

HUAWEI SUN2000-36KTL-M3 Smart String Solar Inverter User Guide

[Home](#) » [Huawei](#) » HUAWEI SUN2000-36KTL-M3 Smart String Solar Inverter User Guide 

*HUAWEI SUN2000-36KTL-M3 Smart String
Solar Inverter User Guide*

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

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 qualified and trained electrical technicians 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).

Contents

[1 1 Overview](#)

[2 2 Installation Requirements](#)

[3 3 Installing a Solar Inverter](#)

[4 4 Connecting Cables](#)

[4.1 4.1 Preparations](#)

[4.2 4.2 Connecting a PE Cable](#)

[4.3 4.3 Installing the AC Output Power Cable](#)

[4.4 4.4 Installing DC Input Power Cables](#)

[4.5 4.5 \(Optional\) Installing the Smart Dongle](#)

[4.6 4.6 Installing the Signal Cable](#)

[5 5 Verifying the Installation](#)

[6 6 System Power-On](#)

[7 7 System Commissioning](#)

[7.1 7.1 Scenario in Which Solar Inverters Are Connected to the FusionSolar Smart PV Management System](#)

[7.2 7.2 Scenario in Which Solar Inverters Are Connected to Other Management Systems](#)

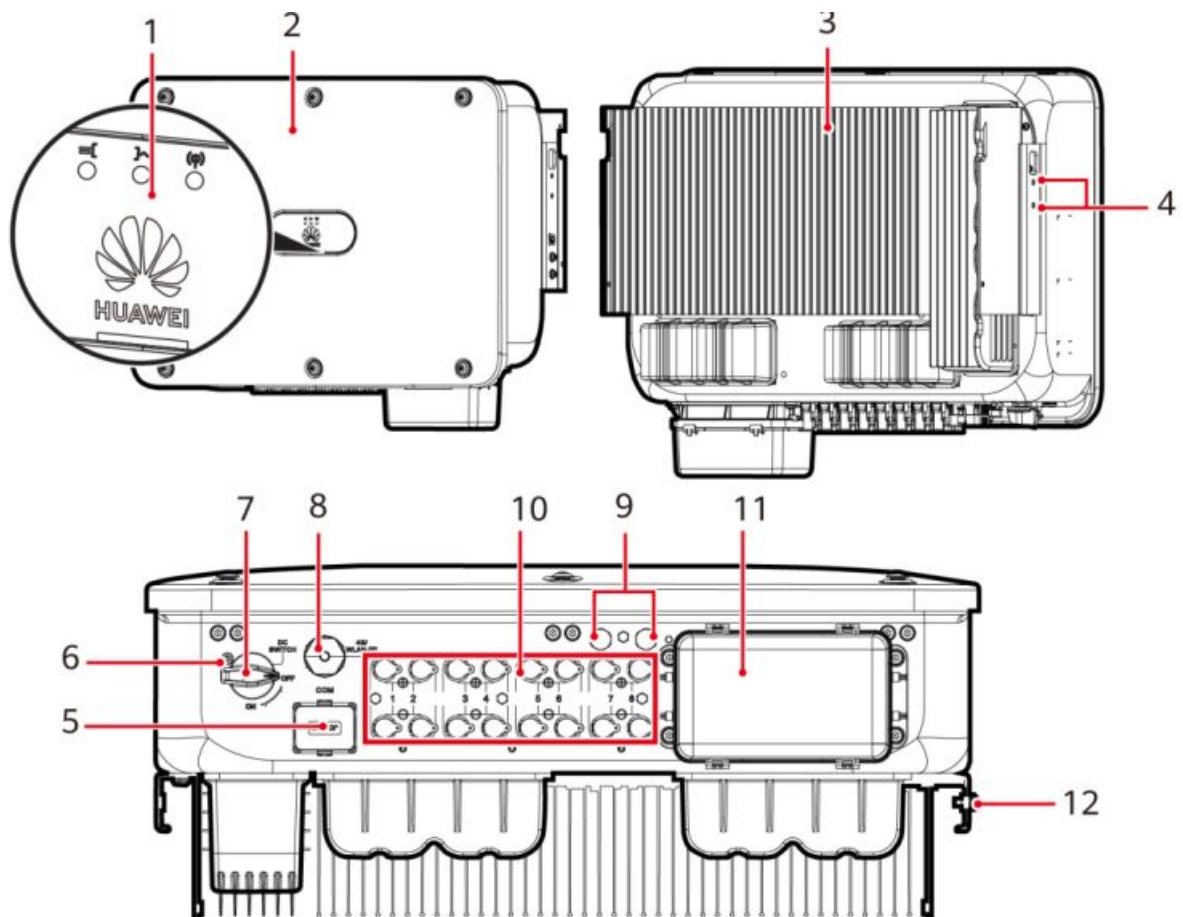
[7.3 7.3 Inverter Connected to Optimizers](#)

[8 8 FAQ: How Do I Reset the Password?](#)

[9 Documents / Resources](#)

[10 Related Posts](#)

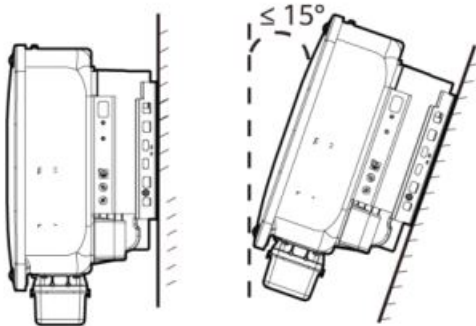
1 Overview



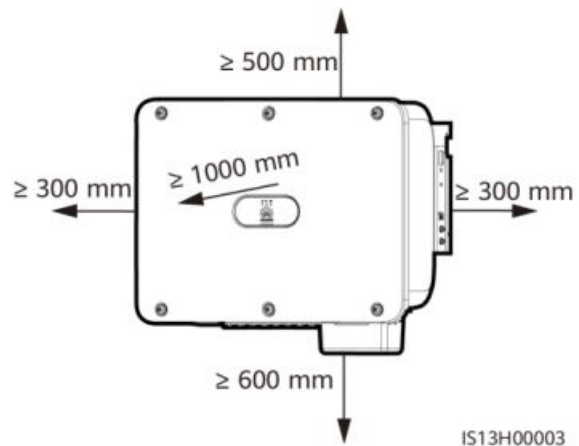
1. LED indicators
2. Host panel
3. Heat sink
4. Screws for fixing the awning
5. Communications port (COM)
6. Hole for the DC switch locking screw
7. DC switch (DC SWITCH)
8. Smart Dongle port (4G/WLAN-FE)
9. Ventilation valves
10. DC input terminals (PV1–PV8)
11. AC output port
12. Ground point

2 Installation Requirements

Angle

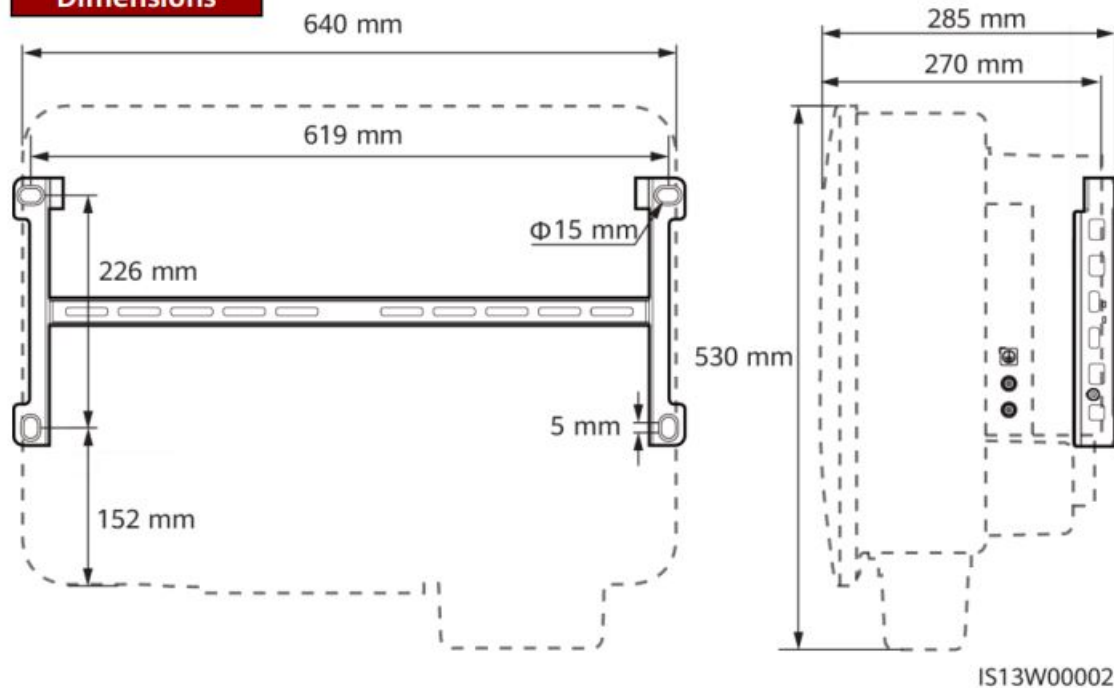


Space



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Dimensions

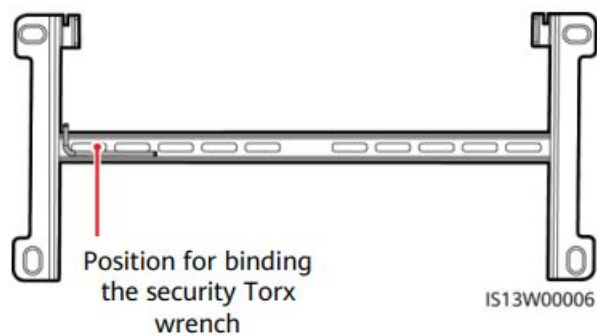


IS13W00002

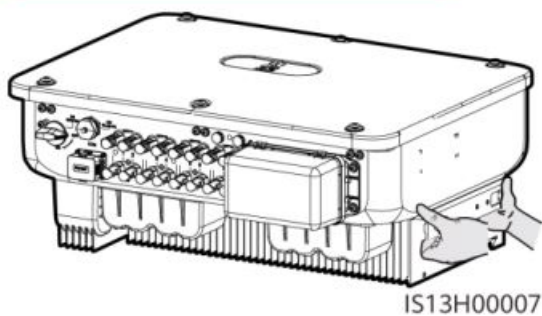
3 Installing a Solar Inverter

NOTE

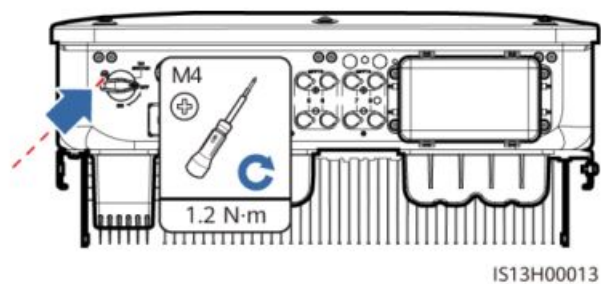
- M12x40 bolt assemblies are supplied with the solar inverter. If the bolt length does not meet the installation requirements, prepare M12 bolt assemblies by yourself and use them together with the supplied M12 nuts.
- This quick guide describes how to install a solar inverter on a support. For details about wall mounted installation, see the user manual.
- For models used in Australia, install the DC switch locking screw according to local standards. The DC switch locking screw is delivered with the solar inverter to prevent the solar inverter from being started by mistake.
- Before installing the mounting bracket, remove the security Torx wrench and set it aside.



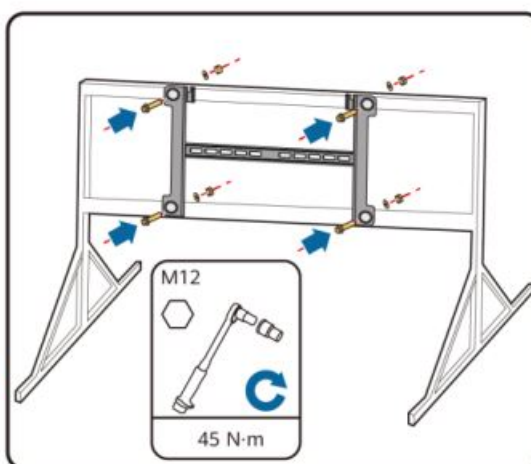
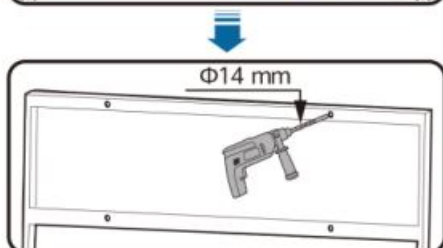
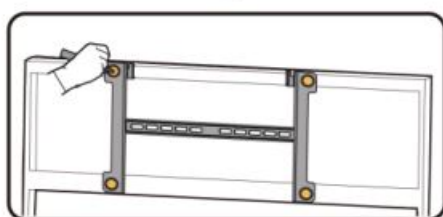
Moving the Solar Inverter



(Optional) Installing the DC Switch Locking Screw



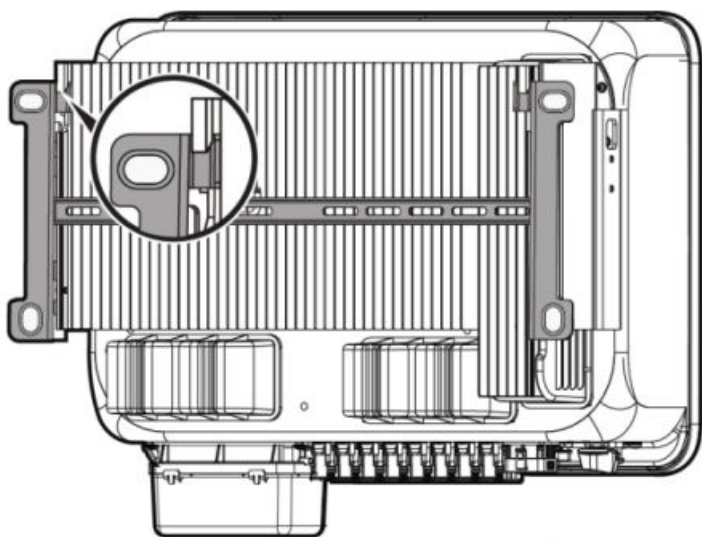
1. Install the mounting bracket.



NOTE

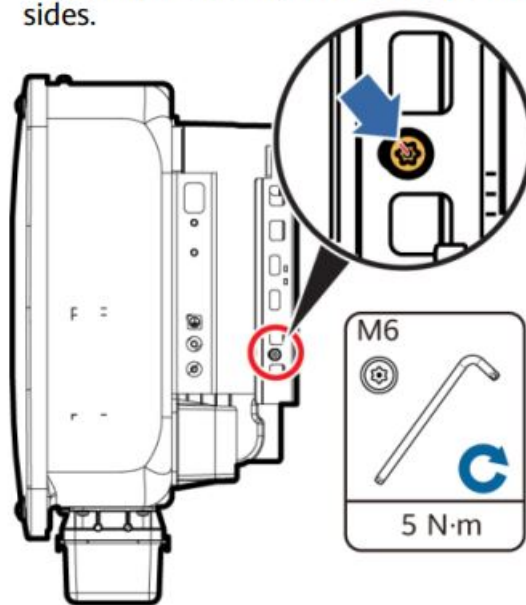
It is recommended that anti-rust measures be taken on the positions for drilling holes.

2. Install the solar inverter onto the mounting bracket.



IS13H00010

3. Tighten the security Torx screws on both sides.



IS13H00011

NOTICE

Secure the screws on the sides before connecting cables.

4 Connecting Cables

4.1 Preparations

NOTICE

- Connect cables in accordance with local installation laws and regulations.
- The cable specifications must comply with local standards.
- Before connecting cables, ensure that the DC switch of the solar inverter and all the switches connected to it are set to OFF. Otherwise, the high voltage produced by the solar inverter may cause electric shocks.

No.	Cable	Type	Specifications
1	PE cable	Single-core outdoor copper-core cable	Conductor cross-sectional area $\geq 16 \text{ mm}^2$
2	AC output power cable	Outdoor copper-core/aluminum-core cable	<ul style="list-style-type: none"> • Conductor cross-sectional area: $16\text{-}50 \text{ mm}^2$ outdoor copper-core cable or $35\text{-}50 \text{ mm}^2$ outdoor aluminum-core cable^a • Cable outer diameter: $16\text{-}38 \text{ mm}$
3	DC input power cable	Common outdoor PV cable in the industry (recommended model: PV1-F)	<ul style="list-style-type: none"> • Conductor cross-sectional area: $4\text{-}6 \text{ mm}^2$ • Cable outer diameter: $5.5\text{-}9 \text{ mm}$
4	(Optional) RS485 communications cable	Two-core outdoor shielded twisted pair (recommended model: DJYP2VP2-2x2x0.75)	<ul style="list-style-type: none"> • Conductor cross-sectional area: $0.2\text{-}1 \text{ mm}^2$ • Cable outer diameter: $4\text{-}11 \text{ mm}$
Note a: Five-core cables with a cross-sectional area of $5 \times 35 \text{ mm}^2$ or $5 \times 50 \text{ mm}^2$ are not supported.			

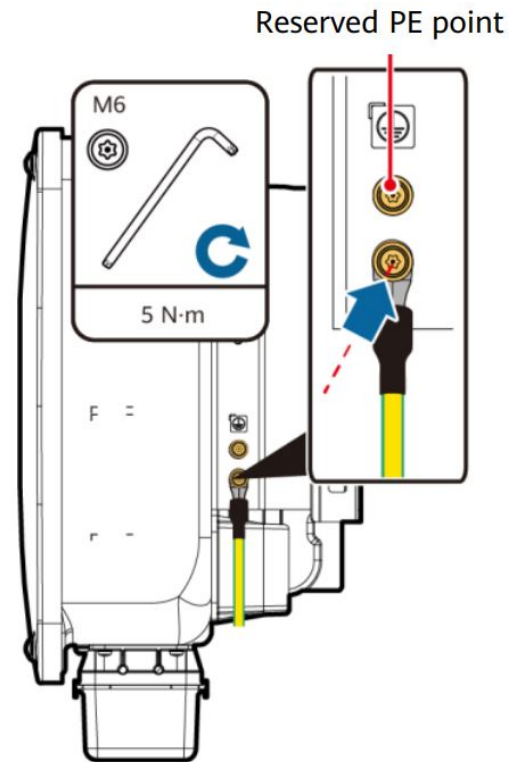
4.2 Connecting a PE Cable

DANGER

Do not connect the neutral wire to the enclosure as a PE cable. Otherwise, electric shocks may occur.

NOTE

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

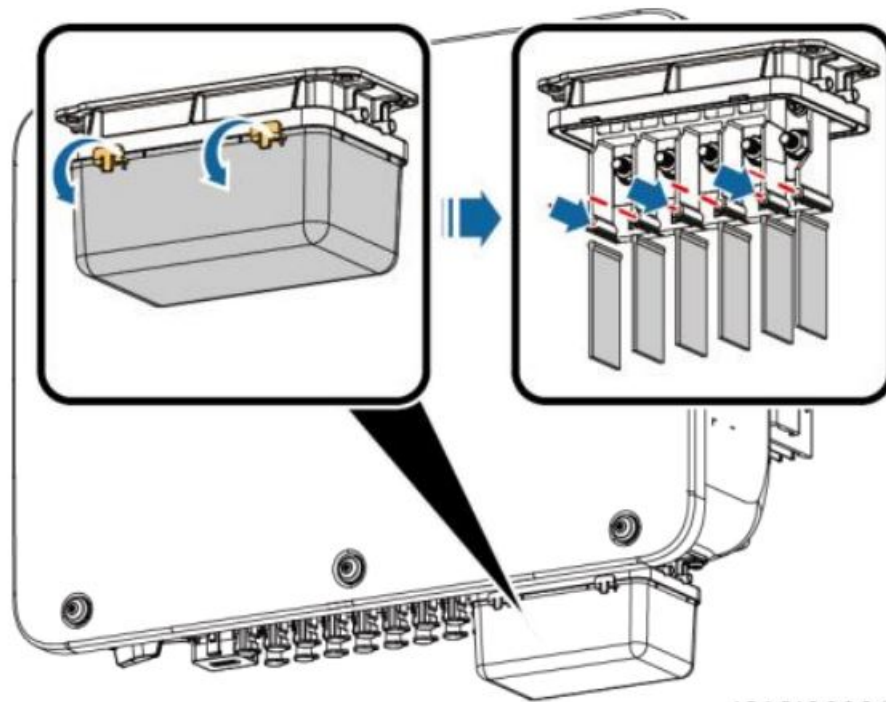


4.3 Installing the AC Output Power Cable

NOTICE

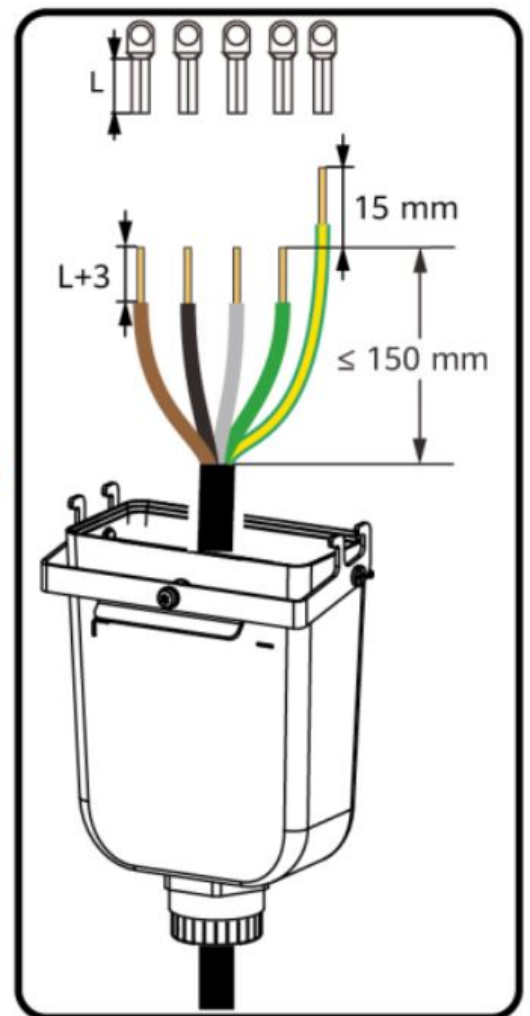
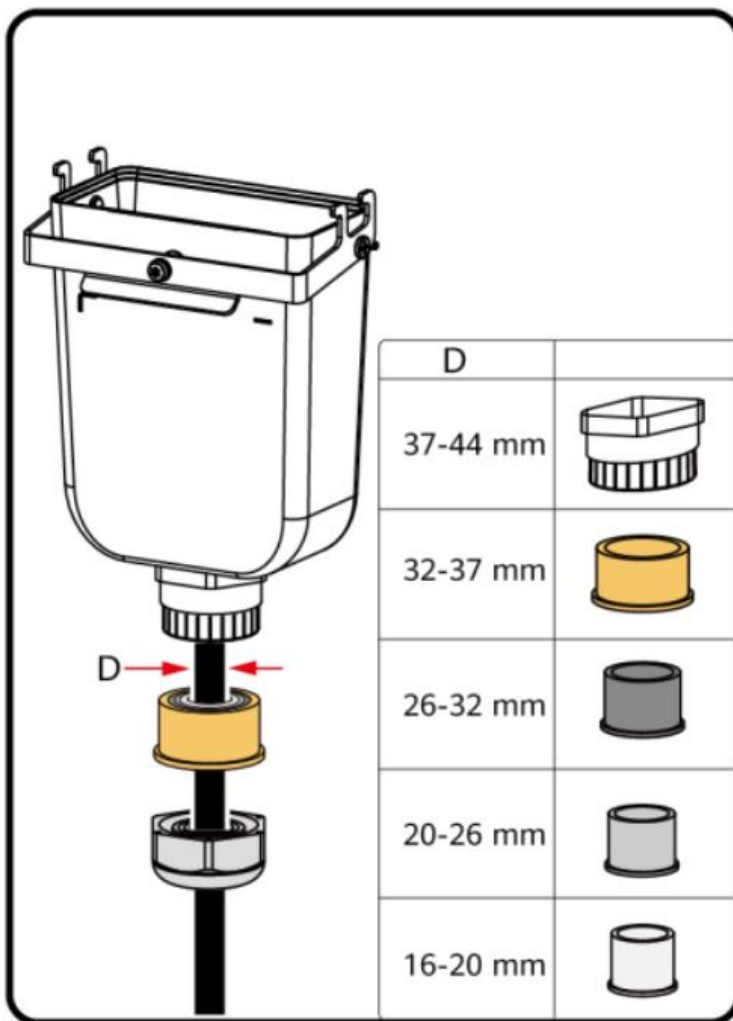
- Use a socket wrench and extension rod to connect the AC power cable. The extension rod must be longer than 100 mm.
- Sufficient slack should be provided in the PE cable to ensure that the last cable bearing the force is the PE cable when the AC output power cable bears pulling force due to force majeure.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

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



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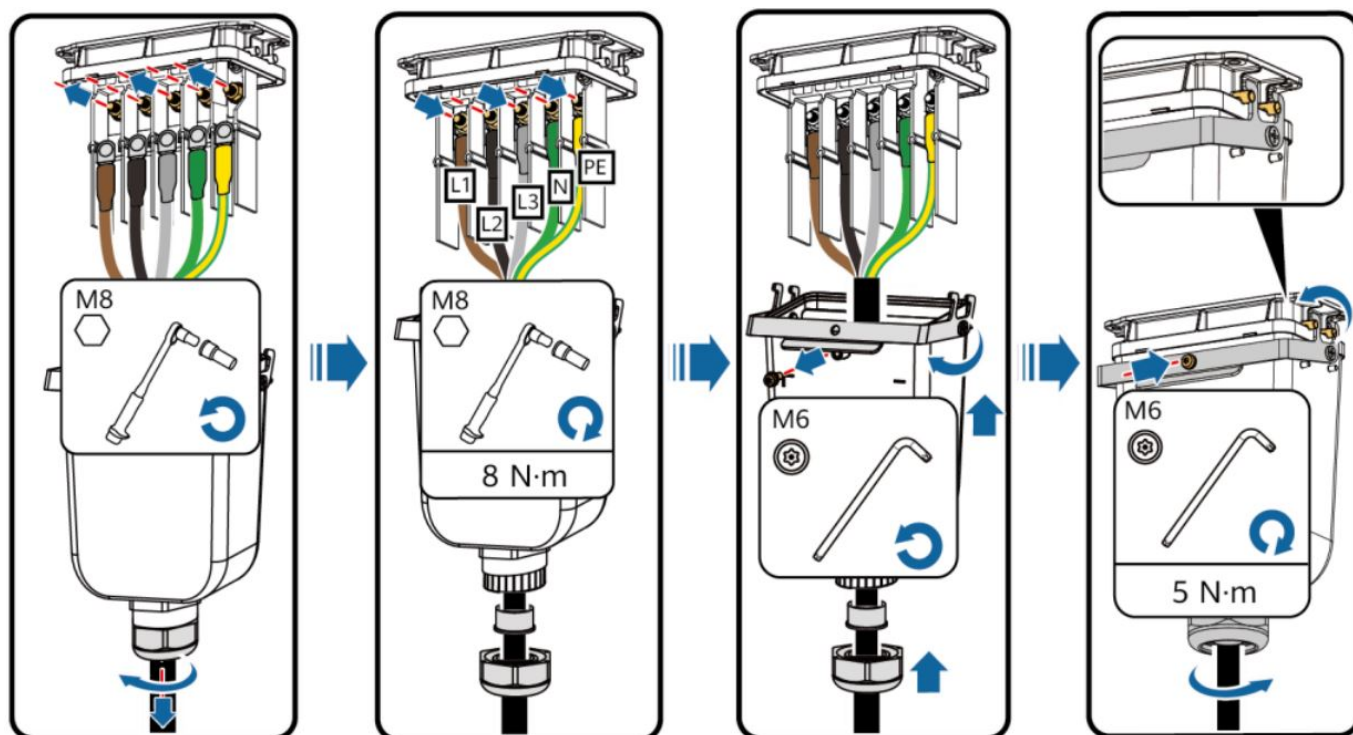
2. Connect the AC output power cable (using a five-core cable as an example).



IS13I20003

NOTE

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



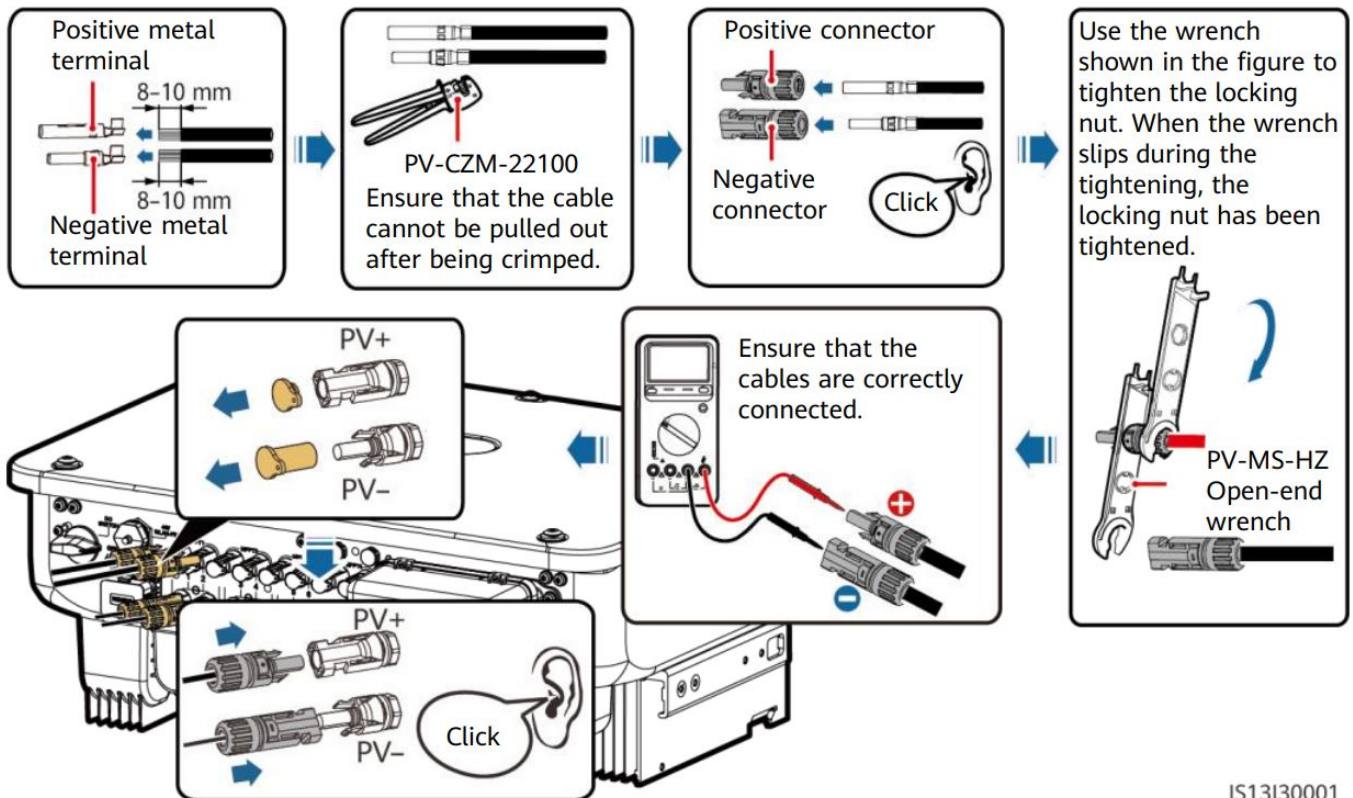
4.4 Installing DC Input Power Cables

NOTICE

1. Use the positive and negative Staubli MC4 metal terminals and DC connectors supplied with the solar inverter. 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.
2. You are advised to use the PV-CZM-22100 (Staubli) crimping tool and do not use it with the positioning block. Otherwise, the metal terminals may be damaged. The PV-MS (Staubli) or PV-MS-HZ (Staubli) open-end wrench is recommended.
3. Ensure that the PV module output is well insulated to ground.
4. The DC input voltage of the SUN2000-29.9KTL /30KTL / 36KTL/40KTL-M3 shall not exceed 1100 V DC under any circumstance.
5. The DC input voltage of the SUN2000-20KTL-M3 shall not exceed 800 V DC under any circumstance.
6. Before installing DC input power cables, label the cable polarities to ensure correct cable connections.
7. If a DC input power cable is reversely connected and the DC switch is turned on, do not operate on the DC switch or the positive/negative connectors immediately. Otherwise, the device may be damaged. The caused device damage is not covered under any warranty. Wait until the night when solar irradiance declines and the PV string current drops to below 0.5 A.
Then set the DC switch to the OFF position, remove the positive and negative connectors, and correct the polarity of the DC input power cable.
8. If the SUN2000 is used with an optimizer, the number of optimizers for a single PV string cannot exceed 25.

9. If the PV string is configured with an optimizer, check the cable polarity by referring to the smart PV optimizer quick guide.

1. Connect the DC power cables.



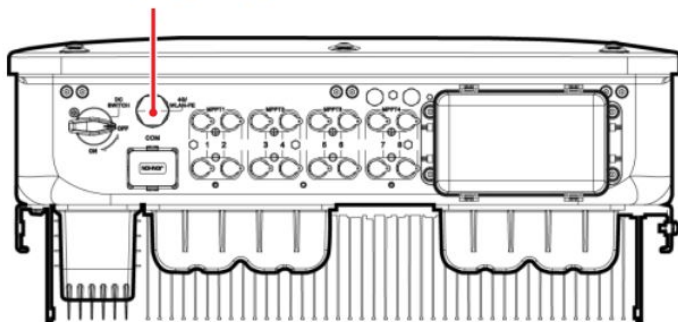
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4.5 (Optional) Installing the Smart Dongle

NOTICE

- The Smart Dongle is not provided in standard configuration.
- For details about how to operate the WLAN-FE Smart Dongle SDongleA-05, see SDongleA05 Quick Guide (WLAN-FE).
- For details about how to operate the 4G Smart Dongle SDongleA-03, see SDongleA-03 Quick Guide (4G).
- The quick guide is delivered with the Smart Dongle or can be obtained by scanning the QR codes.

Smart Dongle port (4G/WLAN-FE)

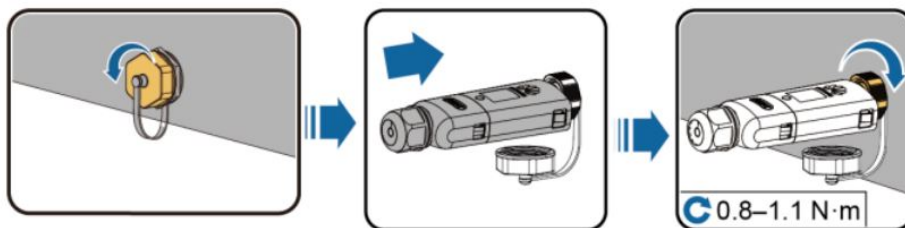


WLAN-FE



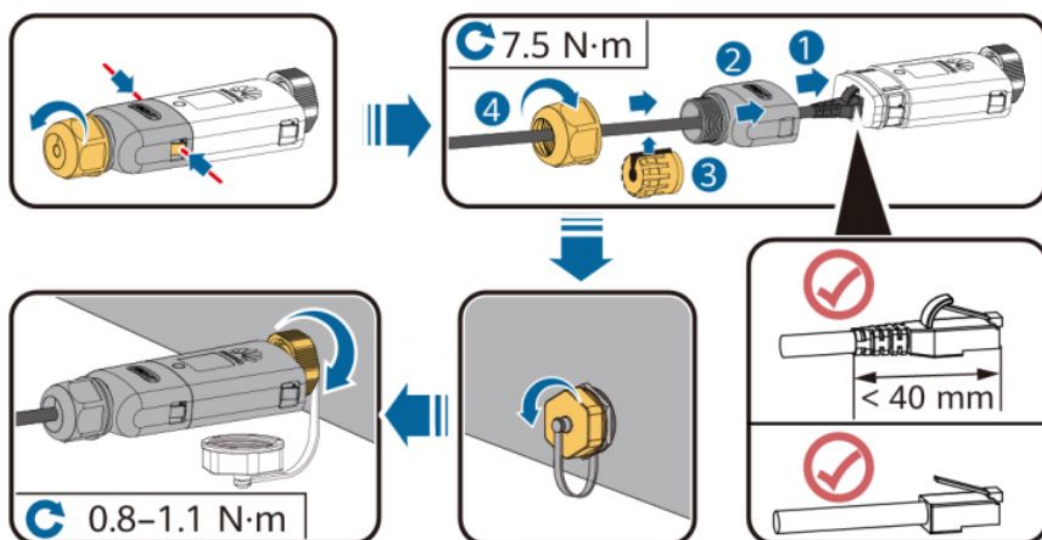
4G

WLAN-FE Smart Dongle (WLAN Communication)



IL04H00005

WLAN-FE Smart Dongle (FE Communication)



IL04H00004

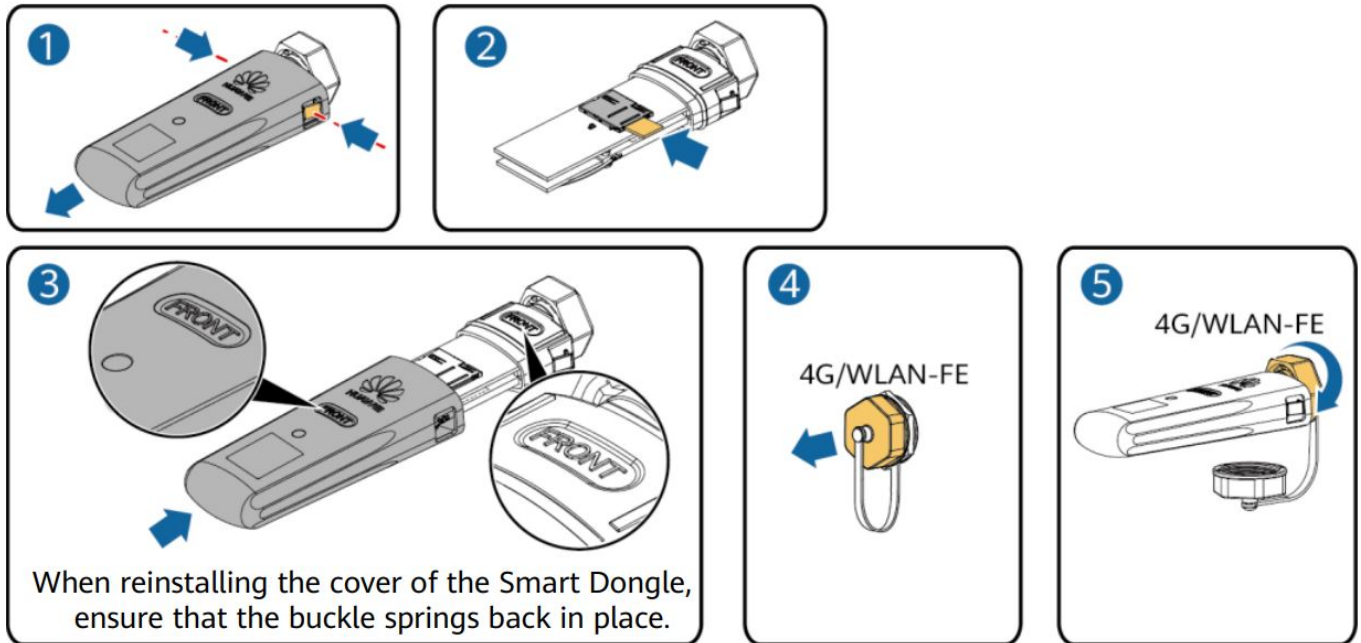
NOTICE

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

4G Smart Dongle

NOTICE

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



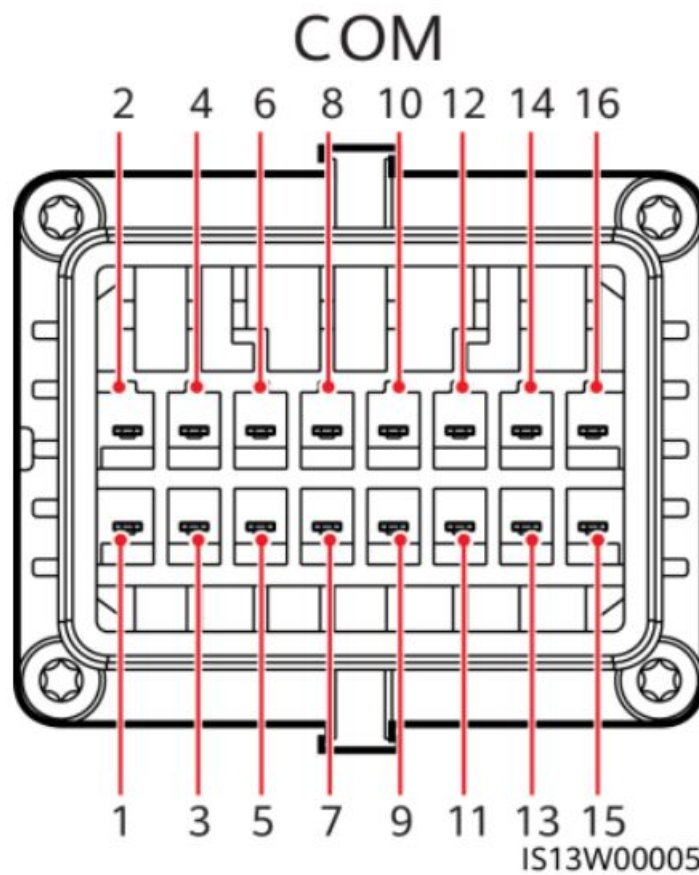
IS10H00016

4.6 Installing the Signal Cable

NOTICE

- When laying out the signal cable, separate it from the power cable and keep it away from strong interference sources to avoid strong communication interference.
- Ensure that the protective layer of the cable is inside the connector, that excess core wires are cut off from the protection layer, that the exposed core wire is totally inserted into the cable hole, and that the cable is connected securely.

COM Port Pin Definitions

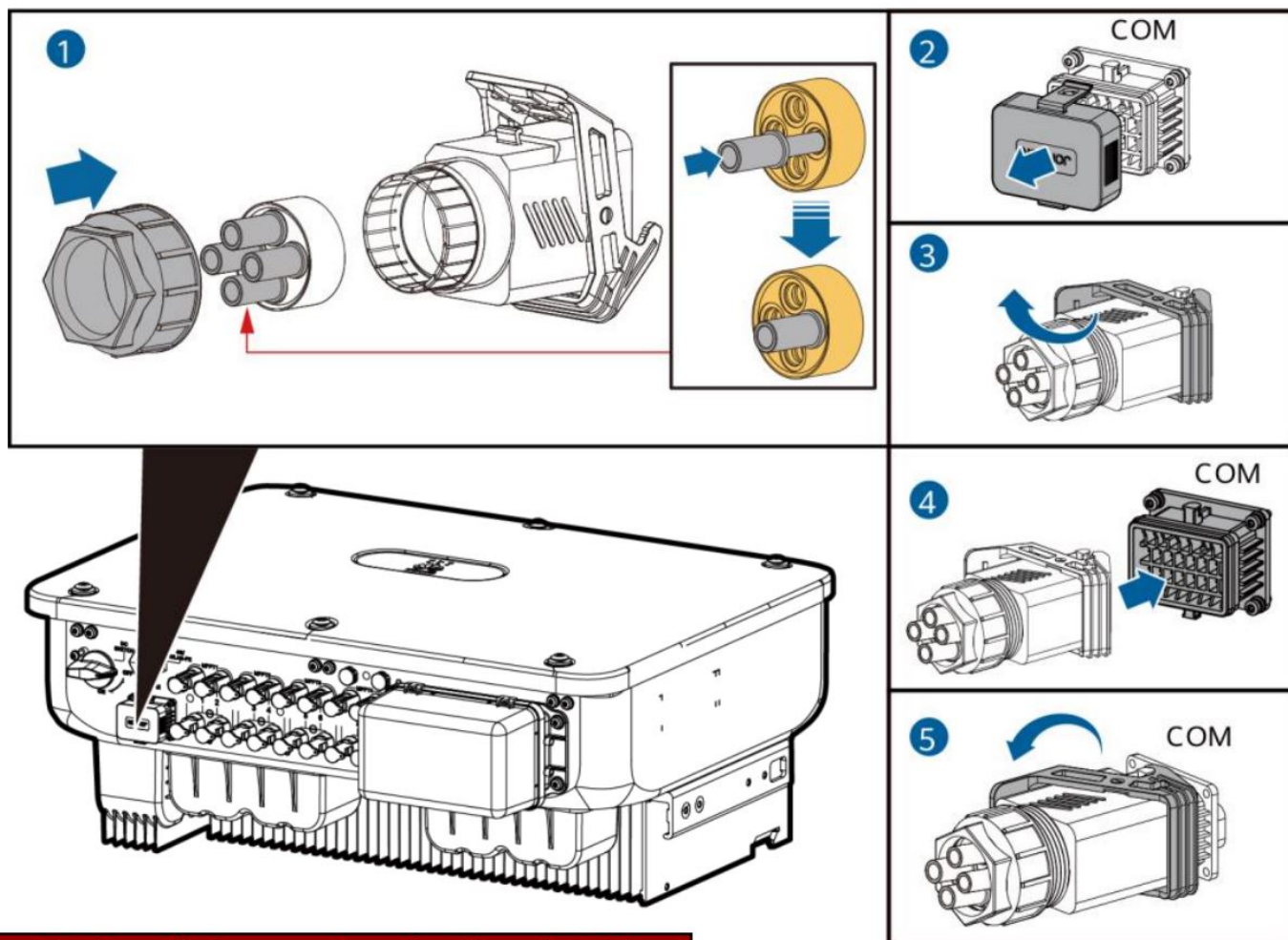


No.	Definition	Function	Description	No.	Definition	Function	Description
1	485A1-1	RS485 differential signal +	Used to cascade inverters or connect to the SmartLogger. It can also connect to an EMI.	2	485A1-2	RS485 differential signal +	Used to cascade inverters or connect to the SmartLogger. It can also connect to an EMI.
3	485B1-1	RS485 differential signal -		4	485B1-2	RS485 differential signal -	
5	PE	Ground point on the shield layer	-	6	PE	Ground point on the shield layer	-
7	485A2	RS485 differential signal +	Connects to the RS485 signal port on the power grid scheduling power meter.	8	DIN1	Dry contact for power grid scheduling	-
9	485B2	RS485 differential signal -		10	DIN2		
11	-	-	-	12	DIN3		
13	GND	GND	-	14	DIN4		
15	DIN5	Rapid shutdown	Supports AC NS protection shutdown, which can be used as a reserved port for rapid shutdown signals.	16	GND		

Scenarios Where No Signal Cable Is Connected

NOTICE

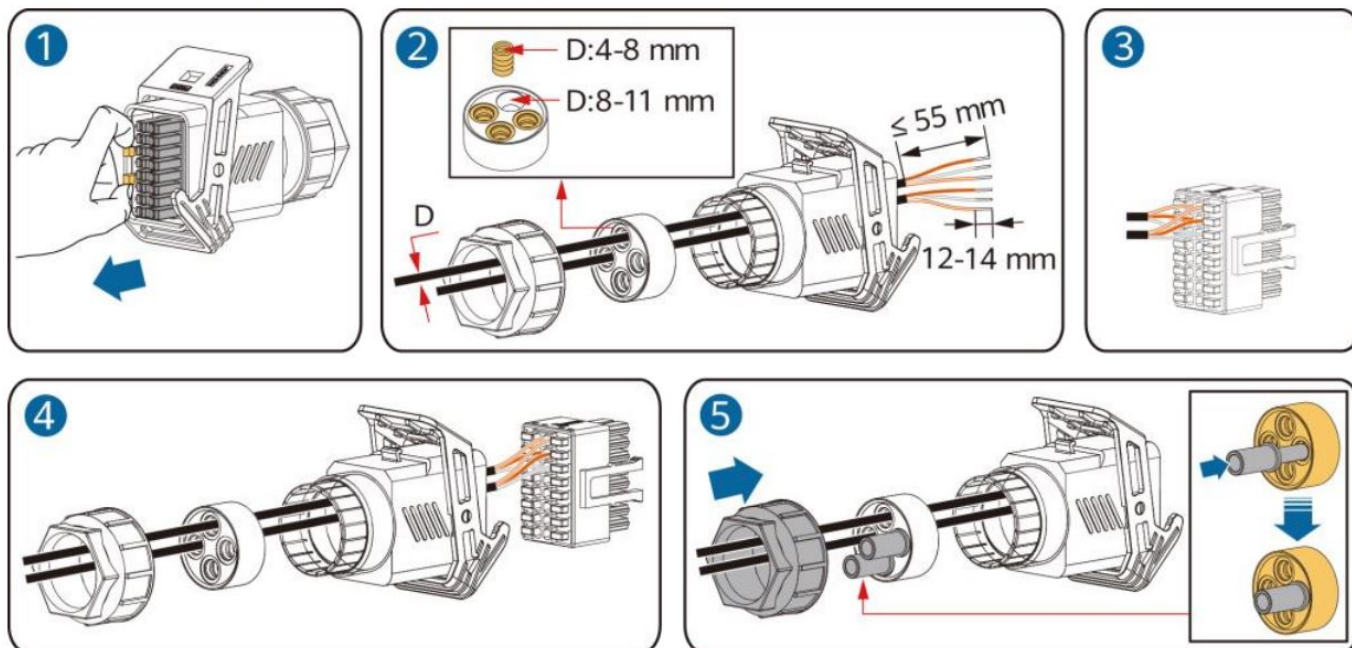
If no signal cable is required for the SUN2000, use waterproof plugs to block the wiring holes on the signal cable connector and connect the signal cable connector to the communications port on the SUN2000 to improve the waterproof performance of the SUN2000.



(Optional) Connecting the Signal Cable

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1. Connect the signal cable to the signal connector.

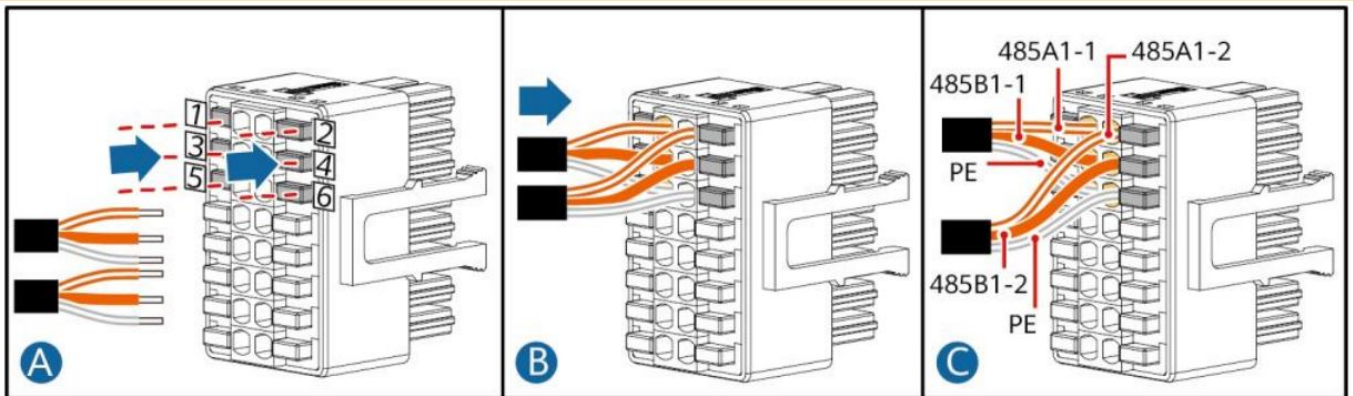


IS13I40002

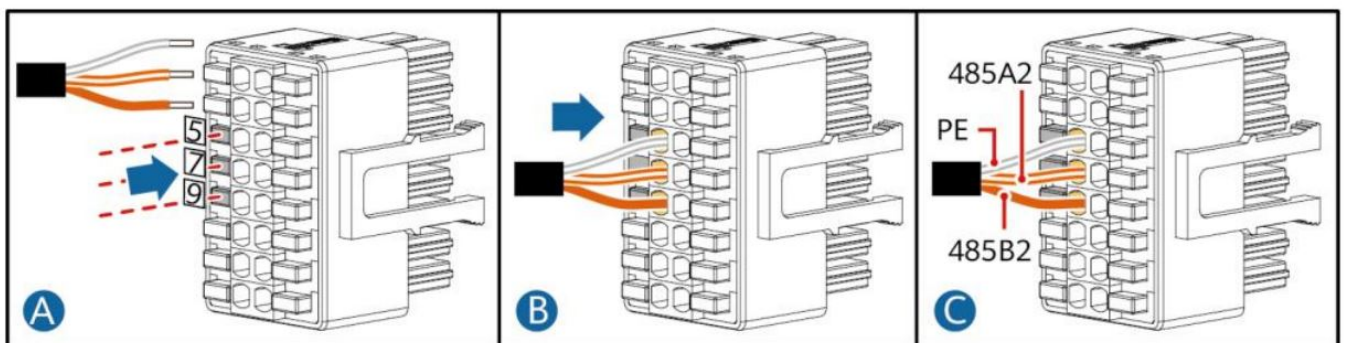
- Connect the RS485 communications cable to the solar inverter.

NOTICE

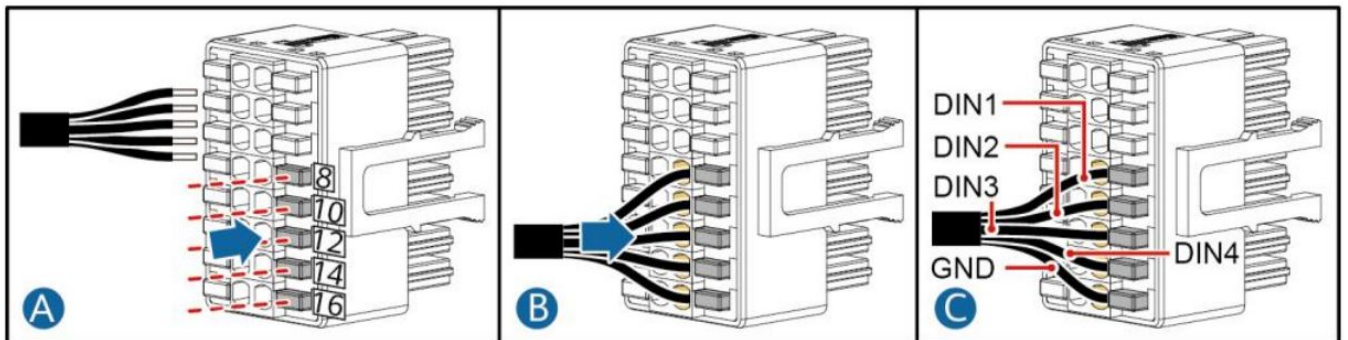
If two or more solar inverters are cascaded, install the RS485 communications cable.



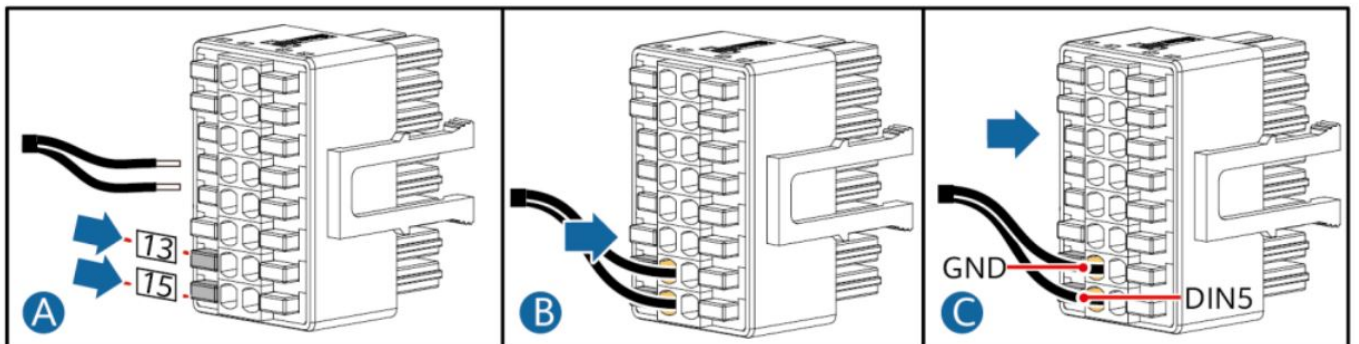
- Connect the RS485 communications cable to the power meter.



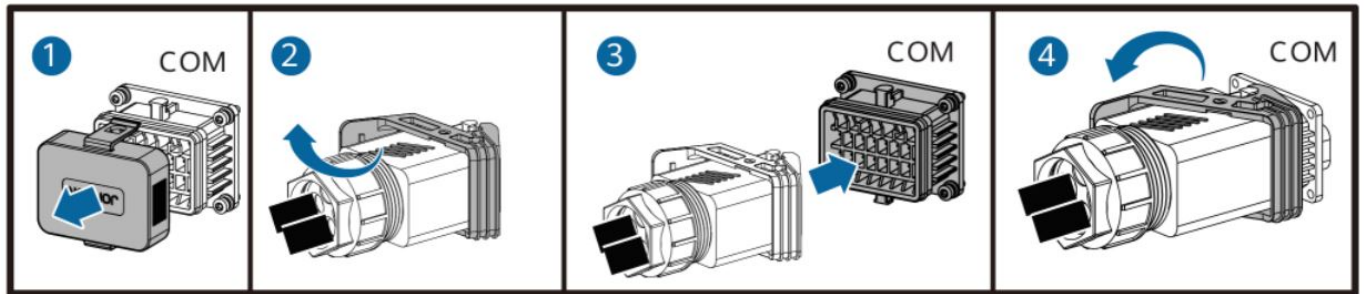
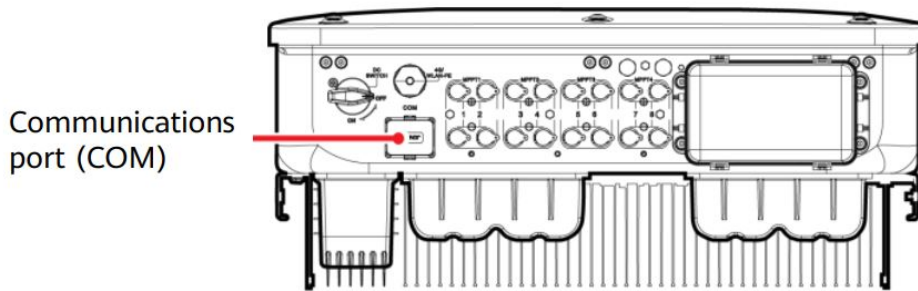
- Connect the power grid scheduling signal cable.



- Connect the rapid shutdown signal cable.



2. Connect the signal cable connector to the communications port.



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5 Verifying the Installation

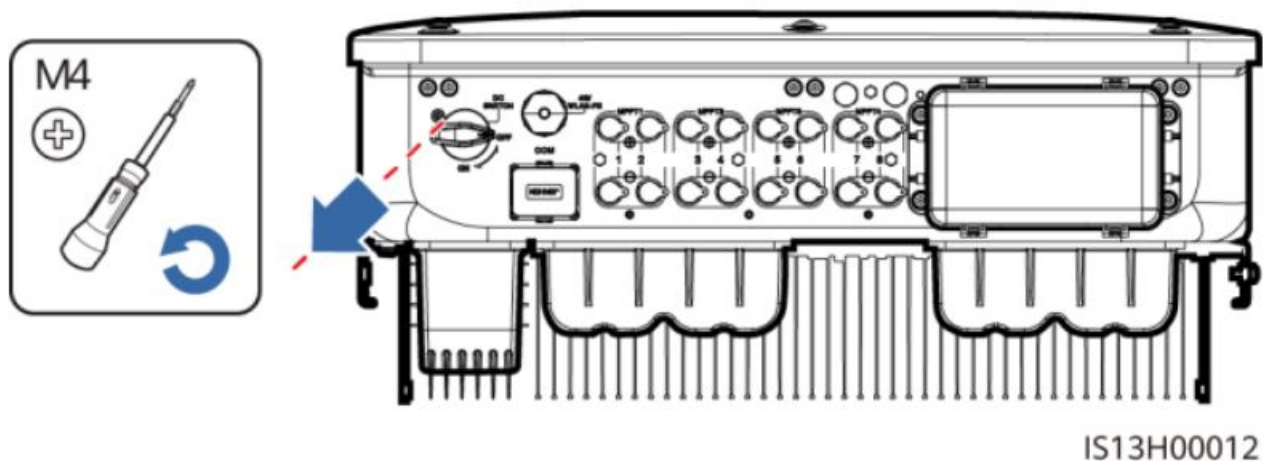
No.	Acceptance Criteria
1	The solar inverter is installed correctly and securely.
2	The cables are routed properly as required by the customer.
3	The communications expansion module is installed correctly and securely.
4	Cable ties are evenly distributed and no burr exists.
5	The PE cable is connected correctly and securely.
6	The DC switch and all the switches connected to the solar inverter are set to the OFF position.
7	The AC output power cable, DC input power cables, and signal cable are connected correctly and securely.
8	Unused terminals and ports are locked by watertight caps.
9	The installation space is proper, and the installation environment is clean and tidy.

6 System Power-On

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. (Optional) Remove the locking screw beside the DC switch. Store the screws properly for future power-off maintenance.



3. Turn on the DC switch at the bottom of the solar inverter.
4. Observe the LED indicators to check the operating status of the solar inverter.

Category	Status (Blinking Slowly: On for 1s and then Off for 1s; Blinking Fast: On for 0.2s and then Off for 0.2s)		Description
Running indicator			-
	Steady green	Steady green	The solar inverter is operating in grid-tied mode.
	Blinking green slowly	Off	The DC is on and the AC is off.
	Blinking green slowly	Blinking green slowly	Both the DC and AC are on, and the solar inverter is not supplying power to the power grid.
	Off	Blinking green slowly	The DC is off and the AC is on.
	Off	Off	Both the DC and AC are off.
	Blinking red fast	-	DC environment alarm
	-	Blinking red fast	AC environment alarm
	Steady red	Steady red	Fault
Communications indicator			-
	Blinking green fast		Communication is in progress.
	Blinking green slowly		Mobile phone access
	Off		No communication

Note: If LED1, LED2, and LED3 are steady red, the solar inverter is faulty and needs to be replaced.

7 System Commissioning

NOTE

- If the solar inverter is connected to the FusionSolar smart PV management system, the FusionSolar app is recommended. In areas (such as the UK) where the FusionSolar app is not available, or when a third-party management system is used, only the SUN2000 app can be used for commissioning.

- Access the Huawei app store (<http://appstore.huawei.com>), search for FusionSolar or SUN2000, and download the app installation package. You can also scan the QR codes below to download the apps.



FusionSolar App

<https://intl.fusionsolar.huawei.com/pvmswebsite/nologin/assets/build/index.html#/jumppage>



SUN2000 App

<https://solar.huawei.com/~media/Solar/APP/SUN2000.apk>

NOTICE

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

7.1 Scenario in Which Solar Inverters Are Connected to the FusionSolar Smart PV Management System

1. (Optional) Register an installer account.

NOTE

If you already have an installer account, skip this step.

- Create the first installer account will generate a domain named after the company.

The image shows three sequential screenshots of the FusionSolar app interface:

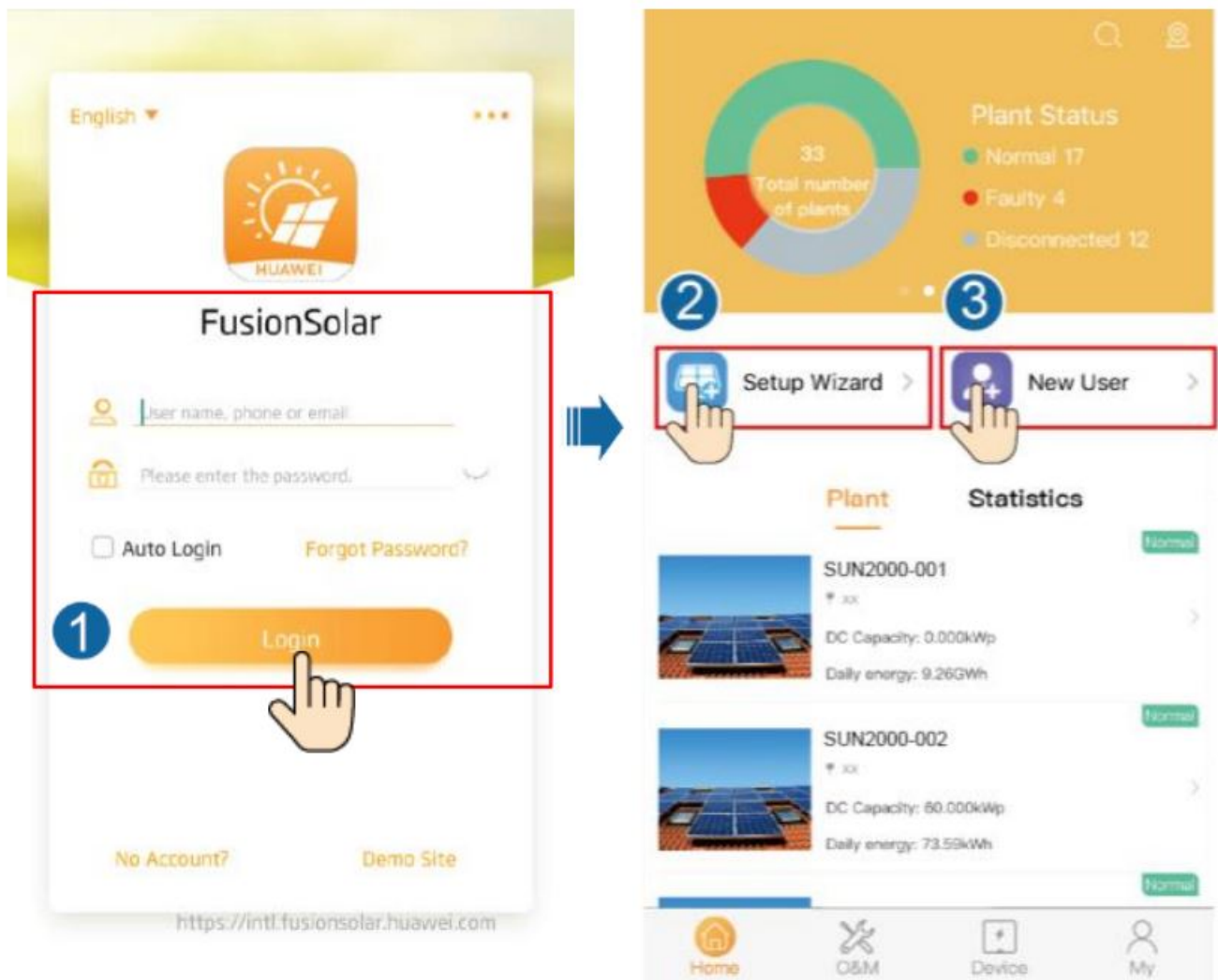
- Login Screen:** A hand points to the "No Account?" link at the bottom left, labeled with a blue circle "1".
- Role Selection Screen:** A hand points to the "Installer role" option, which is highlighted with a red box and labeled with a blue circle "2". The role description includes: "Quick site deployment, plant O&M, and plant operation monitoring" and a link "Click here to create your account".
- Installer Registration Screen:** A hand points to the "Registration" button at the bottom, labeled with a blue circle "3". The form includes fields for: Company Name, Email Address (entered twice), User Name, Password (entered twice), and Verification Code (with a green "khx6" code shown). A note at the top states: "Note: If your company has registered an account, you do not need to register the account again. Contact the administrator to add the registered account to the user list." A checkbox for "I have read and agree to the Terms of Use and Privacy Policy" is also present.

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

The image shows two sequential screenshots of the FusionSolar app interface:

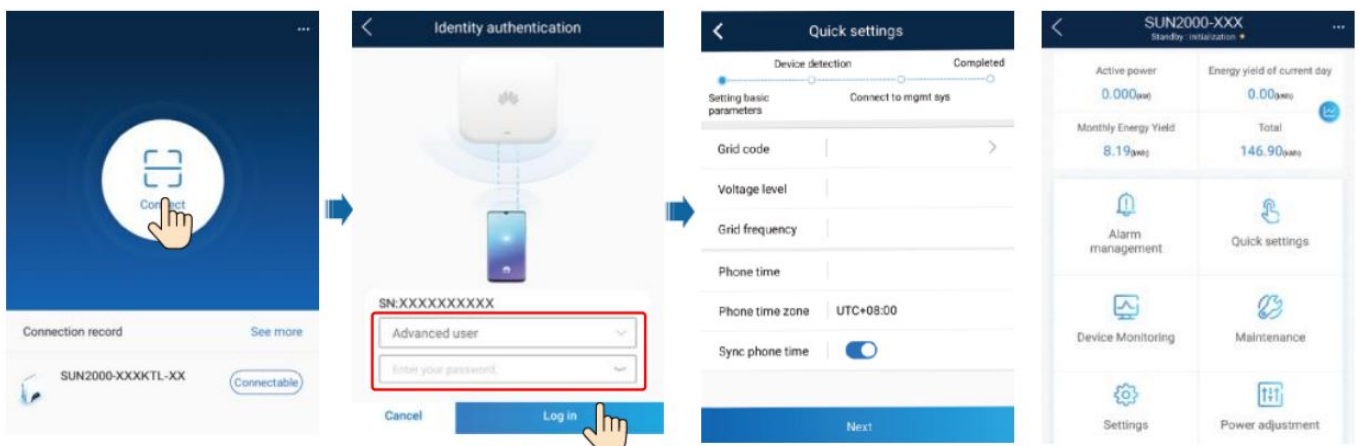
- Main Dashboard:** A hand points to the "New User" button in the bottom navigation bar, labeled with a blue circle "1". The dashboard shows a "Plant Status" pie chart with 17 total plants (5 Normal, 0 Faulty, 12 Disconnected) and a list of plants including "PV plant 1" and "PV plant 2".
- New User Registration Form:** A hand points to the "Company*" field, labeled with a blue circle "2". The form includes fields for: Company*, Role*, Plant*, Photo, User name*, Password*, Phone, and Email*. A disclaimer at the bottom states: "Residential user's authorization obtained. If the content you entered involves third-party personal information, obtain authorization in advance." The form has "CANCEL" and "CONFIRM" buttons at the bottom.

2. Create a PV plant and a plant owner.



7.2 Scenario in Which Solar Inverters Are Connected to Other Management Systems

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



NOTE

For details, see the FusionSolar App Quick Guide. During the FusionSolar app upgrade, scan the QR code to download the corresponding quick guide according to the downloaded app version.



<https://support.huawei.com/enterprise/en/doc/EDOC1100054980>



<https://support.huawei.com/enterprise/en/doc/EDOC1100165052>

7.3 Inverter Connected to Optimizers

For details about how to add optimizers and the physical layout of optimizers, see SUN2000- 450W-P Smart PV Optimizer Quick Guide and FusionSolar App Quick Guide. You can scan the QR codes to obtain the documents. During the FusionSolar app upgrade, scan the QR code to download the corresponding quick guide according to the downloaded app version.



SUN2000-450W-P

<https://support.huawei.com/enterprise/en/doc/EDOC1100134055>



<https://support.huawei.com/enterprise/en/doc/EDOC1100054980>



<https://support.huawei.com/enterprise/en/doc/EDOC1100165052>


8 FAQ: How Do I Reset the Password?

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

NOTICE

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

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<div><div>SUN2000-20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL-M3</div><div>Quick Guide</div><div><div>Issue 38</div><div>First Published: 27/09/2016</div><div>Doc ID: 2017 06 02</div></div><div><div>HUAWEI TECHNOLOGIES CO., LTD.</div><div></div></div></div>	<div><div>HUAWEI SUN2000-36KTL-M3 Smart String Solar Inverter [pdf] User Guide</div><div>SUN2000-20KTL-M3, SUN2000-29.9KTL-M3, SUN2000-30KTL-M3, SUN2000-36KTL-M3, SUN 2000-40KTL-M3, SUN2000-36KTL-M3 Smart String Solar Inverter, Smart String Solar Inverter</div></div>
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