

SUN2000-60KTL-HV-D1

Quick Guide

Issue: Draft A
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HUAWEI TECHNOLOGIES CO., LTD.



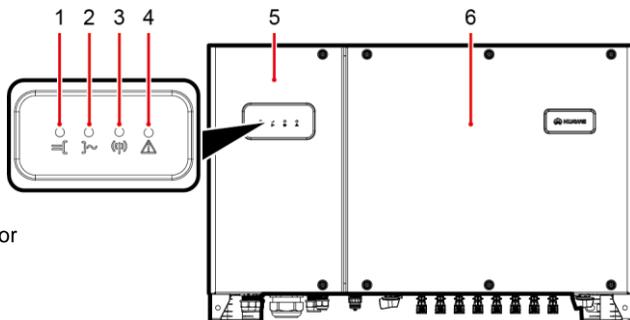
NOTICE

1. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents. But all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
2. Before device installation, carefully read the *SUN2000-60KTL-HV-D1 User Manual* to get familiar with product information and precautions. You can log in to <http://support.huawei.com/carrier/>, and search for **SUN2000** on the **Product Support** tab page to view or obtain the user manual.
3. Only qualified and trained electrical technicians are allowed to operate the device. Operators should understand the components and functioning of a grid-tied PV power system, and they should be familiar with relevant local standards.
4. Before installing the device, check that deliverables are intact and complete against the packing list. If any damage is found or any component is missing, contact the dealer.
5. Use insulated tools when installing the device. For personal safety, wear insulation gloves and protective shoes.
6. The device warranty does not cover the following conditions:
 - The warranty label is removed.
 - The device is damaged due to violation of the storage, transportation, installation, and operation regulations specified in this document and user manual.

1 Product Overview

Front View

- (1) PV connection indicator
- (2) Grid-tied indicator
- (3) Communication indicator
- (4) Alarm/Maintenance indicator
- (5) Maintenance compartment door
- (6) Host panel



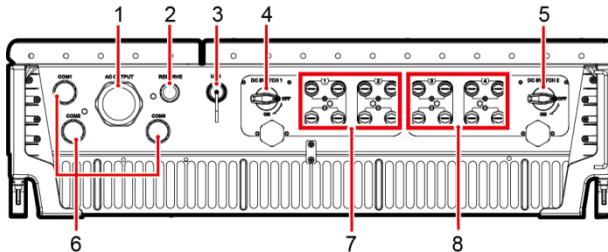
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Indicator Description

Indicator	Status	Description	
PV connection indicator 	DC input detection status	Blinking green	The PV string cable is connected correctly.
		Blinking red	DC input detection is in progress.
		Steady red	The PV string cable is connected incorrectly.
	PV string connection status	Steady green	At least one PV string is properly connected, and the DC input voltage of the corresponding MPPT circuit is higher than or equal to 600 V.
Off		The SUN2000 disconnects from all PV strings, or the DC input voltage of each MPPT circuit is less than 600 V.	
Grid-tied indicator 	Steady green	The SUN2000 has connected to the power grid.	
	Off	The SUN2000 does not connect to the power grid.	

Indicator	Status	Description	
Communication indicator 	Blinking green	The SUN2000 receives data over RS485 or PLC communication.	
	Off	The SUN2000 has not received data over RS485 or PLC communication for 10 seconds.	
Alarm/Maintenance indicator 	Alarm status	Blinking red at long intervals (on for 1s and then off for 4s)	A warning alarm is generated.
		Blinking red at short intervals (on for 0.5s and then off for 0.5s)	A minor alarm is generated.
		Steady red	A critical alarm is generated.
	Local maintenance status	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
		Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.
		Steady green	Local maintenance succeeds.

Ports



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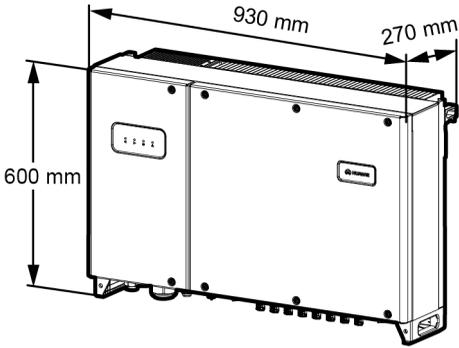
- | | |
|---|---|
| (1) Waterproof cable connector (AC OUTPUT 1) | (2) Waterproof cable connector (RESERVE) |
| (3) USB port (USB) | (4) DC switch 1 (DC SWITCH 1) |
| (5) DC switch 2 (DC SWITCH 2) | (6) Waterproof cable connector (COM1, COM2, and COM3) |
| (7) DC input terminal (controlled by DC SWITCH 1) | (8) DC input terminal (controlled by DC SWITCH 2) |



NOTE

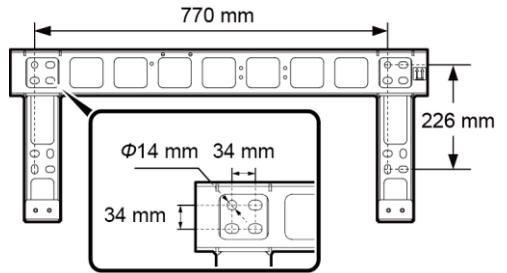
Waterproof cable connector is abbreviated as waterproof connector in the following text.

SUN2000 Dimensions



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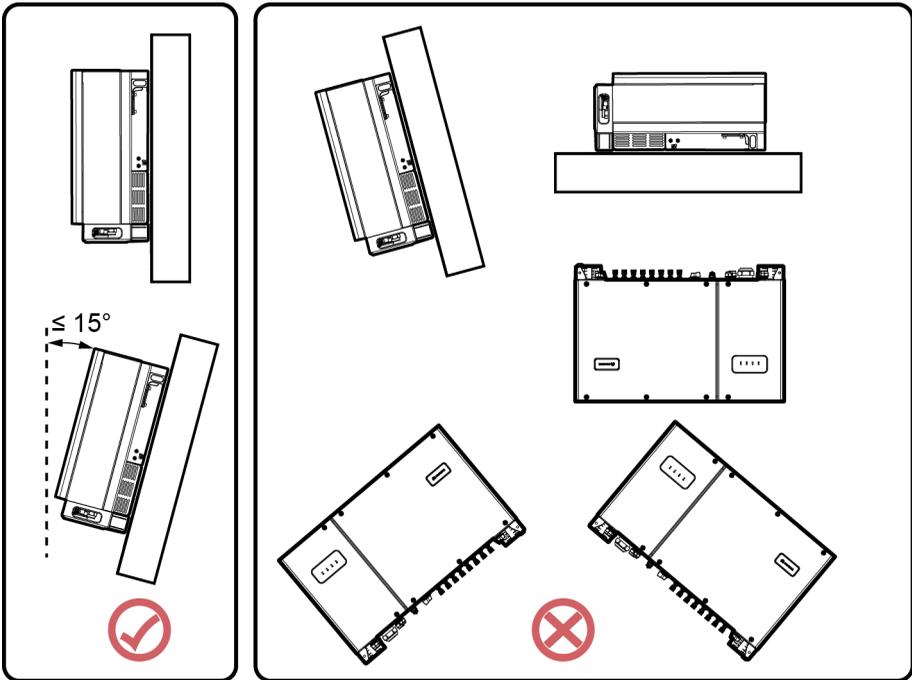
Mounting Bracket Dimensions



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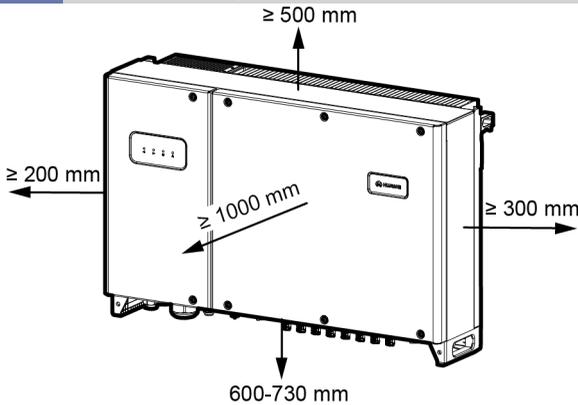
2 Installation Requirements

2.1 Installation Tilt



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2.2 Installation Space



NOTE

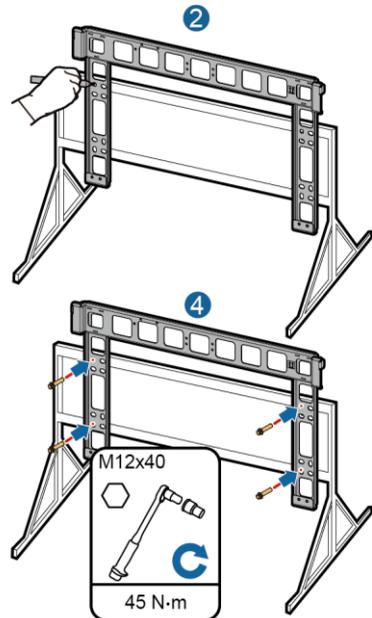
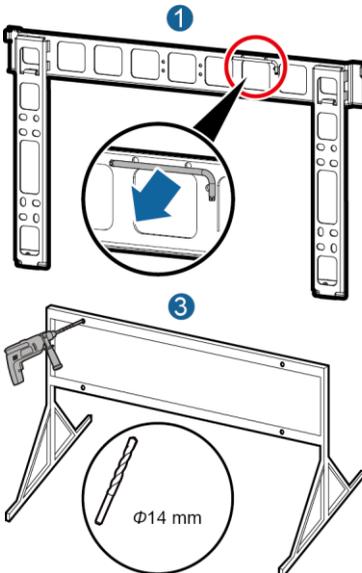
For ease of installing the SUN2000 on the mounting bracket, connecting cables to the bottom of the SUN2000, and maintaining the SUN2000 in future, it is recommended that the bottom clearance be between 600 mm and 730 mm.

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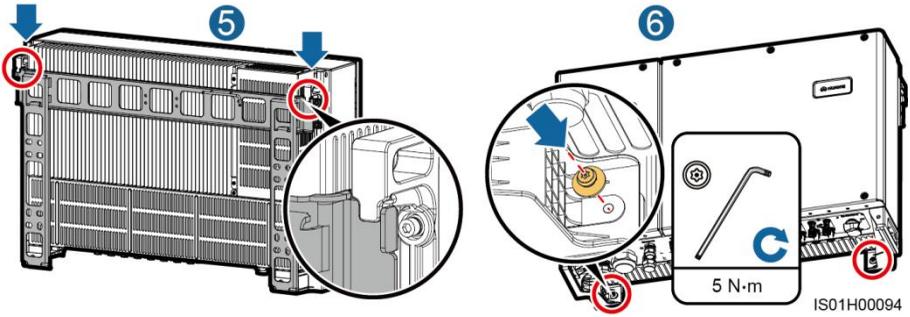
3 Installing the SUN2000

NOTE

- The SUN2000 mounting bracket has four groups of tapped holes, each group containing four tapped holes. Mark any hole in each group based on site requirements and mark four holes in total. Two round holes are preferred.
- The SUN2000 is delivered with M12x40 bolt assemblies. If the bolt length does not meet the installation requirements, prepare M12 bolt assemblies by yourself and use them together with the delivered M12 nuts.
- The following describes how to install the SUN2000 by using support installation as an example. For details about wall-mounted installation, see the *SUN2000-60KTL-HV-D1 User Manual*.



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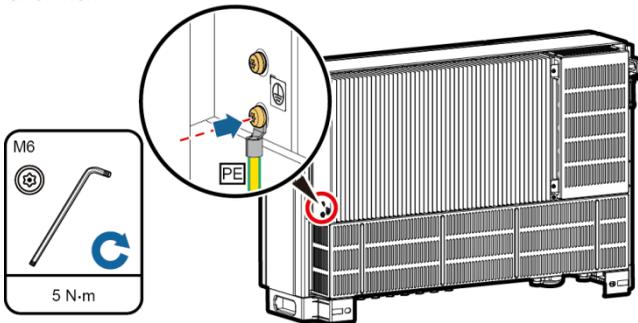
NOTE

1. Set the security torx wrench aside after removing it from the mounting bracket.
2. You are advised to apply anti-rust paint on the hole positions for protection.

4 Electrical Connections

4.1 Installing the Ground Cable

Both the shell and maintenance compartment of the SUN2000 provide a ground point. Select either for connecting the ground cable. There are two ground points on the chassis shell and you only need either of them.



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NOTE

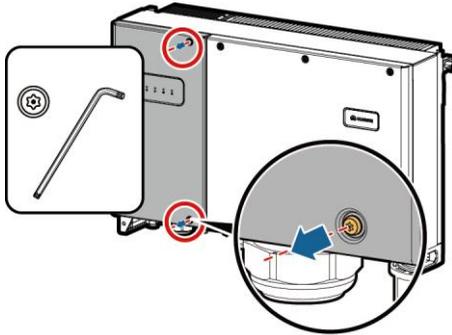
1. You need to prepare M6 OT terminals by yourself.
2. The outdoor copper-core cable with a cross-sectional area of 16 mm² is recommended. The ground cable must be secured.
3. It is recommended that PGND cable of the SUN2000 be connected to the nearest ground point. For a system with multiple SUN2000s connected in parallel, connect the ground points of all SUN2000s to ensure equipotential connections to ground cables.
4. To enhance the corrosion resistance of the PE terminal, apply silica gel or paint on it after connecting the PGND cable.

4.2 Opening the Maintenance Compartment Door

WARNING

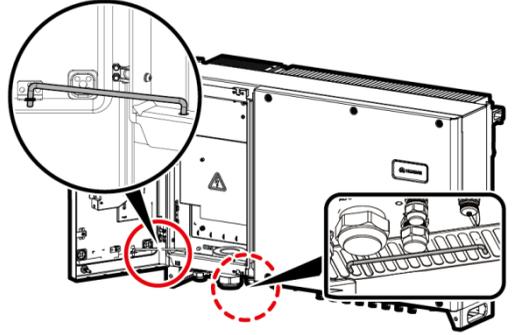
1. Never open the host panel of the SUN2000.
2. Before opening the SUN2000 maintenance compartment door, turn off the downstream AC output switch and the two DC switches at the bottom.
3. If you need to open the maintenance compartment door in rainy or snowy days, take protective measures to prevent rain and snow entering the maintenance compartment. If it is impossible to take protective measures, do not open the maintenance compartment door in rainy or snowy days.
4. Do not leave unused screws in the maintenance compartment.

1. Loosen the two screws on the maintenance compartment door using a security torx wrench.



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2. Open the maintenance compartment door and install the support bar, which is bound to the inductor cover at the bottom of the chassis.

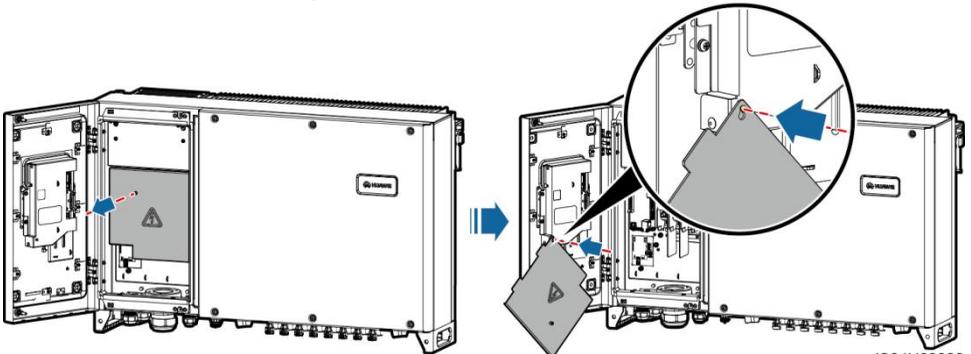


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NOTE

If the screws on the chassis door are lost, obtain spare screws from the fitting bag bound to the inductor cover at the bottom of the chassis.

3. Remove the cover and hang it on the hook of the chassis door.



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4.3 Installing AC Output Power Cables

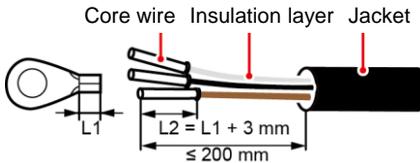


NOTE

- You need to prepare M8 OT terminals by yourself.
- If you connect a ground cable to the ground point on the chassis shell, you are advised to use a three-core outdoor copper-core cable with a cross-sectional area of 25 mm² as the AC output power cable.
- If you connect a ground cable to the ground point in the maintenance compartment, you are advised to use a four-core outdoor copper-core cable with a cross-sectional area of 25 mm² as the AC output power cable.
- For more details about cable specifications, see the *SUN2000-60KTL-HV-D1 User Manual*.

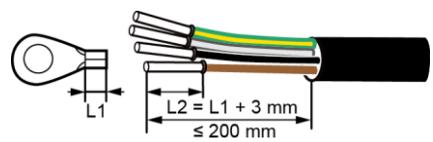
1. Remove an appropriate length of the jacket and insulation layer from the AC output power cable using a wire stripper. (Ensure that the jacket is in the maintenance compartment.)

a. Three-core cable (excluding the ground cable and neutral wire)



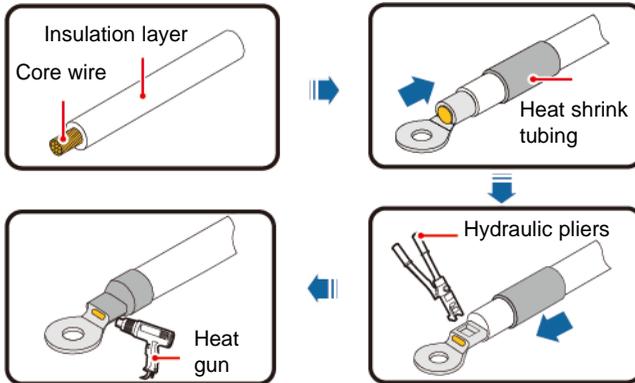
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b. Four-core cable (including the ground cable but excluding the neutral wire)



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2. Prepare OT terminals.

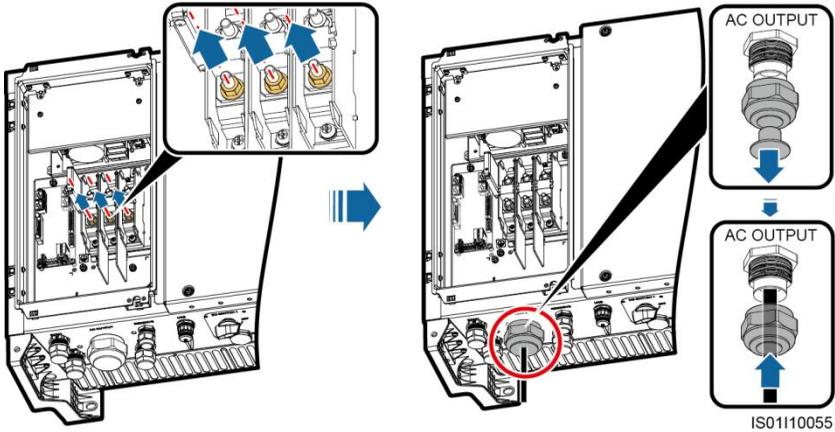


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3. Route the cable through the waterproof connector.

 **NOTE**

For ease of connecting the AC output power cable, you are advised to remove the nut assembly from the AC terminal and set it aside, and then route the cable through the waterproof connector.



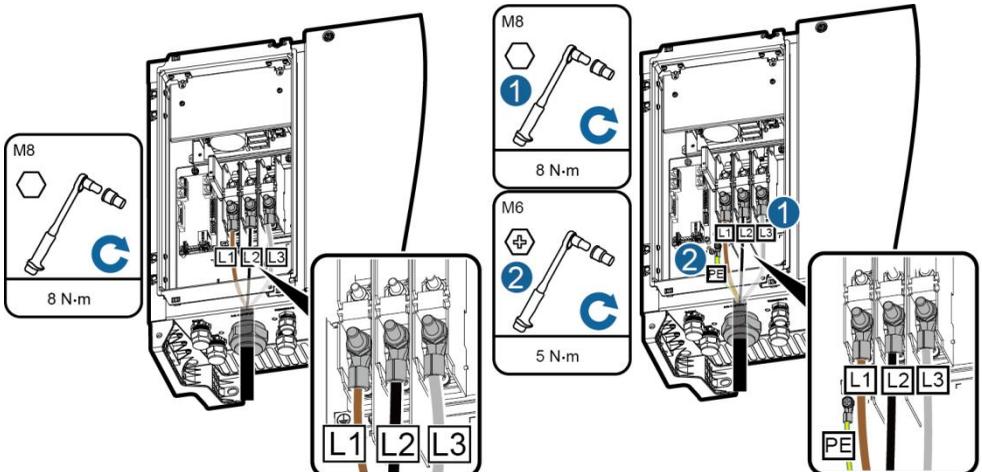
4. Connect the AC output power cable.

 **NOTICE**

Verify that the AC output power cable is connected securely. Otherwise, the SUN2000 may fail to operate or experience a fault that will cause the damage of the terminal block. For example, the SUN2000 may generate heat during operating due to unreliable connection.

a. Excluding the ground cable

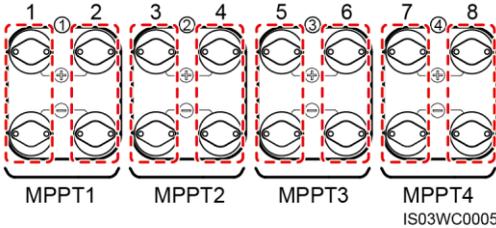
b. Including the ground cable



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4.4 Installing DC Input Power Cables

Selecting DC Input Terminals



NOTE

The SUN2000 provides two DC switches, namely, DC SWITCH 1 and DC SWITCH 2. DC SWITCH 1 controls the first to fourth routes of DC input terminals, whereas DC SWITCH 2 controls the fifth to eighth routes of DC input terminals.

Number of Inputs	SUN2000
1	Connects to any route.
2	Connects to routes 1 and 5.
3	Connects to routes 1, 3, and 5.
4	Connects to routes 1, 3, 5, and 7.
5	Connects to routes 1, 2, 3, 5, and 7.
6	Connects to routes 1, 2, 3, 5, 6, and 7.
7	Connects to routes 1, 2, 3, 4, 5, 6, and 7.
8	Connects to routes 1, 2, 3, 4, 5, 6, 7, and 8.



WARNING

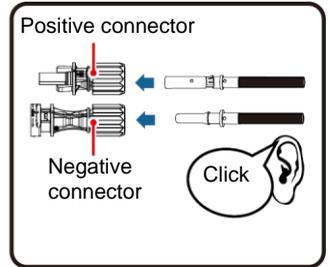
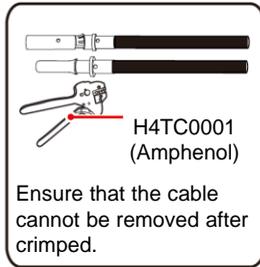
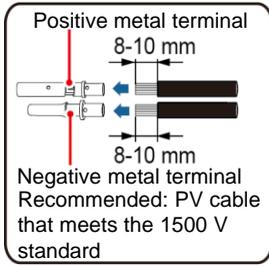
- Ensure that the PV string is well insulated to the ground.
- Before inserting the positive and negative connectors respectively into the positive and negative DC input terminals of the SUN2000, check that the DC voltage does not exceed 1500 V using a multimeter and that the cables are connected correctly. Otherwise, the SUN2000 will be damaged.



NOTICE

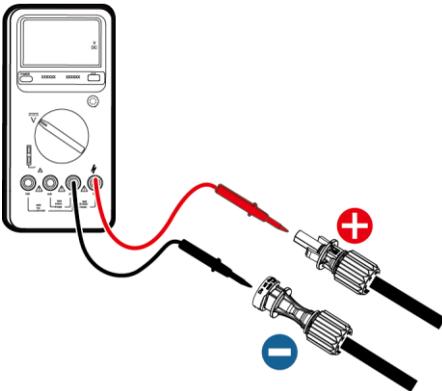
1. Use the Amphenol UTX DC input terminals delivered with the SUN2000.
2. Before connecting DC input power cables, label the cable polarities to ensure correct cable connections. If the cables are connected incorrectly, the SUN2000 may be damaged.
3. Insert the crimped metal terminals of the positive and negative power cables into the appropriate positive and negative connectors. Then pull the DC input power cables to ensure that they are connected securely.
4. Connect the positive and negative connectors to the appropriate positive and negative DC input terminals. Then pull the DC input power cables to ensure that they are connected securely.
5. If the DC input power cable is reversely connected and the DC switch is ON, do not immediately turn off the DC switch or reconnect the positive and negative connectors. Otherwise, the device may be damaged. The caused equipment damage is beyond the warranty scope. Wait until the solar irradiance declines at night and the PV string current reduces to below 0.5 A. Then, turn off the two DC switches, remove the positive and negative connectors, and rectify the connection of the DC input power cable.

1. Prepare the positive and negative connectors, and tighten the locking nuts on the connectors.

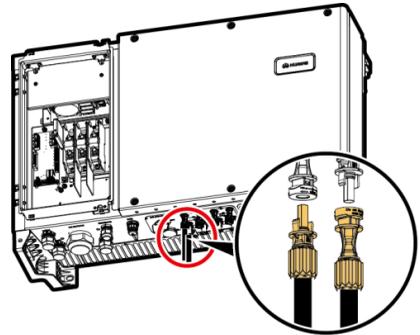


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2. Use a multimeter to measure the DC voltage between the positive polarity and negative polarity of the PV string.
3. Insert the positive and negative connectors into the corresponding positive and negative DC input terminals of the SUN2000 until they snap into place.



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NOTICE

- If the voltage is a negative value, the PV string is reversely connected. Correct the polarity.
- If the voltage is greater than 1500 V, too many PV strings are configured. Remove some PV modules.
- Only after at least one PV string correctly connects to the MPPT1 circuit, can the SUN2000 enables the DC input detection function. Therefore, you are advised to connect DC input power cables to the MPPT1 circuit first.

4.5 Selecting a Communication Mode

The SUN2000 supports either PLC or RS485 communication mode.

NOTE

- If PLC is used, you do not have to connect any communications cable to the SUN2000, but have to connect the PLC CCO module or SmartLogger2000 to the AC power cable. For detailed operations, see the *PLC CCO01A User Manual* or *SmartLogger2000 User Manual*.
- If RS485 is used, do not connect the PLC CCO module to the AC power cable.

4.6 Installing the RS485 Communications Cable

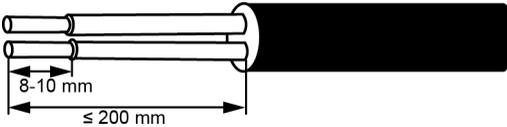
NOTICE

1. When routing communications cables, separate communications cables from power cables to prevent communication from being affected by signal interference.
2. An RS485 cable can connect to either a terminal block or an RJ45 network port. It is recommended that the RS485 cable connect to a terminal block.

Terminal Block Connection (Recommended)

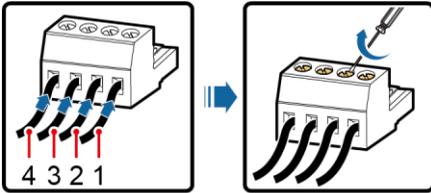
The DJYP2VP2-22 2x2x1 computer cable or a communications cable with a conductor cross-sectional area of 1 mm² and outer diameter of 14–18 mm is recommended.

1. Remove an appropriate length of the jacket and core wire insulation layer from the communications cable using a wire stripper.



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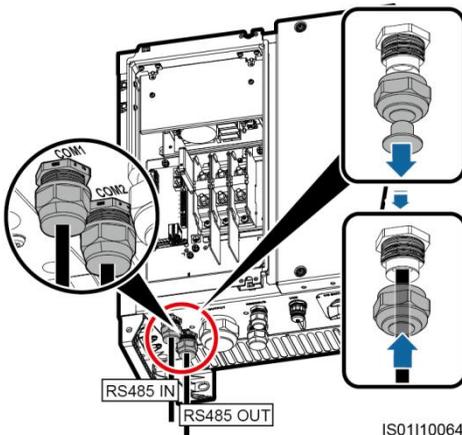
2. Remove the cable terminal base from the terminal block. Connect the communications cable to the terminal base.



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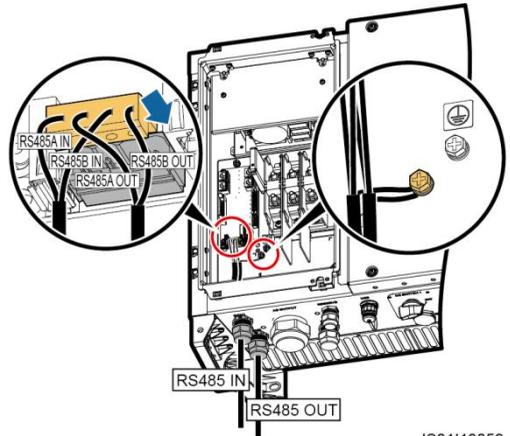
No.	Port Definition	Description
1	RS485A IN	RS485A, RS485 differential signal+
2	RS485A OUT	RS485A, RS485 differential signal+
3	RS485B IN	RS485B, RS485 differential signal-
4	RS485B OUT	RS485B, RS485 differential signal-

3. Route the cable through the waterproof connector.



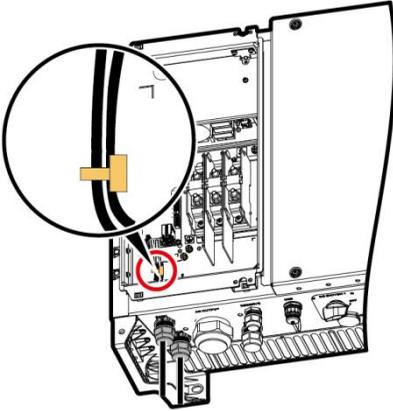
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4. Install the terminal base on the terminal block, and connect the shield layer to the ground point.



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5. Bind the communications cable.



NOTE

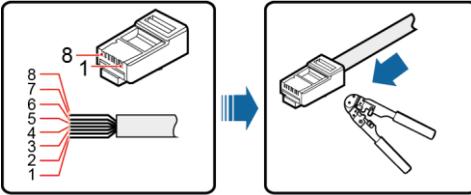
1. When connecting the shielded cable, choose whether to crimp the OT terminal based on site requirements.
2. To ensure airtightness, you are advised to apply firestop putty to the used waterproof connectors at the bottom of the chassis.

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RJ45 Network Port Connection

You are recommended to use a CAT 5E outdoor shielded network cable with an outer diameter less than 9 mm and internal resistance not greater than 1.5 ohms/10 m, as well as a shielded RJ45 connector.

1. Prepare an RJ45 connector.

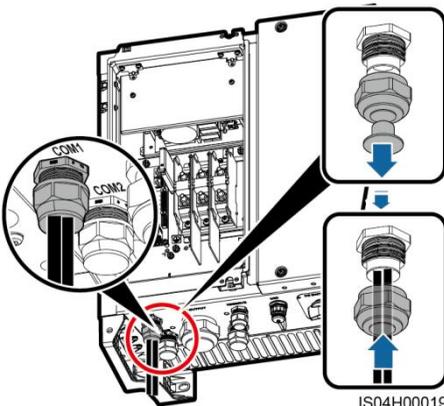


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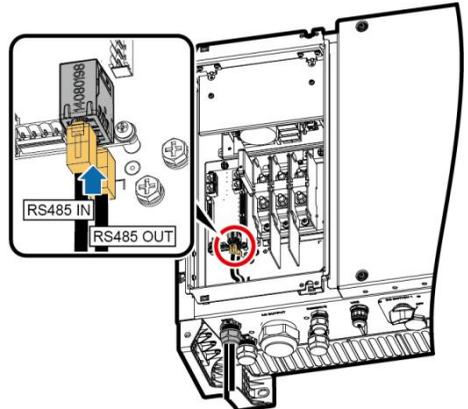
No.	Color	Pin Definition
1	White-and-orange	RS485A, RS485 differential signal+
2	Orange	RS485B, RS485 differential signal-
3	White-and-green	N/A
4	Blue	RS485A, RS485 differential signal+
5	White-and-blue	RS485B, RS485 differential signal-
6	Green	N/A
7	White-and-brown	N/A
8	Brown	N/A

2. Route the cable through the waterproof connector.

3. Insert the RJ45 connector into the RJ45 network port in the SUN2000 maintenance compartment.

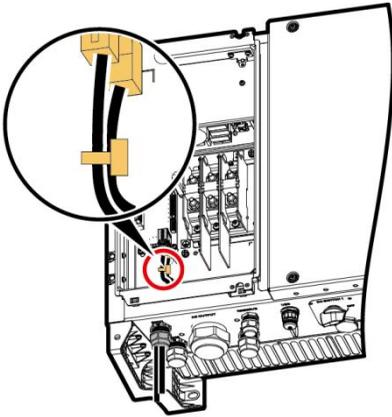


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4. Bind the communications cable.



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NOTE

To ensure airtightness, you are advised to apply firestop putty to the used waterproof connectors at the bottom of the chassis.

5 Checking After Installation

1. The SUN2000 is installed correctly and securely.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
2. The DC switches and downstream AC switch are OFF.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
3. All ground cables are connected securely, without open circuits or short circuits.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
4. AC output power cables are connected correctly and securely, without open circuits or short circuits.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
5. DC input power cables are connected correctly and securely, without open circuits or short circuits.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
6. The RS485 communications cable is connected correctly and securely.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
7. All used waterproof connectors at the chassis bottom are applied with firestop putty.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
8. The AC terminal cover is reinstalled.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
9. The maintenance compartment door is closed and the door screws are tightened.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
10. Idle DC input terminals are sealed.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
11. Idle USB ports are plugged with waterproof plugs.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
12. Idle waterproof connectors are plugged and the locking caps are tightened.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>

6 DC Input Detection

After the DC input power cable connects to the SUN2000 of this model, the SUN2000 detects the DC input voltage of each route using the power generated by PV modules. After one PV string correctly connects to the MPPT1 circuit, the SUN2000 can start the DC input detection function. DC input detection can be performed automatically or manually.

⚠ NOTICE

- Only after at least one PV string correctly connects to the MPPT1 circuit, can the SUN2000 enables the DC input detection function. Therefore, you are advised to connect DC input power cables to the MPPT1 circuit first.
- The DC input detection function allows only independent access from each PV string to the inverter. That is, the PV strings cannot be connected in parallel and then to the inverter.
- The DC input detection function is valid only when the two DC switches on the SUN2000 are OFF.

The following table describes the LED indicator status and buzzer status under the condition that the SUN2000 is detecting the DC input.

PV Connection Indicator Status	Buzzer Status	Meaning
Blinking red	No sound	DC input detection is in progress.
Blinking green	No sound	The PV string cable is connected correctly.
Steady red	Buzzing	The PV string cable is connected incorrectly.

Automatic Detection

Following are the rules for starting automatic detection:

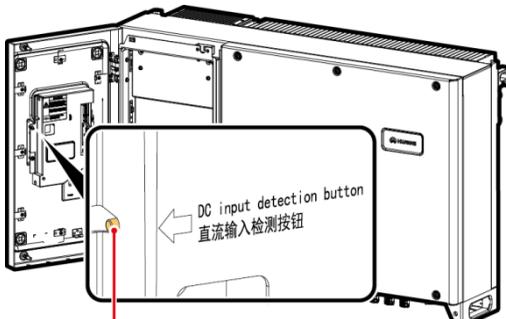
- Initial automatic detection is triggered 2 minutes after at least one PV string correctly connects to the MPPT1 circuit.
- Within three days after initial automatic detection is triggered, the SUN2000 performs automatic detection once every 10 minutes. From the fourth day, the SUN2000 performs automatic detection only upon automatic startup .

Manual Detection

Perform manual detection by pressing the DC input detection button or using the SUN2000 app.

Following are the start rules:

- Perform the triggering operation once to start one time of DC input detection. If DC input detection is ongoing, triggering operations will not take effect .
- You can press the DC voltage detection button two consecutive times to forcibly silence the buzzer .



DC Input detection button

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7 Powering On the System

⚠ NOTICE

- Before turning on the AC switch between the SUN2000 and the power grid, use a multimeter to check that the AC voltage is within the specified range.
- Before turning on the DC switches on the SUN2000, ensure that the DC input power cable is connected correctly.

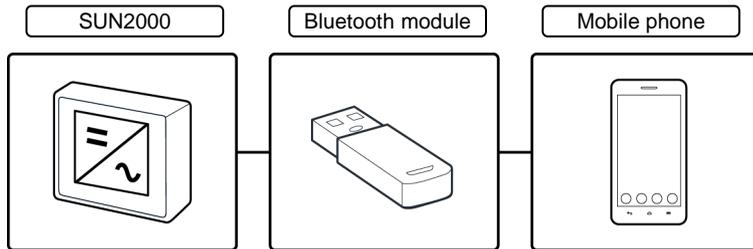
1. Turn on the AC switch between the SUN2000 and the power grid.
2. Ensure that the DC switches at the inverter bottom are ON.

8 SUN2000 App

📖 NOTE

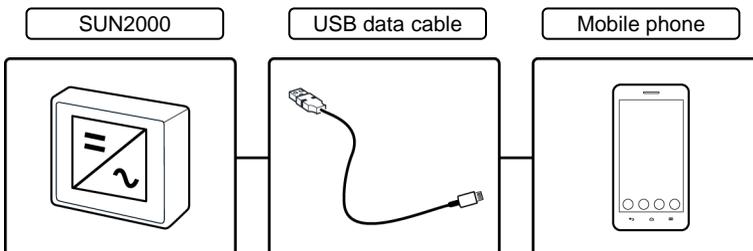
1. The SUN2000 app enables the SUN2000 to communicate with the monitoring system through a USB data cable or Bluetooth for you to query alarms, configure parameters, and perform routine maintenance. The SUN2000 app is a convenient platform for local monitoring and maintenance. The app name is SUN2000.
2. Mobile phone operating system: Android 4.0 or later, iOS 7.0 or later. When the iOS is used, the app supports only Bluetooth connection.
3. Access the Huawei app store (<http://appstore.huawei.com>), **Google Play** (<https://play.google.com>), or **App Store** (iOS), search for **SUN2000**, and download the SUN2000 app software package.
4. Connect a USB data cable or a Bluetooth module to the USB port of the SUN2000 to enable the communication between the SUN2000 and the app.

Connection over a Bluetooth Module



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Data Cable Connection

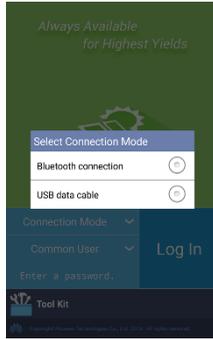


IS01NC0010

Login screen



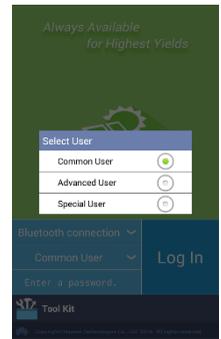
Selecting a connection mode



Connecting Bluetooth



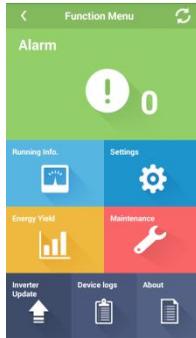
Switching between users



Quick settings



Main menu screen



NOTICE

- The preset passwords for **Common User**, **Advanced User**, and **Special User** are **0000a**.
- Use the preset password upon initial login. To ensure account security, change the password immediately after login.
- The screen snapshots in this document correspond to app V200R001C00SPC100 (Android).

NOTE

By default, the SUN2000 can be grid-tied and you do not have to set parameters. You can modify the parameters based on site requirements. For details about parameter configuration, see the *SUN2000 APP User Manual*.

9 FAQ

How Should I View Active Alarms?

Connect a USB data cable or a Bluetooth module to the USB port of the SUN2000 to enable the communication between the SUN2000 and the app. After login, tap **Alarm** on the main menu to display the **Active Alarm** screen.

10 Troubleshooting

Symptom	Possible Cause	Suggestion
The PV string is connected reversely.	The PV string cables are connected reversely during the SUN2000 installation.	Wait until the solar irradiance declines at night and the PV string current reduces to below 0.5 A. Then, turn off the two DC switches, remove the positive and negative connectors, and rectify the connection of the DC input power cable.

Scan here for technical support (carrier):

Apple Store



Google Play



Huawei
App Store



Scan here for more documents:

Support



WeChat



You can also log in to Huawei technical support website:

<http://support.huawei.com>

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