setting** screen.

Figure 7-12 Performing quick setting using a saved file

📖 **NOTE**

- To change the configuration file to be imported, tap **Change**.

- In the dialog box with **Are you sure you want to configure the inverter connected router settings again**, if you tap **Confirm**, the router configurations saved before will be cleared. If you tap **Cancel**, you only have to enter the saved router password.
- After the connected router is configured, the configuration takes effect after you log out of the app and then log in again.
- After the management system is successfully connected, the SUN2000L will report the SN and installer CD Key number. If the connection fails, another connection attempt will start after 10 seconds. The installer CD Key number is generated by the SUN2000L automatically and is used for the installer to register with the management system and manage the inverter.

Figure 7-13 Operation console
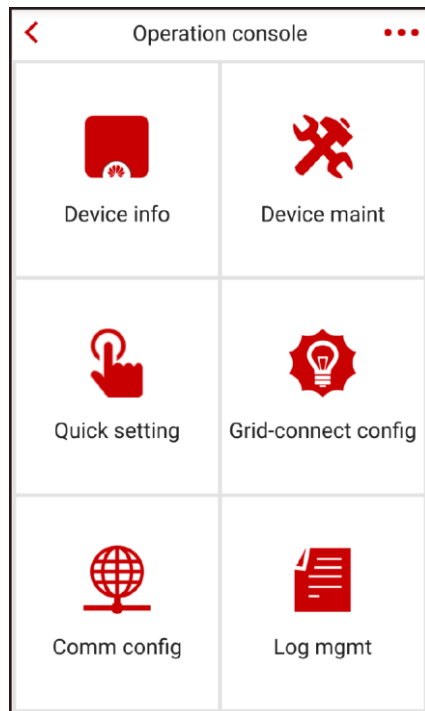
----End

7.4.2 Querying the SUN2000L Information

To query the SUN2000L information, choose **Device info** from the **Operation console** screen.

Querying Power Curves

You can query the current-day power curve and energy yield.

Figure 7-14 Power curve

Querying Energy Yields
================
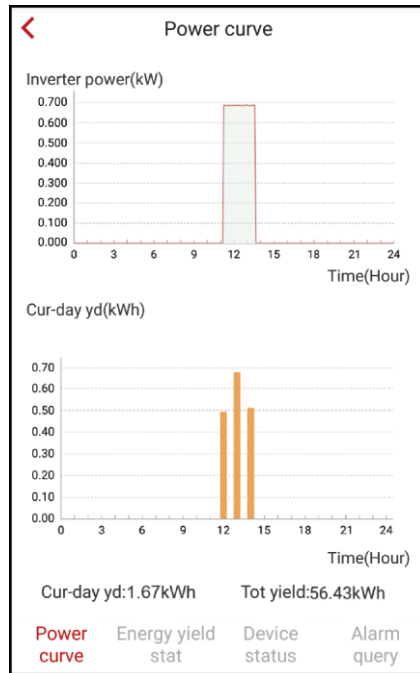
Querying Energy Yields

You can query daily, monthly, and yearly energy yields.

Figure 7-15 Energy yield stat
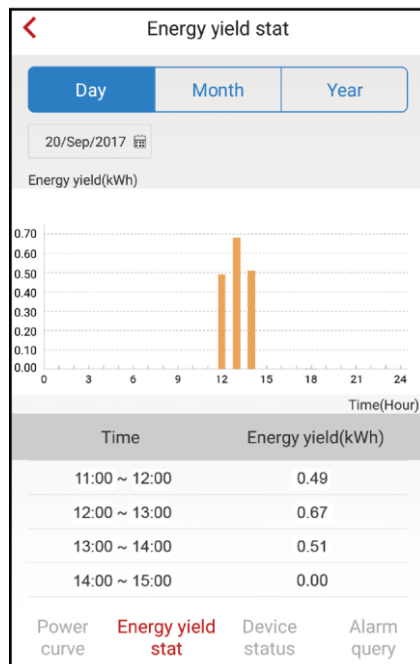
Querying Device Status

You can query the status of each device.

Figure 7-16 Device status
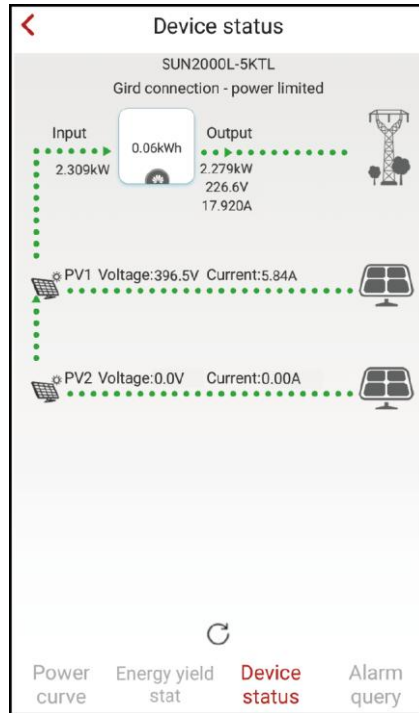
Querying Alarms

You can query active and historical alarms.

To set the sorting mode for active alarms or historical alarms, tap ⚙. To query the historical alarms within a certain time range, tap 📋 and select the time range.

Figure 7-17 Alarm query
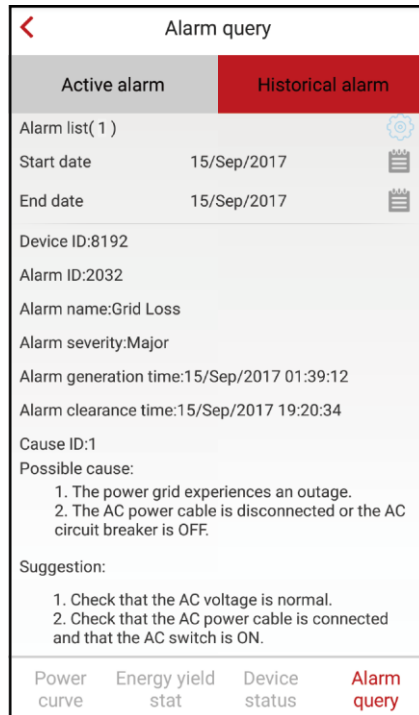
7.4.3 Maintaining the SUN2000L

To maintain the SUN2000L, choose **Device maint** from the **Operation console** screen.

Figure 7-18 Device maintenance
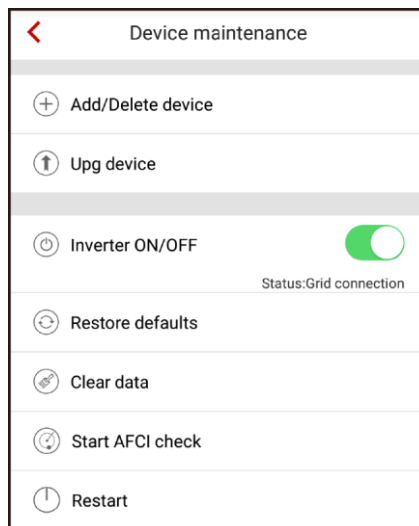
📖 **NOTE**

The SUN2000L model described in this document does not support **Start AFCI check**. This function is supported only by the model with "-US".

7.4.3.1 Adding/Deleting Devices

Procedure

Step 1 On the **Operation console** screen, choose **Device maint** > **Add/Delete device**, and add a power meter and battery according to actual conditions. Tap **Submit** to deliver the device information to the SUN2000L.

☐ NOTE

Each device must have a unique communications address.

Figure 7-19 Adding/Deleting devices
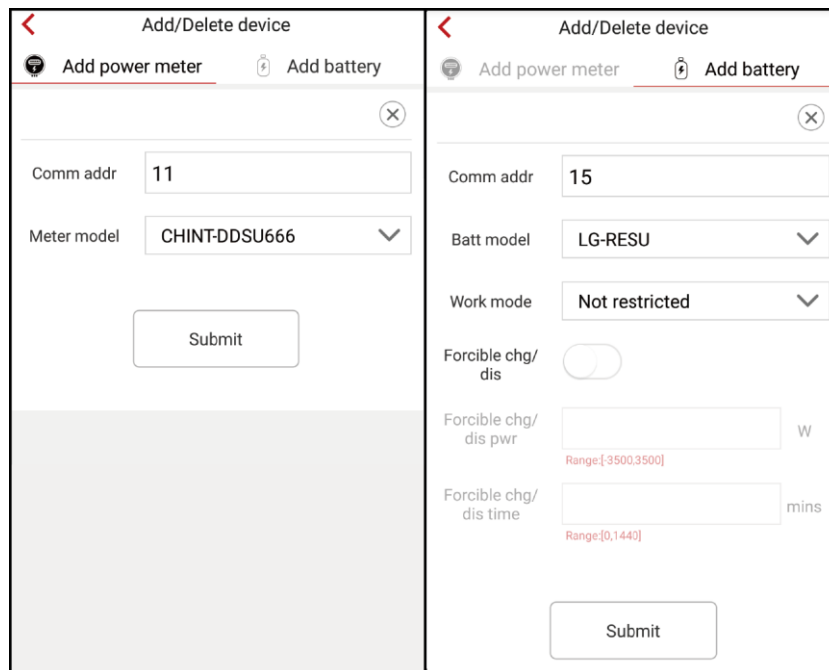
Table 7-1 Description of the parameters on the Add meter tab page

Parameter	Description	Value Range
Comm addr	Specifies the RS485 address for the connected power meter. The address should be the same as the actual address for the power meter.	[1, 247]
Meter model	Specifies the model of the connected power meter. No power meter of other models can be connected.	• CHINT-DDSU666 • WNC-3Y • EASTRON-SDM230

Table 7-2 Description of the parameters on the Add battery tab page

Parameter	Description	Value Range
Comm addr	Specifies the RS485 address for the connected battery. The address should be the same as the actual address for the battery.	[1, 247]
Batt model	Specifies the model of the connected battery. No battery of other models can be connected.	LG-RESU
Work mode	• If this parameter is set to **Not restricted**, the SUN2000L output power is not limited. The SUN2000L can export its rated power to the power grid. • If this parameter is set to **Grid connection with zero power** and a power meter accesses the SUN2000L, the SUN2000L output power is only for local loads and not exported to the power grid. • If this parameter is set to **Maximum use of self-produced power** and a power meter accesses the SUN2000L, the SUN2000L output power can be exported to the power grid after the power requirement for local loads is met.	• Not restricted • Grid connection with zero power • Maximum use of self-produced power
Forcible chg/dis	If this parameter is set to **Enable**, you can manually set the battery charge/discharge power and duration. The user's command is implemented first as long as the power grid regulations are met.	• Enable • Disable
Forcible chg/dis pwr (W)	Specifies the power of forcible charge/discharge.	[Negative maximum discharge power, maximum charge power]

Parameter	Description	Value Range
Forcible chg/dis time (mins)	Specifies the duration of forcible charge/discharge.	[0, 1440]

----End

7.4.3.2 Upgrading the Device

Prerequisites

You have obtained the upgrade file with the help of your supplier or Huawei engineers.

Context

- In the iOS system, the upgrade file can be imported to the mobile phone over your mailbox. The upgrade file name extension must be .zip. **Manually select** is unavailable.
- In the Android system, the upgrade file can be copied to the mobile phone. The upgrade file name extension must be .zip and the file can be stored in your required directory. **Manually select** is available.

Procedure

Step 1 On the **Operation console** screen, choose **Device maint** > **Upg device** and follow the instructions.

Figure 7-20 Upgrading the device
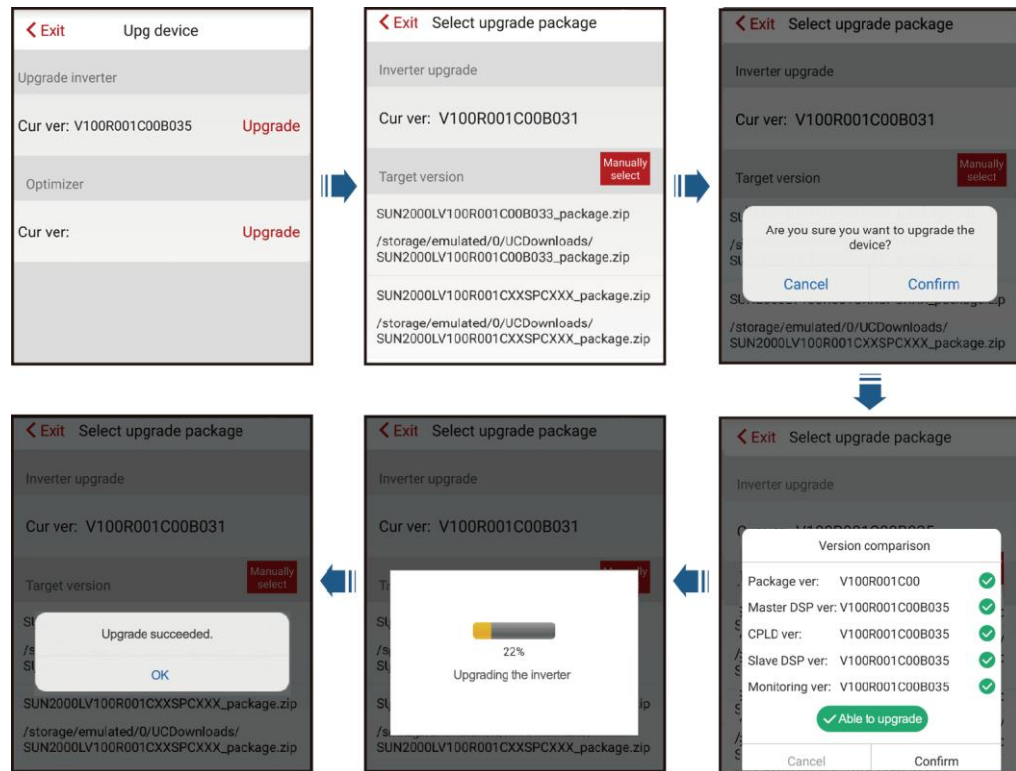
        ----End

7.4.3.3 Starting or Shutting Down the SUN2000L

Procedure

Step 1 On the **Operation console** screen, choose **Device maint** > **Inverter ON/OFF**, and perform operations as required.

Figure 7-21 Starting or shutting down the SUN2000L
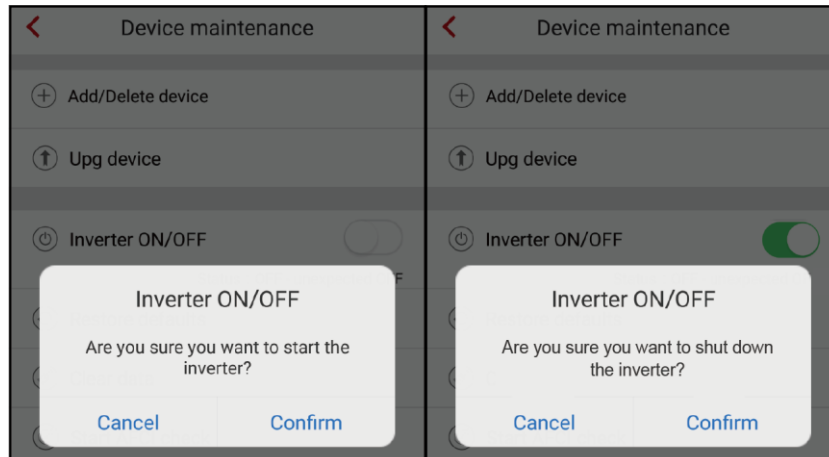
----End

7.4.3.4 Restoring Factory Defaults

Context

⚠ **NOTICE**

Perform this operation with caution because all configured parameters except the current date, time, and networking related parameters will be restored to their factory defaults. This operation will not affect operating information, alarm records, or system logs.

Procedure

Step 1 On the **Operation console** screen, choose **Device maint** > **Restore defaults**, and then tap **Confirm**.

Figure 7-22 Restoring factory defaults
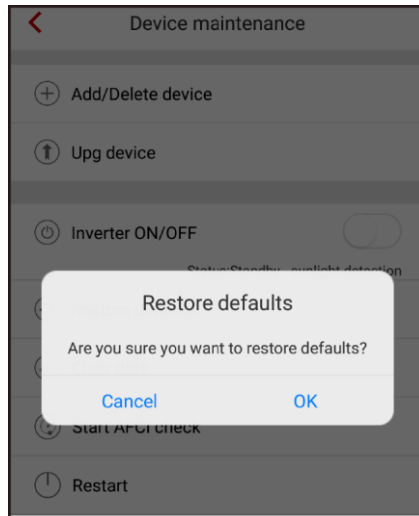
----End

7.4.3.5 Clearing Data

Context

![NOTICE]

NOTICE

If you clear data, all alarms and energy yield data will be cleared.

Procedure

Step 1 On the **Operation console** screen, choose **Device maint** > **Clear data**.

Figure 7-23 Clearing data
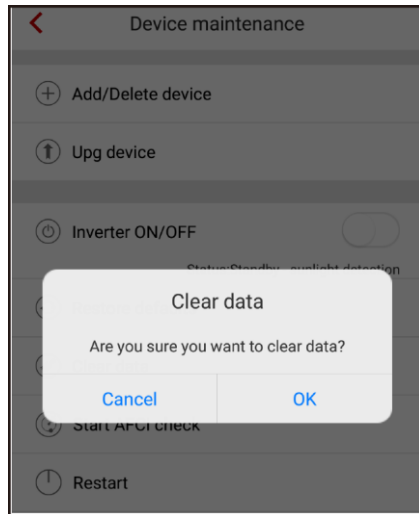
----End

7.4.3.6 Restarting the SUN2000L

Procedure

Step 1 To restart the app, choose **Device maint** > **Restart** from the **Operation console** screen.

Figure 7-24 Restart
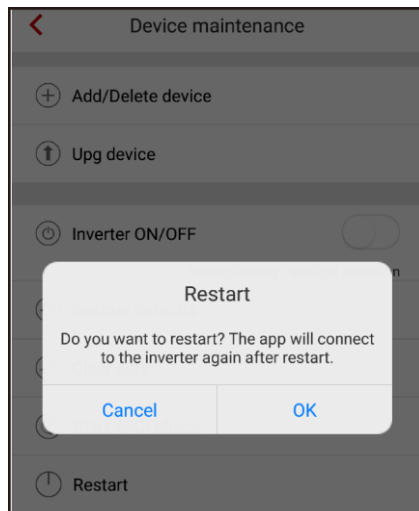
----End

7.4.4 Quick Setting

To enter the **Quick setting** screen, choose **Quick setting** from the **Operation console** screen.

The **Quick setting** screen provides two deployment modes. Select either of them based on site requirements.

To exit the deployment, press the **Back** button on the mobile phone or tap **Exit** on the screen.

Method 1: quick setting

Step 1 Choose **Quick setting** from the **Operation console** screen and perform deployment by following the instructions.
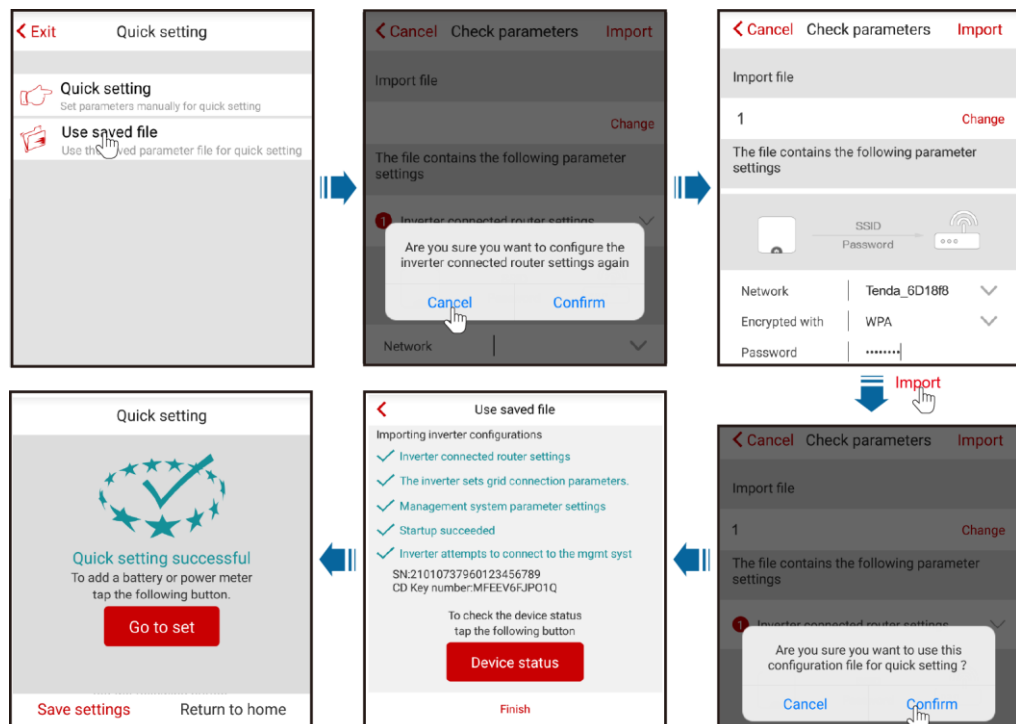
Figure 7-25 Quick setting

> ⚠ **NOTICE**
>
> - Set the grid code that applies to the country or region where the PV plant is located and the SUN2000L model.
> - If there is no need to connect to the router or management system, skip relevant steps. After the connected router is configured, the configuration takes effect after you log out of the app and then log in again.
> - After the management system is successfully connected, the SUN2000L will report the SN and installer CD Key number. If the connection fails, another connection attempt will start after 10 seconds. The installer CD Key number is generated by the SUN2000L automatically and is used for the installer to register with the management system and manage the inverter.
> - For the operations about how to add devices, see 7.4.3.1 Adding/Deleting Devices.
> - After following all the instructions on the **Quick setting** screen, tap **Save settings** to store the configurations or tap **Return to home** to return to the **Operation console** screen.

----End

Method 2: use the saved file

Before choosing **Use saved file** for quick setting, ensure that the corresponding configuration file is saved in your mobile phone. To generate a configuration file, tap **Save settings** on the **Quick setting** screen.

Step 1 Choose **Quick setting** > **Use saved file** from the **Operation console** screen and perform deployment by following the instructions.

**Figure 7-26** Performing quick setting using a saved file

NOTE

- To change the configuration file to be imported, tap **Change**.

- In the dialog box with **Are you sure you want to configure the inverter connected router settings again**, if you tap **Confirm**, the router configurations saved before will be cleared. If you tap **Cancel**, you only have to enter the saved router password.

- After the connected router is configured, the configuration takes effect after you log out of the app and then log in again.

- After the management system is successfully connected, the SUN2000L will report the SN and installer CD Key number. If the connection fails, another connection attempt will start after 10 seconds. The installer CD Key number is generated by the SUN2000L automatically and is used for the installer to register with the management system and manage the inverter.

----End

7.4.5 Setting Grid-Connection Parameters

Setting Grid-Connection Parameters

To set grid codes, choose **Grid-connect config** from the **Operation console** screen.

NOTE

Voltage level, **Grid frequency**, and **Output mode** do not have to be set because they are associated with the grid code.

Figure 7-27 Grid-connect config
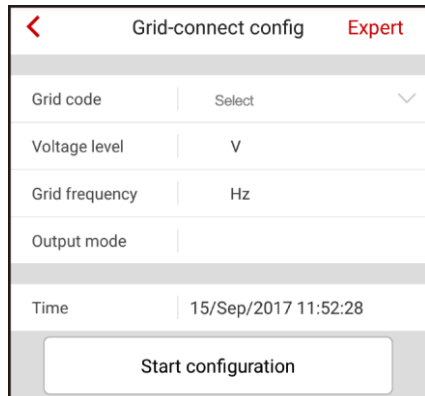
Expert Mode

To set grid parameters, protection parameters, feature parameters, power adjustment parameters, and time in expert mode, choose **Grid-connect config** > **Expert** from the **Operation console** screen.

7.4.5.1 Setting Grid Parameters

To set grid parameters, choose **Grid-connect config** > **Expert** > **Grid parameters** from the **Operation console** screen.

Figure 7-28 Grid parameters
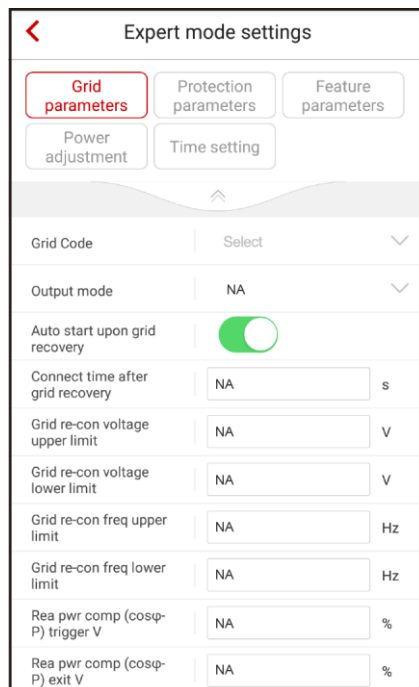
◫ **NOTE**

● Vn represents the rated voltage and Fn represents the rated frequency.

- The grid parameter values vary with grid codes. The displayed values prevail.

Table 7-3 Description of grid parameters

Parameter	Description	Value Range
Grid code	Set this parameter based on the grid code of the country or region where the SUN2000L is used and the SUN2000L application scenario. For details of the grid codes, see A Grid Codes.	The default value varies depending on the model. The displayed value prevails.
Output mode		• Single-phase • Split-phase • Dual–live wire
Auto start upongrid recovery	Specifies whether the SUN2000L can start automatically when the power grid recovers.	• Disable • Enable
Connect time after grid recovery (s)	Specifies the time after which the SUN2000L begins restarting after the power grid recovers.	[0, 900]
Grid re-con voltage upper limit (V)	For a specific grid code, if the grid voltage exceeds the upper threshold, the SUN2000L is not allowed to connect to the power grid.	[100%Vn, 136%Vn]
Grid re-con voltage lower limit (V)	For a specific grid code, if the grid voltage is below the lower threshold, the SUN2000L is not allowed to connect to the power grid.	[45%Vn, 95%Vn]
Grid re-con freq upper limit (Hz)	For a specific grid code, if the grid frequency exceeds the upper threshold, the SUN2000L is not allowed to connect to the power grid.	[100%Fn, 112%Fn]
Grid re-con freq lower limit (Hz)	For a specific grid code, if the grid frequency is below the lower threshold, the SUN2000L is not allowed to connect to the power grid.	[85%Fn, 100%Fn]
Rea pwr comp (cosφ-P) trigger V (%)	Specifies the voltage threshold for triggering reactive power compensation when low voltage ride-through (LVRT) occurs.	[100, 110]
Rea pwr comp (cosφ-P) exit	Specifies the voltage	[90, 100]

Parameter	Description	Value Range
V (%)	threshold for exiting reactive power compensation when the SUN2000L recovers from LVRT.	

7.4.5.2 Setting Protection Parameters

To set protection parameters, choose **Grid-connect config** > **Expert** > **Protection parameters** from the **Operation console** screen.

Figure 7-29 Protection parameters
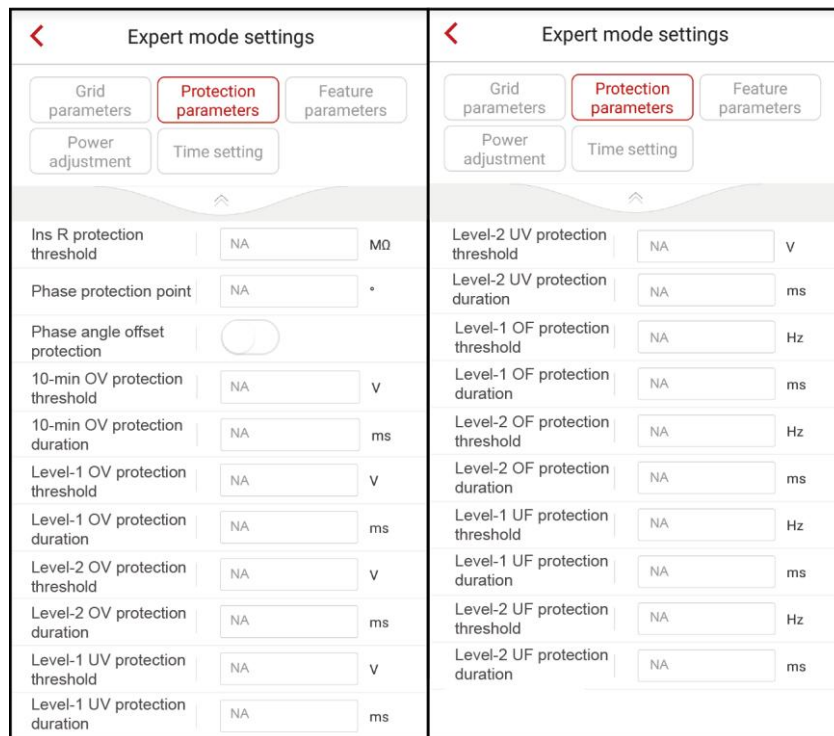
☐ NOTE

- Vn represents the rated voltage and Fn represents the rated frequency.
- The protection parameter values vary with the grid code. The displayed values prevail.

Table 7-4 Description of protection parameters

Parameter	Description	Value Range
Ins R protection threshold (MΩ)	To ensure device safety, the SUN2000L detects the insulation resistance of the input side to the ground when it starts a self-check. If the detected value is less than the preset value, the SUN2000L does not start.	[0.02, 1.5]
Phase protection point (ʿ)	The Japanese standard requires that during passive islanding detection, protection should be triggered if an abrupt voltage phase change is detected. The SUN2000L model described in this document does not support this function. This function is supported only by the model with "-JP".	[3, 15]
Phase angle offset protection	Under a specific grid code, the SUN2000L needs to be protected when the phase angle offset of the three phases of the power grid exceeds a certain value.	• Enable • Disable
10-min OV protection threshold (V)	Specifies the 10-minute overvoltage protection threshold.	[1xVn, 1.5xVn]
10-min OV protection duration (ms)	Specifies the 10-minute overvoltage protection duration.	[50, 7200000]
Level-1 OV protection threshold (V)	Specifies the level-1 overvoltage protection threshold.	[1xVn, 1.5xVn]
Level-1 OV protection duration (ms)	Specifies the level-1 overvoltage protection duration.	[50, 7200000]
Level-2 OV protection threshold (V)	Specifies the level-2 overvoltage protection threshold.	[1xVn, 1.5xVn]
Level-2 OV protection duration (ms)	Specifies the level-2 overvoltage protection duration.	[50, 7200000]

Parameter	Description	Value Range
Level-1 UV protection threshold (V)	Specifies the level-1 undervoltage protection threshold.	[0.15xVn, 1xVn]
Level-1 UV protection duration (ms)	Specifies the level-1 undervoltage protection duration.	[50, 7200000]
Level-2 UV protection threshold (V)	Specifies the level-2 undervoltage protection threshold.	[0.15xVn, 1xVn]
Level-2 UV protection duration (ms)	Specifies the level-2 undervoltage protection duration.	[50, 7200000]
Level-1 OF protection threshold (Hz)	Specifies the level-1 overfrequency protection threshold.	[1xFn, 1.15xFn]
Level-1 OF protection duration (ms)	Specifies the level-1 overfrequency protection duration.	[50, 7200000]
Level-2 OF protection threshold (Hz)	Specifies the level-2 overfrequency protection threshold.	[1xFn, 1.15xFn]
Level-2 OF protection duration (ms)	Specifies the level-2 overfrequency protection duration.	[50, 7200000]
Level-1 UF protection threshold (Hz)	Specifies the level-1 underfrequency protection threshold.	[0.85xFn, 1xFn]
Level-1 UF protection duration (ms)	Specifies the level-1 underfrequency protection duration.	[50, 7200000]
Level-2 UF protection threshold (Hz)	Specifies the level-2 underfrequency protection threshold.	[0.85xFn, 1xFn]
Level-2 UF protection duration (ms)	Specifies the level-2 underfrequency protection duration.	[50, 7200000]

7.4.5.3 Feature parameters

To set feature parameters, choose **Grid-connect config** > **Expert** > **Feature parameters** from the **Operation console** screen.

Figure 7-30 Feature parameters
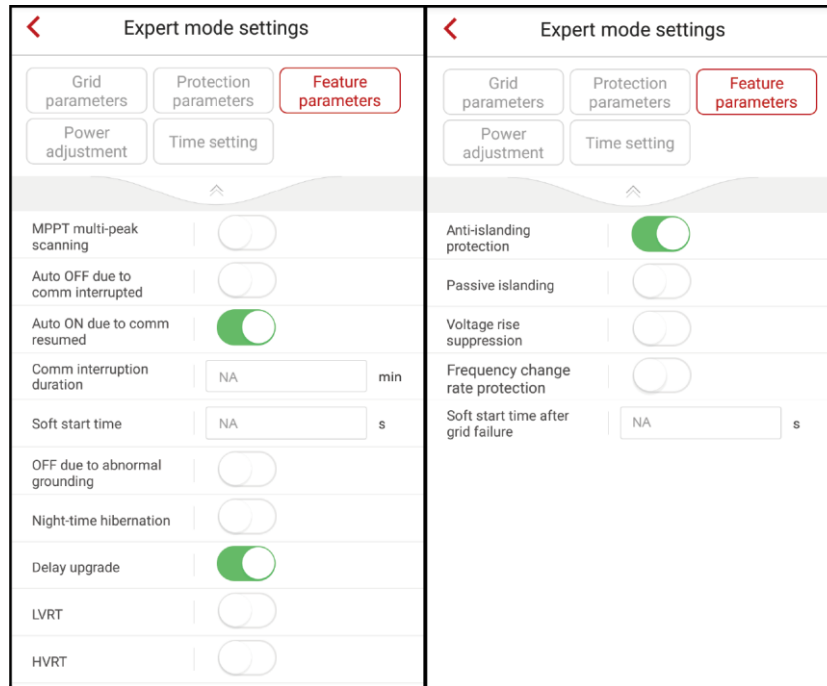
Table 7-5 Description of feature parameters

Parameter	Description	Value Range
MPPT multi-peak scanning	When the SUN2000L is used in scenarios where PV strings are obviously shaded, enable this function. Then the SUN2000L will perform MPPT scanning for all PV strings at regular intervals to locate the maximum power. The scan interval is specified by **MPPT multi-peak scan interval**.	• Disable • Enable
MPPT multi-peak scan interval (min)	Specifies the MPPT multi-peak scanning interval. This parameter is displayed only when **MPPT multi-peak scanning** is set to **Enable**.	[5, 30]

Parameter	Description	Value Range
Auto OFF due to comm interrupted	Certain power grids require that the SUN2000L must shut down after the communication is interrupted for a certain time. If **Auto OFF due to comm interrupted** is set to **Enable** and the SUN2000L communication is interrupted for a period of time specified by **Comm interruption duration**), the SUN2000L will automatically shut down.	• Disable • Enable
Auto ON due to comm resumed	If this parameter is enabled, the SUN2000L automatically starts after communication recovers. If this parameter is disabled, the SUN2000L needs to be started manually after communication recovers.	• Disable • Enable
Comm interruption duration (min)	Specifies the duration for determining communication interruption. Used for automatic shutdown for protection in case of communication interruption.	[1, 120]
Soft start time (s)	Specifies the duration for the power to gradually increase when the SUN2000L starts.	[20, 1800]

Parameter	Description	Value Range
OFF due to abnormal grounding	This function is used to detect whether the SUN2000L is properly grounded before starting the SUN2000L, or to detect whether the ground cable is disconnected when the SUN2000L is working. This parameter is set to **Enable** by default. For certain types of power grids, if an isolation transformer connects to the output side of the SUN2000L, you need to set **OFF due to abnormal grounding** to **Disable** after checking that the SUN2000L is properly grounded. Then the SUN2000L can start normally. If you are not sure whether the SUN2000L connects to such a power grid, confirm it with your dealer or Huawei technical support.	• Disable • Enable
Night-time hibernation	The SUN2000L monitors PV strings at night. If **Night-time hibernation** is set to **Enable**, the monitoring function of the SUN2000L will hibernate at night, reducing power consumption.	• Disable • Enable
Delay upgrade	This parameter is mainly used in the upgrade scenarios where the PV power supply is disconnected at night due to no sunlight or unstable at dawn or dusk due to poor sunlight.	• Disable • Enable
LVRT	When the grid voltage is abnormally low for a short time, the SUN2000L cannot disconnect from the power grid immediately and has to work for some time. This is called low voltage ride-through (LVRT).	• Disable • Enable

Parameter	Description	Value Range
Threshold for triggering LVRT (V)	Specifies the threshold for triggering LVRT.	[50%Vn, 92%Vn]
LVRT undervoltage protection shield	Specifies whether to shield the undervoltage protection function during LVRT.	• Disable • Enable
LVRT reactive power comp factor	During LVRT, the SUN2000L needs to generate reactive power to support the power grid. This parameter specifies the reactive power generated by the SUN2000L.	[0, 3]
HVRT	When the grid voltage is abnormally high for a short time, the SUN2000L cannot disconnect from the power grid immediately and has to work for some time. This is called high voltage ride-through (HVRT).	• Disable • Enable
Anti-islanding protection	Specifies whether to enable the active islanding protection function.	• Disable • Enable
Passive islanding	Specifies whether to enable the passive islanding protection function. The SUN2000L model described in this document does not support this function. This function is supported only by the model with "-JP".	• Disable • Enable
Voltage rise suppression	For a specific grid code requires that the active power of the SUN2000L be derated according to a certain slope when the output voltage exceeds a certain value.	• Disable • Enable

Parameter	Description	Value Range
V rise suppress reactive adjust point (%)	For a specific grid code requires that the SUN2000L generate a certain amount of reactive power when the output voltage exceeds a certain value. This parameter is displayed when **Voltage rise suppression** is set to **Enable**.	[100, 115]
V rise suppress active derating point (%)	For a specific grid code requires that the active power of the SUN2000L be derated according to a certain slope when the output voltage exceeds a certain value. This parameter is displayed when **Voltage rise suppression** is set to **Enable**. **V rise suppress active derating pt** must be greater than **V rise suppress reactive adjust pt**.	[100, 115]
Frequency change rate protection	Specifies whether to protect the SUN2000L when the grid frequency changes too fast.	• Enable • Disable
Freq chg rate protection threshold (Hz/s)	For a specific grid code, the SUN2000L is protected when the grid frequency change rate exceeds the value. This parameter is displayed if **Frequency change rate protection** is set to **Enable**.	[0.1, 5]
Freq chg rate protection duration (s)	The SUN2000L is protected when the grid frequency change duration exceeds the value. This parameter is displayed if **Frequency change rate protection** is set to **Enable**.	[0.2, 20]

Parameter	Description	Value Range
Soft start time after grid failure (s)	Specifies the time for the power to gradually increase when the SUN2000L restarts after the power grid recovers.	[20, 800]

7.4.5.4 Adjusting Power

To set power adjustment parameters, choose **Grid-connect config** > **Expert** > **Power adjustment** from the **Operation console** screen.

Figure 7-31 Power adjustment
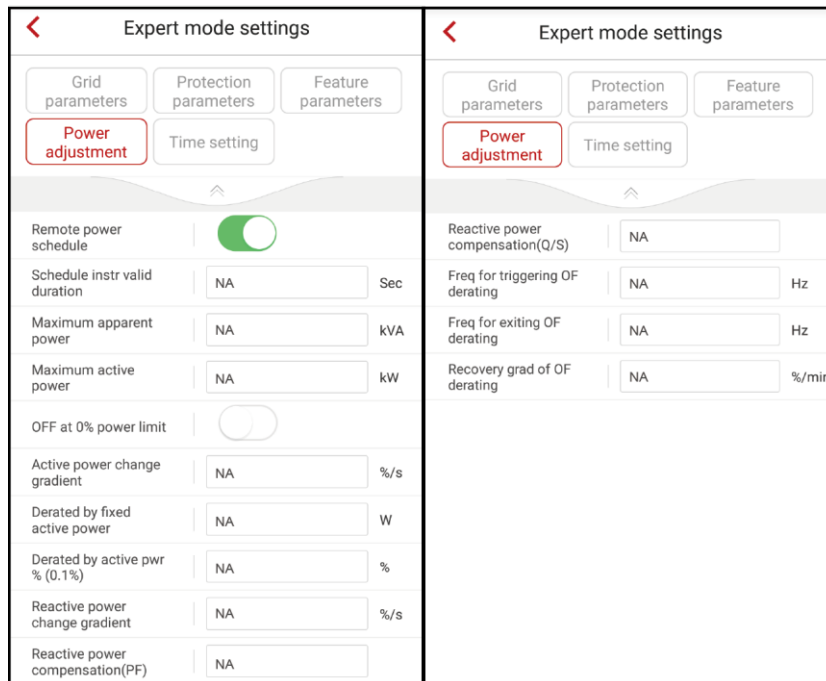
📖 NOTE

The power adjustment parameter values vary with grid codes. The displayed values prevail.

Table 7-6 Description of power adjustment parameters

Parameter	Description	Value Range
Remote power schedule	If **Remote power schedule** is disabled, the SUN2000L will not follow the remote power scheduling instruction.	• Disable • Enable

Parameter	Description	Value Range
Schedule instr valid duration (Sec)	Adjusts the duration within which the scheduling instruction is valid. If this parameter is set to **0**, the instruction is valid permanently.	[0, 86400]
Maximum apparent power (kVA)	Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements for standard transformers and customized transformers. If the maximum active power equals Smax_limit, this parameter is not displayed.	[Maximum active power, Smax_limit]
Maximum active power (kW)	Specifies the output upper threshold for the maximum active power to adapt to different market requirements.	[0.1, Pmax_limit]
OFF at 0% power limit	If this parameter is set to **Enable**, the SUN2000L shuts down after receiving the 0% power limit instruction. If this parameter is set to **Disable**, the SUN2000L does not shut down after receiving the 0% power limit instruction.	• Disable • Enable
Active power change gradient (%/s)	Adjusts the change speed of the SUN2000L active power.	[0.1, 1000]
Derated by fixed active power (W)	Adjusts the active power output of the SUN2000L based on fixed values. Pmax refers to the maximum active power.	[0, Pmax_limit]
Derated by active pwr % (0.1%)	Adjusts the active power output of the SUN2000L to a percentage. If this parameter is set to **100**, the SUN2000L delivers its maximum output power.	[0, 100]

Parameter	Description	Value Range
Reactive power change gradient (%/s)	Adjusts the change speed of the SUN2000L reactive power.	[0.1, 1000]
Reactive power compensation (PF)	Adjusts the SUN2000L output power factor.	(–1, –0.8]U[0.8, 1]
Reactive power compensation (Q/S)	Adjusts the SUN2000L output reactive power.	[–0.6, 0.6]
Freq for triggering OF derating (Hz)	For a specific grid code, the SUN2000L output active power needs to be derated when the grid frequency exceeds a specific value.	- When the output frequency is 50 Hz, the value range is 45.00–55.00 Hz. - When the output frequency is 60 Hz, the value range is 55.00–65.00 Hz.
Freq for exiting OF derating (Hz)	Specifies the frequency threshold for exiting overfrequency derating.	- When the output frequency is 50 Hz, the value range is 45.00–55.00 Hz. - When the output frequency is 60 Hz, the value range is 55.00–65.00 Hz.
Recovery grad of OF derating (%/min)	Specifies the power recovery gradient for overfrequency derating.	[5, 20]

7.4.5.5 Setting Time

To set time, choose **Grid-connect config** > **Expert** > **Time setting** from the **Operation console** screen.

Figure 7-32 Time setting
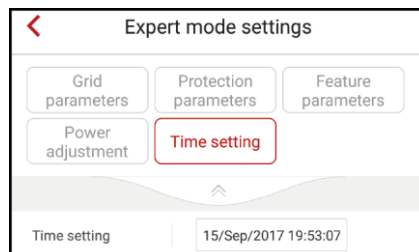
7.4.6 Comm config

To access the **Comm config** screen, choose **Comm config** from the **Operation console** screen.

Figure 7-33 Comm config
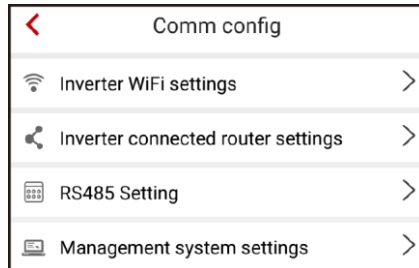
Setting Inverter WiFi Parameters

To set the inverter WiFi parameters, choose **Comm config** > **Inverter WiFi settings** from the **Operation console** screen, and then select the appropriate SUN2000L.

Figure 7-34 Inverter WiFi settings
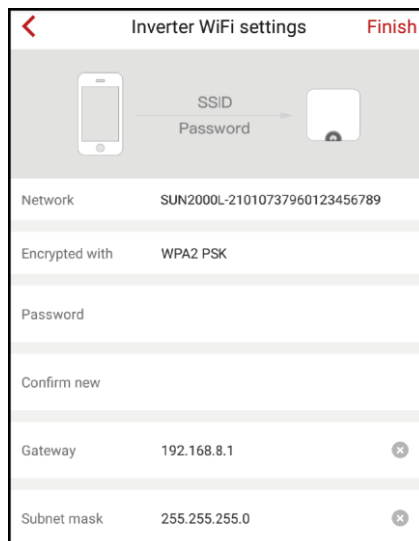
Table 7-7 Description of the parameters on the Inverter WiFi settings screen

Parameter	Description	Value Range
Network	Specifies the service set identifier (SSID) of the inverter WiFi network that functions as an access point (AP).	N/A

Parameter	Description	Value Range
Encrypted with	Specifies the encryption level of the physical layer of the inverter WiFi network.	N/A
Password Confirm new	Specifies the password for the inverter WiFi network. The initial password is **Changeme**. To ensure the account security, change the password as soon as possible.	• The password length must be 8 to 64 characters. • The password cannot contain special characters.
Gateway	Specifies the IP address for the inverter WiFi network that functions as an AP. The default value is recommended.	[1.0.0.0, 223.255.255.255]
Subnet mask	The default value (**255.255.255.0**) is recommended.	[0.0.0.0, 255.255.255.255]

Setting the Router Connected to the SUN2000L

To set the parameters for the router connected to the SUN2000L, choose **Comm config** > **Inverter connected router settings** from the **Operation console** screen.

Figure 7-35 Inverter connected router settings
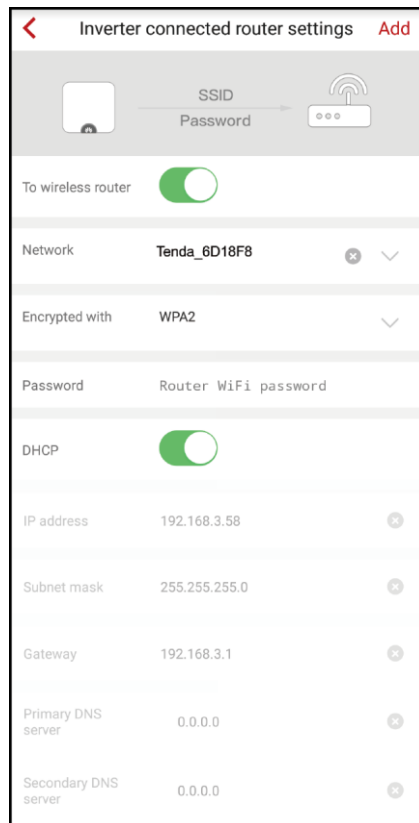
☐ NOTE

Before the **Inverter WiFi settings screen** is displayed, the app sends a command to start scanning. Then the SUN2000L starts to scan nearby WiFi networks and sends the list of WiFi networks to the app.

Table 7-8 Description of the parameters on the Inverter connected router settings screen

Parameter	Description	Value Range
To wireless router	Controls whether to connect the SUN2000L to a router.	• Disable • Enable
Network	Specifies the SSID of the router to which the inverter WiFi network connects.	N/A
Encrypted with	Specifies the encryption level of the router to which the inverter WiFi network connects. It is related to the network name.	• Not encrypted • WEP_OPEN • WEP_SHARED • WPA • WPA2
Password	Specifies the WiFi password for the router.	N/A

Parameter	Description	Value Range
DHCP	• If the IP address automatically assigned by the home router is used, enable this parameter. Then the following parameters will be automatically assigned. • If the IP address automatically assigned by the home router is not used, disable this parameter. Then the following parameters need to be manually assigned.	• Disable • Enable
IP address	Specifies the IP address for the router to which the inverter WiFi network connects. Recommended: Set the IP address in the same network segment as the home router IP address.	[1.0.0.0, 223.255.255.255]
Subnet mask	Specifies the router subnet mask.	N/A
Gateway	Specifies the router gateway address.	N/A
Primary DNS server	Specifies the address for the primary domain name service (DNS) server.	N/A
Secondary DNS server	Specifies the address for the secondary DNS server.	N/A

Setting RS485 Communications Parameters

To set RS485 communications parameters, choose **Comm config** > **RS485 setting** from the **Operation console** screen.

☐ NOTE

- If a power meter or battery is connected, the SUN2000L baud rate should be the same as the baud rate of the power meter or battery. Otherwise, the power meter or battery cannot communicate with the SUN2000L.

- The communications address is used only when the SUN2000L connects to the upper-level management unit over RS485.

Figure 7-36 RS485 setting

Table 7-9 Description of the parameters on the RS485 setting screen

Parameter	Description	Value Range
Protocol type	- The SUN2000L can connect to the upper-level management unit over MODBUS RTU, Sunspec, or AVM. - If the SUN2000L connects to a power collector or battery, set this parameter only to **MODBUS RTU**. - If the SUN2000L does not communicate over RS485, set this parameter to **Invalid protocol type**.	- Invalid protocol type - MODBUS RTU - Sunspec - AVM
Baud rate (bps)	Specifies the RS485 communication rate, which should be the same as the communication baud rates of the power collector and battery.	4800 9600 19200
Parity mode	Specifies the parity mode of RS485 communications, which should be the same as the communication parity modes of the power collector and battery.	- No parity - Odd parity - Even parity

Parameter	Description	Value Range
Comm addr	Specifies the communications address used by the SUN2000L to connect to the upper-level management unit. Keep the address different from the communications address for any other device on the same bus.	[1, 247]

Configuring the Management System

1. To set the management system parameters and connect to the management system, choose **Comm config** > **Management system settings** from the **Operation console** screen.

Figure 7-37 Connecting to the management system
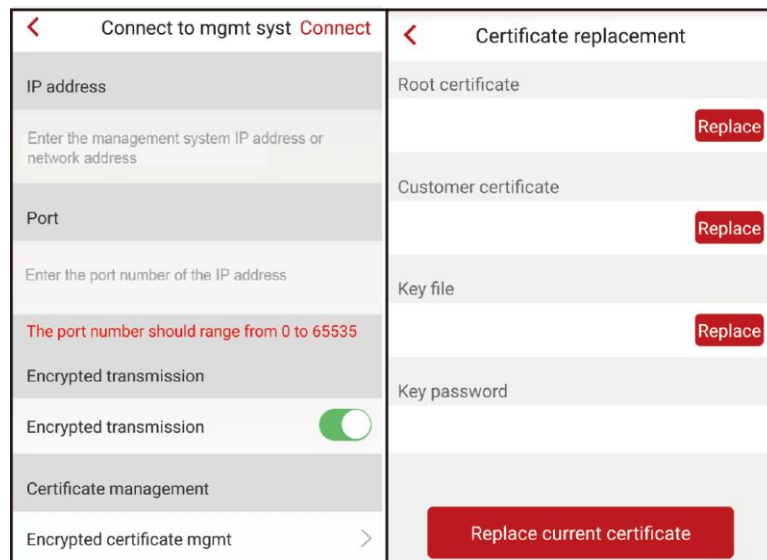
Table 7-10 Description of the parameters on the Connecting to the management system screen

Parameter	Description	Value Range
IP address	Specifies the IP address or network address used for connecting to the management system.	N/A

Parameter	Description	Value Range
Port	Specifies the number of the port on the management system to which the SUN2000L connects over a network protocol. Set this parameter according to the requirements of the accessed management system.	[0, 65535]
Encrypted transmission	If this parameter is enabled, data is transmitted between the SUN2000L and the management system after encrypted with SSL. If this parameter is disabled, data is transmitted between the SUN2000L and the management system as plaintext, which poses security risks.	• Disable • Enable
Certificate replacement	Replaces the certificate used by the SUN2000L. You can select the appropriate root certificate, customer certificate, or key file and enter the private key password. After the replacement is complete, connect the SUN2000L to the management system and check the correctness of the certificate.	N/A

2. Tap **Connect** in the upper right corner. After the management system is successfully connected, the SUN2000L will report the SN and installer CD Key number. If the connection fails, another connection attempt will start after 10 seconds.

📖 NOTE

The installer CD Key number is generated by the SUN2000L automatically and is used for the installer to register with the management system and manage the inverter.

Figure 7-38 Connection succeeded
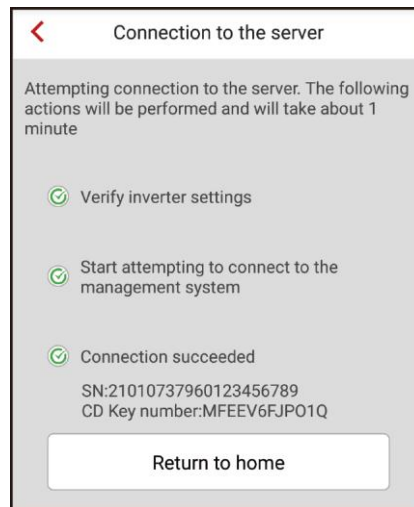
7.4.7 Managing Logs

Context

The way of downloading all logs is the same as the way of downloading fault logs. This section describes how to download all logs.

Procedure

Step 1 On the **Operation console** screen, choose **Log mgmt** to access the **Download logs** screen, and then download logs by following the instructions.

Figure 7-39 Downloading logs
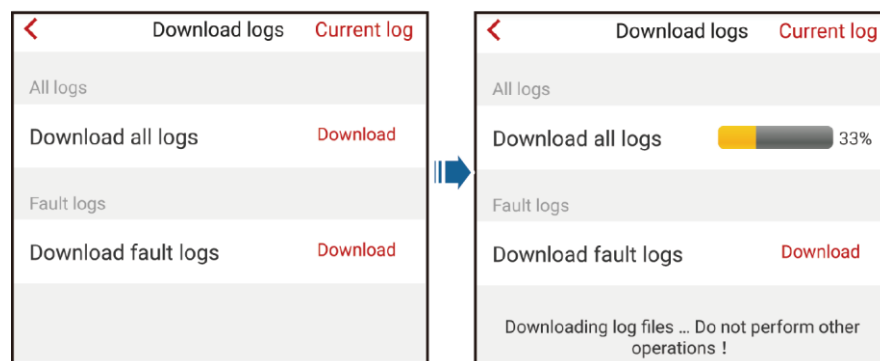
Step 2 After logs are downloaded, choose **Current log** to access the log list, where you can view the downloaded logs. To email or delete logs, tap **Select** in the upper right corner and select the logs that need to be emailed or sent.

Figure 7-40 Current log
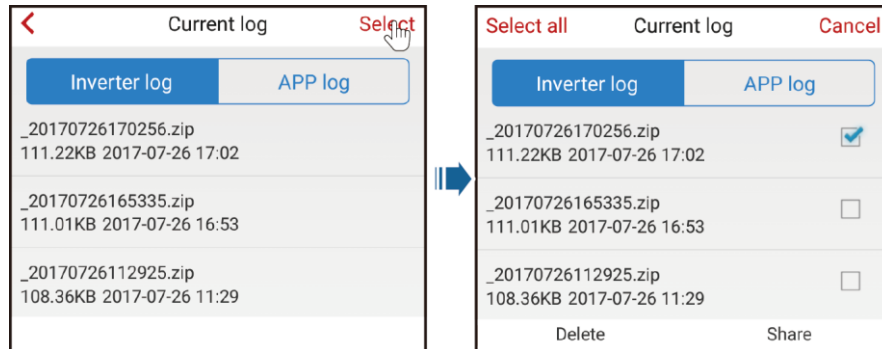
----End

7.4.8 Menu

7.4.8.1 Changing the Password

To change the login password for the installer, choose ●●● > **Change password** in the upper right corner on the **Operation console** screen.

📖 **NOTE**

The password should meet the following requirements:

- Contains 6–20 characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.
- Differs from the old password in at least two characters.

Figure 7-41 Change password

7.4.8.2 About

To view the version information, choose ●●● > **About** from the **Operation console** screen.

Figure 7-42 About

7.5 App Operations by the User

7.5.1 Logging In to the App

Prerequisites

- You have logged in as **installer** and followed the instructions on the **Quick setting** screen.
- The corresponding SUN2000L is displayed on the **Inverter list** screen.

Procedure

Step 1 On the **Inverter list** screen, tap the corresponding SUN2000L, select **user**, enter the password, and log in to the app.

📖 **NOTE**

- The name of the connected SUN2000L is represented by its serial number (SN), which is available on the SN label attached to the side of the SUN2000L.

- The login password is the same as that for the SUN2000L connected to the app and is used only when the SUN2000L connects to the app.

- The initial password is **00000a**. Use the initial password upon first login. To ensure account security, change the password immediately after login.

- If you enter wrong passwords for five consecutive times and the interval between two consecutive passwords is within 2 minutes, your account will be locked out for 5 minutes.

Figure 7-43 Identity verification
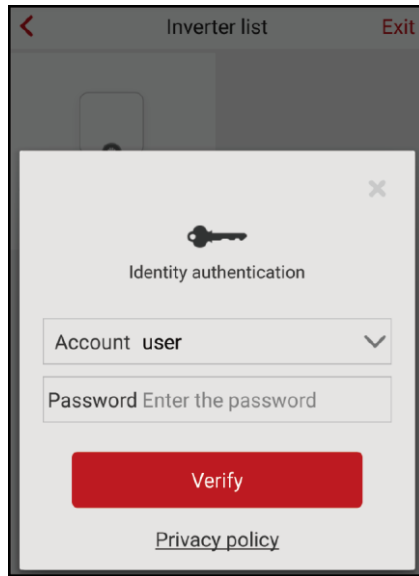
Step 2 If you log in successfully, the home screen is displayed.

Figure 7-44 Home screen
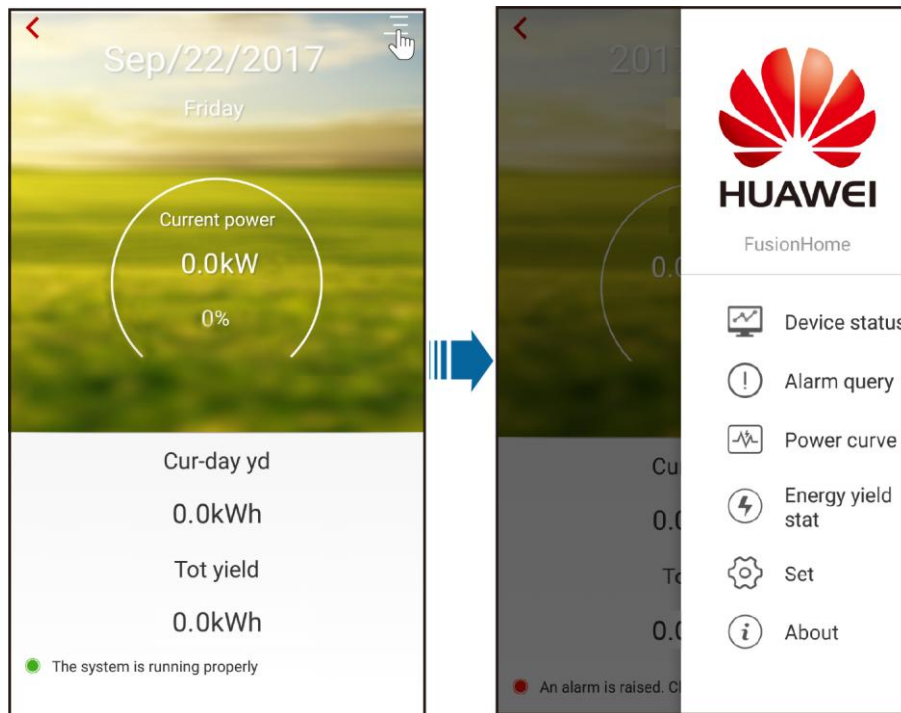
----End

7.5.2 Querying the Device Status

To query the status of each device, choose ![menu icon] > **Device status** from the main screen.

Figure 7-45 Querying the device status
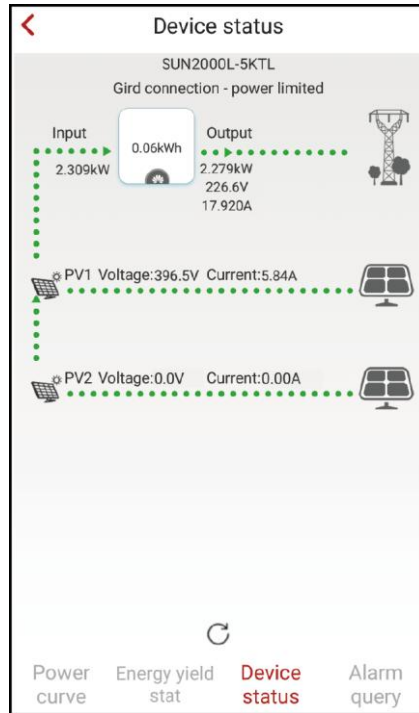
7.5.3 Querying Alarms

To query active and historical alarms, choose ![menu icon] > **Alarm query** from the main screen.

To set the sorting mode for active alarms or historical alarms, tap ![gear icon]. To query the historical alarms within a certain time range, tap ![list icon] and select the time range.

Figure 7-46 Querying alarms
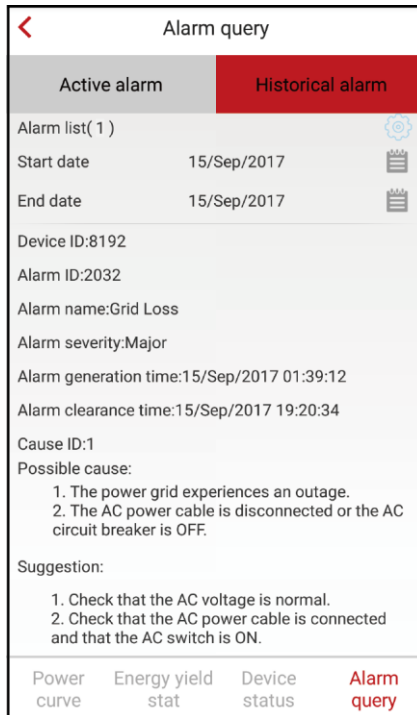
7.5.4 Querying Power Curves

To query the current-day power curve and energy yield, choose > **Power curve** from the main screen.

Figure 7-47 Power curve
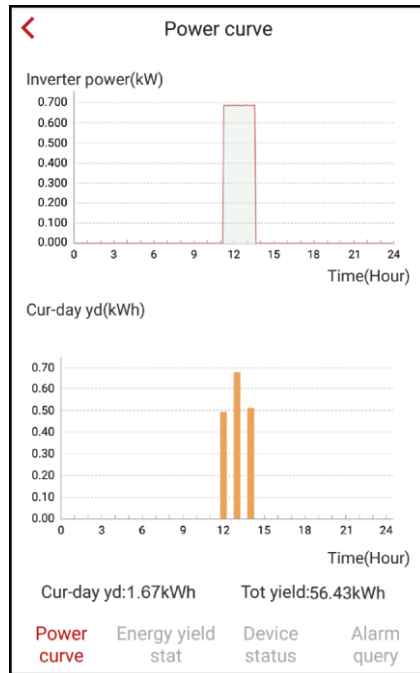
7.5.5 Querying Energy Yields

On the main screen, choose ⬛ > **Energy yield stat** to query the daily, monthly, and yearly energy yields.

Figure 7-48 Querying energy yields
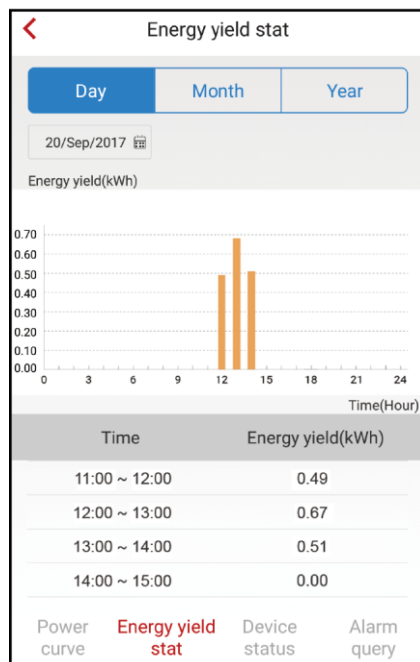
7.5.6 Settings

On the main screen, choose ▤ > **Set** and perform the following operations as required.

Figure 7-49 Settings
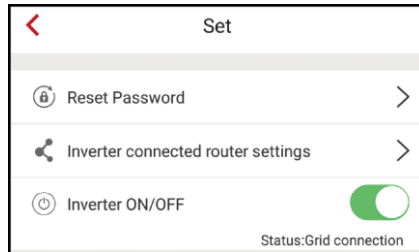
- Reset the password for **user** to log in to the SUN2000L.

📖 **NOTE**

The password should meet the following requirements:

- Contains 6–20 characters.
- Contains at least two of the three types: lowercase letters, uppercase letters, and digits.
- Differs from the old password in at least two characters.

Figure 7-50 Change password

- Select the router to be connected and set parameters as required.

Figure 7-51 Inverter connected router settings
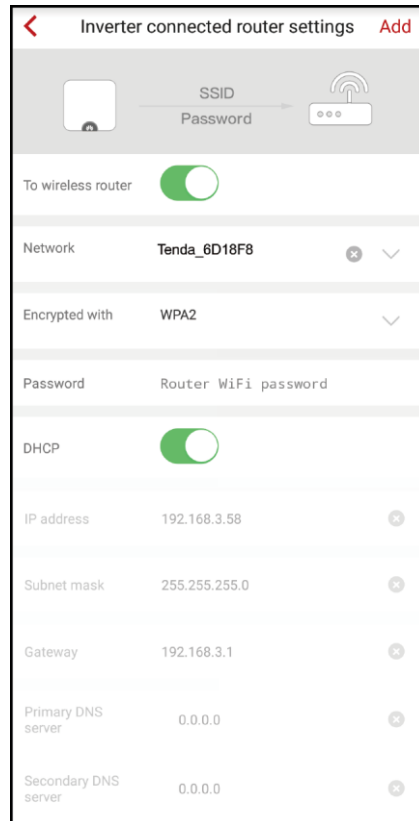
NOTE

Before the **Inverter WiFi settings screen** is displayed, the app sends a command to start scanning. Then the SUN2000L starts to scan nearby WiFi networks and sends the list of WiFi networks to the app.

Table 7-11 Description of the parameters on the Inverter connected router settings screen

Parameter	Description	Value Range
To wireless router	Controls whether to connect the SUN2000L to a router.	• Disable • Enable
Network	Specifies the SSID of the router to which the inverter WiFi network connects.	N/A
Encrypted with	Specifies the encryption level of the router to which the inverter WiFi network connects. It is related to the network name.	• Not encrypted • WEP_OPEN • WEP_SHARED • WPA • WPA2
Password	Specifies the WiFi password for the router.	N/A

Parameter	Description	Value Range
DHCP	• If the IP address automatically assigned by the home router is used, enable this parameter. Then the following parameters will be automatically assigned. • If the IP address automatically assigned by the home router is not used, disable this parameter. Then the following parameters need to be manually assigned.	• Disable • Enable
IP address	Specifies the IP address for the router to which the inverter WiFi network connects. Recommended: Set the IP address in the same network segment as the home router IP address.	[1.0.0.0, 223.255.255.255]
Subnet mask	Specifies the router subnet mask.	N/A
Gateway	Specifies the router gateway address.	N/A
Primary DNS server	Specifies the address for the primary domain name service (DNS) server.	N/A
Secondary DNS server	Specifies the address for the secondary DNS server.	N/A

● Start or shut down the SUN2000L.

Figure 7-52 Starting or shutting down the SUN2000L
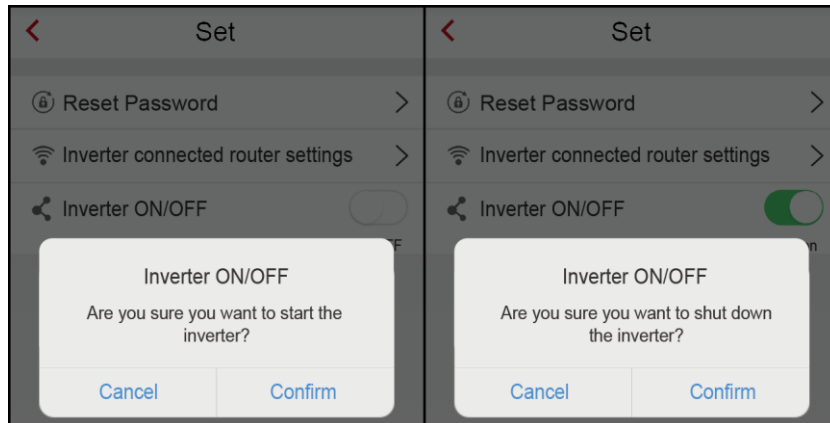
7.5.7 About

To view the version information, choose ▤ > **About** from the main screen.

Figure 7-53 About

7.6 Troubleshooting

Table 7-12 Common faults and troubleshooting measures

Symptom	Possible Cause	Measures
The app fails to be installed on an Android mobile phone.	• The version of the mobile phone operating system is earlier than the required version. • **Allow Installation of apps from unknown source** is not selected.	• Upgrade the version of the mobile phone operating system. • Choose **Settings** > **Security** and select **Allow Installation of apps from unknown sources**.
The communication fails.	The mobile phone or router is more than 5 meters away from the SUN2000L, so the WiFi connection is disconnected.	Keep the mobile phone or router within 5 meters of the SUN2000L and reconnect the WiFi connection.
The **Failed to connect to the inverter. Reconnecting ...** message is displayed.	The mobile phone or router is more than 5 meters away from the SUN2000L, or the WiFi signal is weak.	Ensure that the WiFi network is connected. Log out of the app and then log in again.
Data fails to be obtained during operations.	Connection to the SUN2000L is disconnected.	Reconnect to the SUN2000L.
The SUN2000L list fails to be obtained.	An error occurs in the WiFi connection to the app.	If the list still cannot be obtained after several attempts, log out. Then log in and try again.
No upgrade package is available for an upgrade.	No upgrade package is saved in the mobile phone.	Save the upgrade package in the mobile phone.

8 System Maintenance

8.1 Routine Maintenance

To ensure that the SUN2000L 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 maintaining the grounding reliability, power off the system (see 6.3 Powering Off the System for details).

Table 8-1 Maintenance list

Check Item	Acceptance Criteria	Maintenance Interval
System cleanliness	The heat sinks are free from obstacles or dust.	Once every 6 to 12 months
System running status	• The SUN2000L is not damaged or deformed. • The SUN2000L operates with no abnormal sound. • All SUN2000L parameters are correctly set. Perform this check when the SUN2000L is running.	Once every 6 months
Electrical connections	• Cables are securely connected. • Cables are intact, and in particular, the parts touching the metallic surface are not scratched. • Unused DC input terminals, battery terminals, COM ports, ALARM ports, and ANT ports are locked by watertight caps.	The first maintenance is half a year after the initial commissioning. From then on, perform the maintenance once every 6 to 12 months.

Check Item	Acceptance Criteria	Maintenance Interval
Grounding reliability	Ground cables are securely connected.	The first maintenance is half a year after the initial commissioning. From then on, perform the maintenance once every 6 to 12 months.

8.2 Troubleshooting

Alarm severities are defined as follows:

- Major: The SUN2000L enters Shutdown mode and disconnects from the power grid to stop generating power after a fault occurs.
- Minor: Some components are faulty but the SUN2000L can still connect to the power grid and generate power.
- Warning: The SUN2000L output power decreases due to external factors.

Table 8-2 Common alarms and troubleshooting measures

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2001	High String Input Voltage	Major	The PV array is incorrectly configured. Excessive PV modules are connected in series to the PV string, and therefore the open-circuit voltage exceeds the maximum inverter input voltage.	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 input voltage. After the PV array is correctly configured, the inverter alarm disappears. The following is the mapping between PV strings and alarm cause IDs: • Cause ID 1: string 1 • Cause ID 2: string 2

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2011	String Reversed	Major	The PV string is reversely connected.	Check whether the PV string is reversely connected to the SUN2000L. If yes, wait until the solar irradiance declines at night and the PV string current reduces to below 0.5 A. Then, turn off the DC switch and correct the PV string polarity. The following is the mapping between PV strings and alarm cause IDs: • Cause ID 1: string 1 • Cause ID 2: string 2
2032	Grid Failure	Major	Cause ID = 1 • The power grid experiences an outage. • The AC circuit is disconnected or AC switch is off.	1. Check the AC voltage. 2. Check that the AC power cable is connected and that the AC switch is ON.
2033	Grid Undervoltage	Major	Cause ID = 1 The grid voltage is below the lower threshold or the low voltage duration has lasted for more than the value specified by LVRT.	1. If the alarm occurs accidentally, the power grid may be abnormal temporarily. The SUN2000L automatically recovers after detecting that the power grid becomes normal. 2. If the alarm occurs frequently, check whether the grid voltage is within the acceptable range. If no, contact the local power operator. If yes, modify the power grid overvoltage and undervoltage protection thresholds with the consent of the local power operator. 3. If the fault persists for a long time, check the connection between the AC switch and the output power cable.

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2034	Grid Overvoltage	Major	Cause ID = 1 The grid voltage exceeds the higher threshold or the high voltage duration has lasted for more than the value specified by HVRT.	1. Check whether the grid connection voltage exceeds the upper threshold. If yes, contact the local power operator. 2. If you have confirmed that the grid connection voltage exceeds the upper threshold and obtained the consent of the local power operator, modify the overvoltage and undervoltage protection thresholds. 3. Check whether the peak grid voltage exceeds the upper threshold.
2035	Unbalanced Grid Voltage	Major	The difference between grid phase voltages exceeds the upper threshold.	1. Check that the grid voltage is within the normal range. 2. Check the connection of the AC output power cable. 3. If the cable connection is proper but the alarm occurs frequently and affects the power production of the PV plant, contact the local power operator.
2036	Grid Overfrequency	Major	Cause ID = 1 Power grid exception: The actual grid frequency is higher than the local power grid standard.	1. If the alarm occurs accidentally, the power grid may be abnormal temporarily. The SUN2000L automatically recovers after detecting that the power grid becomes normal. 2. If the alarm occurs frequently, check whether the grid frequency is within the acceptable range. If no, contact the local power operator. If yes, modify the grid overfrequency protection threshold with the consent of the local power operator.

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2037	Grid Underfrequency	Major	Cause ID = 1 Power grid exception: The actual grid frequency is lower than the local power grid standard.	1. If the alarm occurs accidentally, the power grid may be abnormal temporarily. The SUN2000L automatically recovers after detecting that the power grid becomes normal. 2. If the alarm occurs frequently, check whether the grid frequency is within the acceptable range. If no, contact the local power operator. If yes, modify the grid underfrequency protection threshold with the consent of the local power operator.
2038	Unstable Grid Frequency	Major	Cause ID = 1 Power grid exception: The actual grid frequency change rate does not comply with the local power grid standard.	1. If the alarm occurs accidentally, the power grid may be abnormal temporarily. The SUN2000L automatically recovers after detecting that the power grid becomes normal. 2. If the alarm occurs frequently, check whether the grid frequency is within the acceptable range. If no, contact the local power operator.
2039	Output Overcurrent	Major	Cause ID = 1 The grid voltage drops dramatically or the power grid is short-circuited. As a result, the inverter transient output current exceeds the upper threshold and therefore the inverter protection is triggered.	1. The SUN2000L monitors its external working conditions in real time. The SUN2000L automatically recovers after the fault is rectified. 2. If the alarm occurs frequently and affects the power production of the PV plant, check whether the output is short-circuited. If the fault persists, contact your dealer.
2040	Output DC Component Overhigh	Major	Cause ID = 1 The DC component of the SUN2000L output current exceeds the specified upper threshold.	1. The SUN2000L monitors its external working conditions in real time. The SUN2000L automatically recovers after the fault is rectified. 2. If the alarm occurs frequently, contact your dealer.

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2051	Abnormal Residual Current	Major	Cause ID = 1 The insulation impedance of the input side to PE decreases when the SUN2000L is operating.	1. If the alarm occurs accidentally, the external power cable may be abnormal temporarily. The SUN2000L automatically recovers after the fault is rectified. 2. If the alarm occurs frequently or persists, check that the impedance between the PV string and ground is not below the lower threshold.
2061	Abnormal Grounding	Major	Cause ID = 1 • The protective earthing (PE) cable for the SUN2000L is not connected. • The voltage between the SUN2000L neutral wire and ground exceeds the upper threshold.	1. Check that the PE cable for the SUN2000L is connected properly. 2. Check that the voltage between the SUN2000L neutral wire and ground is within the normal range. If an isolation transformer is connected, set **OFF due to abnormal grounding** to **Disable** by referring to 7.4.5.3 Feature parameters.
2062	Low Insulation Resistance	Major	Cause ID = 1 • The PV string is short-circuited to PE. • The PV string is installed in a moist environment for a long time.	1. Check the impedance between the PV array output and PE, and eliminate short circuits and poor insulation points. 2. Check that the SUN2000L PE cable is correctly connected. 3. If you are sure that the impedance is less than the default value in a cloudy or rainy environment, reset **Insulation resistance protection**.
2063	Overtemperature	Major	Cause ID = 1 • The SUN2000L is installed in a place with poor ventilation. • The ambient temperature exceeds the upper threshold. • The SUN2000L is not working properly.	• Check the ventilation and ambient temperature at the SUN2000L installation position. • If the ventilation is poor or the ambient temperature exceeds the upper threshold, improve the ventilation and heat dissipation. • If the ventilation and ambient temperature both meet requirements, contact your dealer.
2064	Device Fault	Major	Cause ID = 1–12 An unrecoverable fault occurs on a circuit inside the SUN2000L.	Turn off the AC output switch and DC input switch, and then turn them on after 5 minutes. If the fault persists, contact your dealer.

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2065	Upgrade Failed	Major	Cause ID = 1-4 The upgrade does not end normally.	1. Perform an upgrade again. 2. If the upgrade fails several times, contact your dealer.
61440	Monitoring Unit Faulty	Minor	Cause ID = 1 • The flash memory is insufficient. • The flash memory has bad sectors.	Contact your dealer to rectify the fault.
2067	Faulty Power Collector	Major	Cause ID = 1 • In Grid Connection with Zero Power mode, the power collector communication is interrupted. • In Maximum Use of Self-Produced Power mode, the power collector communication is interrupted.	1. Check that the preset power collector model is the same as the actual model. 2. Check that the preset communications parameters for the power collector are the same as the actual configurations. 3. Check that the power collector is powered on and the RS485 communications cable is correctly connected.
2068	Abnormal Battery	Minor	Cause ID = 1 • The battery is faulty. • The battery communication is interrupted. • The battery switch trips when the SUN2000L is running.	1. Check that the communications cable and power cable between the SUN2000L and the battery are properly connected. 2. Check that the battery switch is turned on properly. 3. Turn off the AC output switch, DC input switch, and battery switch, and then turn them on after 5 minutes. If the fault persists, contact your dealer.
2070	Active Islanding	Major	Cause ID = 1 When the power grid experiences an AC power outage, the SUN2000L detects an island grid actively.	Check that the grid connection voltage of the SUN2000L is normal.
2071	Passive Islanding	Major	Cause ID = 1 When the power grid experiences an AC power outage, the SUN2000L detects an island grid passively.	Check that the grid connection voltage of the SUN2000L is normal.

Alarm ID	Alarm Name	Alarm Severity	Possible Cause	Suggestion
2072	Transient AC Overvoltage	Major	Cause ID = 1 The SUN2000L detects that the phase voltage exceeds the transient AC overvoltage protection threshold.	1. Check whether the grid connection voltage exceeds the upper threshold. If yes, contact the local power operator. 2. If you have confirmed that the grid connection voltage exceeds the upper threshold and obtained the consent of the local power operator, modify the overvoltage protection threshold. 3. Check whether the peak grid voltage exceeds the upper threshold.
2075	Peripheral Port Short Circuit	Warning	Cause ID = 1 The SUN2000L Alarm port is short-circuited when supplying 12 V power to peripherals.	1. Turn off the AC and DC switches on the SUN2000L and disconnect the peripheral from the Alarm port. Then power on the SUN2000L again and try to clear the alarm manually. If the alarm persists, contact your dealer to rectify the fault. If the alarm is cleared, it indicates that the port on the SUN2000L is normal. Then check that the pins in the power port on the peripheral are not short-circuited. 2. Replace the peripheral, and then start a self-check to check that the port functions properly.

◻ NOTE

Contact your dealer if all failure analysis procedures listed above are completed and the fault still exists.

9 Handling the SUN2000L

9.1 Removing the SUN2000L

Procedure

Step 1 Power off the system by following the instructions in 6.3 Powering Off the System.

Step 2 Disconnect all cables from the SUN2000L, including signal cables, DC input power cables, battery cables, AC output power cables, and PE cables.

Step 3 Remove the WiFi antenna from the SUN2000L.

Step 4 Remove the SUN2000L from the mounting bracket.

Step 5 Remove the mounting bracket.

----End

9.2 Packing the SUN2000L

- If the original packaging is available, put the SUN2000L inside it and then seal it using adhesive tape.
- If the original packaging is not available, put the SUN2000L inside a suitable cardboard box and seal it properly.

9.3 Disposing of the SUN2000L

If the SUN2000L service life expires, dispose of it according to the local disposal rules for electrical equipment and electronic component waste.

10 Technical Specifications

Efficiency

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Maximum efficiency	98.4%	98.5%	98.5%	98.6%	98.6%	98.6%
European weighted efficiency	97%	97.6%	97.8%	97.9%	98%	98%

Input

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Maximum input voltage[a]	600 V					
Maximum input current (per MPPT)	11 A					
Maximum short-circuit current (per MPPT)	15 A					
Maximum inverter backfeed current to the PV array	0 A					
Operating voltage range	• 90–500 V (No LG-RESU battery connects to the SUN2000L.) • 90–495 V (An LG-RESU battery connects to the SUN2000L.)					

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Start voltage range	• 120–600 V (No LG-RESU battery connects to the SUN2000L.) • 120–495 V (An LG-RESU battery connects to the SUN2000L.)					
MPPT voltage range	• 90–500 V (No LG-RESU battery connects to the SUN2000L.) • 90–425 V (An LG-RESU battery connects to the SUN2000L.)					
Full power MPPT voltage range[a]	120–480 V	160–480 V	190–480 V	210–480 V	260–480 V	260–480 V
Rated input voltage	380 V					
Number of inputs	2					
Number of MPP trackers	2					
Note a: If an LG-RESU battery connects to the SUN2000L, the maximum full power MPPT voltage is 425 V.						

Output

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Rated output power[a]	2000 W	3000 W	3680 W	4000 W	4600 W	5000 W
Maximum apparent power[b]	2200 VA	3300 VA	3680 VA	4400 VA	4500 VA	5500 VA
Rated output voltage	220 V/230 V/240 V					
Adapted grid frequency	50 Hz/60 Hz					
Maximum output current[c]	10 A	15 A	16 A	20 A	23 A	25 A
Power factor	0.8 leading ... 0.8 lagging					
Maximum total harmonic distortion (rated power)	≤ 3%					

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
• Note a: The maximum output power of the SUN2000L-5KTL is 4990 W if the Australian AS4777 grid code is selected. • Note b: The maximum apparent power of the SUN2000L-4.6KTL is 4600 VA if the Germany VDE-AR-N 4105 grid code is selected. The maximum apparent power of the SUN2000L-4.6KTL and SUN2000L-5KTL is 4990 VA if the Australian AS4777 grid code is selected. • Note c: The maximum output current of the SUN2000L-4.6KTL and SUN2000L-5KTL is 21.7 A if the Australian AS4777 grid code is selected.						

Protection

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Anti-islanding protection	Supported					
Input reverse polarity protection	Supported					
Output short-circuit protection	Supported					
RCMU	Supported					
AC surge protection	Supported					
DC surge protection	Supported					
Output overvoltage protection	Supported					
Insulation resistance detection	Supported					

Communication

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Display	LED					
WiFi	Supported					

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
RS485	Supported					

Common parameters

Item	SUN2000L-2KTL	SUN2000L-3KTL	SUN2000L-3.68KTL	SUN2000L-4KTL	SUN2000L-4.6KTL	SUN2000L-5KTL
Topology	Transformerless					
Ingress Protection Rating	IP65					
Cooling mode	Natural cooling					
Dimensions (W x H x D)	375 mm x 375 mm x 117 mm (excluding the mounting plate)/375 mm x 375 mm x 149.5 mm (including the mounting plate)					
Weight	10.6 kg (including the mounting plate)					
Operating temperature	−30 ℃ to +60 ℃ (derated above +45 ℃)					
Humidity	0%−100% RH					
Operating altitude	0–4000 m (derated above 2000 m)					

A Grid Codes

☐ NOTE

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

Table A-1 Grid codes (SUN2000L-2KTL/SUN2000L-3KTL)

No.	Grid Code	Description	Grid Voltage	Grid Frequency
1	VDE-AR-N-4105	Germany low-voltage power grid	230 V	50 Hz
2	NB/T 32004	China Golden Sun low-voltage power grid	220 V	50 Hz
3	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
4	UTE C 15-712-1(B)	France island power grid (50 Hz)	230 V	50 Hz
5	UTE C 15-712-1(C)	France island power grid (60 Hz)	230 V	60 Hz
6	G83-England	England 230 V power grid (I < 16 A)	230 V	50 Hz
7	G83-Scotland	Scotland 240 V power grid (I < 16 A)	240 V	50 Hz
8	CEI0-21	Italy power grid	230 V	50 Hz
9	EN50438-NL	Netherlands power grid	230 V	50 Hz
10	AS4777	Australia power grid	230 V	50 Hz
11	IEC61727	IEC61727	230 V	50 Hz

No.	Grid Code	Description	Grid Voltage	Grid Frequency
		low-voltage power grid (50 Hz)		
12	EN50438-TR	Turkey low-voltage power grid	230 V	50 Hz
13	IEC61727-60Hz	IEC61727 low-voltage power grid (60 Hz)	230 V	60 Hz
14	CLC/TS50549_IE	Ireland power grid	230 V	50 Hz

Table A-2 Grid codes (SUN2000L-3.68KTL)

No.	Grid Code	Description	Grid Voltage	Grid Frequency
1	VDE-AR-N-4105	Germany low-voltage power grid	230 V	50 Hz
2	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
3	UTE C 15-712-1(B)	France island power grid (50 Hz)	230 V	50 Hz
4	UTE C 15-712-1(C)	France island power grid (60 Hz)	230 V	60 Hz
5	G83-England	England 230 V power grid (I < 16 A)	230V	50Hz
6	G83-Scotland	Scotland 240 V power grid (I < 16 A)	240 V	50 Hz
7	CEI0-21	Italy power grid	230 V	50 Hz
8	EN50438-NL	Netherlands power grid	230 V	50 Hz
9	AS4777	Australia power grid	230 V	50 Hz
10	IEC61727	IEC61727 low-voltage power grid (50 Hz)	230 V	50 Hz
11	EN50438-TR	Turkey low-voltage power grid	230 V	50 Hz

No.	Grid Code	Description	Grid Voltage	Grid Frequency
12	IEC61727-60Hz	IEC61727 low-voltage power grid (60 Hz)	230 V	60 Hz
13	CLC/TS50549_IE	Ireland power grid	230 V	50 Hz

Table A-3 Grid codes (SUN2000L-4KTL)

No.	Grid Code	Description	Grid Voltage	Grid Frequency
1	VDE-AR-N-4105	Germany low-voltage power grid	230 V	50 Hz
2	NB/T 32004	China Golden Sun low-voltage power grid	220 V	50 Hz
3	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
4	UTE C 15-712-1(B)	France island power grid (50 Hz)	230 V	50 Hz
5	UTE C 15-712-1(C)	France island power grid (60 Hz)	230 V	60 Hz
6	G59-England	England 230 V power grid (I > 16 A)	230 V	50 Hz
7	G59-Scotland	Scotland 240 V power grid (I > 16 A)	240 V	50Hz
8	CEI0-21	Italy power grid	230 V	50 Hz
9	EN50438-NL	Netherlands power grid	230 V	50 Hz
10	AS4777	Australia power grid	230 V	50 Hz
11	IEC61727	IEC61727 low-voltage power grid (50 Hz)	230 V	50 Hz
12	EN50438-TR	Turkey low-voltage power grid	230 V	50 Hz

No.	Grid Code	Description	Grid Voltage	Grid Frequency
13	IEC61727-60Hz	IEC61727 low-voltage power grid (60 Hz)	230 V	60 Hz
14	CLC/TS50549_IE	Ireland power grid	230 V	50 Hz

Table A-4 Grid codes (SUN2000L-4.6KTL)

No.	Grid Code	Description	Grid Voltage	Grid Frequency
1	VDE-AR-N-4105	Germany low-voltage power grid	230 V	50 Hz
2	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
3	UTE C 15-712-1(B)	France island power grid (50 Hz)	230 V	50 Hz
4	UTE C 15-712-1(C)	France island power grid (60 Hz)	230 V	60 Hz
5	G59-England	England 230 V power grid (I > 16 A)	230 V	50 Hz
6	G59-Scotland	Scotland 240 V power grid (I > 16 A)	240 V	50Hz
7	CEI0-21	Italy power grid	230 V	50 Hz
8	EN50438-NL	Netherlands power grid	230 V	50 Hz
9	AS4777	Australia power grid	230 V	50 Hz
10	IEC61727	IEC61727 low-voltage power grid (50 Hz)	230 V	50 Hz
11	EN50438-TR	Turkey low-voltage power grid	230 V	50 Hz
12	IEC61727-60Hz	IEC61727 low-voltage power grid (60 Hz)	230 V	60 Hz
13	CLC/TS50549_IE	Ireland power grid	230 V	50 Hz

Table A-5 Grid codes (SUN2000L-5KTL)

No.	Grid Code	Description	Grid Voltage	Grid Frequency
1	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
2	NB/T 32004	China Golden Sun low-voltage power grid	220 V	50 Hz
3	UTE C 15-712-1(A)	France mainland power grid	230 V	50 Hz
4	UTE C 15-712-1(B)	France island power grid (50 Hz)	230 V	50 Hz
5	UTE C 15-712-1(C)	France island power grid (60 Hz)	230 V	60 Hz
6	G59-England	England 230 V power grid (I > 16 A)	230 V	50 Hz
7	G59-Scotland	Scotland 240 V power grid (I > 16 A)	240 V	50Hz
8	CEI0-21	Italy power grid	230 V	50 Hz
9	EN50438-NL	Netherlands power grid	230 V	50 Hz
10	AS4777	Australia power grid	230 V	50 Hz
11	IEC61727	IEC61727 low-voltage power grid (50 Hz)	230 V	50 Hz
12	EN50438-TR	Turkey low-voltage power grid	230 V	50 Hz
13	IEC61727-60Hz	IEC61727 low-voltage power grid (60 Hz)	230 V	60 Hz
14	CLC/TS50549_IE	Ireland power grid	230 V	50 Hz

B Acronyms and Abbreviations

A

AC   alternating current

D

DC   direct current

I

ID   identifier

L

LED   light emitting diode

LVRT   low voltage ride-through

M

MAC   Media Access Control

MPPT   maximum power point
                                tracking

P

PC   personal computer

PE   protective earthing

PV   photovoltaic

R

RCD	residual current device
RCMU	residual current monitoring unit
RH	relative humidity
S	
SN	serial number
T	
THDi	total distortion of the input current waveform
W	
WEEE	waste electrical and electronic equipment
WiFi	Wireless Fidelity