CanadianSolar

CSI-350K-T8001A-E

CSI-350K-T8001B-E

CSI-333K-T8001A-E

CSI-333K-T8001B-E

CSI-250K-T8001A-E

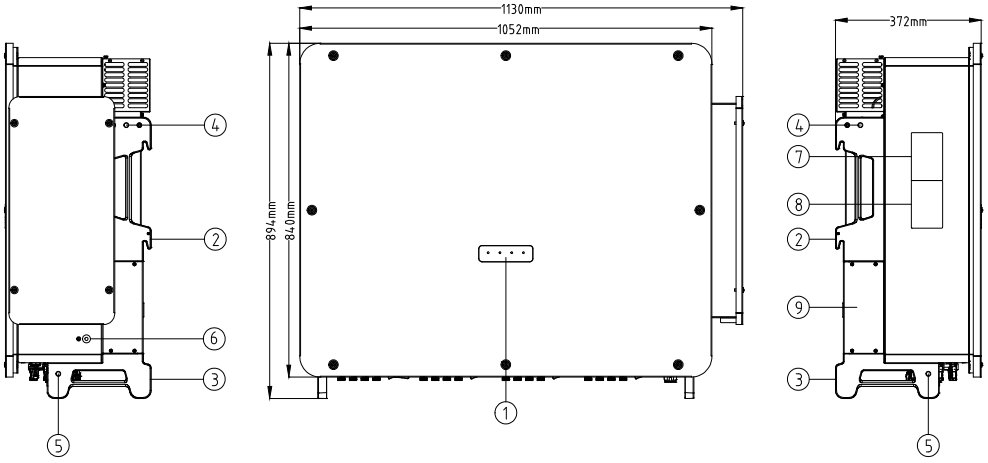
PV Grid-Connected Inverter Quick Installation Guide

(Part No: 91000588; Release Date: April, 2024)

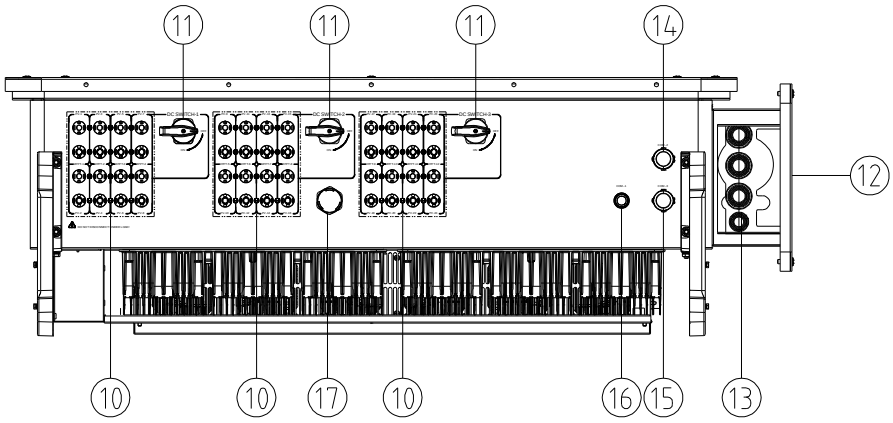
1. About This Guide

1) This guide only applies to the following inverters：CSI-250K-T8001A-E、CSI-333K-T8001A-E、CSI-333K-T8001B-E、CSI-350K-T8001A-E、CSI-350K-T8001B-E.
2) This instruction only provides an overview of the installation of the above-mentioned inverters.
3) Due to product version upgrades or other reasons, this guidance will be updated irregularly. Under no circumstances can this guide replace the user manual and the safety instructions on the product.
4) Please read the user manual and related standard specifications carefully before performing any operation on this series of products. You can scan the QR code on the left side of the device or at the end of this guide to obtain an electronic copy of the manual.
5) All operations on this series of products must be completed by professional technicians. Professional and technical personnel must be specially trained, read the user manual, master the safety matters related to the operation, and be familiar with local standards and electrical system safety specifications.
6) Before installing the products, please check whether the products are complete, consistent with the order, and whether there is obvious damage. If there is any abnormality, please contact the local dealer or CSI Solar Co., Ltd.

2 Product Introduction

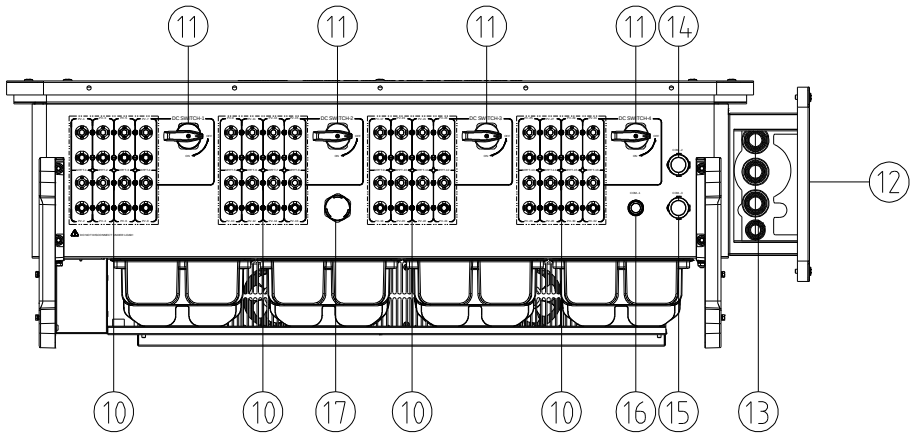


CSI-250K-T8001A-E
CSI-333K-T8001A-E
CSI-350K-T8001A-E



CSI-333K-T8001B-E

CSI-350K-T8001B-E



1. LED indicator panel
2. Side handles and mounting supports
3. Lower mounting supports
4. M12 holes for lifting eyes or shanks
5. M12 holes for lifting shanks
6. Additional grounding points
7. Nameplate
8. Warning label
9. The cover of the outer fan module
10. DC input connector (24 or 32 pairs)
11. DC switch (3 or 4 pieces)
12. AC wiring box
13. AC output cable gland
14. Dry contact interface
15. RS485 communication interface
16. Communication connector for data logger
17. Breather valve

FIG 2-1 Product introduction (The picture is for reference only)

3.1 Installation Environment Requirements

1) Do not install the inverter on structures constructed of flammable, thermolabile, or explosive materials.
2) Ensure the inverter is out of children's reach.
3) The ambient temperature should be between -30℃~ 60℃.
4) The humidity of the installation location should be below 100% without condensation.
5) Do not install the inverter outdoors in salt, sulfur, or other corrosive areas.
6) Prevent the inverter from direct exposure to sun, rain and snow.
7) The inverter should be well-ventilated. Ensure air circulation.
8) Never install the inverter in living areas. The inverter will generate noise during operation, affecting daily life.
9) Install at an appropriate height for ease of viewing LED indicators and operating switches.

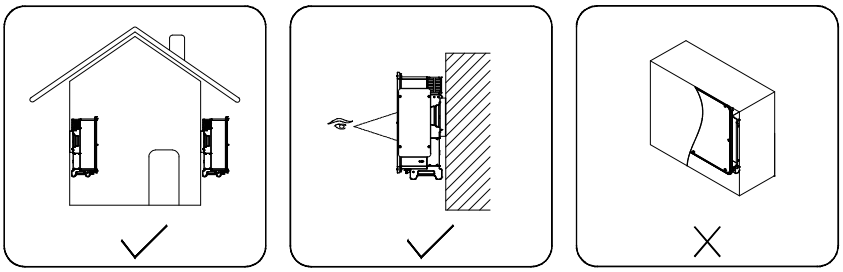


FIG 3-1 Installation site

3.2 Structural Requirements

The inverter(s) must be installed on a structure with a load-bearing capacity of >4 times the inverter weight.

3.3 Installation Angle Requirements

Install the inverter vertically or at a minimum back tilt of 10°. Forward installation or upside-down installation is prohibited.

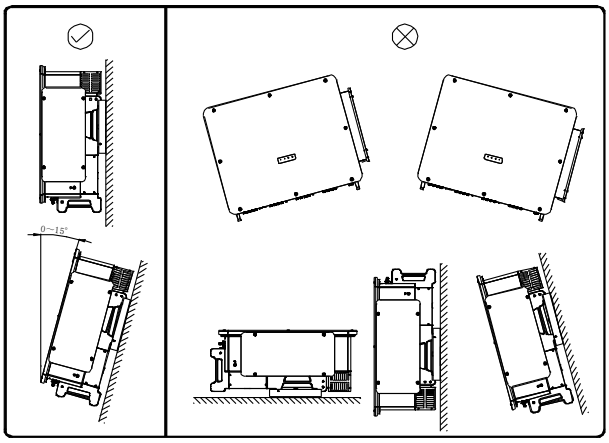


FIG 3-2 Installation angle

3.4 Installation Clearance Requirements

1) Ensure ample clearance surrounding the inverter to accommodate adequate heat dissipation (as shown in FIG 3-3 The maintenance of the inverter's external fan module requires a larger clearance on the left side).
2) When installing multiple inverters, ensure that there is adequate spacing between each unit to allow for proper ventilation and avoid overheating, as shown in FIG 3-4.

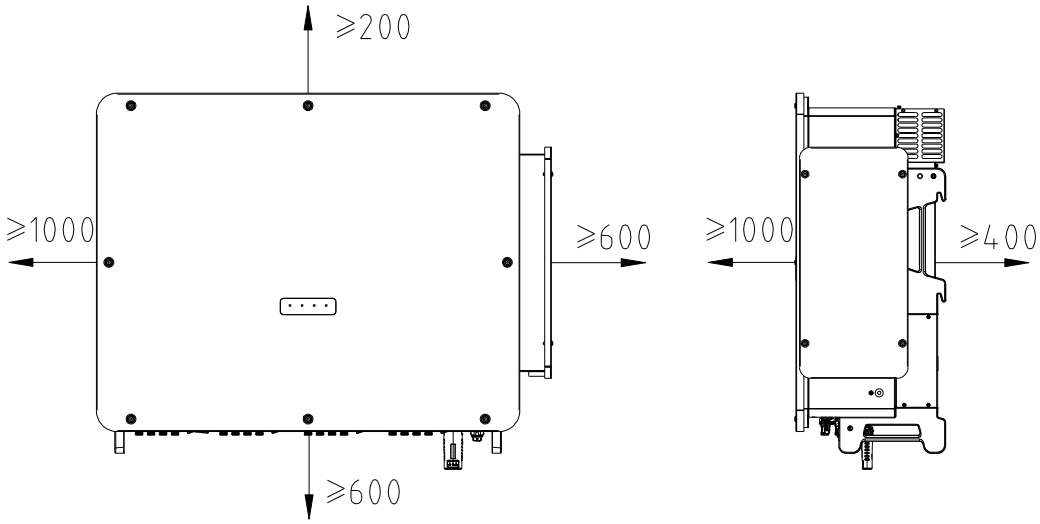


FIG 3-3 Single inverter installation space

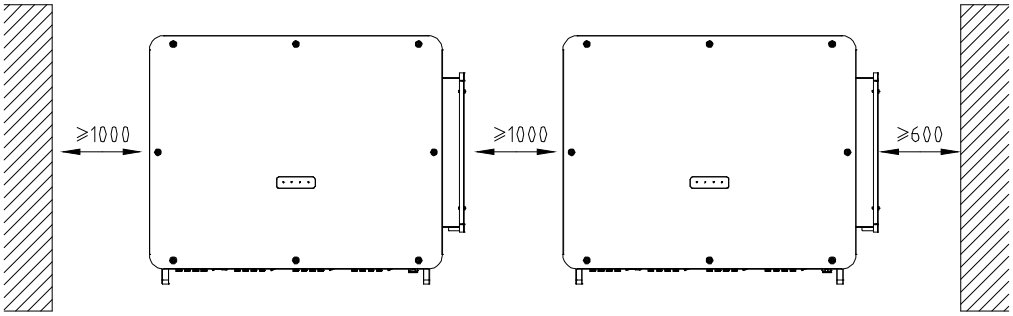


FIG 3-4 Multiple inverters installation space

3.5 Assembling the mounting-bracket

Dimensions of the assembled mounting bracket are as follows 3-5.

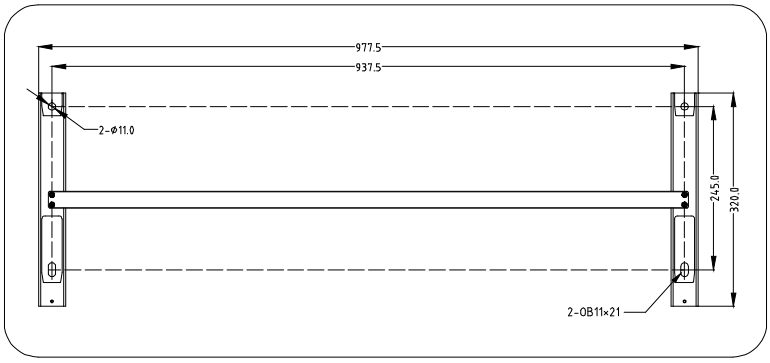


FIG 3-5 Dimensions of the mounting bracket

3.5.1 Standard C or U Steel Installation

Mounting Steps:

Step 1: Localize the hole positions in C or U-section steel to install the mounting bracket.

Step 2: Secure the mounting bracket with M10 bolts and nuts.

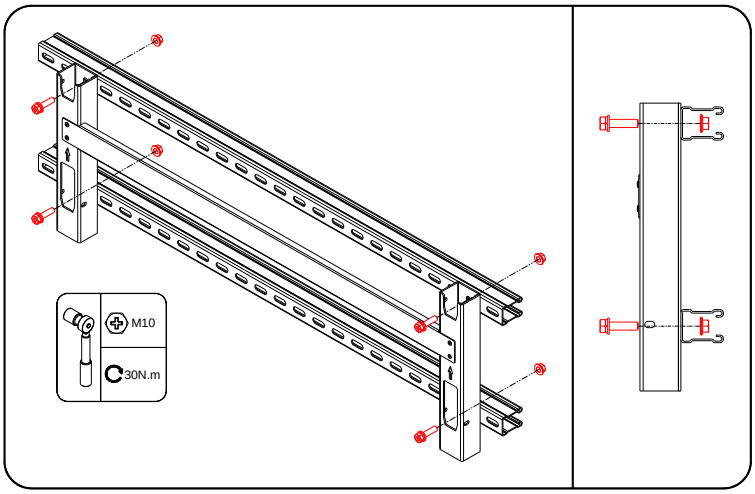


FIG 3-6 Locate the mounting hole

3.5.2 Steel Frame Installation

Mounting Steps:

Step 1: Level the assembled mounting bracket by using a level, and mark the positions for drilling holes on the steel frame. Drill the holes. Recommended aperture 12mm.

Step 2: Secure the mounting bracket with M10 bolts and nuts.

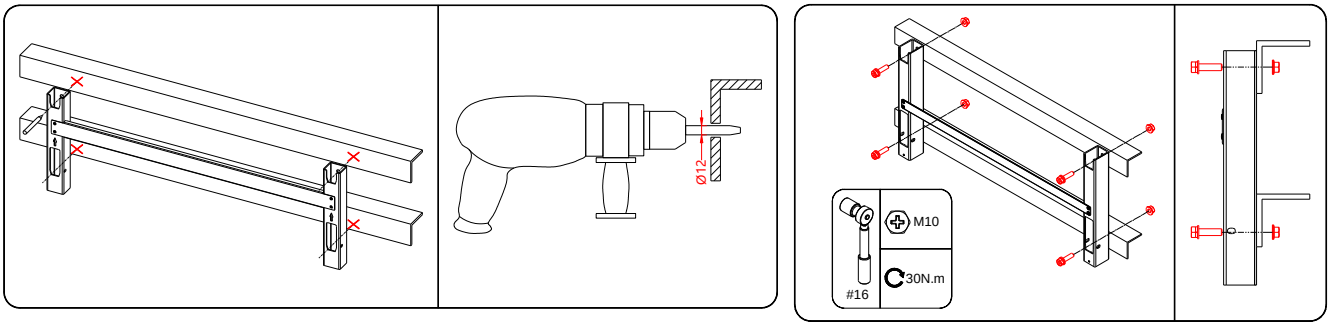


FIG 3-7 Install the wall bracket

3.6 Inverter Installation

Step 1: Take out the inverter from the packing carton.

Step 2: Hoist the inverter to the mounting-bracket when necessary. If the installation position is not high enough, skip performing this step.

Step 3: Hang the inverter to the mounting-bracket and ensure that the mounting ears perfectly engage with the mounting-bracket.

Step 4: Fix the mounting-bracket with two screws M6x30. (Note: This is not a locking fixation, it is sufficient to screw the screws to the end.)

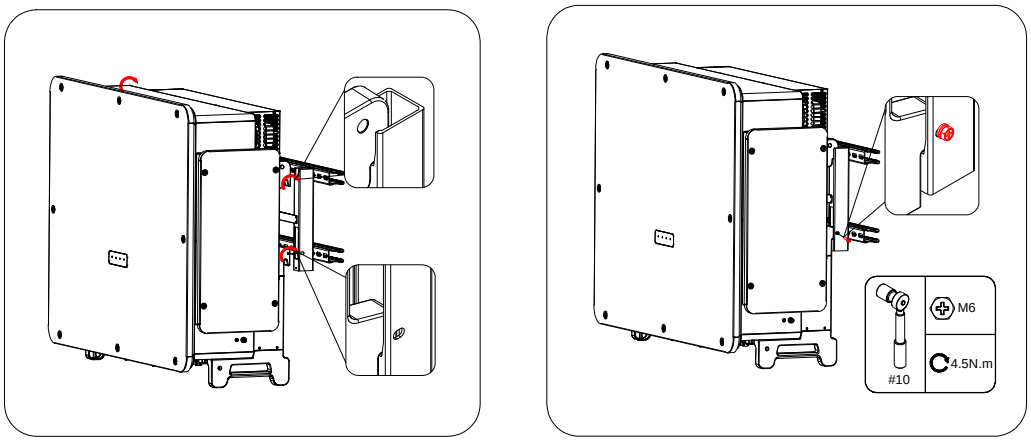


FIG 3-8 Install the inverter

4 Electrical Connection

4.1 Electrical Connection Overview

A) PV string; B) Inverter; C) AC distribution box/cabinet; D) Utility grid; E) Monitoring device

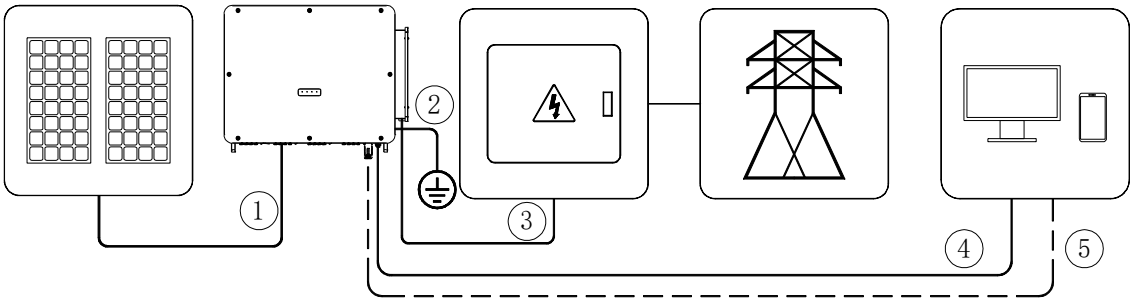


FIG 4-1 General electrical connection diagram

Table 4-1 Recommended Cables

No.	Cable Name	Cable Type	Conductor Cross-Sectional Area	Outer Diameter
1	PV Cable	PV cable meeting 1500V standard	4~6mm²	6~9mm
2	Secondary Grounding Cable	Outdoor single-core copper wire	Same as the ground wire of the AC cable	/
3	AC Cable	Recommended outdoor single-core copper wire or aluminum wire*Note (1)	Copper wire S: 150mm~400mm²; Sp≥S/2 Aluminum alloy wire or copper clad aluminum wire: S: 150mm²~400mm²; Sp≥S/2	20mm~38mm
		Outdoor multi-core copper wire or	Copper wire: S: 150mm²~400mm²;	35mm~75mm

		aluminum wire*Note (1)	Sp≥S/2 Aluminum alloy wire or copper clad aluminum wire: S: 150mm²~400mm²; Sp≥S/2	
4	Tracking System Power Cable	Double-layer protected three-core outdoor copper wire cable and M4 OT terminal	10mm²	15mm~18mm
5	Communication Cable	485 Communication Cable	0.2~1.0mm²	4.5mm~6.5mm* Note (2)
6	Wireless Communication	/	/	/

Note

(1) When using aluminum wire, copper-aluminum transition terminals are required. Please refer to "Requirements for Aluminum Conductors".

(2) If a thicker communication cable is required, please contact your local dealer or CSI.

Table 4-2 PE wire requirements

Phase wire cross-section	PE wire cross-section	Note
S > 35 mm²	S/2	The specifications are valid only when the phase and PE wires use the same material. If otherwise, ensure that the cross-section of PE wire produces a conductance equivalent to that of the wire specified in the table.

Table 4-3 Power cable for tracking system

Cable	Cable Type	Conductor Cross-Sectional Area	Outer Diameter	Voltage Level
Power cable for tracking system	Outdoor copper conductor cable	2 or 3 x 4~10mm²	15~18mm	Consistent with selected AC cable

4.2 Connecting the PE Cable

⚠ WARNING	Since the inverter is a transformerless inverter, neither the negative pole nor the positive pole of the PV string can be grounded. Otherwise, the inverter will not operate normally. Connect the additional grounding terminal to the protective grounding point before AC, PV, and communication cable connections. The ground connection of this additional grounding terminal cannot replace the connection of the PE terminal of the AC cable. Make sure those terminals are both grounded reliably.

4.2.1 Connection Procedure

Step 1: Prepare the external grounding cable as shown in the following diagram: stripping the wire -> crimping the terminal -> applying the heat shrinkable sleeve. Recommended terminal type: DT or DTM.

Step 2: Remove the bolt on the external grounding point (i.e., the secondary grounding point) and use a torque wrench to secure the cable terminal.

Step 3: Apply paint to the grounding terminal to ensure corrosion resistance.

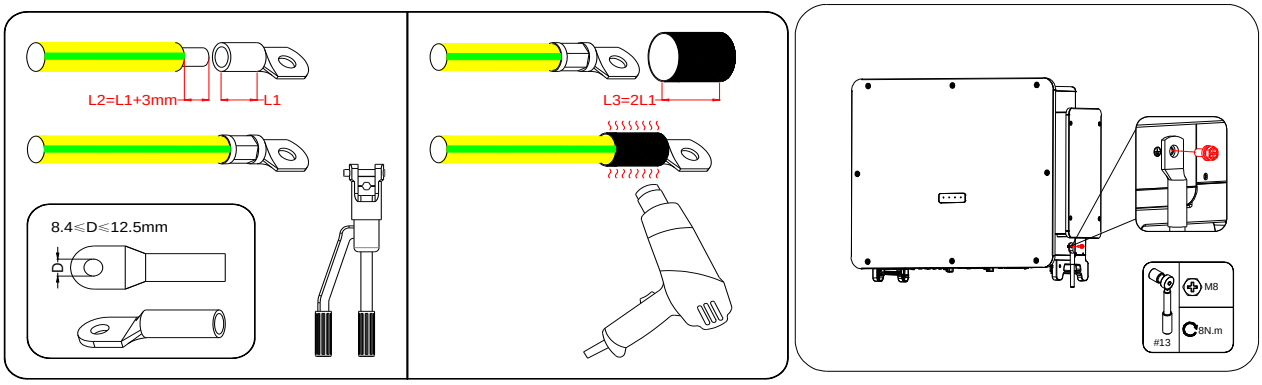
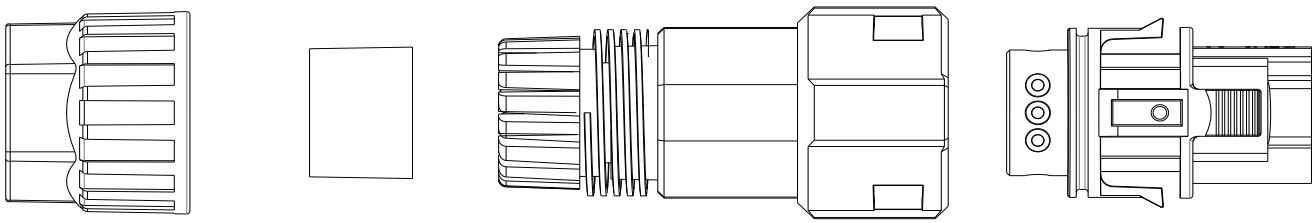


FIG 4-2 PE cable installation

4.3 Communication Cable Connection

4.3.1 RS485 Wiring Steps

Connector schematic diagram, as shown below.



Gland nut | Sealing ring | threaded sleeve | Plug (metal pins and outer casing)

FIG 4-3 Connector schematic diagram

Step 1: Prepare the signal cable (Strip off about 40mm of the signal cable sheath, and then strip off about 8mm of the insulation layer.).

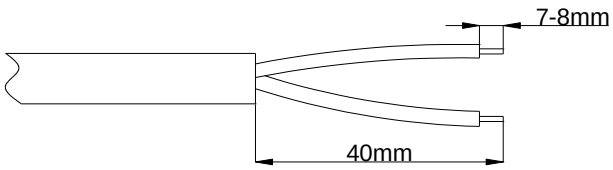
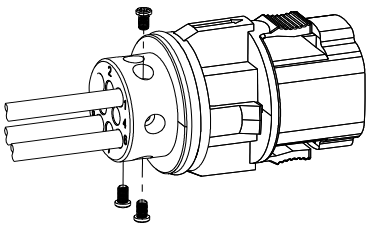


FIG 4-4 Signal wire stripping diagram

Step 2: Insert the wire into the corresponding pin of the plug and secure it with a screw (Tool: #1cross screwdriver. Torque: 0.6~0.8N.m).



Port	Pin Number	Function Description	
RS485-2	PIN1	RS485A2+	Used for inverter cascade or connecting equipment such as sub-array controllers
	PIN2	RS485B2-	
	PIN3	PE	
	PIN4	RS485A2+	Used for inverter cascade or connecting equipment such as sub-array controllers
	PIN5	RS485B2-	
	PIN6	PE	
RS485-1	PIN7	RS485A1+	Used for connecting communication devices of the tracking system
	PIN8	RS485B1-	

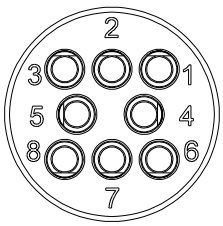


FIG 4-5 RS485 wiring diagram

Step 3: Tighten the gland nut and push the threaded sleeve into the plug.

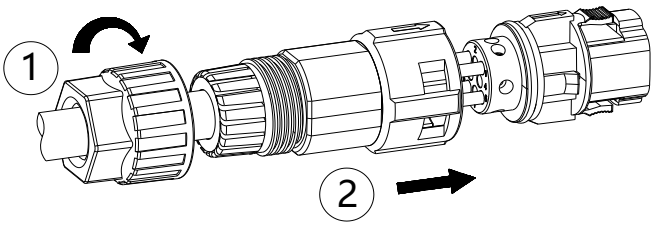


FIG 4-6 Connector installation

Step 4: Finally, insert the assembled connector into the RS485 socket (COM.-3) on the inverter.

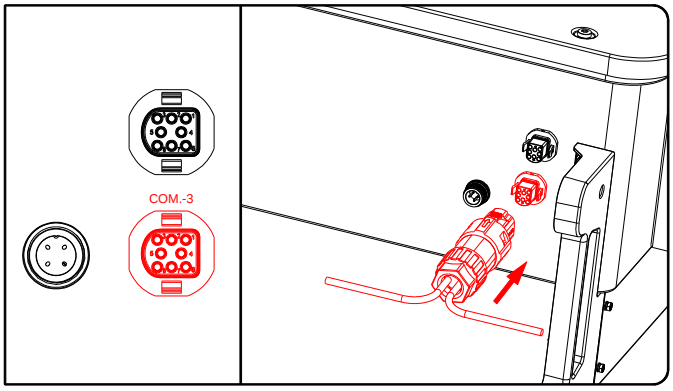
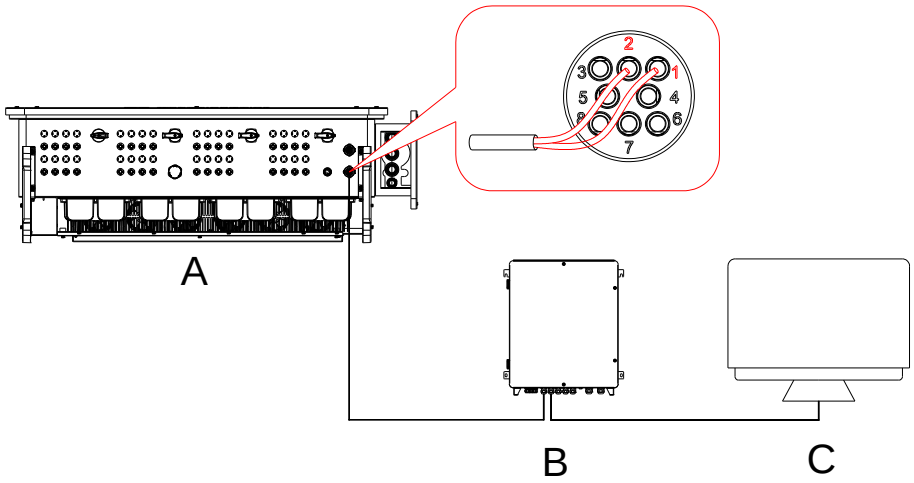


FIG 4-7 RS485 socket installation

4.3.2 RS485 Communication System

4.3.2.1 Single Inverter Communication System

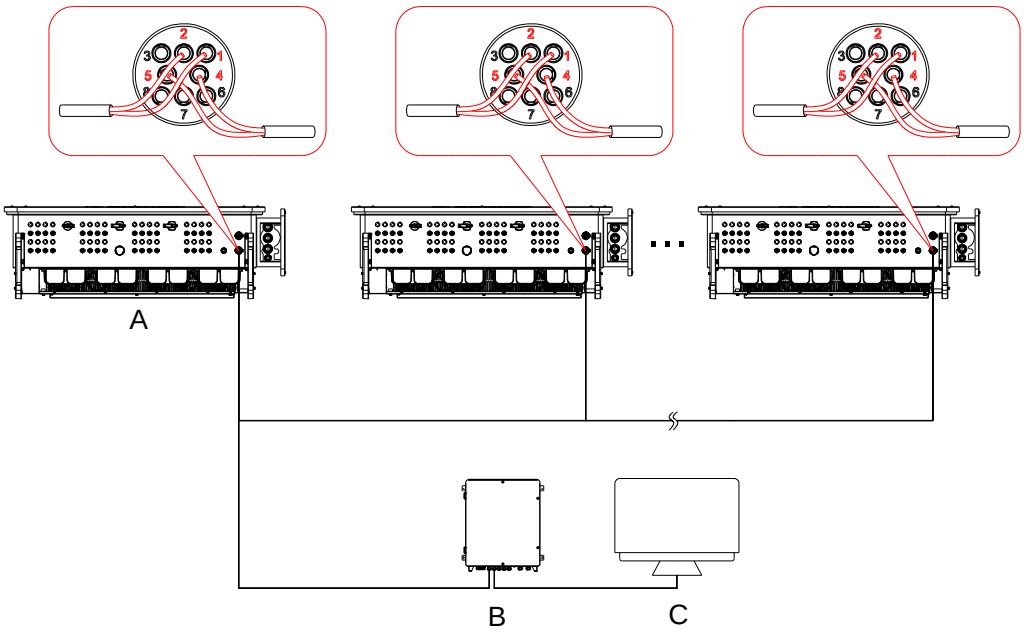
For the application scenario of a single inverter, a single RS485 communication cable can be used to establish communication connection.



(A) Inverter (B) Sub-array Controller (C) Upper Computer

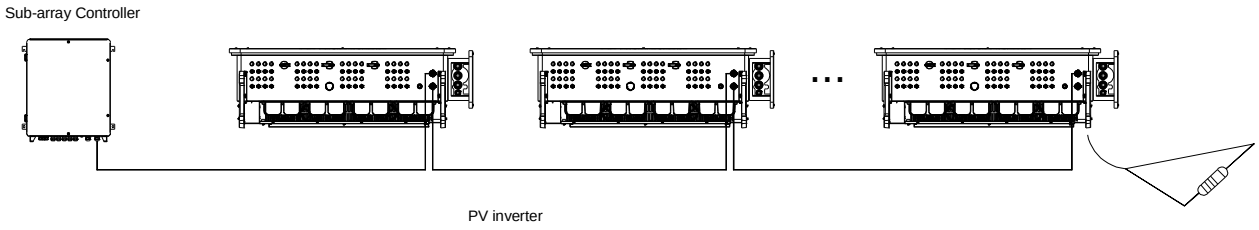
4.3.2.2 Multiple Inverters Communication System

For the application scenario of multiple inverters, all inverters can be connected in the form of a daisy chain using RS485 communication cables.



(A) Inverter (B) Sub-array Controller (C) Upper Computer

When multiple inverters are connected in parallel (more than 15 inverters), a 120R matching resistor should be added to the first and last inverters.



	The length of the RS485 communication cable cannot exceed 1000m.

4.4 Communication Module Connection (Optional)

This product supports the smart data stick. For more information about the smart data stick, please refer to the "Installation Guide for the Smart Data Stick".

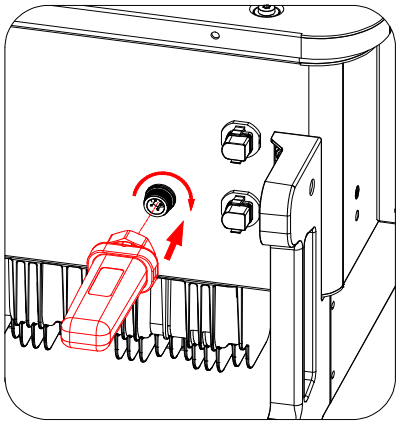


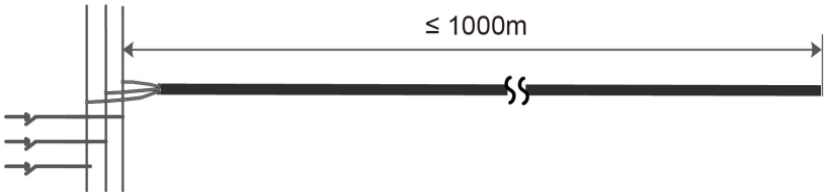
FIG 4-8 Communication Module Connection

4.5 PLC Communication Connection

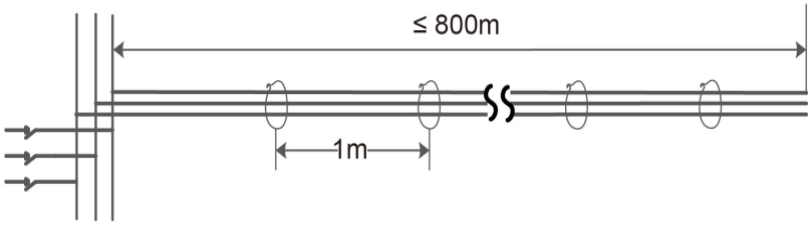
The inverter has an embedded PLC communication module that can be adapted to work with the sub-array controller provided by CSI to enable data communication. Please refer to the user manual of the sub-array controller for specific connection instructions.

Maximum PLC communication distance from the transformer substation to the inverter:

AC cables with multi-core wires can achieve a maximum communication distance of 1000m.



AC cables with single-core wires can achieve a maximum communication distance of 800m. Use cable ties to bind three-phase cables every 1m.



	The sub-array controller is an optional component and can be ordered from CSI. The sub-array controller can directly use the AC output cables of the inverter for data communication, eliminating the need for laying and maintaining dedicated communication cables. The sub-array controller also supports RS485 interfaces and has conventional RS485 wiring options.

4.6 AC Cable Connection

4.6.1 AC Side Requirements

Before connecting the inverter to the grid, it is crucial to verify that the grid voltage and frequency adhere to the technnical specification of the inverter. Detailed parameters can be found on the machine's nameplate or in the user manual.

	Connect the inverter to the grid only after getting an approval from the local electric power company.

4.6.2 Connection Procedure

Step 1: Turn off the AC side circuit breaker and prevent it from being connected accidentally.

Step 2: Open the wiring box cover, remove the accessories, and properly save them, as shown in FIG 4-9.

Step 3: Peel off a certain length of cable insulation sheath and core wire insulation layer according to FIG 4-10 (Take multi-core wires as an example.).

Step 4: If you need to perform power supply wiring for the tracking bracket system, please refer to the user manual. Otherwise, ignore this step.

Step 5: Process the cable cores: select suitable terminal blocks (recommended types DT or DTM) -> crimp terminals -> use heat shrink tubings, as FIG 4-11.

Step 6: Remove the nuts on the AC terminal blocks and bolts on the internal ground points, and install the AC cables in the corresponding positions.

Step 7: Cut the sealing rings according to cable specifications, as FIG 4-12.

Step 8: Open the terminal protection cover, connect the AC cables to the corresponding terminals, and ensure that the cables are securely connected.

Step 9: Adjust the length of the cables left inside the cabinet and the position of the cores, and tighten the nuts clockwise.

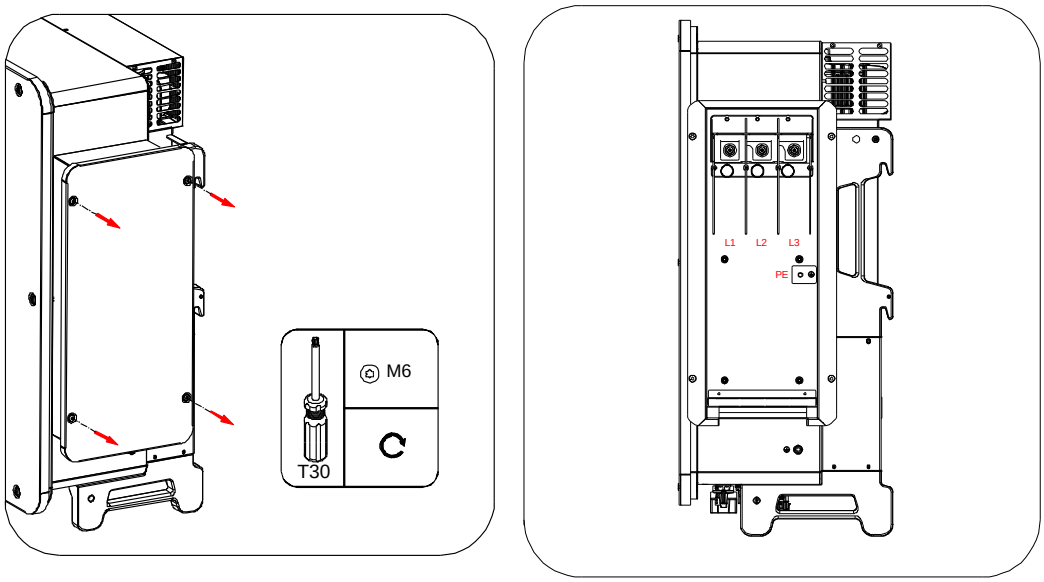


FIG 4-9 Open the wiring box cover

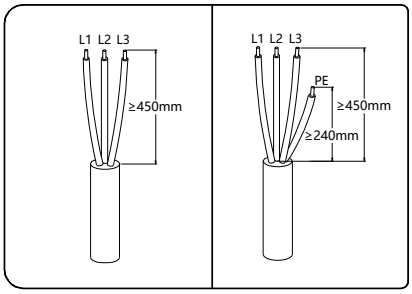


FIG 4-10 Peel off the cable insulation sheath and core wire insulation layer

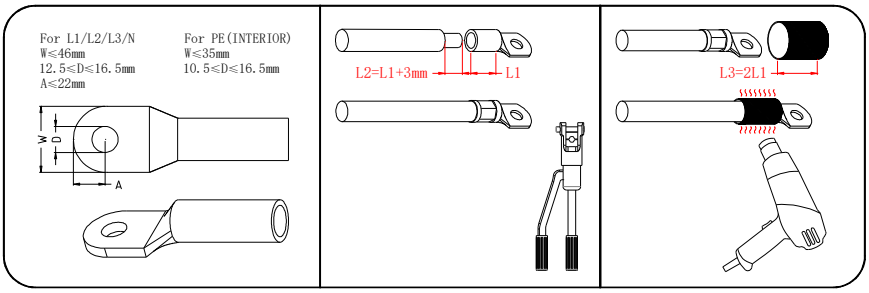


FIG 4-11 Process the cable cores

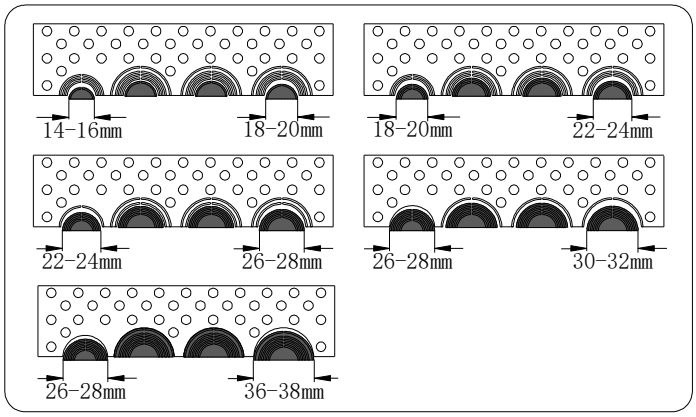


FIG 4-12 Cut sealing rings for single-core cables

Note: When connecting the power supply line for the tracking system, this ground wire is not connected.

4.6.2.1 Single-core cables:

Refer to FIG 4-11 for processing cable cores and FIG 4-12 for cutting sealing rings for single-core cables. Connect single-core cables as shown in FIG 4-13.

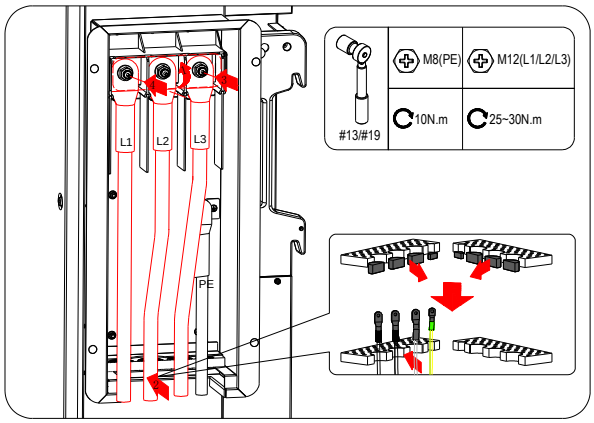


FIG 4-13 Connection of single-core cables

4.6.2.2 Multi-core cables:

Refer to FIG 4-10 for peeling off the cable insulation sheath and core wire insulation layer, FIG 4-11 for processing cable cores, and FIG 4-12 for cutting sealing rings for single-core cables. Connect multi-core cables as shown in FIG 4-14.

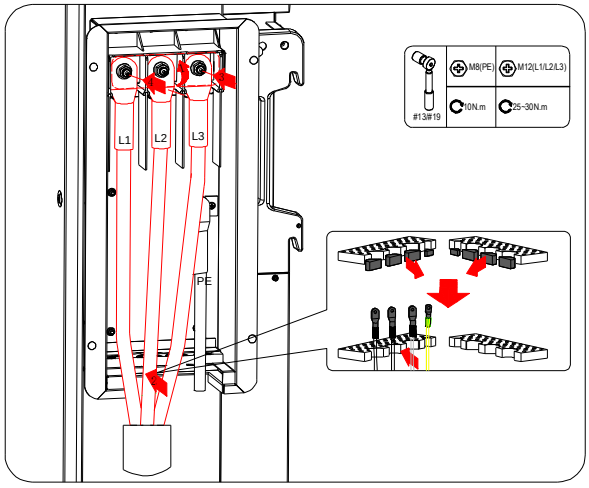


FIG 4-14 Connection of multi-core cables

4.6.3 Close the wiring box cover.

Replace the upper cover of the junction box as shown in FIG 4-15.

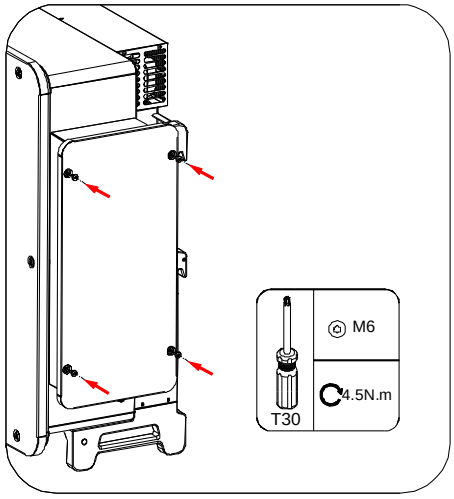


FIG 4-15 Replace the upper cover of the junction box

4.7 DC Cable Connection

DANGER	Electric shock! Once exposed to sunlight, the PV array generates potentially fatal high voltage. Before performing electrical operations, ensure that all cables are uncharged. Do not turn on the AC circuit breaker before the inverter is electrically connected.
CAUTION	Ensure that the PV array is adequately insulated from the ground to prevent any electrical hazards before connecting it to the inverter. During the installation of PV strings and the solar inverter, the positive or negative terminals of PV strings may be short-circuited to ground if the power cable is not properly installed or routed. In this case, an AC or DC short circuit may occur and damage the solar inverter. In the event of an AC or DC short circuit causing damage to the solar inverter, please note that the affected device is not covered under any warranty.
NOTICE	There is a risk of inverter damage! The following requirements should be met. Failure to do so will void guarantee and warranty claims. ▪ Make sure the maximum voltage of each string is always less than 1500 V. ▪ Make sure the maximum short circuit current on the DC side is within the permissible range. ▪ The polarities of electric connections are correct on the DC input side. The positive and negative terminals of the PV string are connected to the corresponding positive and negative DC input terminals of the solar inverter.
CAUTION	Use the connectors delivered with the solar inverter. If the PV connectors are lost or damaged, purchase the connectors of the same model. The device damage caused by incompatible PV connecotrs is beyond the warranty scope.

4.7.1 Connection Procedure

Step 1: Strip the insulation layer of the PV cable for about 7mm.

Step 2: Use the crimping tool to crimp the terminal.

Step 3: After threading the crimped cable through the locking nut and the sealing ring at the tail of the connector housing, insert the cable into the connector housing. When the terminal is inserted into position, there will be a "click" sound indicating proper engagement. Lightly pull the cable to ensure that the terminal is securely in place, and then tighten the locking nut (please use a special wrench for PV connectors, which is not included in the supply scope).

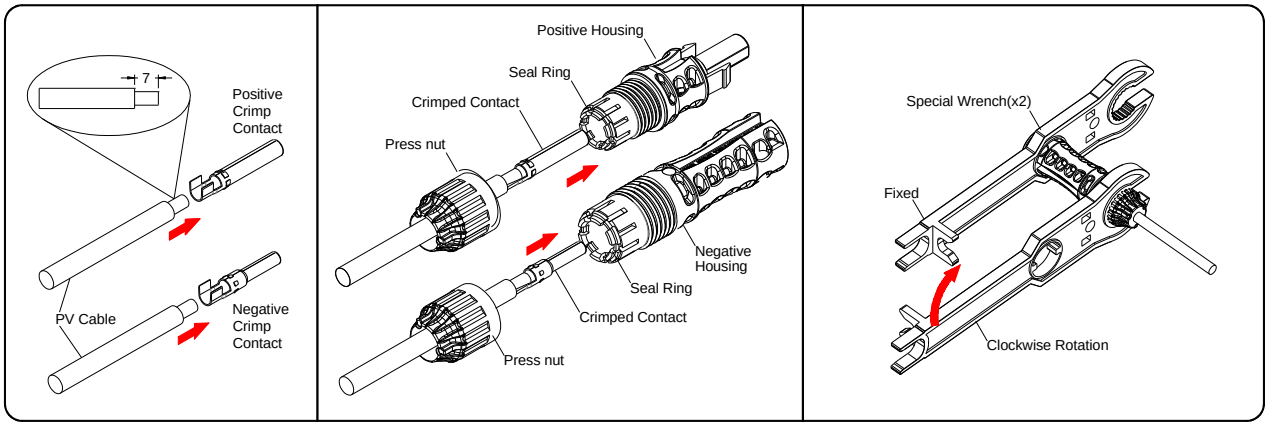


FIG 4-16 DC cable connection

4.7.2 Installing the PV Connectors

Step 1: Rotate all DC switches to the "OFF" position.

Step 2: Check if the polarity of the connection cables and connectors for the PV strings is correct, as shown in FIG 4-17. (Note: If the DC input polarity is reversed, the inverter will not operate properly.)

Ensure that the open-circuit voltage does not exceed the inverter's maximum input limit of 1500V in any case.

Step 3: Remove the protective covers of the DC connectors on the inverter that need to be connected to the PV strings. (Note: Please keep the protective covers of the connectors that do not need to be wired.)

Step 4: Insert the connector of the PV string into the corresponding DC terminal of the inverter until you hear a "click" sound.

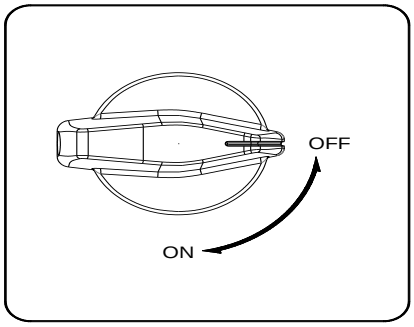


FIG 4-17 DC switch

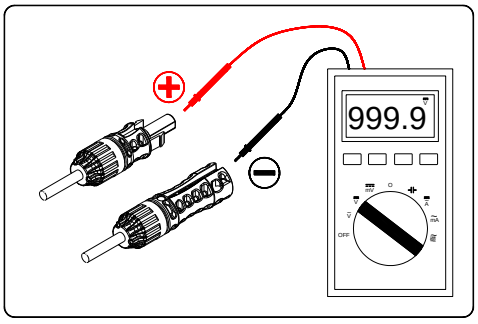


FIG 4-18 Check the polarity of PV string

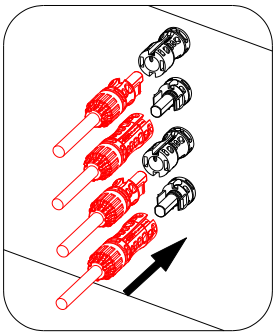


FIG 4-19
Connect the PV connectors to the inverter

5 Commissioning Inverter

5.1 Electrical Inspection

Table 5-1 Inspection before Commissioning

No.	Inspection Items	Result	
		Yes	No
1	The inverter DC switch and external circuit breaker are disconnected		
2	The inverter should be accessible for operation, maintenance and service.		
3	Nothing is left on the top of the inverter.		
4	The inverter is correctly connected to the external devices.		
5	The cables are routed in a safe place or protected against mechanical damage.		
6	The selection of the AC circuit breaker is in accordance with the User manual and all applicable local standards.		
7	All unused terminals at the bottom of the inverter are properly sealed.		
8	Warning signs & labels are suitably affixed and durable.		

5.2 Commissioning Procedure

If all the aforementioned items satisfy the necessary criteria, please adhere to the subsequent instructions to initiate the inverter's initial startup procedure.

Step 1: Turn the DC switch of the inverter to the "ON" position.

Step 2: Connect the AC switch (if applicable) between the inverter and the grid.

Step 3: Connect the DC switch (if applicable) between the inverter and the PV string.

Step 4: Utilize the CSI Smart Energy App to establish the preliminary safety parameters. Provided that the irradiation and grid conditions are satisfactory, the inverter will operate smoothly.

Step 5: Observe the LED indicator to ensure that the inverter operates normally.

LED indicator	LED state	Definition
 PV connection indicator	Steady green	One or more PV strings are properly connected to the inverter and the DC input voltage for at least one MPPT is higher than 550V.
	Off	DC input voltage of all MPPTs is lower than 250V.
 Grid connection indicator	Steady green	The inverter is generating and is connected to the AC grid.
	Blinking green	The solar inverter is in self-test mode or wait mode.
	Off	The solar inverter is not in grid-tied mode.
 Communications/Maintenance indicator	Blinking green	Communication operates normally.
	Off	Communication lost for more than 10 seconds.
	Steady green	Maintenance state.
 Alarm indicator	Steady red	A major alarm is generated.
	Blinking red	A minor or warning alarm is generated.
	Off	No alarm
All LEDs	Take turns flashing	The solar inverter is waiting for the grid code setting.

6 CSI Smart Energy App – Local Mode

6.1 APP Introduction

The CSI SmartEnergy APP can establish a communication connection to the dongle via Bluetooth, thereby achieving local access to the inverter. Users can use the App to view basic information, alarms, set parameters, etc.

6.2 Download and Install the App

Method 1 Scan the following QR Code to download and install the App according to the prompt information.

Method 2 For the monitoring and local APP information, please refer to documents published on our website: https://smartenergy.csisolar.com

6.3 Use the Local Mode to login the App

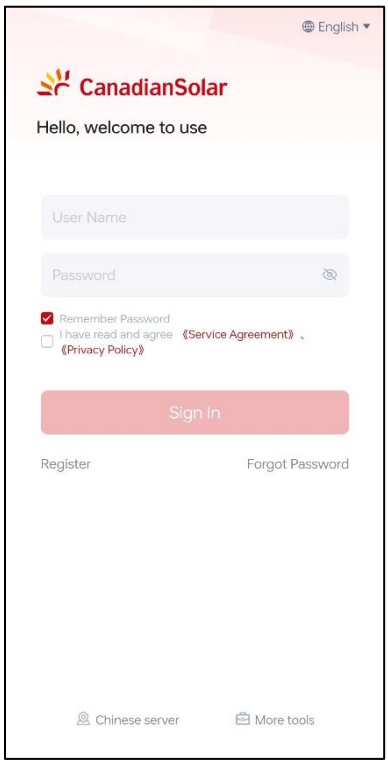
Notice: To use the local mode, the following conditions should be met:

(1) The dongle is connected to the inverter and powered on.

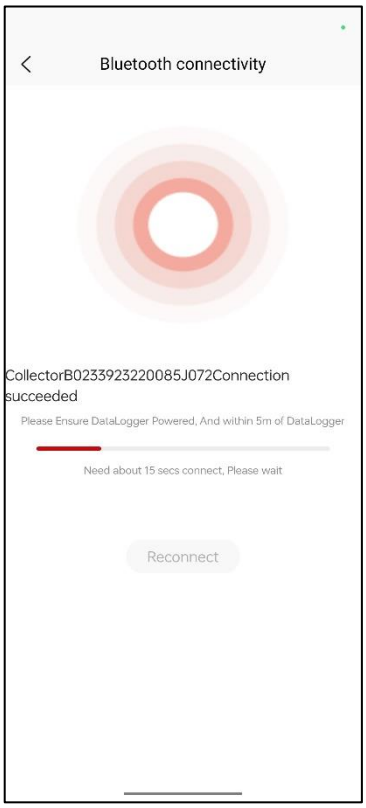
(2) The distance between the mobile phone and the dongle should be within 5m and there are no obstacles.

(3) Make sure the Bluetooth of your phone is turned on.

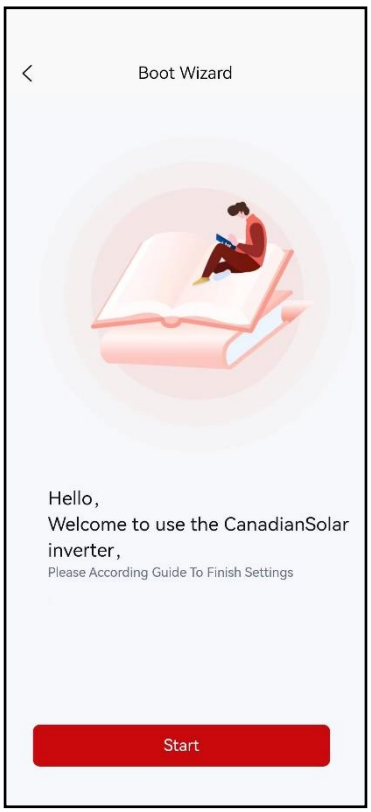
Step 1: Open the CSI Smart Energy APP.

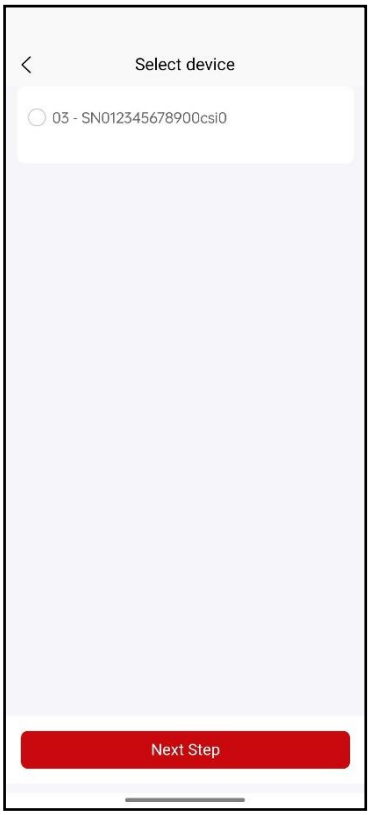


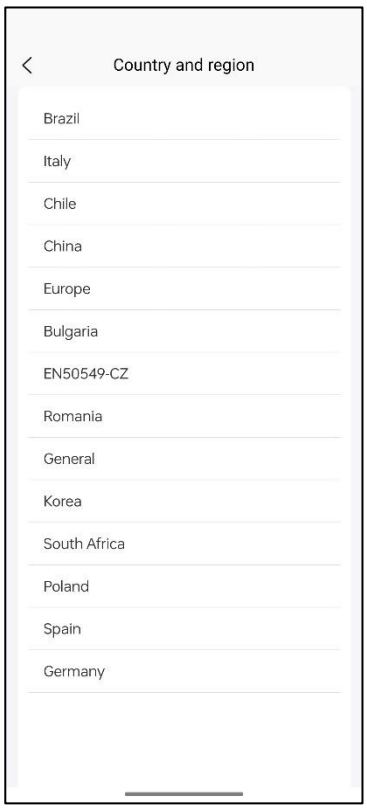
Step 2: Select " More tools"->" Local Access". Scan the QR code of the dongle, and the mobile phone will connect the dongle automatically.

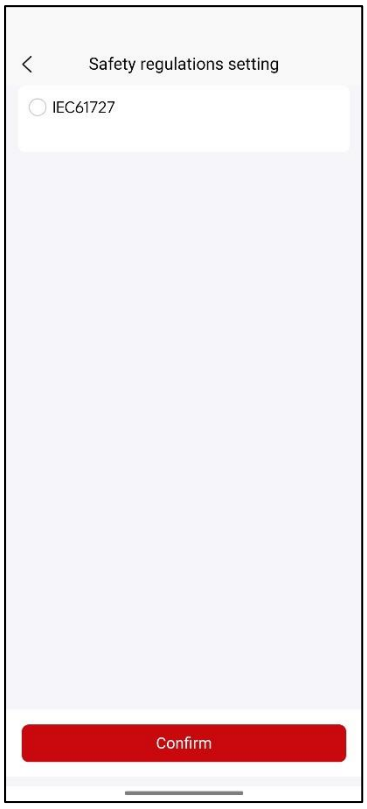


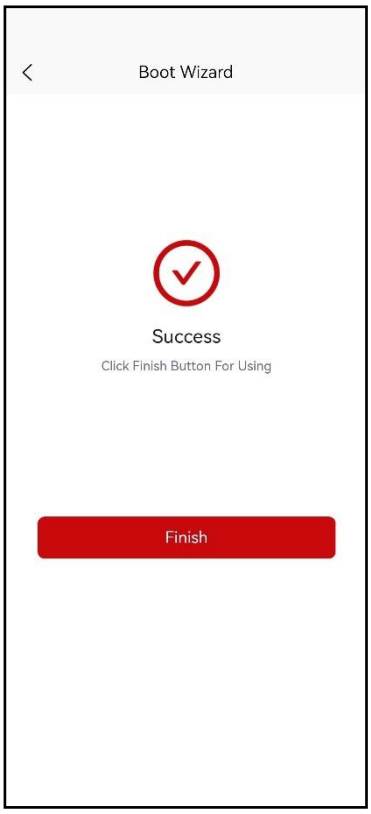
Step 3: If the inverter is booted for the first time, you need to set the Grid Code as required on the boot page.





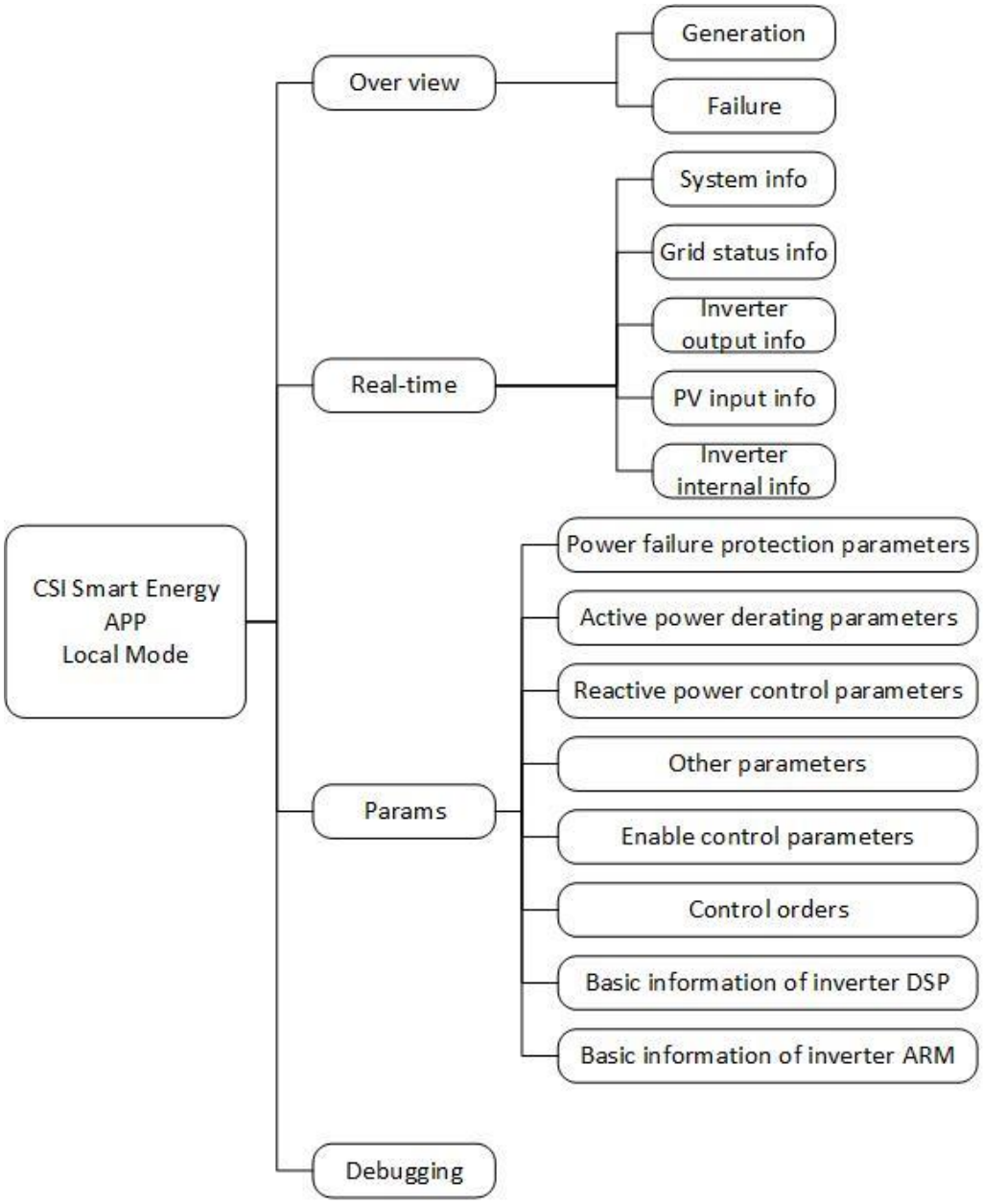






⚠ Notice	Must select the correct gird code where the inverter is installed. If the gird code is not suitable, it may cause the inverter to report a fault error. You can also set the grid code on the "Parameter" -> "Inverter Basic Information-DSP" ->" Grid Code" after setting on this page.

6.4 Function List



7 Obtaining User Manual

Please scan the QR code for more detailed information in the user manual.

320-350K