

# **SUN2000-(100KTL, 110KTL, 125KTL) Series Quick Guide**

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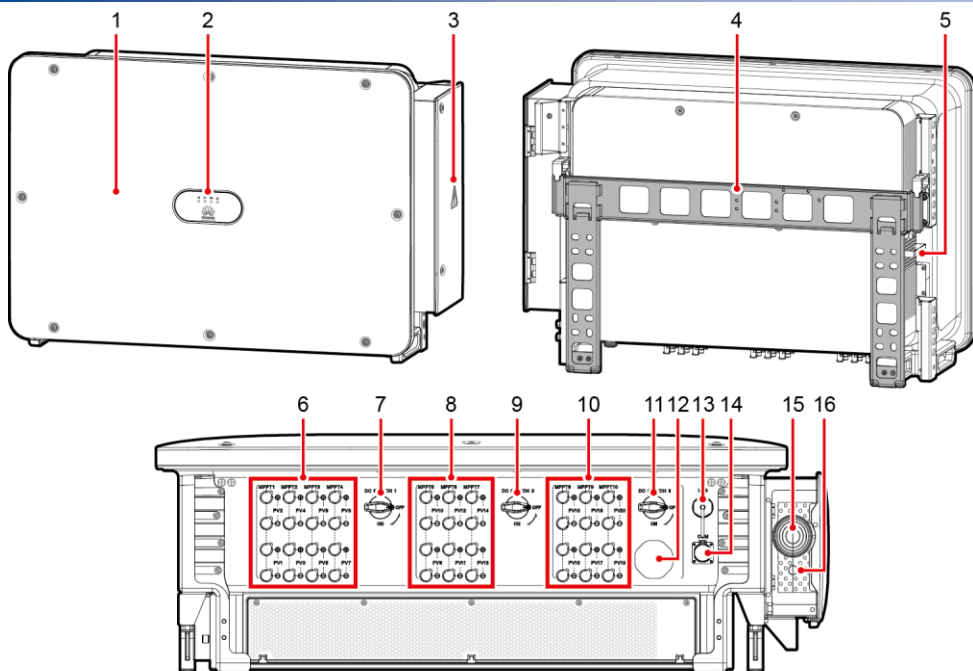
**HUAWEI TECHNOLOGIES CO., LTD.**



## NOTICE

- 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.
- Only certified electricians are allowed to operate the device. Operation personnel should understand the composition and working principles of the grid-tied PV power system and local regulations.
- Before installing the device, read the user manual carefully to get familiar with product information and safety precautions. Huawei shall not be liable for any consequences caused by the violation of the storage, transportation, installation, and operation regulations specified in this document and the user manual.
- Use insulated tools when installing the device. For personal safety, wear proper personal protective equipment (PPE).

## 1 Overview

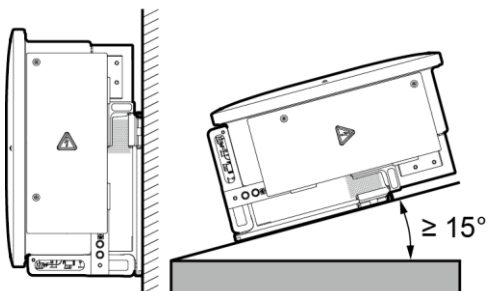


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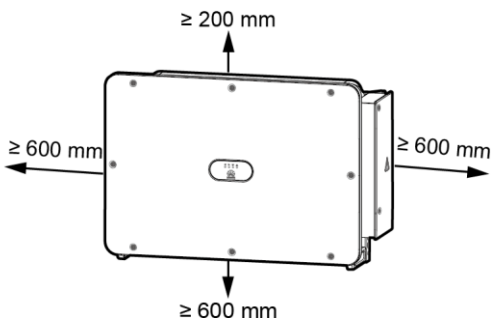
- |   |   |
|---|---|
| (1) Panel                               | (2) LED indicators  |
| (3) Maintenance compartment door        | (4) Mounting bracket  |
| (5) External fan tray                   | (6) DC input terminal group 1 (PV1–PV8, controlled by DC SWITCH 1)    |
| (7) DC switch 1 (DC SWITCH 1)           | (8) DC input terminal group 2 (PV9–PV14, controlled by DC SWITCH 2)   |
| (9) DC switch 2 (DC SWITCH 2)           | (10) DC input terminal group 3 (PV15–PV20, controlled by DC SWITCH 3) |
| (11) DC switch 3 (DC SWITCH 3)          | (12) Ventilation valve  |
| (13) USB port (USB)                     | (14) Communications port (COM)  |
| (15) Hole for the AC output power cable | (16) Hole for the tracking system power cable                         |

## 2 Installation Requirements

### Angle



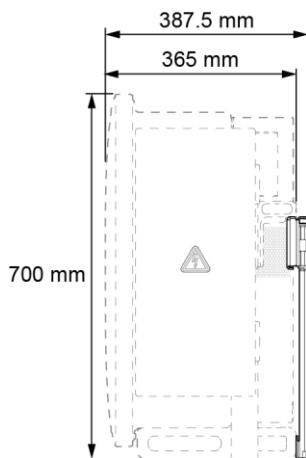
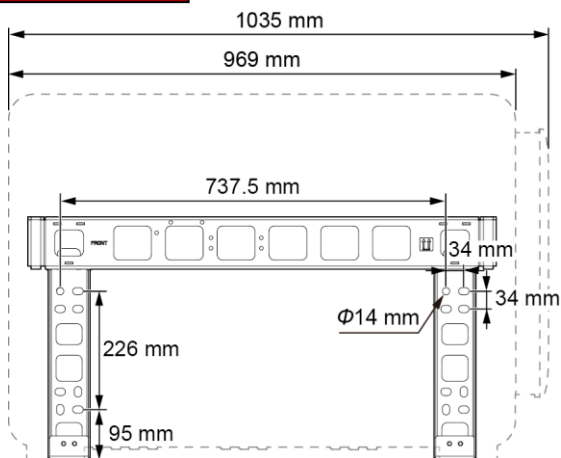
### Space



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Recommended:  $600 \text{ mm} \leq \text{Bottom space} \leq 730 \text{ mm}$

### Dimensions



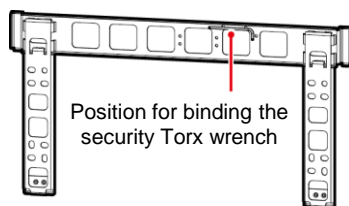
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## 3 Installing a Solar Inverter



### NOTE

- This quick guide describes how to install a solar inverter on a support. For details about wall-mounted installation, see the user manual.
- The M12x40 bolt assemblies are delivered with the solar inverter. If the bolt assembly length does not meet the installation requirements, prepare M12 bolt assemblies by yourself and use them together with the delivered M12 nuts.
- Before installing the mounting bracket, remove the security Torx wrench and set it aside.

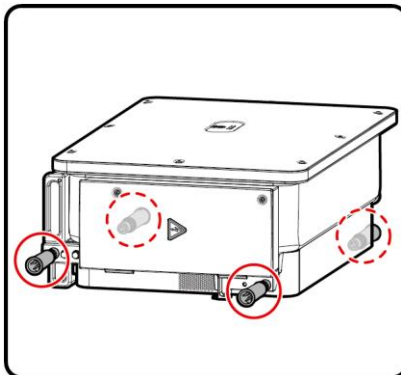


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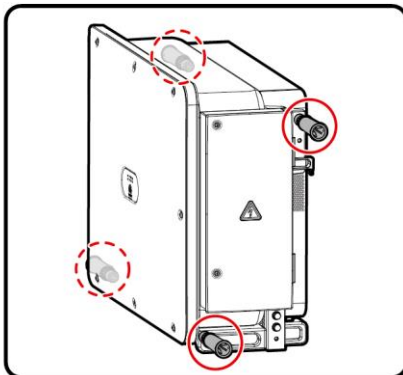
#### NOTICE

Use the handles to facilitate installation. Handles are optional and delivered separately. Ensure that the handles are securely installed. After the installation is complete, remove the handles and set them aside.

#### Installation Positions of Handles During Transportation

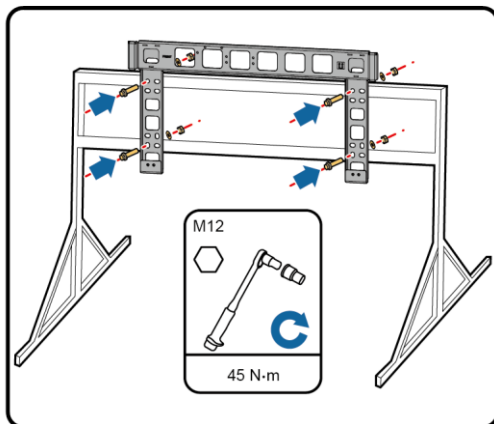
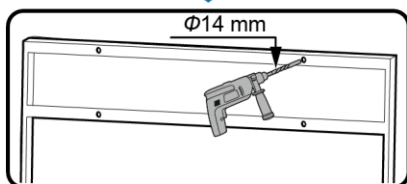
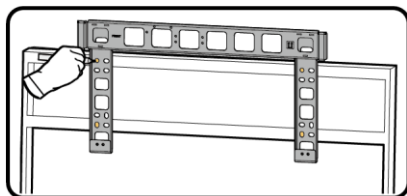


#### Installation Positions of Handles During Installation



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1. Install the mounting bracket.

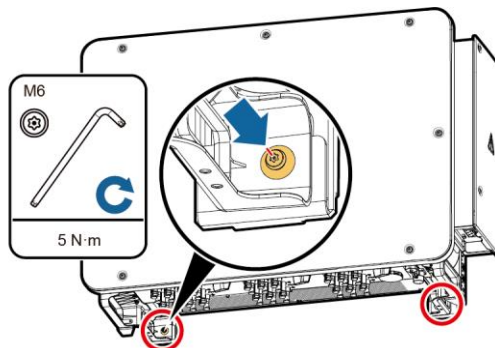
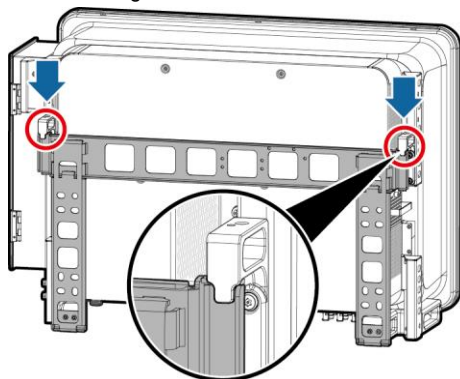


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It is recommended that anti-rust measures be taken on the positions for drilling holes.

2. Install the solar inverter onto the mounting bracket.

3. Tighten security Torx screws.



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## 4 Connecting Cables

### NOTICE

- Connect cables in accordance with the local installation laws and regulations.
- To prevent poor cable connection due to overstress, leave enough slack before connecting the cables to the appropriate ports.

### 4.1 Preparations



#### NOTE

$S$  and  $S_p$  are the conductor cross-sectional areas of AC power cables and PE cables respectively.

### 3-pin Model (125KTL) Cable Description

No.	Cable	Type	Recommended Conductor Cross-Sectional Area	Outer Diameter
1	PE cable	Outdoor cable and M10 OT/DT terminals	$S_p \geq S/2$	N/A
2	Tracking system power cable	Three-core outdoor copper cable with dual-layer protection	10 mm <sup>2</sup>	15–18 mm
3	AC output power cable (multi-core)	<ul style="list-style-type: none"> <li>• If you connect a ground cable to the ground point on the chassis shell, you are advised to use a three-core (L1, L2, and L3) outdoor cable and M12 OT/DT terminals (L1, L2, and L3).</li> <li>• If you connect a ground cable to the ground point in the maintenance compartment, you do not need to prepare a PE cable but are advised to use a four-core (L1, L2, L3, and PE) outdoor cable, M12 OT/DT terminals (L1, L2, and L3), and M10 OT/DT terminals (PE).</li> </ul>	<ul style="list-style-type: none"> <li>• Copper cable                             <ul style="list-style-type: none"> <li>– <math>S</math>: 95–185 mm<sup>2</sup></li> <li>– <math>S_p \geq S/2</math></li> </ul> </li> <li>• Aluminum alloy cable or copper-clad aluminum cable:                             <ul style="list-style-type: none"> <li>– <math>S</math>: 120–240 mm<sup>2</sup></li> <li>– <math>S_p \geq S/2</math></li> </ul> </li> </ul>	24–66 mm
	AC output power cable (single-core)	You are advised to use a single-core outdoor cable and M12 OT/DT terminals.	<ul style="list-style-type: none"> <li>• Copper cable                             <ul style="list-style-type: none"> <li>– <math>S</math>: 95–185 mm<sup>2</sup></li> </ul> </li> <li>• Aluminum alloy cable or copper-clad aluminum cable:                             <ul style="list-style-type: none"> <li>– <math>S</math>: 120–240 mm<sup>2</sup></li> </ul> </li> </ul>	14–32 mm
4	DC input power cable	PV cable that meets the 1100 V standard	4–6 mm <sup>2</sup>	4.5–7.8 mm
5	RS485 communications cable	Outdoor shielded twisted pair that meets the local standard	0.25–1 mm <sup>2</sup>	<ul style="list-style-type: none"> <li>• One or two communications cables: 4–11 mm</li> <li>• Three communications cables: 4–8 mm</li> </ul>

The value of  $S_p$  is valid only if the conductors of the PE cable and AC power cable use the same material. If the materials are different, ensure that the conductor of the PE cable with a proper cross-sectional area produces a conductance equivalent to that of the cable specified in the table.

## 4-pin Model (100KTL/110KTL) Cable Description

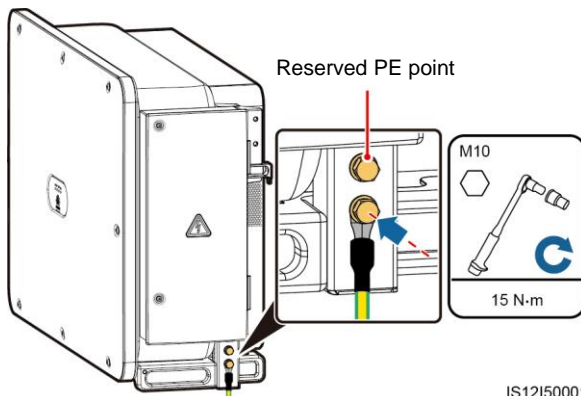
No.	Cable	Type	Recommended Conductor Cross-Sectional Area	Outer Diameter
1	PE cable	Outdoor cable and M10 OT/DT terminal	$S_p \geq S/2$	N/A
2	Tracking system power cable	Three-core outdoor copper cable with dual-layer protection	10 mm <sup>2</sup>	15–18 mm
3	AC output power cable (multi-core)	<ul style="list-style-type: none"> <li>If you connect a ground cable to the ground point on the chassis shell and the neutral wire is not used, you are advised to use a three-core (L1, L2, and L3) outdoor cable and M12 OT/DT terminals (L1, L2, and L3).</li> <li>If you connect a ground cable to the ground point in the maintenance compartment and the neutral wire is not used, you are advised to use a four-core (L1, L2, L3, and PE) outdoor cable, M12 OT/DT terminals (L1, L2, and L3), and M10 OT/DT terminals (PE).</li> <li>If you connect a ground cable to the ground point on the chassis shell and the neutral wire is used, you are advised to use a four-core (L1, L2, L3, and N) outdoor cable and M12 OT/DT terminals (L1, L2, L3, and N).</li> <li>If you connect a ground cable to the ground point in the maintenance compartment and the neutral wire is used, you are advised to use a five-core (L1, L2, L3, N, and PE) outdoor cable, M12 OT/DT terminals (L1, L2, L3, and N), and M10 OT/DT terminals (PE).</li> </ul>	<ul style="list-style-type: none"> <li>Copper cable <ul style="list-style-type: none"> <li>– S: 95–185 mm<sup>2</sup></li> <li>– <math>S_p \geq S/2</math></li> </ul> </li> <li>Aluminum alloy cable or copper-clad aluminum cable: <ul style="list-style-type: none"> <li>– S: 120–240 mm<sup>2</sup></li> <li>– <math>S_p \geq S/2</math></li> </ul> </li> </ul>	24–66 mm
	AC output power cable (single-core)	You are advised to use a single-core outdoor cable and M12 OT/DT terminals.	<ul style="list-style-type: none"> <li>Copper cable <ul style="list-style-type: none"> <li>– S: 95–185 mm<sup>2</sup></li> </ul> </li> <li>Aluminum alloy cable or copper-clad aluminum cable: <ul style="list-style-type: none"> <li>– S: 120–240 mm<sup>2</sup></li> </ul> </li> </ul>	14–32 mm
4	DC input power cable	PV cable that meets the 1100 V standard	4–6 mm <sup>2</sup>	4.5–7.8 mm
5	RS485 communications cable	Outdoor shielded twisted pair that meets the local standard	0.25–1 mm <sup>2</sup>	<ul style="list-style-type: none"> <li>One or two communications cables: 4–11 mm</li> <li>Three communications cables: 4–8 mm</li> </ul>

The value of  $S_p$  is valid only if the conductors of the PE cable and AC power cable use the same material. If the materials are different, ensure that the conductor of the PE cable with a proper cross-sectional area produces a conductance equivalent to that of the cable specified in the table.

## 4.2 Installing a PE Cable

### NOTE

- It is recommended that the PE cable of the solar inverter be connected to a nearby ground point. Connect the PE points of all solar inverters in the same array to ensure equipotential connections to PE cables.
- To enhance the corrosion resistance of a ground terminal, you are advised to apply silica gel or paint on it after connecting the PE cable.



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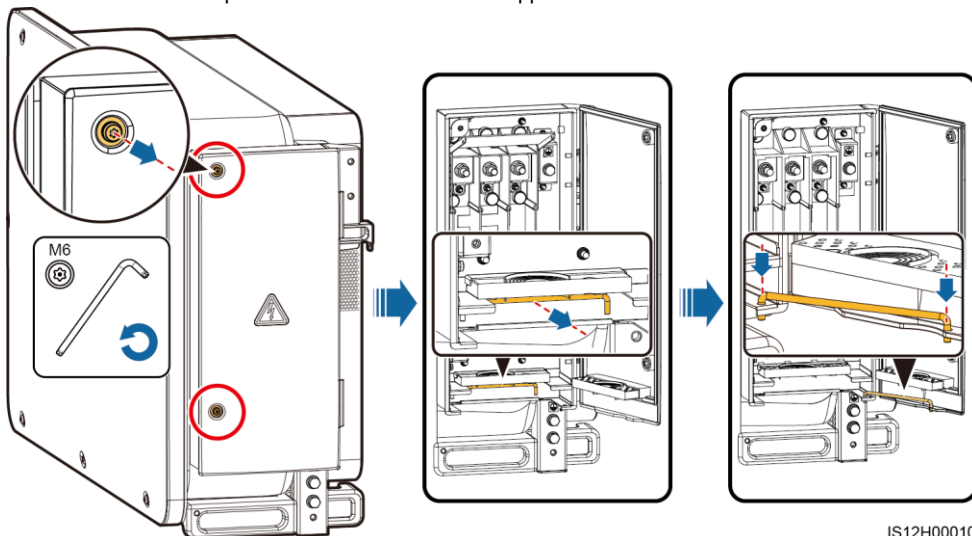
## 4.3 Opening the Maintenance Compartment Door

### WARNING

- Do not open the panel of the solar inverter.
- Before opening the maintenance compartment door, turn off the downstream AC output switch and three DC switches at the bottom.
- Do not open the maintenance compartment door in rainy or snowy days. If you have to, take protective measures to prevent rain or snow from entering the maintenance compartment.
- Do not leave unused screws in the maintenance compartment.

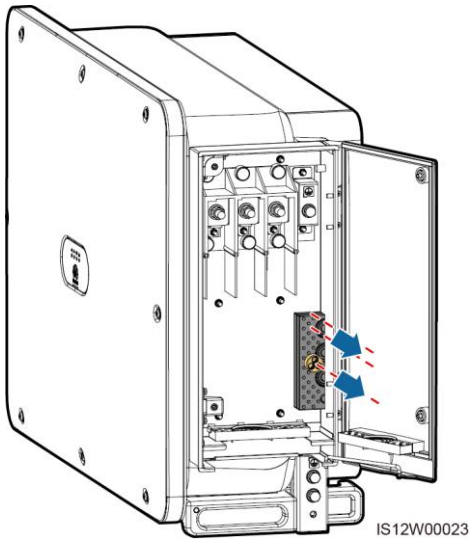
1. Loosen the screws on the maintenance compartment door.

2. Open the maintenance compartment door and adjust the support bar.

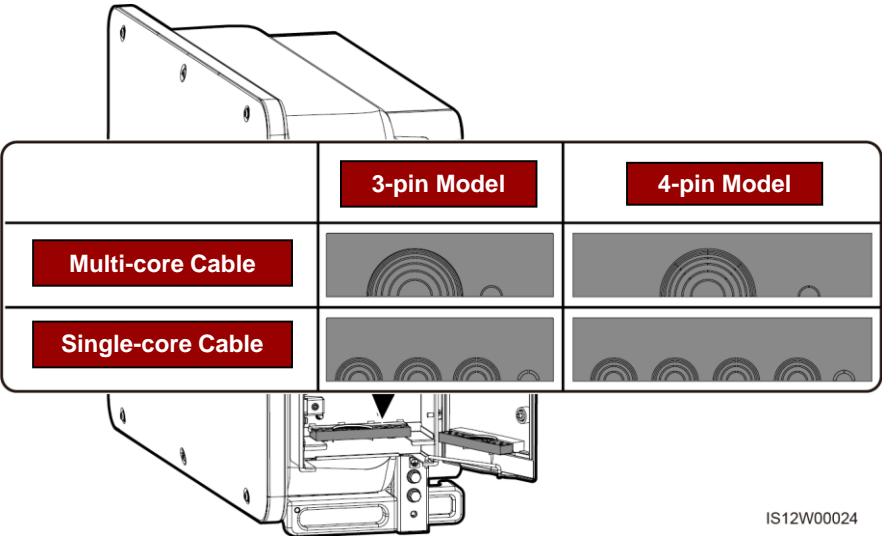


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3. Remove the accessories and set them aside.



4. Select a crimping module according to the type of the AC output power cable.

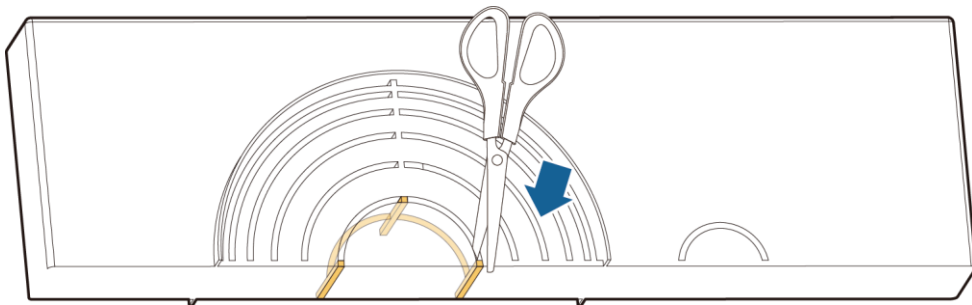


## 4.4 Removing the Rubber Rings from the Crimping Module

Use scissors to cut off the joints of the rubber rings to remove them. All rubber rings are removed in the same way.

### NOTICE

Remove the corresponding rubber rings strictly according to the cable diameter range, and ensure that the crimping module is not damaged. Otherwise, the protection level of the solar inverter will be affected.

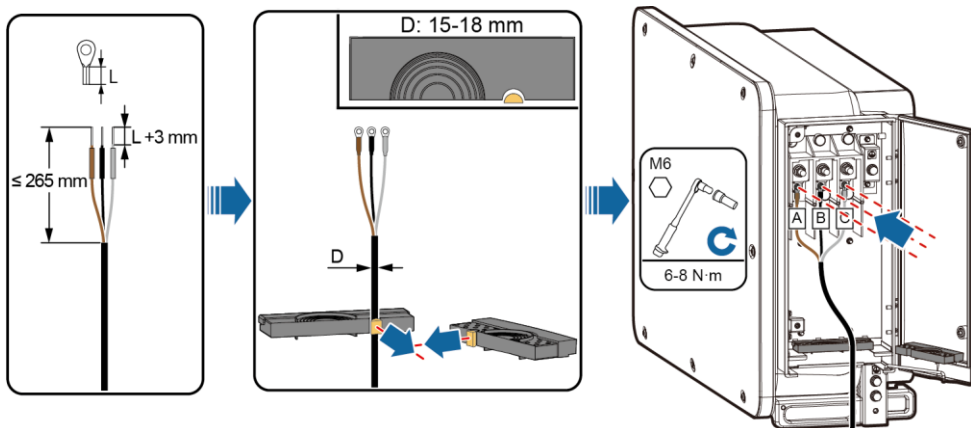


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## 4.5 (Optional) Installing the Tracking System Power Cable

### NOTICE

- The tracking system should be equipped with an overcurrent protective device or component. The length of the cable between the power cable terminal and the overcurrent protection device or component must be less than or equal to 2.5 m.
- The power supply of the tracking system should be an AC three-phase power grid.
- Keep inflammable materials away from the power cable.
- The power cable must be protected with a conduit to prevent short circuits caused by insulation layer damage.



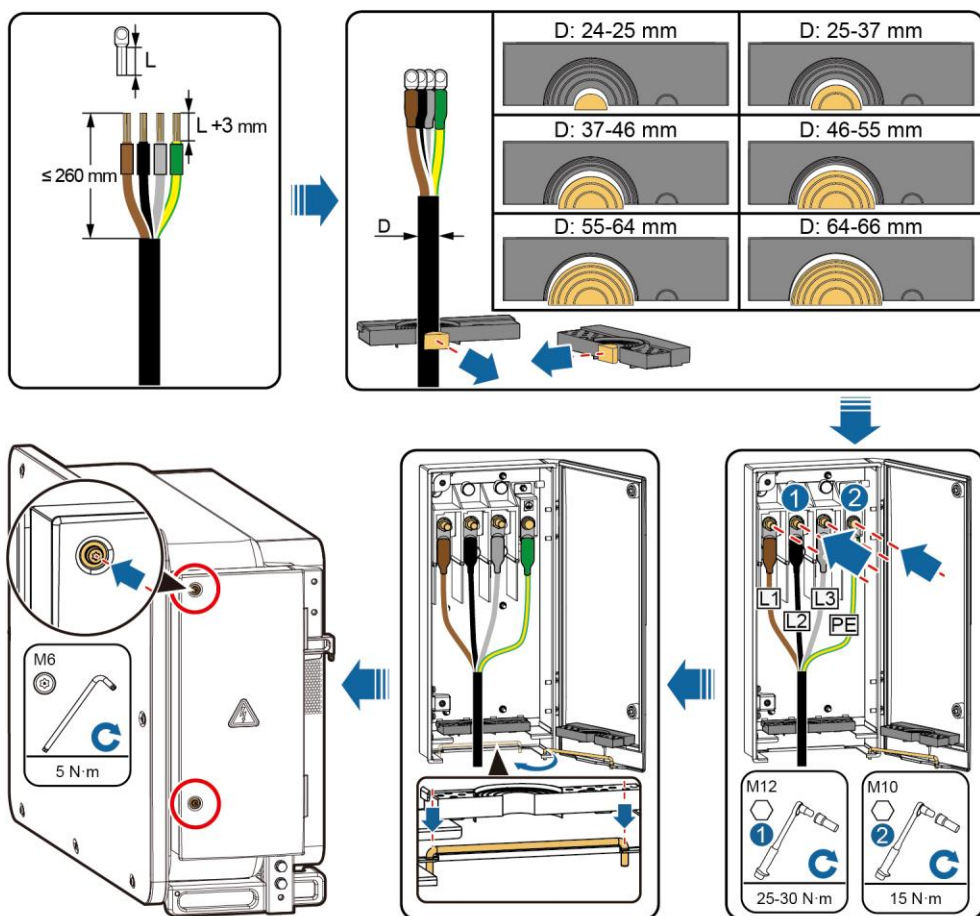
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## 4.6 Installing the AC Output Power Cable

### NOTICE

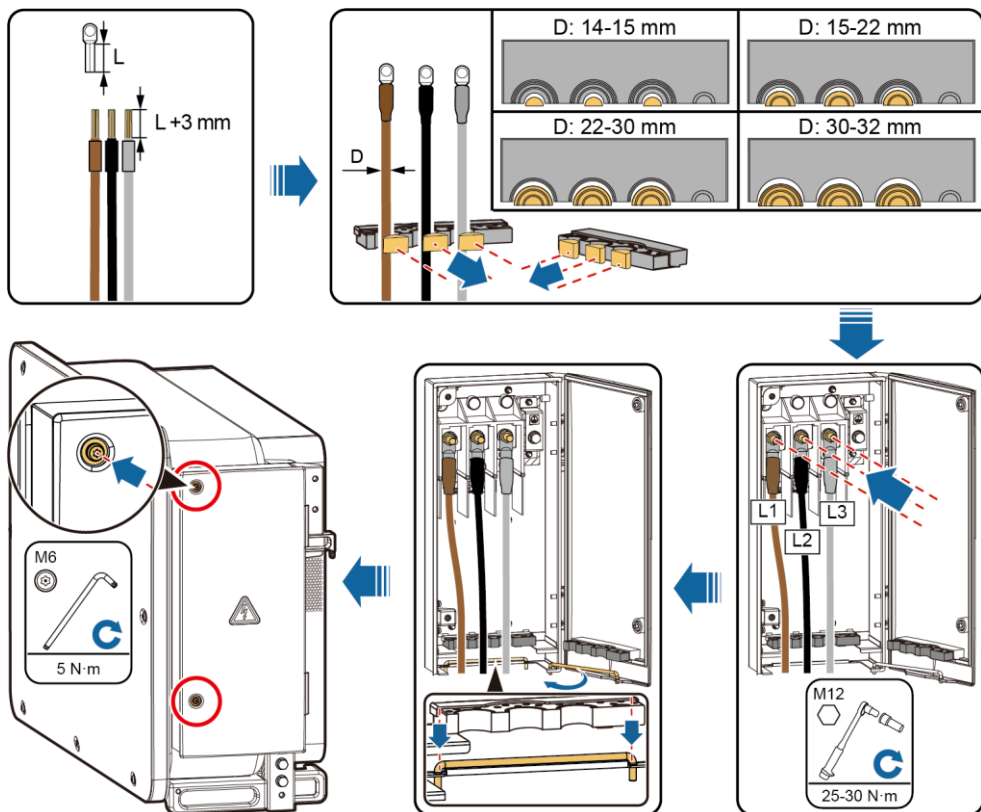
- This section describes how to install an AC output power cable for the 3-pin model.
- The cable outer diameter can be measured using the ruler sticker in the maintenance compartment.
- Ensure that the AC output power cable is secured. Failure to do so may cause the solar inverter to malfunction or damage to its terminal block by issues such as overheating.
- Sufficient slack should be provided in the PE cable to ensure that the last cable bearing the force is the PE cable when the AC output power cable bears pulling force due to force majeure.
- If a screw on the maintenance compartment door is lost, obtain the spare screw from the fitting bag tied at the bottom of the maintenance compartment.

### Multi-core Connection Method



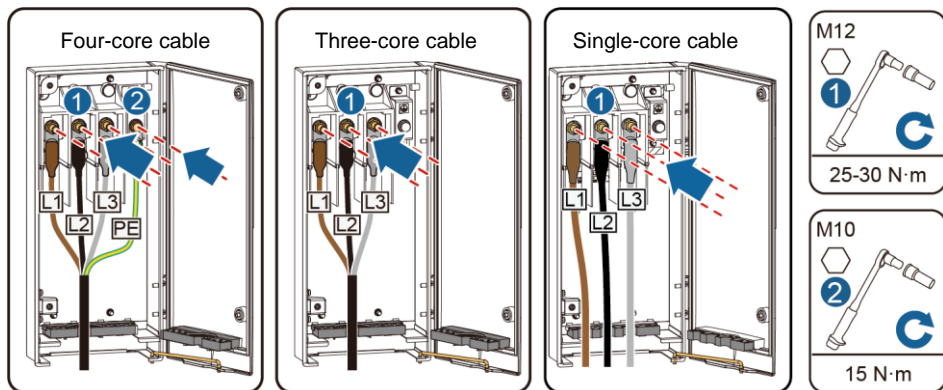
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## Single-core Connection Method



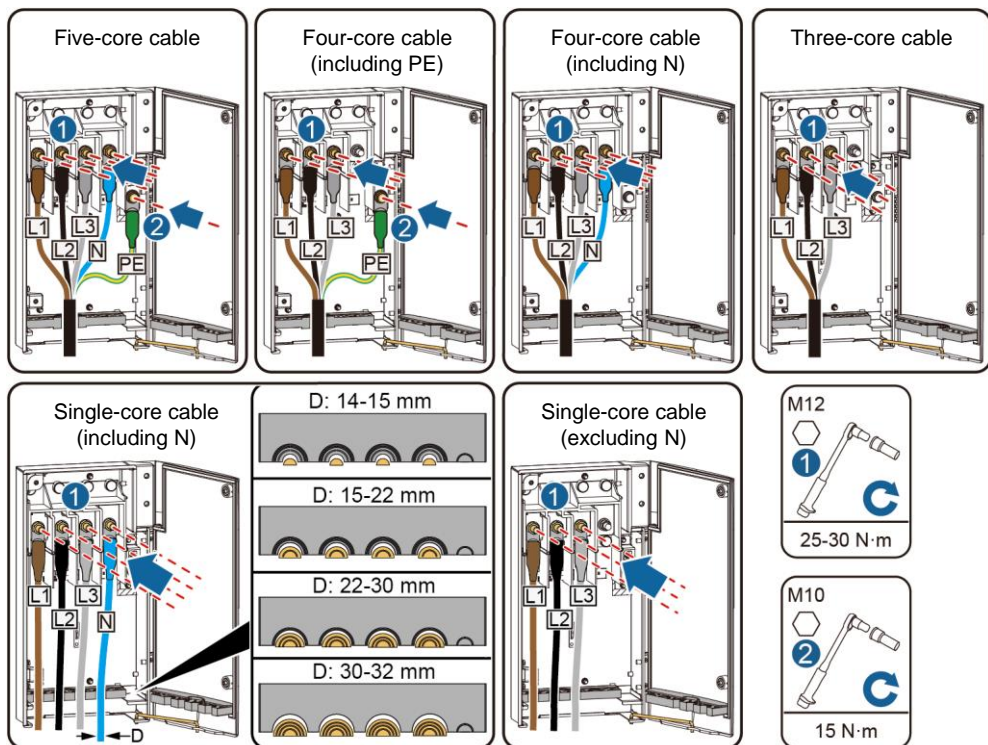
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## 3-pin Model (125KTL) Cable Connections



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## 4-pin Model (100KTL/110KTL) Cable Connections



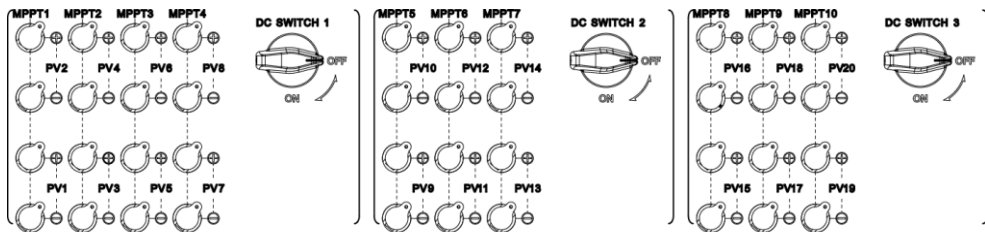
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## 4.7 Installing DC Input Power Cables

### Selecting DC Input Terminals

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

1. Evenly distribute the DC input power cables on the DC input terminals controlled by the three DC switches. DC SWITCH 1 is preferred.
2. Maximize the number of connected MPPT circuits.
3. Give preference to even-numbered DC input terminals.



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### WARNING

Ensure that the PV module output is well insulated to ground.

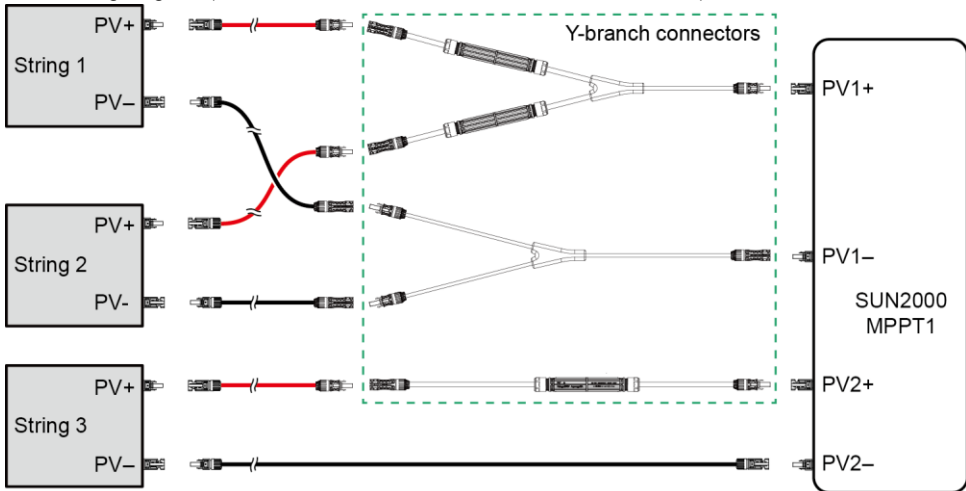
## Wiring Description of Y-branch Connectors

### NOTICE

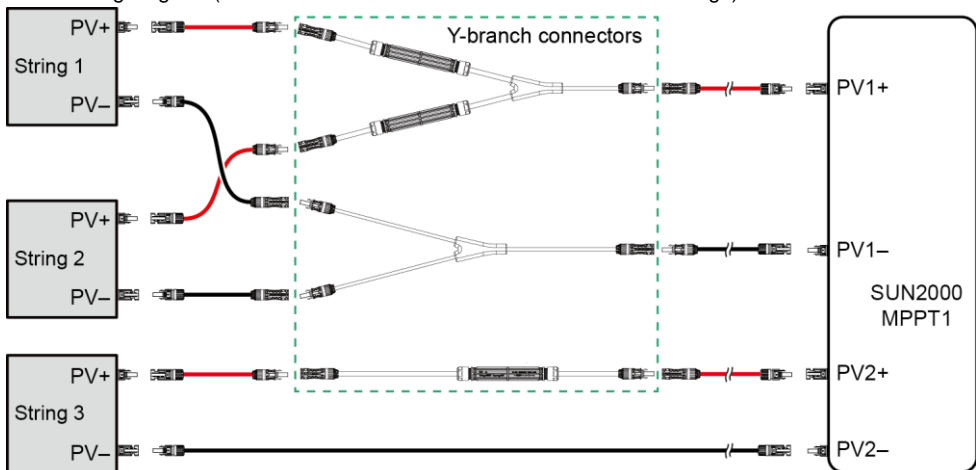
- When connecting cables using Y-branch connectors, ensure that all connectors are of the same model provided by the same vendor.
- If connectors of different vendors are connected to each other or different types of connectors of the same vendor are connected to each other without permission, the contact resistance of the connectors will exceed the allowed value. As a result, the connectors will be heated and oxidized continuously, which is prone to faults.
- When the Y-branch connector is used with the MC4 EVO2 contacts, you are advised to use the 32.6020-22100-HZ (Staubli) or the PV-CZM-22100 (Staubli) crimping tool. When choosing PV-CZM-22100 (Staubli), do not use the locator. Otherwise, the metal contacts would be damaged.

Wiring rules:

1. A maximum of one set of Y-branch connectors can be used for each MPPT.
2. The PV+ on the inverter side must be connected to the PV+ on the PV string side, and the PV- on the inverter side must be connected to the PV- on the string side.
  - a. Wiring diagram (with Y-branch connectors connected to the inverter)



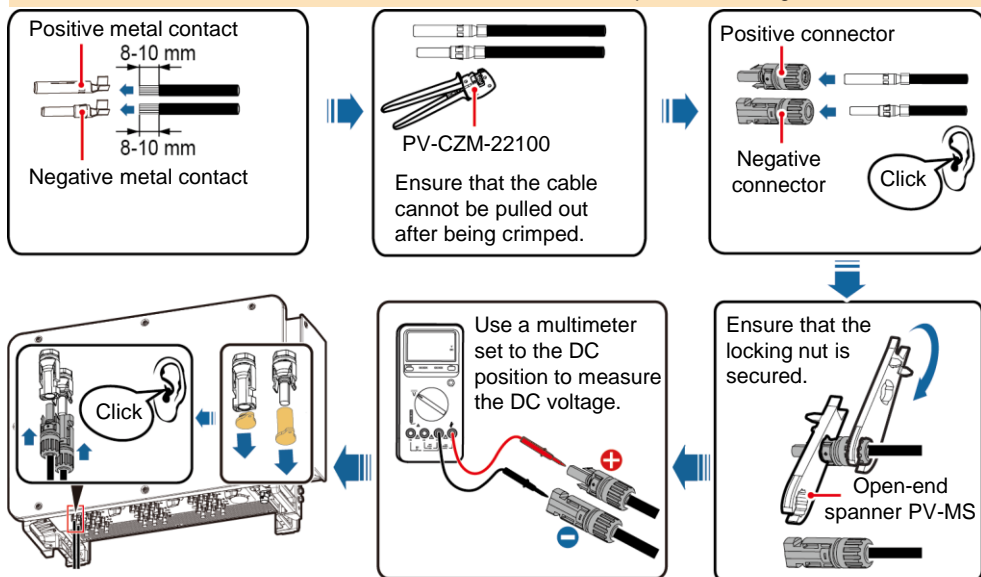
- b. Wiring diagram (with Y-branch connectors connected to the PV strings)



## Installing a DC input power cable

### NOTICE

1. Use the positive and negative Staubli MC4 metal contacts and DC connectors supplied with the solar inverter. Using incompatible positive and negative metal contacts and DC connectors may result in serious consequences. The caused device damage is not covered under any warranty.
2. Before connecting the DC input power cables, label the cable polarities to ensure correct cable connections. Otherwise, the solar inverter may be damaged.
3. Measure the voltage at the DC input end using a multimeter set to the DC position. If the voltage is a negative value, the DC input polarity is incorrect. Correct the polarity. If the voltage is greater than 1100 V, too many PV modules are configured to the same string. Remove some PV modules.
4. If the DC input power cable is reversely connected and the DC switches are set to ON, do not perform any operation on the switches or the positive and negative connectors. Otherwise, the device may be damaged. The caused device damage is not covered under any warranty. Wait until the solar irradiance weakens at night and the PV string current decreases below 0.5 A. Set the three DC switches to OFF, and correct the connection of positive and negative connectors.



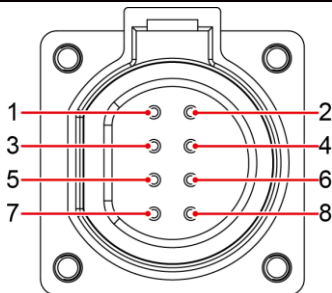
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## 4.8 Installing the RS485 Communications Cable

### NOTICE

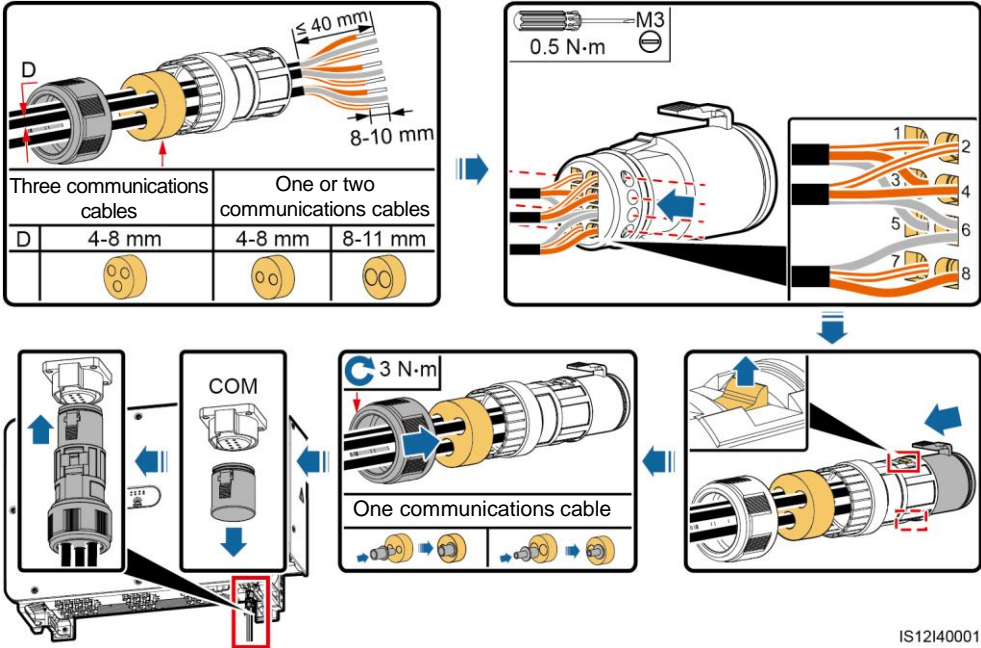
- The solar inverter supports RS485 communication and MBUS communication. If the MBUS communication mode is used, you do not need to connect the communications cable to the RS485-1 port.
- This section describes how to connect three communications cables.
- When routing communications cables, separate communications cables from power cables to prevent communication from being affected.

### Pin Definitions of Communications Ports



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Port	Pin	Definition	Pin	Definition	Description
RS485-1	1	RS485A IN, RS485 differential signal+	2	RS485A OUT, RS485 differential signal+	Used for cascading solar inverters or connecting to devices such as the SmartLogger.
	3	RS485B IN, RS485 differential signal–	4	RS485B OUT, RS485 differential signal–	
Protection ground	5	PE, shielding ground	6	PE, shielding ground	N/A
RS485-2	7	RS485A, RS485 differential signal+	8	RS485B, RS485 differential signal–	Used for connecting to RS485 slave devices.



## 5 Verifying the Installation





No.	Acceptance Criteria
1	The solar inverter is installed correctly and securely.
2	The DC switches and downstream AC switch are set to OFF.
3	All cables are connected correctly and securely.
4	Unused terminals and ports are locked by watertight caps.
5	The installation space is proper, and the installation environment is clean and tidy.
6	The maintenance compartment door is closed and secured.

## 6 Powering On the System

### NOTICE

Before turning on the AC switch between the solar inverter and the power grid, check that the AC voltage is within the specified range using a multimeter set to the AC position.

1. Turn on the AC switch between the solar inverter and the power grid.
2. Set DC SWITCH 1 (MAIN SWITCH) at the bottom of the solar inverter chassis to ON.
3. Check the status of the PV connection indicator. If it is steady green, set DC SWITCH 2 and DC SWITCH 3 to ON.
4. Observe the LED indicators to check the operating status of the solar inverter.

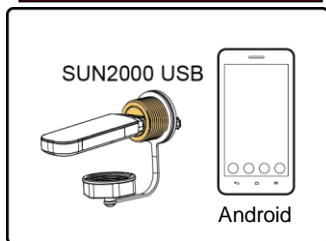
Indicator	Status (Blinking Fast: On for 0.2s and then Off for 0.2s; Blinking Slowly: On for 1s and then Off for 1s)		Description
PV connection indicator 	Steady green		At least one PV string is properly connected, and the DC input voltage of the corresponding MPPT circuit is at least 200 V.
	Blinking green fast		If the alarm/maintenance indicator is red, an environmental fault at the DC side of the solar inverter is generated.
	Off		The solar inverter disconnects from all PV strings, or the DC input voltage of all MPPT circuits is less than 200 V.
Grid connection indicator 	Steady green		The solar inverter is in grid-tied mode.
	Blinking green fast		If the alarm/maintenance indicator is red, an environmental fault (excluding <b>Grid Loss</b> ) at the AC side of the solar inverter is generated.
	Off		The solar inverter is not in grid-tied mode (due to reasons including <b>Grid Loss</b> ).
Communications indicator 	Blinking green fast		The solar inverter receives communication data normally.
	Off		The solar inverter has not received communication data for 10 seconds.
Alarm/Maintenance indicator 	Alarm status	Steady red	A major alarm is generated. <ul style="list-style-type: none"> <li>• If the PV connection indicator or grid connection indicator is blinking green fast, troubleshoot DC or AC environmental faults as instructed by the SUN2000 app.</li> <li>• If the PV connection indicator and grid connection indicator are both not blinking green fast, replace components or the solar inverter as instructed by the SUN2000 app.</li> </ul>
		Blinking red fast	A minor alarm is generated.
		Blinking red slowly	A warning alarm is generated.
	Local maintenance status	Steady green	Local maintenance succeeds.
		Blinking green fast	Local maintenance fails.
		Blinking green slowly	In local maintenance or shuts down over a command.

# 7 SUN2000 App

## NOTE

1. The SUN2000 app is a mobile phone app that communicates with the solar inverter over a WLAN module, a Bluetooth module, or a USB data cable. As a convenient local monitoring and maintenance platform, it allows for querying alarms, configuring parameters, and performing routine maintenance. The app is named SUN2000.
2. Access Huawei application store (<https://appstore.huawei.com>) or Google Play (<https://play.google.com>), search for **SUN2000**, and download the app installation package.
3. Connect the WLAN module, Bluetooth module, or USB data cable to the USB port on the solar inverter to ensure that the solar inverter can communicate with the SUN2000 app.

### WLAN Connection or Bluetooth Connection



### USB Data Cable Connection

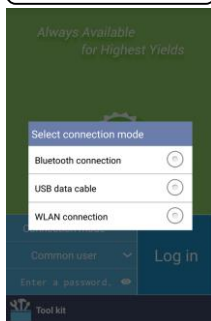


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#### Login Page



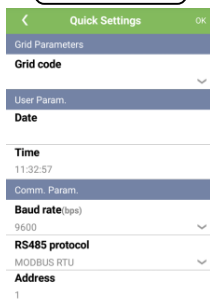
#### Select Connection Mode



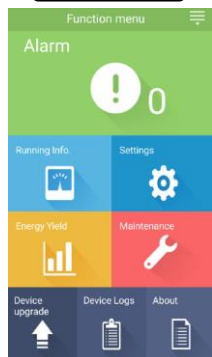
#### Select User



#### Quick Settings



#### Function Menu



## NOTICE

- The screenshots in this document correspond to app version 3.2.00.001 (this app is available only on Android phones currently).
- When the WLAN connection is used, the initial name of the WLAN hotspot is **Adapter-WLAN module SN**, and the initial password is **Changeme**.
- The initial password to log in to the app for **Common User**, **Advanced User**, and **Special User** is **00000a**.
- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- Set the correct grid code based on the application area and scenario of the solar inverter.

