

Version: EN-UM-1.0

USER MANUAL

Single-Phase Grid-Tied Solar Inverter

HISTORY

VERSION	ISSUED	COMMENTS
1.0	Oct. 2025	First release

About This Manual

This manual describes the installation, connection, commissioning and maintenance etc. of the inverter. Please first read the manual and related documents carefully before using the product, and be sure to store it in a place within the reach of installation, operation and maintenance personnel.

As the technology is constantly updated and improved, the illustrations in this Manual are for reference only. This Manual is subject to change without prior notice. (Specific products in kind prevail.)

Target Group

Single-phase grid-tied solar inverters must be installed by professional electrical engineers who have obtained relevant qualifications.

Scope

This manual is valid for:

Model 1

- SE-TH02 2.0TL1
- SE-TH02 3.0TL1
- SE-TH02 3.6TL1
- SE-TH02 4.0TL1

Model 2

- SE-TH02 5.0TL1
- SE-TH02 6.0TL1
- SE-TH02 6.6TL1

It will be referred to as "inverter" hereinafter unless otherwise specified.

Convention

The following safety instructions and general information are used within this Manual.

 DANGER	Indicates an imminently hazardous situation which, if not correctly followed, will result in serious injury or death.
 WARNING	Indicates a potentially hazardous situation which, if not correctly followed, will result in serious injury or death.
 CAUTION	Indicates a potentially hazardous situation which, if not correctly followed, could result in moderate or minor injury.
 NOTICE	Indicates a potentially hazardous situation which, if not correctly followed, could result in equipment failure, or property damage.
 NOTE	Call attention to important information, best practices and tips: supplement additional safety instructions for your better use of the inverter to reduce the waste of you resource.

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1 Safety

Before using the inverter, please read all instructions and cautionary markings on the console and manual. Keep this manual within reach.

The Single-Phase Grid-tied Solar Inverter (hereinafter referred to as the inverter) strictly conforms to related safety rules in design and test. Please follow the local laws and regulations during installation, operation and maintenance. Incorrect operation may result in personal injury or death, inverter damage and properties damage to the operator or a third party.

1.1 Safety Caution

Personnel Safety

- Installation, maintenance and connection of inverters must be performed by qualified personnel, in compliance with the electrical standards, wiring rules and requirements of local power authorities and/or companies.
- Ensure children are kept away from the inverter.
- The technician must read through this User Manual carefully and master it before any operation.
- Take appropriate measures to avoid electric shock.
- When exposed to sunlight, the PV array will generate dangerous high DC voltage. So please operate it according to our instructions, or your life will be in danger.

PV Inverter Protection



NOTICE

As soon as receiving the PV inverter, please check if it is damaged during its transportation. If yes, please contact your dealer immediately.

- Do not tamper with any warning signs on the inverter enclosure because these signs contain important information about safe operation.
- Do not remove or damage the nameplate on the inverter's enclosure because it contains important product information.

Installation Safety



NOTICE

Please read the User Manual carefully before installing the PV inverter; warranty or liability will be exempted from the company if damage is caused by installation faults.

- Ensure there is no electrical connections around ports of the PV inverter before installation;
- Adequate ventilation must be provided for inverter installation location. Mount the inverter in vertical direction, and ensure that no object is put on the heat sink affecting the cooling. (For details, refer to Chapter 4 Mounting).
- Don't open the front cover of the inverter. Unless performing work at the wiring terminal (as instructed in this Manual), touching or changing components without authorization may cause personal injury, damage to inverter and annulment of the warranty.

Electrical Connections



DANGER

Before installing the inverter, check all electrical ports to ensure no damage and no short circuit. Otherwise personal casualty and/or fire will occur.

- Input terminals of the PV inverter apply only to input terminals of PV String; do not connect any other DC source to the input terminals.
- Before connecting PV modules, ensure that its voltage is within the safe range; when exposed to any sunlight, PV modules can generate high voltage.
- All electrical connections must meet the electrical standards of the country or region.
- Cables used in electrical connections must be well fixed, under good insulation, and with appropriate specification.
- Do not insert or pull the AC and DC terminals when the inverter is running.
- Ensure the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty annulled.

Operating and Commissioning

 DANGER	While the inverter operating, high voltage can lead to an electrical shock hazard, and even cause personal casualties. Therefore, operate the PV inverter strictly according to the safety precautions in the user manual.
 WARNING	When the photovoltaic array is exposed to light, it supplies DC voltage to the PCE.

- Before getting the permission of electrical power authority in the country/region, the grid-tied PV inverter cannot start power generation.
- Follow the procedures of commissioning described in the user manual when commissioning the PV inverter.
- The temperature of some parts of the inverter may exceed 60°C during operation, so do not touch the inverter during operation, otherwise you may be burnt.

Maintenance

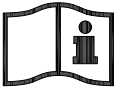
 DANGER	Power OFF all electrical terminals before the inverter maintenance; strictly comply with the safety precautions in this document when operating the inverter.
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- To avoid electric shock, DC input and AC output of the inverter must be terminated at least 5 minutes before performing any installation or maintenance.
- For personal safety, maintenance personnel must wear appropriate personal protective equipment (like insulation gloves and protective shoes) for the inverter maintenance.
- Place temporary warning signs or erect fences to prevent unauthorized access to the maintenance site.
- Follow the procedures of maintenance stipulated in the manual strictly.
- Check the relevant safety and performance of the inverter; rectify any faults that may compromise the inverter security performance before restarting the inverter.

Additional Information

 NOTICE	To avoid any other unforeseeable risk, contact your dealer immediately if there is any issue found during operation.
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1.2 Symbols on the Inverter

Symbol	Description
	Danger of high voltage! Only qualified personnel may perform work on the inverter.
	Residual voltage exists after the inverter is powered off. It takes 5 minutes for system to discharge to a safe voltage.
	Danger of hot surface.
	Environmental Protection Use Period.
	Refer to the operating instructions.
	Don't dispose of the inverter with the household waste.
	CE mark is attached to the solar inverter to verify that the unit follows the provisions of the European Low Voltage and EMC Directives.

2 Delivery and Storage

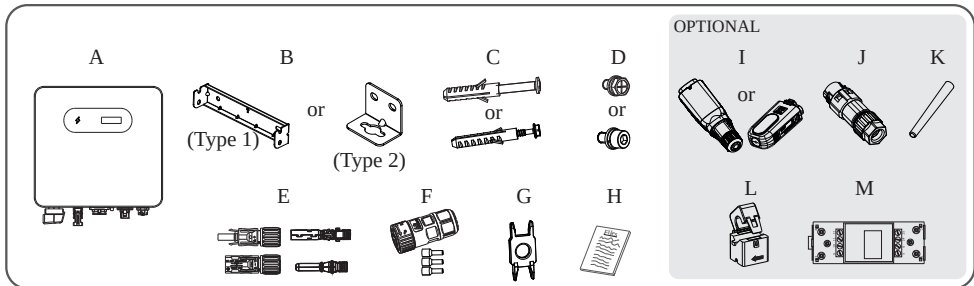
2.1 Scope of Delivery

Complete test and strict inspection before the inverter is sent out.

When receiving the inverter, check that the packing materials are intact.

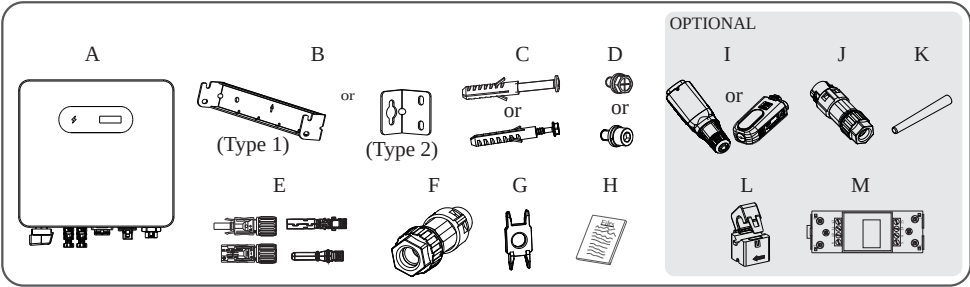
After unpacking, examine the PV inverter and its fittings for damage and check that the deliverables are complete.

- **Model 1**



Number	Description	Quantity
A	Inverter	1
B	Mounting bracket	1 (Type 1) / 2 (Type 2)
C	M6 Expansion screw	2
D	M6 Security screw	2
E	PV connector group	1
F	AC output connector (with 3 wire ferrule)	1
G	Tightening/Removal tool for PV connector	1
H	File package	1
I	Wi-Fi/LAN/4G module	1 (optional)
J	RS485 connector	1 (optional)
K	External antenna	1 (optional)
L	CT	1 (optional)
M	Meter	1 (optional)

• **Model 2**



Number	Description	Quantity
A	Inverter	1
B	Mounting bracket	1 (Type 1) / 2 (Type 2)
C	M6 Expansion screw	2
D	M6 Security screws	2
E	PV connector group	1 / 2
F	AC output connector	1
G	Tightening/Removal tool for PV connector	1
H	File package	1
I	Wi-Fi/LAN/4G module	1 (optional)
J	RS485 connector	1 (optional)
K	External antenna	1 (optional)
L	CT	1 (optional)
M	Meter	1 (optional)

2.2 Storage Inverter

If the inverter is not used immediately, please keep the inverter in a specific environment according to the following:

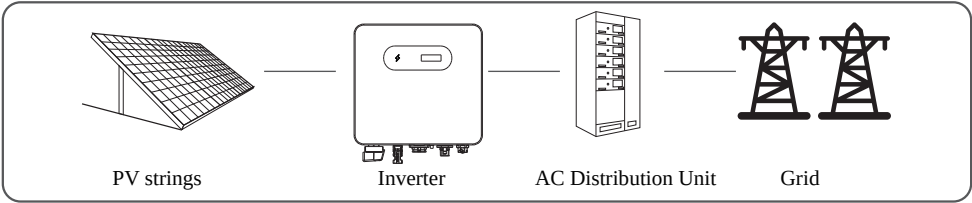
- Do not unpack the inverter and put desiccant in the original box if the PV inverter is unpacked.
- Store temperature range: -25 °C to +60 °C; Relative humidity range: 0 % to 100 %.
- The PV inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
- When stacking inverters, strictly adhere to the layer limit indicated on carton.
- Do not position the inverter at a front tilt, excessive back tilt, or side tilt, or upside down.
- Conduct periodic inspection during storage. Replace the packing materials immediately if any rodent bites are found.
- Ensure that qualified personnel inspect and test the inverter before use if it has been stored for a long time.

3 Product Introduction

3.1 System Overview

The single-phase grid-tied solar inverter converts the direct current (DC) generated by PV panels into single-phase alternating current (AC) and is delivered to the grid.

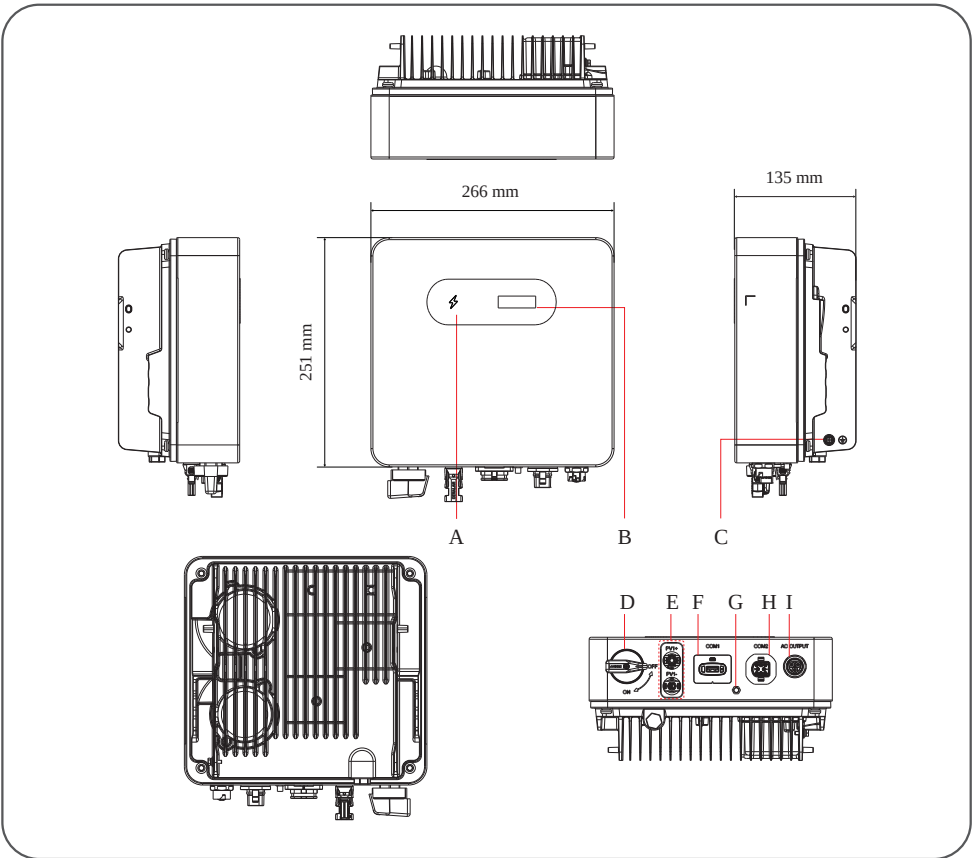
This series of inverter is an important part of PV system and it is suitable for household use, commercial roof, fishing light, and agricultural light and more scenarios.



3.2 Product Appearance

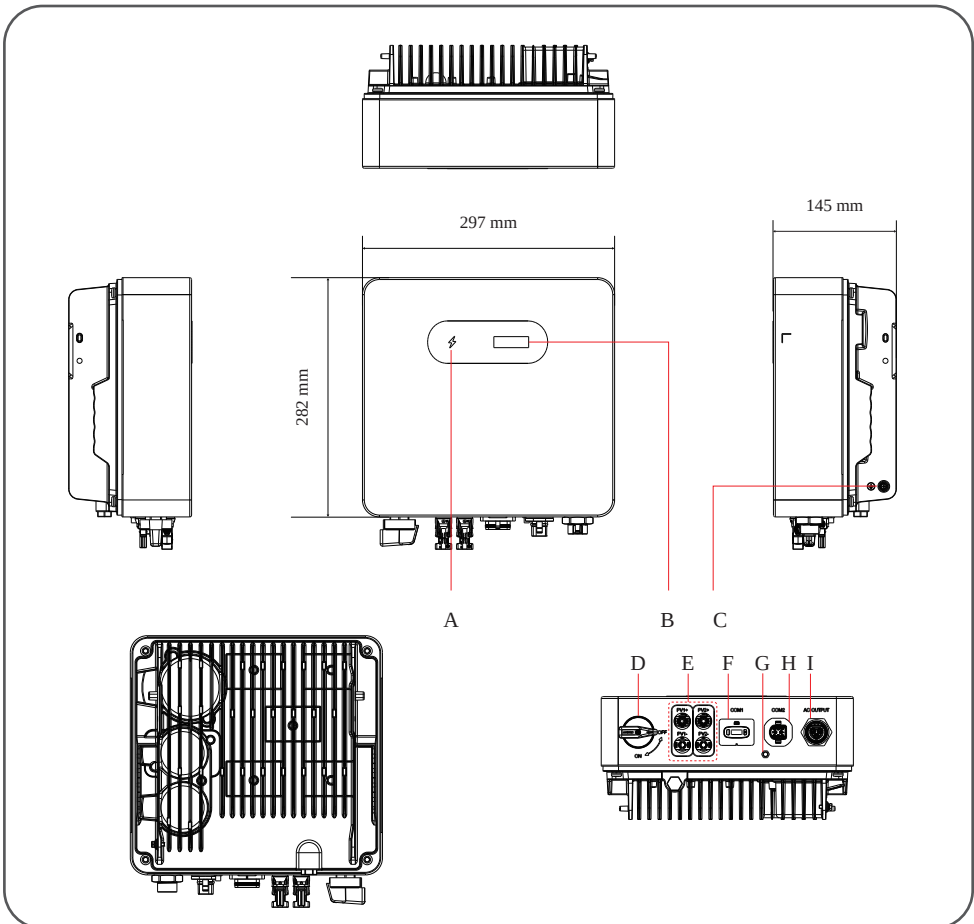
The following figures are only for reference, specific products in kind prevail.

- **Model 1**



Number	Description
A	LED Indicator
B	LCD Screen (Optional)
C	Grounding Port
D	DC Switch
E	PV Connection Port
F	COM1 (Wi-Fi/4G/LAN)
G	External Antenna Terminal Port (Optional)
H	COM2 (RS485/Meter/CT)
I	AC Output Connector Port

• **Model 2**

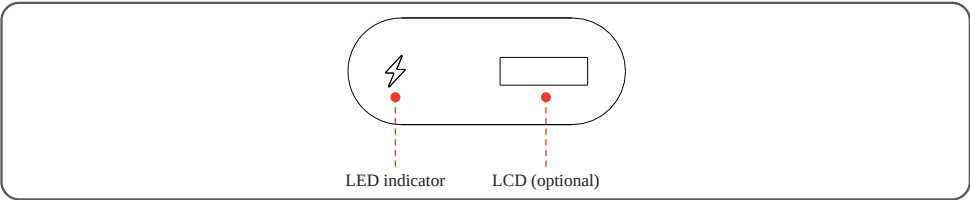


Number	Description
A	LED Indicator
B	LCD Screen (Optional)
C	Grounding Port
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F	COM1 (Wi-Fi/4G/LAN)
G	External Antenna Terminal Port (Optional)
H	COM2 (RS485/Meter/CT)
I	AC Output Connector Port

3.3 User Interface

Inverter display panel is consisted of LED indicator and LCD.

Please find the LED status and its corresponding explanations in Table 3-1; the details of LCD screen in Table 3-2; and warning information in Table 3-3.



NOTE

You can view & set data of the inverter through inverter APP.
For details about operation, refer to APP User Manual. APP User Manual is available for free from website.

3.3.1 LED

Table 3-1 LED Status Description

LED Indicator	Descriptions	Status
Green led	Standby	Normal status
	Blink(slowly)	On
Blue led	Power limited status	On
Red led	Refer to the Table 3-3	

3.3.2 LCD

Table 3-2 LCD automatic-page-turning display

Mode	Display content	Note
The LCD display interface of the inverter standby state is shown in the following sequence:	SE 3.8KTL-S1 Ver 01.00.00	Model name Version
	Udc: 360V	PV voltage (single MPPT)
	Udc: 360/360V	PV voltage (double MPPT)
	Uac 220V	AC voltage
	Today 80kWh Etot 8000kWh	Today Energy Total Energy
The LCD display interface for countdown of inverter grid-connected is shown in the right picture:	A0 Grid OV B1 Imp abn	Warning
	Starting 60s	Start counter down
The LCD display interface of the inverter grid-connected state is shown in the figure on the right:	Pac 5000W Today 50kWh	Output power Today Energy
	Etot 8000kWh Htot 8000hr	Total Energy Total Hours
	Udc 360/360V Idc 8/8A	PV voltage PV current
	Uac 220V Iac 28A	AC voltage AC current
	08:00 2018-08-08	hour:minute year/month/day

Table 3-3 Warning Table

LED Indicator status	Warning Definition	LCD Display	
Red led blink slowly	Grid over voltage	A0 Grid OV	
	Grid under voltage	A1 Grid UV	
	Grid absent	A2 Grid Loss	
	Grid over frequency	A3 Grid OF	
	Grid under frequency	A4 Grid UF	
	Grid abnormal	A6 Grid unba	
	Grid over mean voltage	A7 Mov OV	
Red led blink quickly	PV over voltage	B0 PV OV	
	Insulation resistance abnormal	B1 Iso abn	
	Leakage current abnormal	B2 Lkge abn	
	PV under voltage	B4 PV UV	
	PV Strings reverse	B7 PV Revers	
Red on	Grid N abnormal	A8 GridN abn	
	Internal power supply abnormal	/ (LCD screen will be turned off)	
	Arc fault detection	C1 Arc fault	
	Inverter over dc-bias current	C2 OP Dc OC	
	Inverter relay abnormal	C3 RLY abn	
	Inverter over temperature	C5 SYS OT	
	GFCI abnormal	C6 LkgCT abn	
	System type error	C7 SYS err	
	DC link over voltage	CA Bus OV	
	Internal communication error	CB COM err	
	Software incompatibility	CC FW Incomp	
	Internal storage error	CD EEP err	
	Data inconsistency	CE Inconsis	
	Inverter abnormal	CF INV abn	
	Boost abnormal	CG Bst abn	
	Data logger lost	CH Masterlos	
	Meter lost	CJ Meterlos	
	/	Fan abnormal	C8 FAN lock
		Remote off	CN RMT OFF
	 NOTE	If you choose the LCD screen, the warning code will be displayed on the screen. Non-lcd screen models need to enter the app to view corresponding warning code.	

4 Mounting

After checking the outer packing, move the PV inverter to the designated installation position horizontally.

 DANGER	Ensure there is no electrical connections around ports of the PV inverter before installation.
 CAUTION	1. Please place the inverter horizontally on the foam or other soft pads and ensure that the ports are free of load-bearing pressure to avoid inverter damages or scratches. 2. Be careful to prevent the inverter from slipping and hurting the operator when moving the inverter.

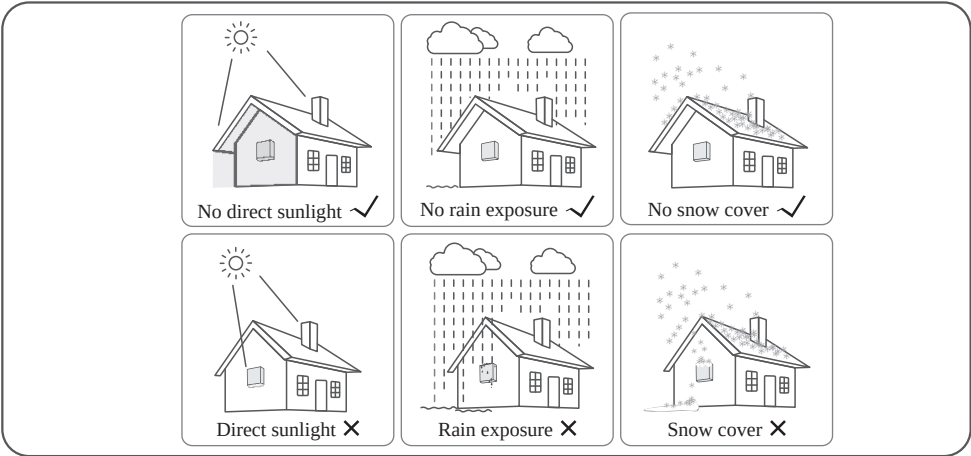
4.1 Requirements for Mounting

Basic Requirements

- With an IP66 protection rating, the inverter can be mounted indoors or outdoors.
- The installation method and position must be appropriate for the weight and dimensions of the inverter.
- The mounting location should be inaccessible to unrelated personnel since the housing and heat sinks are extremely hot during operation.
- DO NOT install the inverter in areas with flammable materials or gases.

Environment Requirements

- To ensure optimum operation and a long service life, the ambient temperature should be -25°C to 60°C.
- The inverter should be mounted in a well-ventilated environment to ensure good heat dissipation.
- To ensure long service life, the inverter should not be exposed to direct solar irradiation, rain, or snow. It is recommended that the inverter be mounted in a sheltered place.

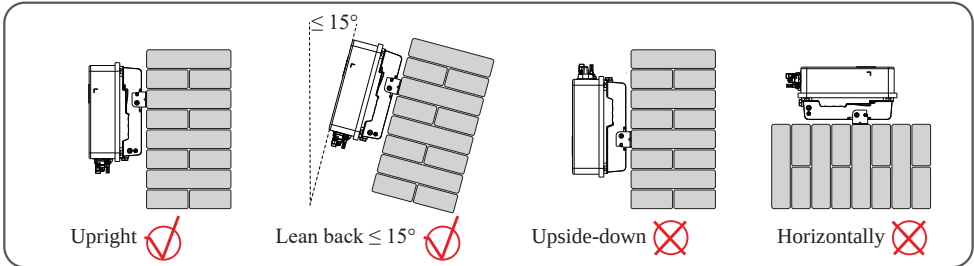


Carrier Requirements

- The carrier where the inverter is mounted must be fire-proof. **DO NOT** mount the inverter on flammable building materials.
- The wall must be solid enough to bear the weight of the inverter.
- **DO NOT** install the inverter on a wall made of gypsum boards or similar materials with weak sound insulation to avoid noise disturbance in a residential area.

Angle Requirements

Install the inverter upright or at a maximum back tilt of 15 degrees to facilitate heat dissipation.

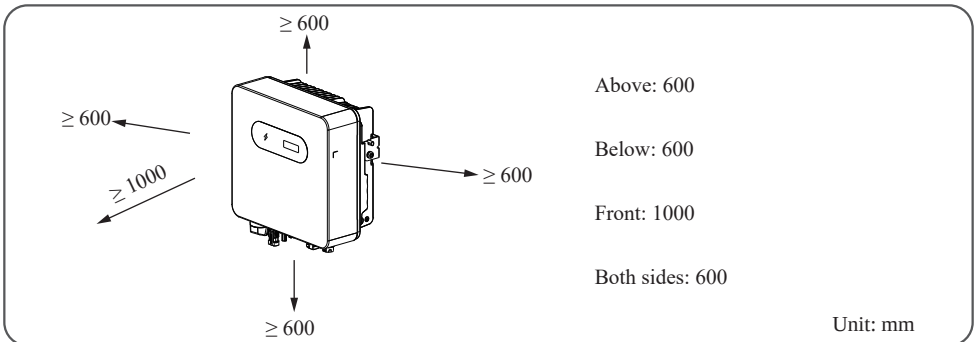


NOTICE

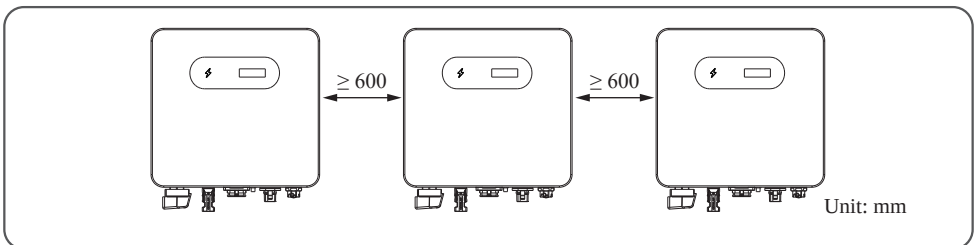
Improper installation will lead to inverter operation failure.

Clearance Requirements

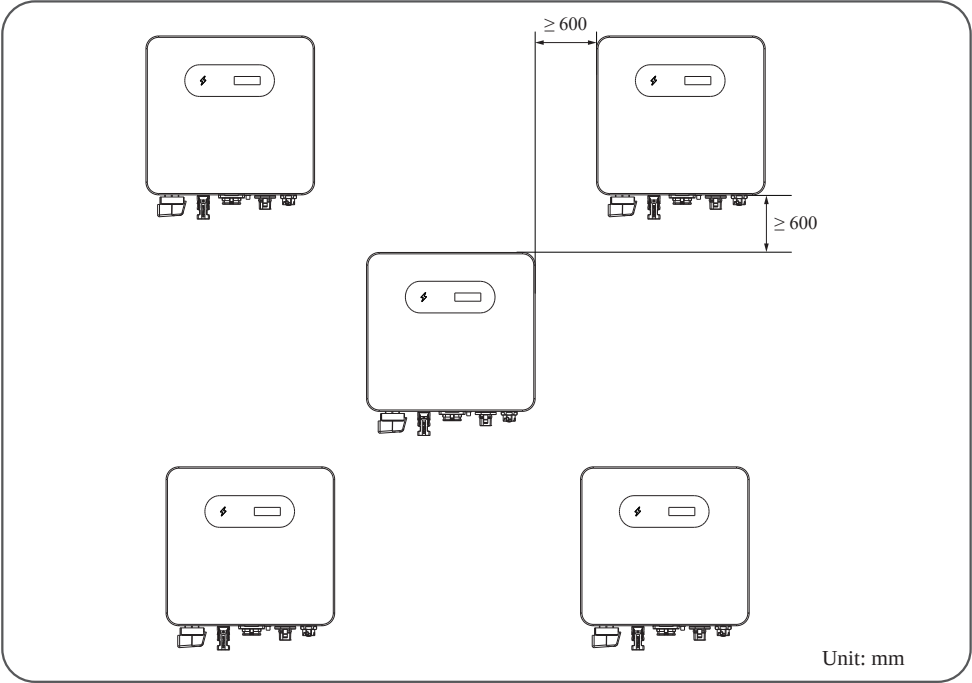
To keep the inverter normal and easy to operate, the requirements for available spaces of the inverter must be followed, e.g. to keep enough clearance. For details, see the following figures.



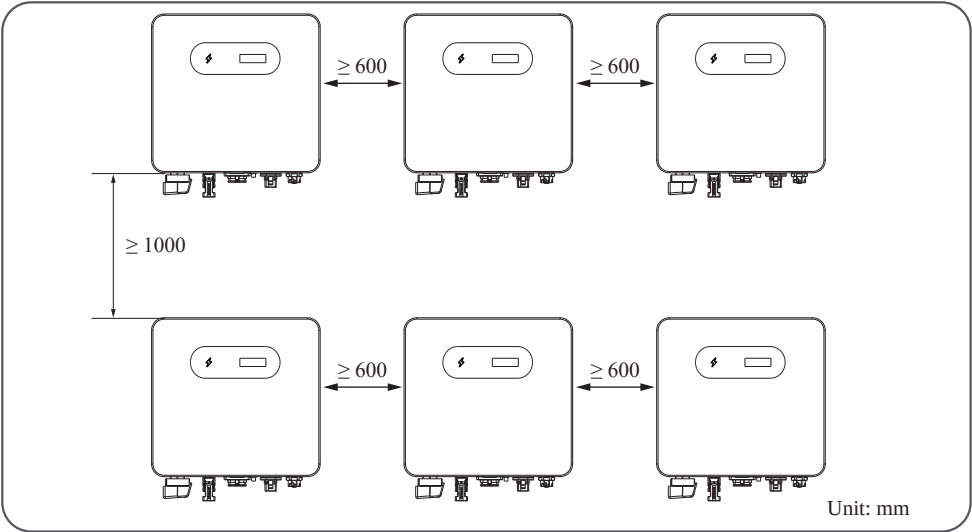
Installation along the same line for multiple inverters:



Installation in triangle mode for multiple inverters:



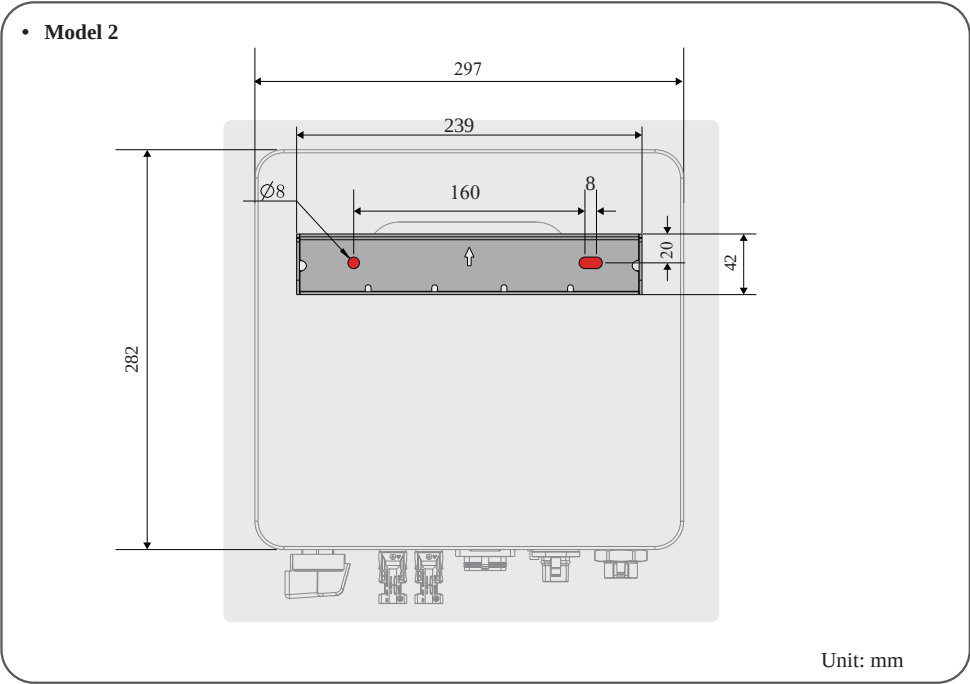
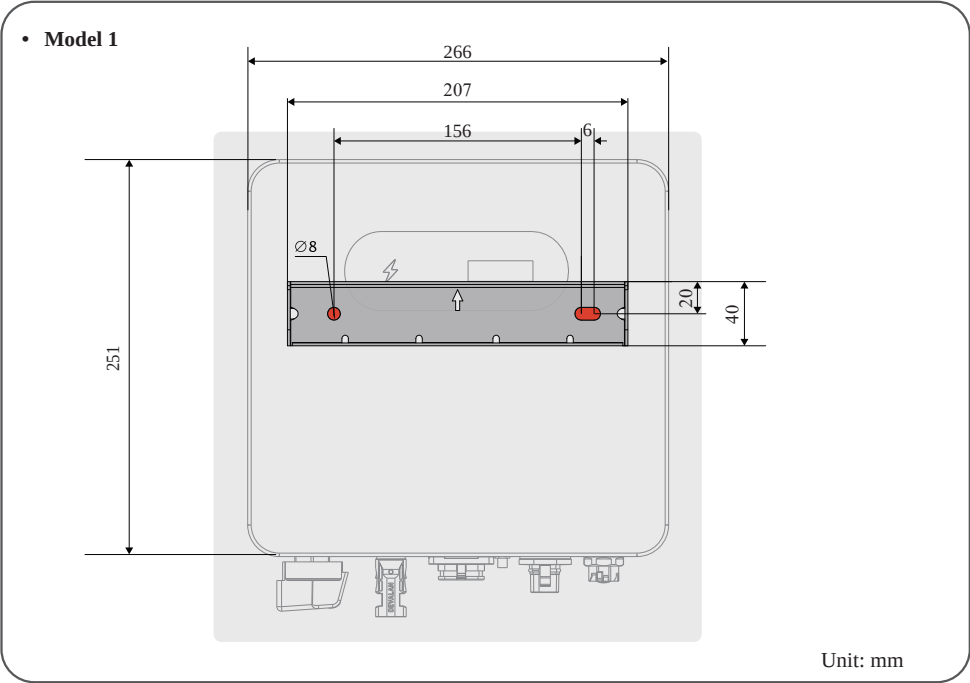
Installation in stacked mode for multiple inverters:



NOTICE

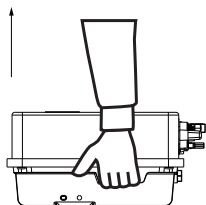
The clearance between multiple inverters must be increased to ensure proper heat dissipation when they are installed in a hot area.

Installation perspective schematic:



4.2 Moving the Inverter

After checking the outer packing, move the PV inverter to the designated installation position horizontally. Hold the handles on both sides of the inverter, as shown in the following figure.



CAUTION

- Do not place the PV inverter with its wiring terminals contacting the floor because the power ports and signal ports at the bottom of the device are not designed to support the weight of the inverter.
- When placing the inverter on the floor horizontally, put foam or paper under to protect its enclosure.

4.3 Mounting the Inverter



DANGER

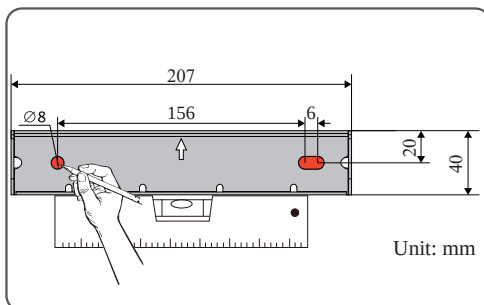
- The installation walls must be fire-proof and non-flammable materials, otherwise there is a fire risk.
- Before drilling holes, ensure that there is no electrical pipes or other pipes buried in the walls to avoid risks.

• Model 1

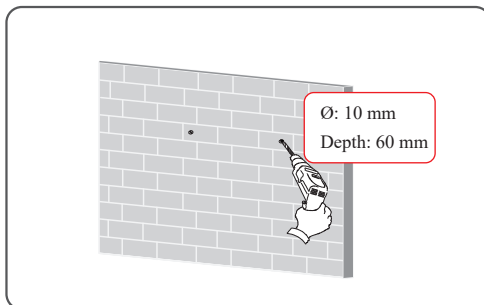
Type 1

Step 1 Determine the positions for drilling holes (Please refer to the relevant position dimensions as shown in *Installation perspective schematic*) using the mounting bracket.

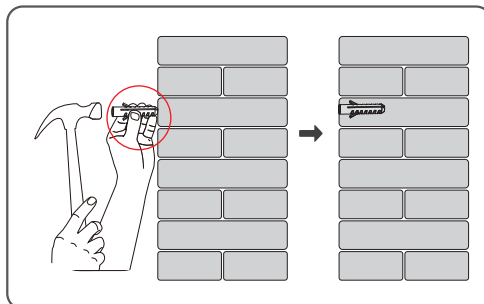
Step 2 Use a level ruler to mark the position of the drill holes on the installation site.



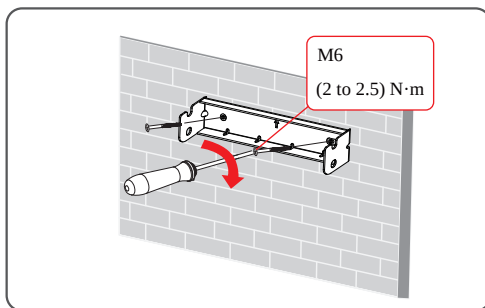
Step 3 Drill 2 holes, 10 mm in diameter and 60 mm in depth.



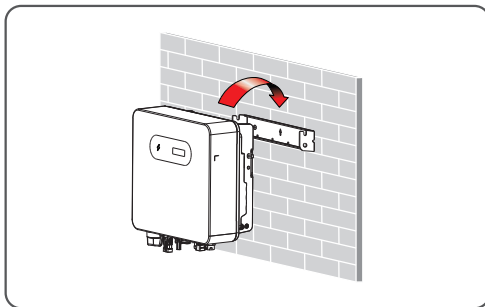
Step 4 Using a hammer to tap the expansion sleeve into the hole.



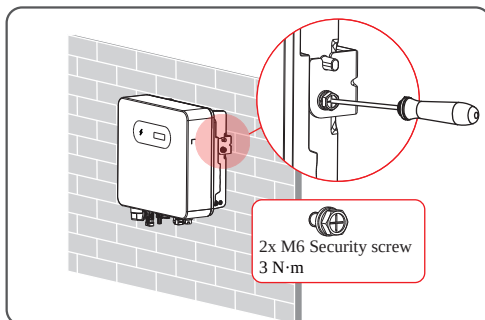
Step 5 Fix the mounting bracket with expansion screws.



Step 6 Hold the handles at both sides of the inverter and then lift, mount the inverter on the mounting bracket and keep them aligned with each other.



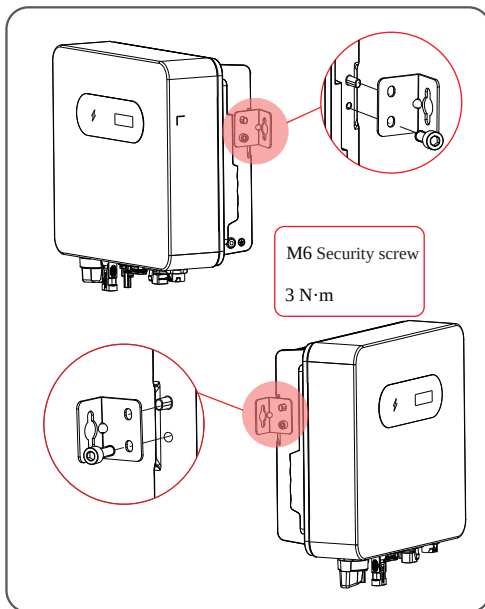
Step 7 Tighten the two hexagon screws at the both sides of the inverter to a torque of 3 N·m. Screw specs is M6.



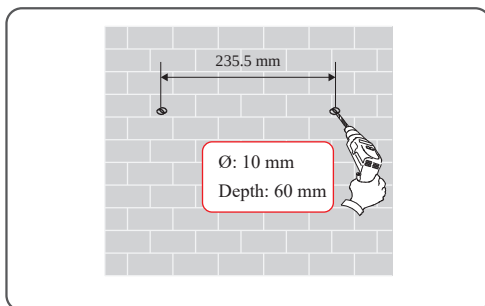
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Type 2

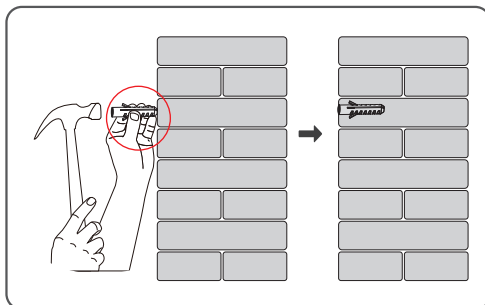
Step 1 Install the mounting brackets on both sides of the inverter.



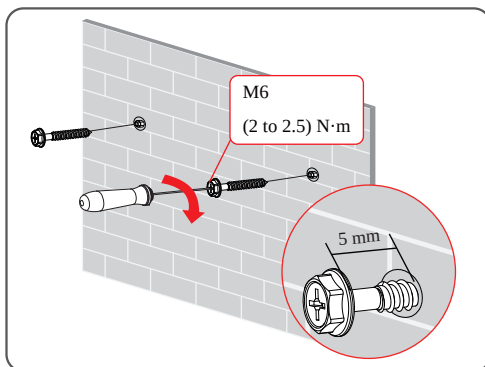
Step 2 Drill 2 holes, 10 mm in diameter and 60 mm in depth.



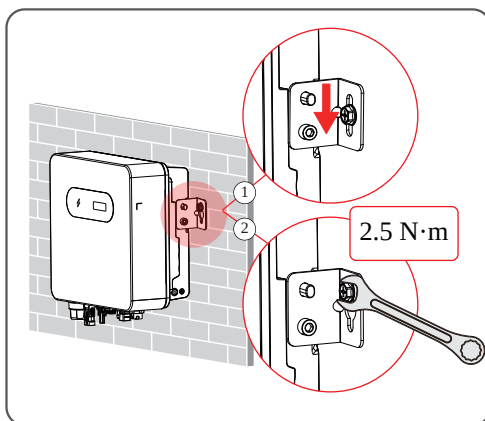
Step 3 Using a hammer to tap the expansion sleeve into the hole.



Step 4 Fix the expansion screws and reserve approximately 5 mm of length protruding outside the wall.



Step 5 Fix the inverter and tighten the expansion screws.



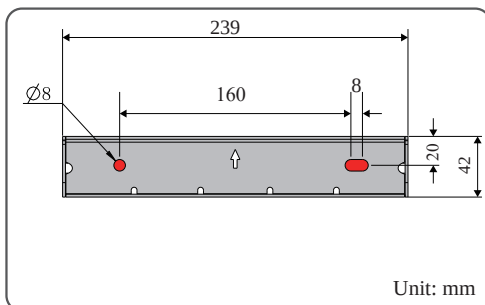
--End

- **Model 2**

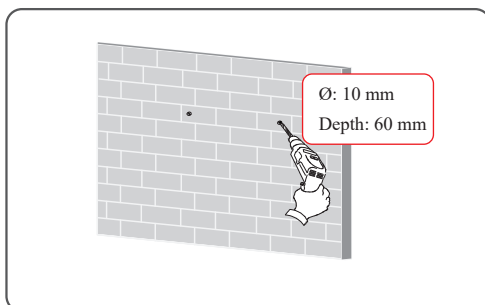
Type 1

Step 1 Determine the positions for drilling holes (Please refer to the relevant position dimensions as shown in *Installation perspective schematic*) using the mounting bracket.

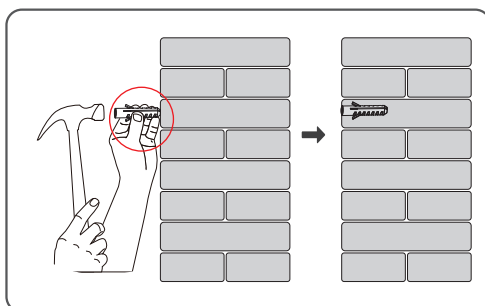
Step 2 Use a level ruler to mark the position of the drill holes on the installation site.



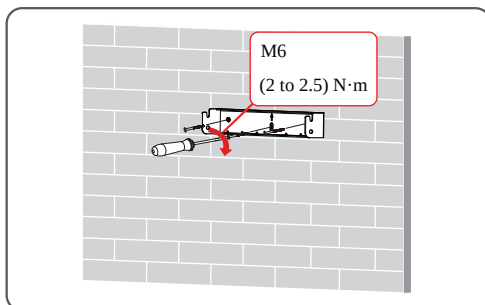
Step 3 Drill 2 holes, 10 mm in diameter and 60 mm in depth.



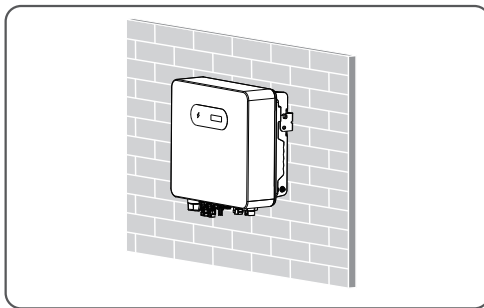
Step 4 Using a hammer to tap the expansion sleeve into the hole.



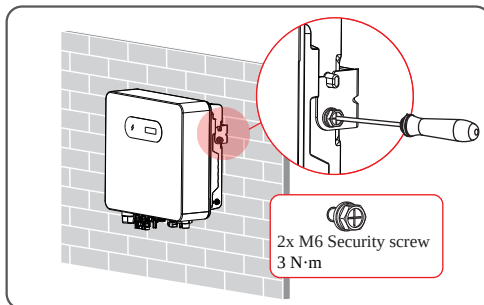
Step 5 Fix the mounting bracket with expansion screws.



Step 6 Hold the handles at both sides of the inverter and then lift, mount the inverter on the mounting bracket and keep them aligned with each other.



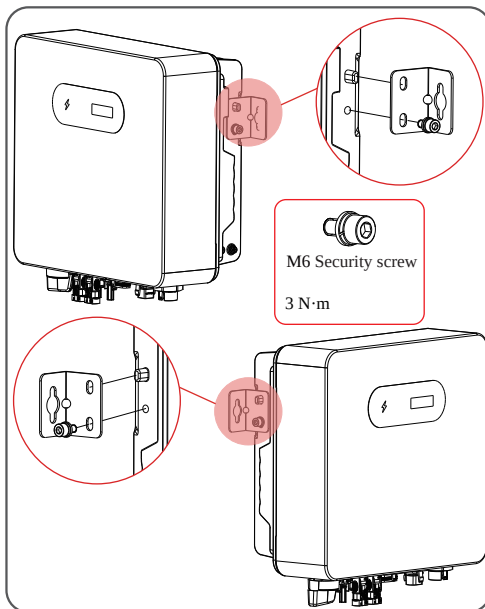
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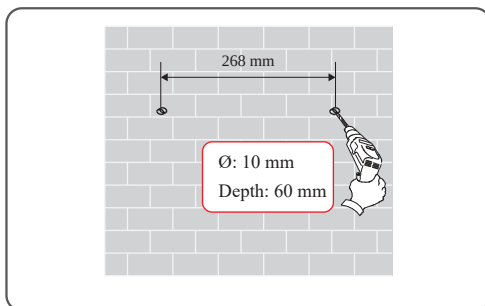
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Type 2

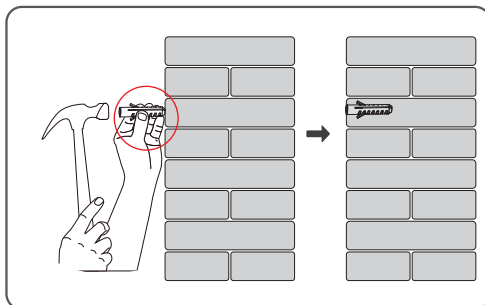
Step 1 Install the mounting brackets on both sides of the inverter.



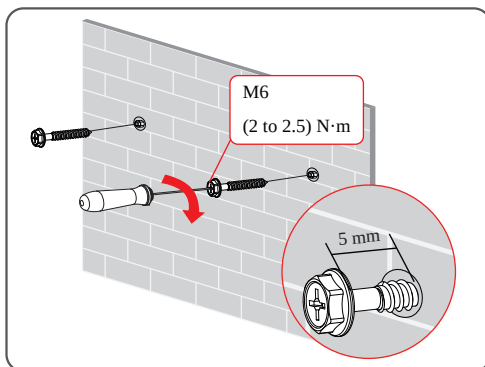
Step 2 Drill 2 holes, 10 mm in diameter and 60 mm in depth.



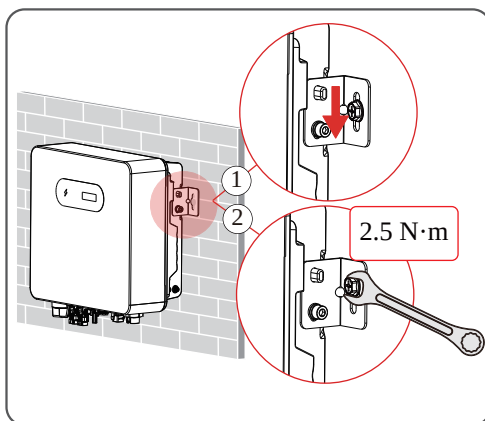
Step 3 Using a hammer to tap the expansion sleeve into the hole.



Step 4 Fix the expansion screws and reserve approximately 5mm of length protruding outside the wall.



Step 5 Fix the inverter and tighten the expansion screws.



--End

4.4 Self-check

Ensure that the inverter is well fixed.

5 Electrical Connection

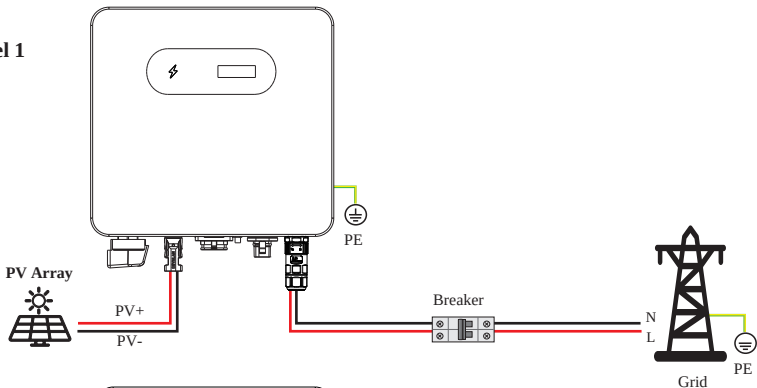
5.1 System Connection



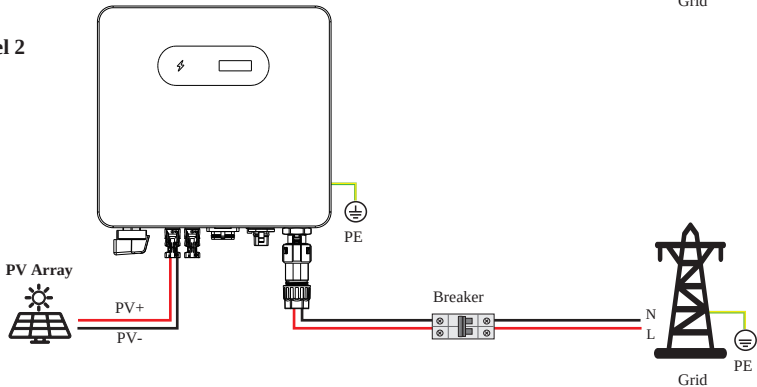
DANGER

Before electrical connection, please ensure that both the AC and DC ends are powered off, otherwise there will be a high voltage shock.

• **Model 1**



• **Model 2**



NOTE

The cable colors in figures are only for reference. Select appropriate cables according to the local standards.

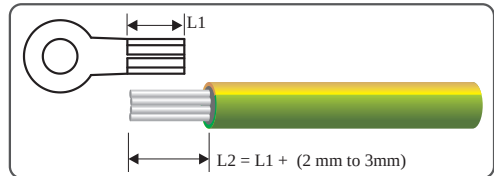
5.2 External Ground Protection Connection

The right side of the device has a protective grounding connection. Be sure to connect the protection ground cable to this port when installing the inverter. The ground cable must be outdoor copper-core cables with a cross sectional area of 4 mm² or more.

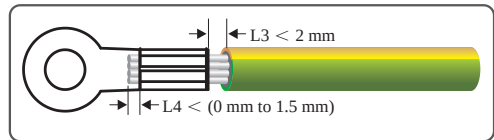
Users should perform the ground connection according to the on-site condition.

 DANGER	Before performing electrical connections, ensure that both DC and AC switches are OFF. Otherwise, high voltage may result in fatal injury.
 CAUTION	Good grounding for the inverter helps resist the impact of surge voltage and improve the EMI performance. Connect the PGND cable before connecting the AC power cables, DC power cables, and communication cables.
 NOTE	It is recommended that the ground cable be connected to a nearby ground position. For a system with multiple inverters connected in parallel, connect the ground points of all inverters to ensure equipotential connections.

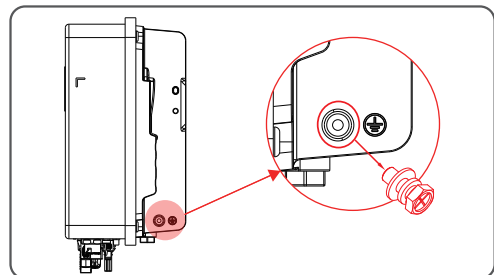
Step 1 Remove an appropriate length using a wire Stripper.



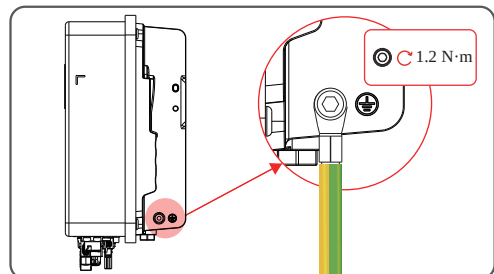
Step 2 Insert the exposed core wires into the crimping areas of the OT terminal and crimp them using hydraulic pliers.
(Recommended OT Terminal: OT6-4)



Step 3 Remove the ground screws from the ground points.



Step 4 Secure the PGND cable using the ground screw and tighten the screw using a socket wrench.



--End

5.3 AC Connection

Preparation

The AC power cable and AC terminals have been prepared.

- AC power cable: Outdoor copper-core cables are recommended.

Inverter Model	Cable Type	Cross-sectional Area(mm ²)	Cable Outer Diameter(mm)
Model 1	Multi-core outdoor AC cable	≤ 4 (Range)	10 to 14 (Range)
		2.5 (Recommended)	14 (Recommended)
Model 2		4 to 6 (Range)	10 to 14 (Range)
		6 (Recommended)	14 (Recommended)

- The recommended specifications of circuit breaker are shown in the table below.

Inverter Model	Recommended Value	
Model 1	SE-TH02 2.0TL1	16A
	SE-TH02 3.0TL1, SE-TH02 3.6TL1	25A
	SE-TH02 4.0TL1	32A
Model 2	SE-TH02 5.0TL1	32A
	SE-TH02 6.0TL1, SE-TH02 6.6TL1	40A



WARNING

- To ensure that the inverter is safely disconnected from the grid, the independent AC breaker must be configured for each inverter as a protective device.
- Multiple inverters are not allowed to share a circuit breaker.
- Load is not allowed to connect between the inverter and the AC breaker.

Procedure

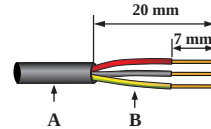
• Model 1

Step 1 Wires making.



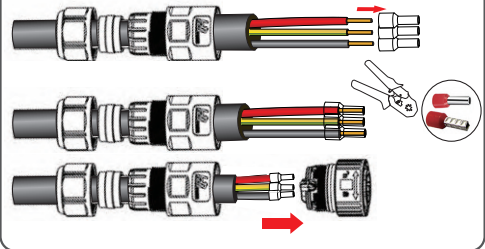
NOTE

It is recommended to use outdoor dedicate cables with multiple copper cores.



A. Diameter (mm)	10 to 14
B. Cross Section (mm ²)	≤ 4 (Range)
	2.5 (Recommend)

Step 2 Lead the AC cable through the rubber nut, seal and so on.

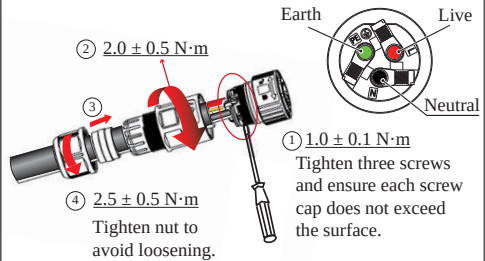


Step 3 Tighten three screws and ensure each screw cap does not exceed the surface, then install AC connector.

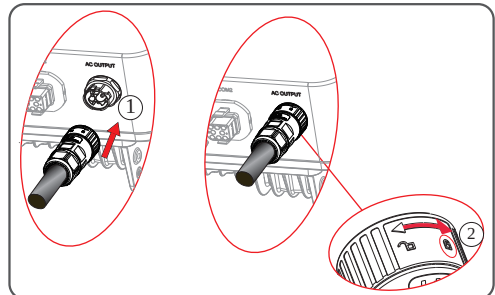


NOTE

Earth, neutral, and live wires must correspond to PE, N, and L terminals of AC connectors respectively. Otherwise, the faulty connection will lead to the invert performance failure.



Step 4 Plug the AC connector into the inverter.



--End

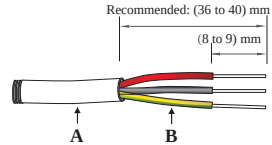
• **Model 2**

Step 1 Wires making.



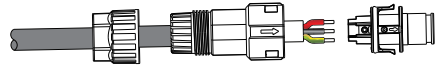
NOTE

It is recommended to use outdoor dedicate cables with multiple copper cores.



A. Diameter (mm)	10 to 14
B. Cross Section (mm ²)	4 to 6 (Range)
	6 (Recommend)

Step 2 Lead the AC cable through the rubber nut, seal and so on.

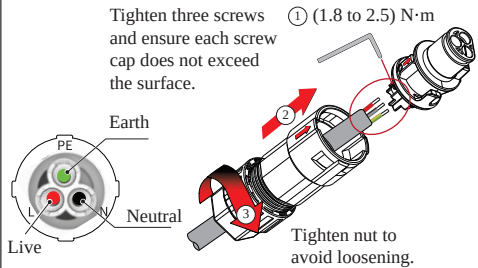


Step 3 Tighten three screws and ensure each screw cap does not exceed the surface, then install AC connector.

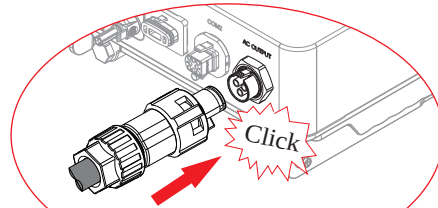


NOTE

Earth, neutral, and live wires must correspond to PE, N, and L terminals of AC connectors respectively. Otherwise, the faulty connection will lead to the inverter performance failure.



Step 4 Plug the AC connector into the inverter.



--End

5.4 PV Connection

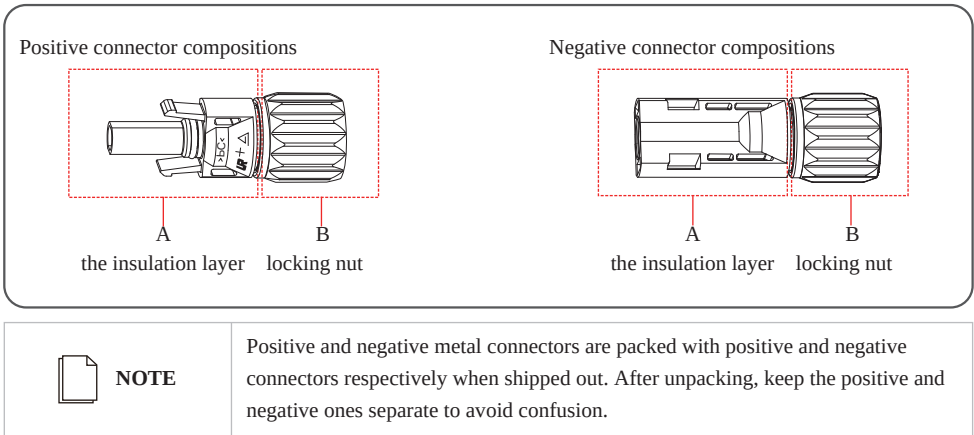
 DANGER	▪ PV modules generate electric energy when exposed to sunlight and can create an electrical shock hazard. Therefore, when connecting the PV modules, shield them with opaque cloth and ensure that DC switches are OFF. To avoid electric shock, don't touch the charge part and connect the terminals carefully. ▪ Before connecting power cables, ensure the AC/DC switches are OFF. ▪ When the inverter is connected to the grid, don't plug in or plug out the PV strings. ▪ Don't perform any operation until the inverter is shut down.
 WARNING	▪ PV modules connected in series in each PV string must be of the same specifications. ▪ The maximum open-circuit voltage of each PV string must be always lower than or equal to its permitted range. ▪ The maximum short circuit current of each PV string must be always lower than or equal to its permitted range. ▪ Ensure that the positive and negative terminals of each PV strings connected to the inverter correctly. ▪ The positive or negative terminals of PV strings can't be connected with short circuit. ▪ The total output power of all PV strings can't exceed the maximum input power of the inverter.

Preparation

- PV Strings DC input cable and connectors have been prepared; The recommended outdoor copper-core DC input cable specifications is shown as below.

Inverter Model	Cable Type	Cross-sectional Area(mm ²)	Cable OuterDiameter(mm)
All	Common PV cables in the industry (model: PV1-F)	4 to 6 (Range) 4 (Recommended)	5 to 8

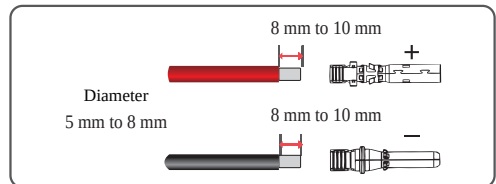
- Connectors of PV Strings: Positive and negative DC input connectors are used, as shown in the following Figure.



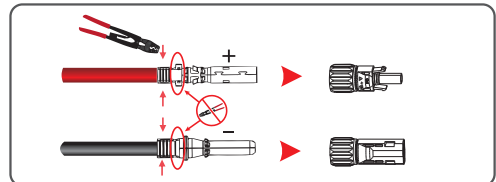
Procedure

PV connection please refer to below steps.

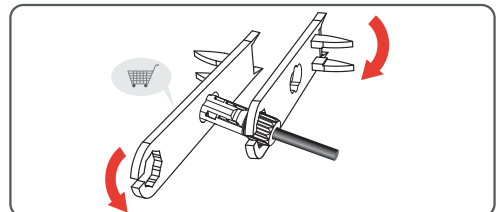
Step 1 Wires making.



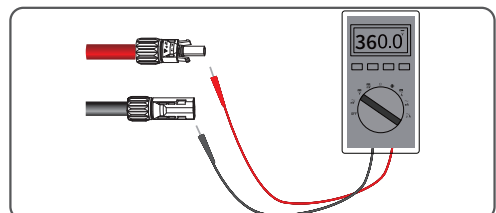
Step 2 Use crimping tool to stitch. Red-circled area can't be crimped.



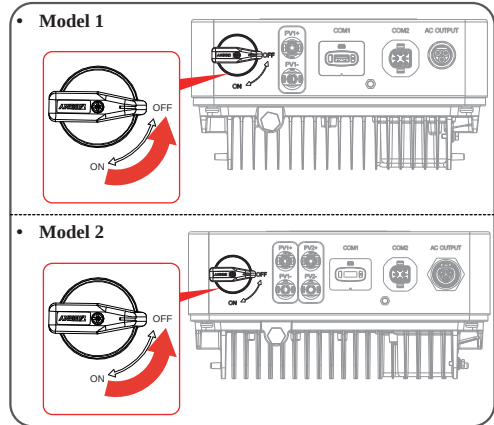
Step 3 Tighten the waterproof nuts on each connector with a tool to avoid loosening.



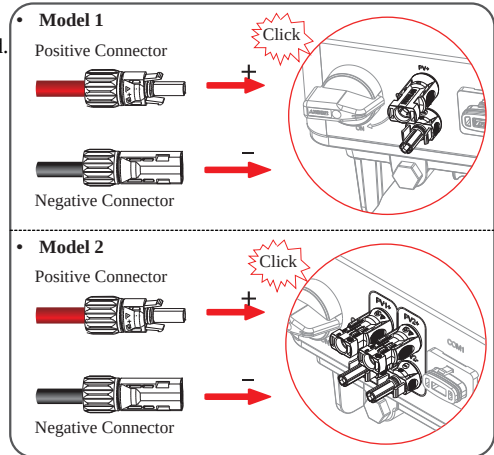
Step 4 Test string voltage and confirm string polarity.



Step 5 Ensure that the DC switch is OFF.



Step 6 Insert the positive and negative connectors into the PV+/PV- ports until a “click” sound is heard.



DANGER

- Photovoltaic arrays exposed to sunlight will generate dangerous voltages!
- Before connecting the DC terminal, ensure that both the AC terminal and the DC terminal are powered off and the DC switch is OFF. Otherwise there is a risk of high voltage shock.
- Please check polarity of PV connectors!
If polarity reversed, do not try to disconnect any PV connector until the irradiance declines and the DC currents fall below 0.5 A! Only then disconnect the PV plugs and correct the polarity before reconnecting.

--End

5.5 Communication Connection

5.5.1 Communication Mode Description

You can use the following communication modes to implement communication: Bluetooth, WIFI, and RS485, all of which are described as follows.

- Bluetooth Module

You can turn on the Bluetooth function of the mobile phone, and set parameters and monitor data of the inverter through the mobile APP. For details about operation, refer to APP User Manual.

- Wi-Fi Module

Wi-Fi module implements communication with Cloud server through wireless network to monitor PV inverter's data status. There are two installation schemes to achieve Wi-Fi communication of the inverter, you can choose one according to your needs.

- Scheme A - Install an external antenna
- Scheme B - Install an external Wi-Fi module

- LAN Modules

LAN module communicates with Cloud server through wired network to monitor PV inverter's data status.

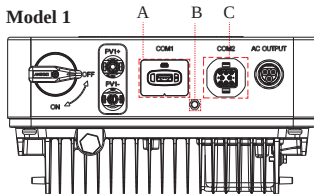
- 4G Module

4G module communicates with Cloud server through a mobile phone to monitor PV inverter's data status.

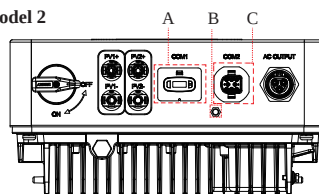
- RS485 Module

Through a 8-Pin terminal, the inverter can connect to a data logger to achieve data exchange with cloud devices.

- Model 1

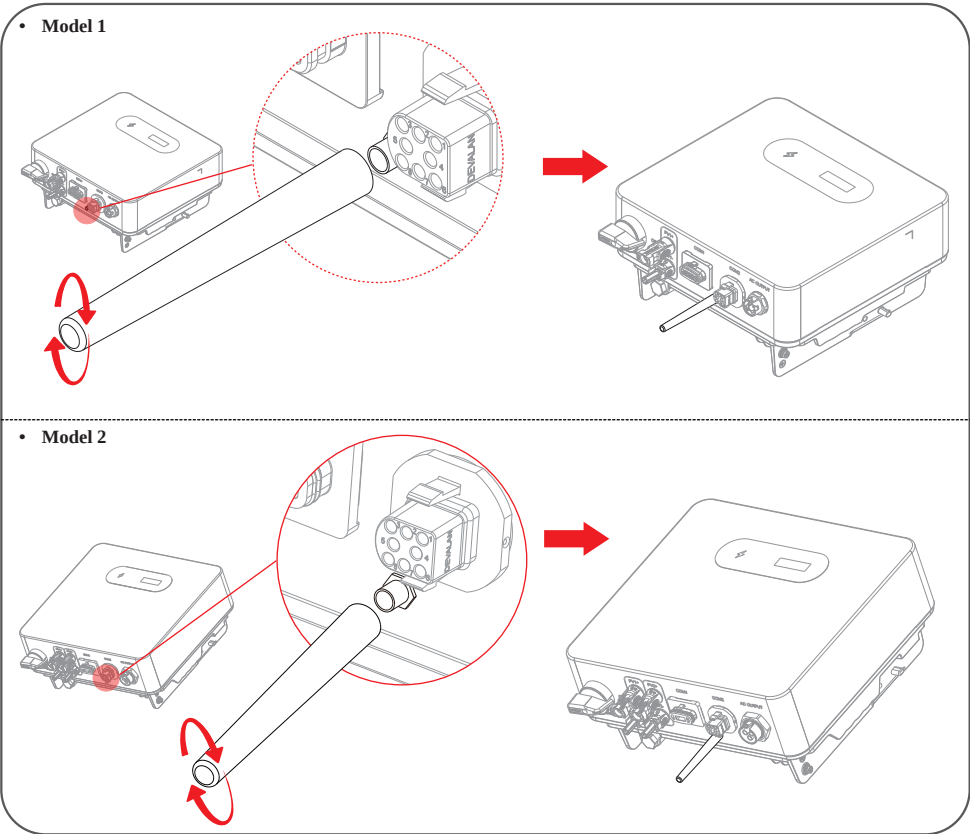


- Model 2



Number	Description
A	COM1 (Wi-Fi/4G/LAN)
B	External Antenna Terminal Port
C	COM2 (RS485/Meter/CT)

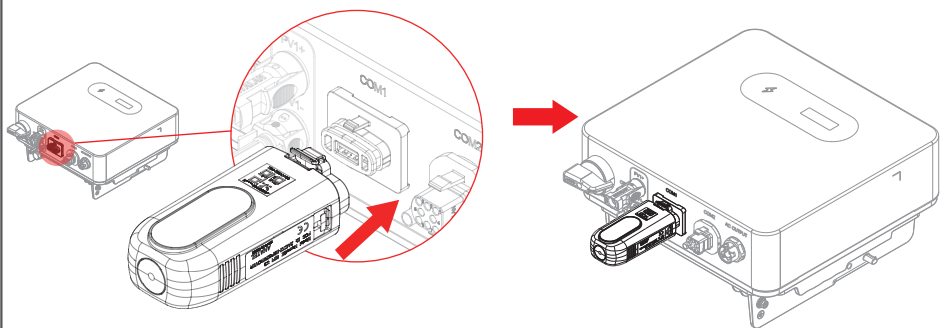
5.5.2 External Antenna Installation (Optional)



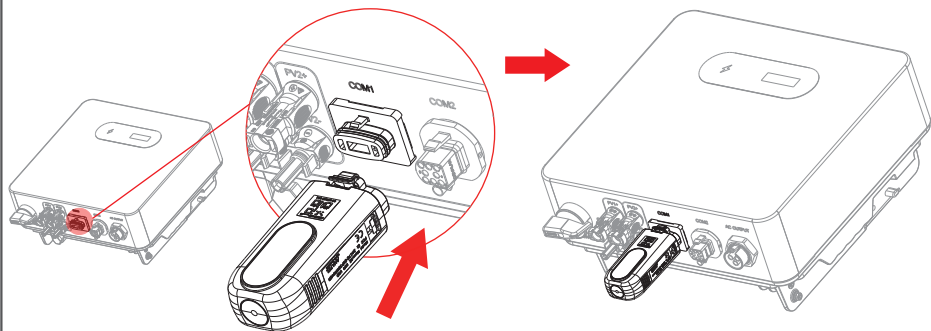
5.5.3 Wi-Fi/LAN/4G Module Installation (Optional)

For details, please refer to the corresponding Module Installation Guide in the pack. The appearance of the actual modules may be slightly different. The figures shown here are only for illustration.

• **Model 1**

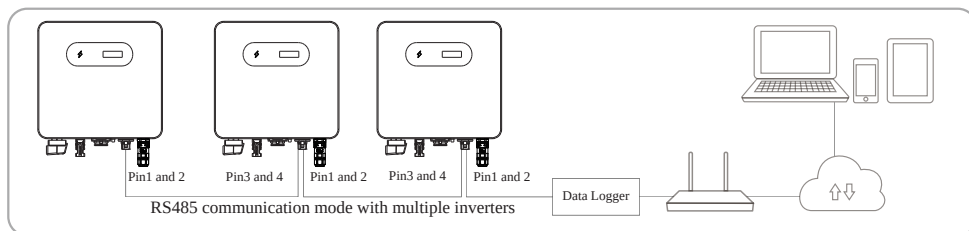


• **Model 2**



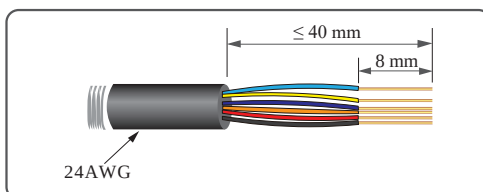
5.5.4 RS485 Installation (Optional)

The multiple inverters network and RS485 communication is as follows:



Procedure

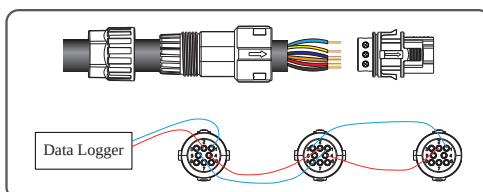
Step 1 Strip an RS485 communication cable.



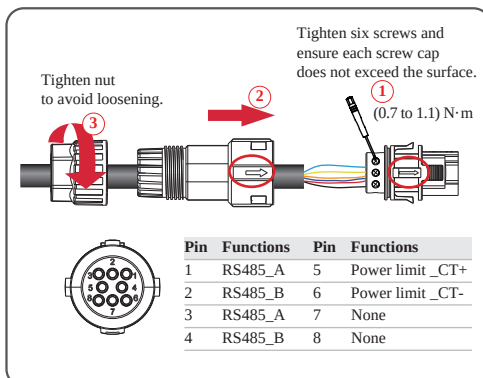
Step 2 Wires threading.

Connect the differential positive and negative signal wires of the first RS485 cable from the data logger to Pin1 and Pin2 of the 8-Pin terminal respectively.

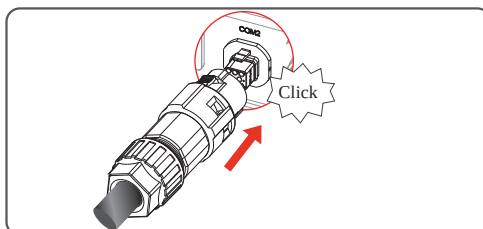
If there is more than one inverter, connect Pin3 and Pin 4 to Pin1 and Pin2 of another inverter.



Step 3 Install the terminal.



Step 4 Insert the RS485 terminal into RS485 port.



--End

Modbus Address setting

Step 1 Download the APP.

- Scan the QR code on the inverter to download the APP.
- Download the APP from the App Store or Google Play.



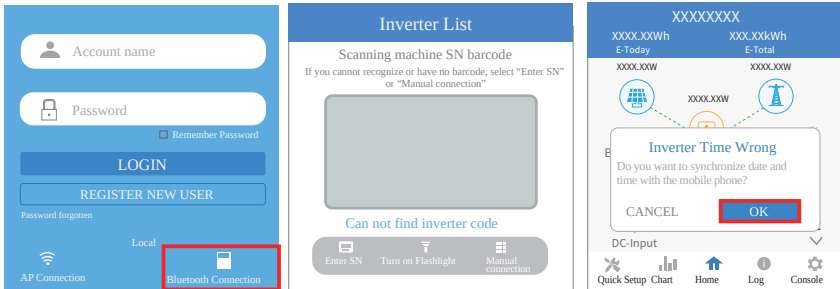
NOTE

The APP should access some permissions such as inverter's location. You need to grant all rights in all pop-up windows when installing the APP or setting your phone.

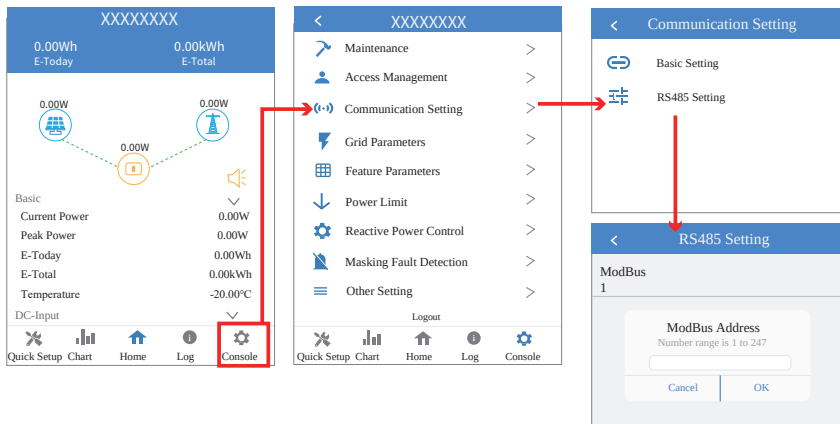
Step 2 Power on the inverter.

Step 3 Connect the inverter.

Open the Bluetooth on your own phone, then open the APP. Then follow the instructions below.



Step 4 Go to **Console > Communication Setting > RS485 Setting > Modbus** Page, check the Modbus address (the default value is 1), and click to modify the address as required if necessary.

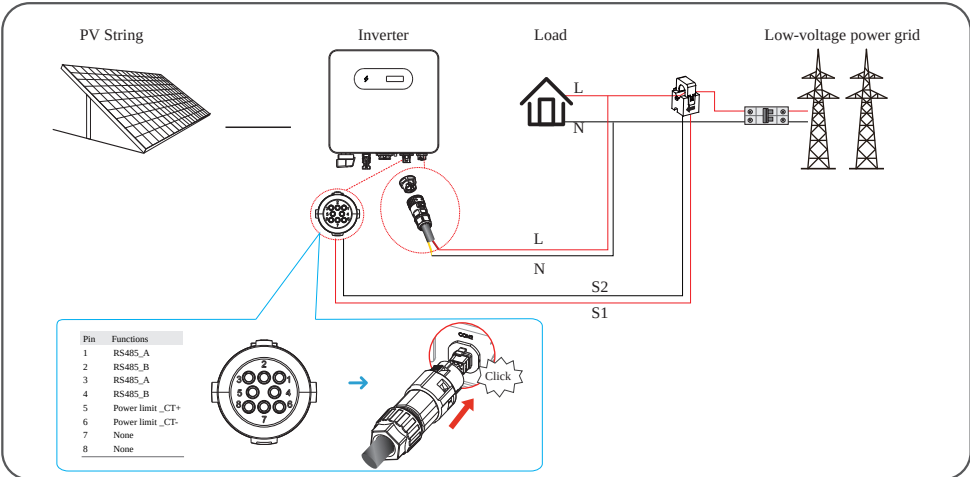


--End

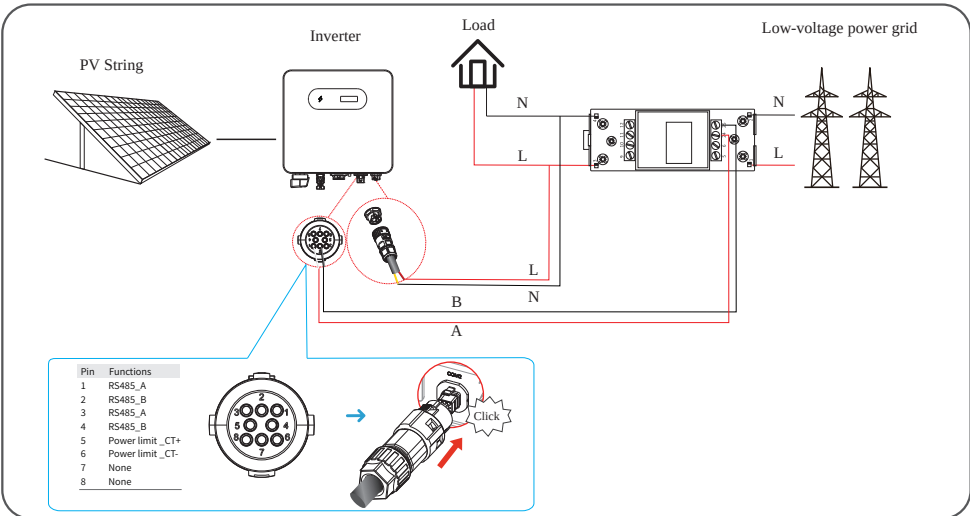
5.6 Power Limit

Wiring Diagram

• Inverter + CT



• Inverter + Meter



Settings via App

Go to **Console > Power Limit** page, select the options according to your demands.

• Inverter + CT

< Power Limit

Power control
CT sensor

Meter location
On Grid

Power limit CT ratio
1000:1

Power flow direction
From inverter to grid

Maximum feed in grid power(W)
0

- Set the “Power control” to “CT sensor”
- Set the “Meter location” base on the CT installed on load or on grid
- Set the “Power limit CT ratio” based on the actual situation
- Set the “Power flow direction” based on the actual situation
- Set the “Maximum feed in grid power” if needed

• Inverter + Meter

< Power Limit

Power control
Digital Power Meter

Meter location
On Grid

Meter Type
Unknown

Power flow direction
From inverter to grid

Digital meter modbus address
1

Maximum feed in grid power(W)
0

- Set the “Power control” to “Digital Power Meter”
- Set the “Meter location” base on the meter installed on load or on grid
- Set the “Meter Type” based on the actual situation
- Set the “Power flow direction” based on the actual situation
- Set the “Maximum feed in grid power” if needed

When "Power limit function" is set to "Digital Power Meter", the RS485 of inverter will turn into a Host that communicates with digital meter via Modbus-RTU protocol (9600 BPS, 8 data bit, 1 stop bit, no parity data format) through communication address 1.

Please make sure that the meter is set to Modbus-RTU, 9600, 8-N-1 with address 1. For details of digital meter settings, please refer to the meter user manual.

6 System Operation

6.1 Inspection

 WARNING	For Brazil, the installation of this equipment must comply with the current technical standards for photovoltaic electrical installations (NBR 16690) and fire risk management in photovoltaic systems (IEC 63226).
--	---

Check following this steps after installation.

No.	Items
1	No other objects are put on the PV inverter.
2	All screws, especially the screws used for electrical connections, are tightened.
3	The PV inverter is installed correctly and securely.
4	Ground, AC, DC, and Communications cables are connected tightly/correctly and securely.
5	Check and ensure there is no open circuit or short-circuits at AC and DC terminals using multimeter.
6	Waterproof connectors at AC terminals and RS485 ports are plugged with waterproof plugs tightly.
7	Covers at AC terminals are tightened.
8	Idle terminals are sealed.
9	All safety warning symbols are intact and complete on the inverter.
10	For Brazil, do not compatible with rapid shutdown methods, devices, or systems.

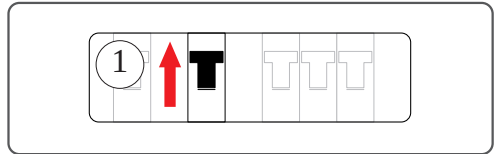
6.2 Startup Procedure

Following the procedures:

Step 1 Supply mains switch (see if there's any on site).



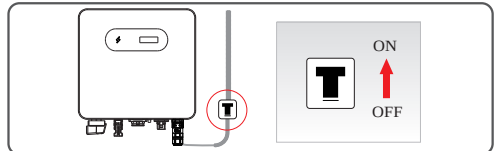
NOTE
The figure is only for reference.



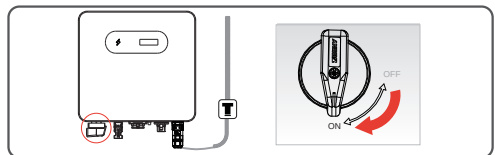
Step 2 Turn on the AC circuit breaker between the inverter and the grid.



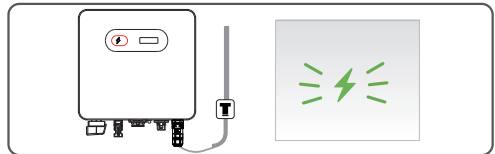
NOTE
The figure is only for reference.



Step 3 Rotate the PV switch to “ON”.



Step 4 Observe the LED icon to normal status (Green on).



Step 5 Go to APP > Scan SN barcode on the inverter > Synchronize inverter time with mobile phone.

--End

6.3 Shutdown Procedure

It may be necessary to shut down the inverter sometimes during the daily use. If necessary, please follow the procedures:



WARNING

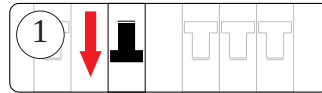
After the inverter is powered off, the heat sink generates heat and there is excess electricity in the inverter. To avoid electric shocks and burns, powered off inverter for at least 10 minutes before performing operations.

Step 1 Supply mains switch (see if there's any on site).



NOTE

The figure is only for reference.

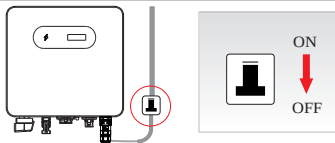


Step 2 Turn off the AC circuit breaker between the inverter and the grid.

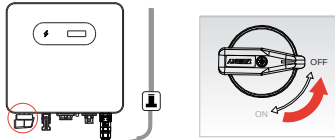


NOTE

The figure is only for reference.



Step 3 Rotate the PV switch to "OFF".



Step 4 Wait at least 5 minutes, let inverter discharge to a safe voltage range



--End

7 Maintenance

 DANGER	• Wrong maintenance will result in personnel injury or equipment damage! • Before performing any maintenance operations, you must follow these steps: - First, disconnect the AC circuit breaker on the grid side, and then disconnect the DC switch. - Wait at least 10 minutes after the inverter is powered off, otherwise there will be a high voltage shock. • Use testing equipment to make sure there no voltage or current.
 WARNING	Before maintaining and commissioning inverter and its peripheral distribution unit, switch off all the charged terminals of the inverter and wait at least 10 minutes after the inverter is powered off, otherwise there will be a high voltage shock.
 NOTICE	Comply with ESD protection specifications and power distribution ESD bracelets. Avoid unnecessary contact with the circuit board. Touching printed circuit boards or other electrostatic sensitive components may cause damage during the process.

7.1 Inverter Troubleshooting

If the inverter is broken down, the LED indicators will turn to red.

Alarm Name	Measures Recommended
Grid over voltage	1. If the alarm occurs accidentally, possibly the power grid is abnormal accidentally. No extra action is needed. 2. If the alarm occurs repeatedly, contact the local power station. After receiving approval of the local power bureau, revise the electrical protection parameter settings on the inverter through APP. 3. If the alarm persists for a long time, check whether the AC circuit breaker/AC terminals is disconnected or not, or if the grid has a power outage. 4. If the above problems are excluded, please contact customer service to report a repair.
Grid under voltage	
Grid absent	
Grid over frequency	
Grid under frequency	
Grid abnormal	
Grid over mean voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No extra action is needed.
	2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Grid N abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No extra action is needed.
	2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact the customer service center.
PV over voltage	Check the number of PV modules and adjust it if need.

Alarm Name	Measures Recommended
Insulation Resistance Abnormal	1. Check the insulation resistance against the ground for the PV strings. If a short circuit has occurred, rectify the fault. 2. If the insulation resistance against the ground is less than the default value in a rainy environment, set Insulation resistance protection on APP.
Leakage Current Abnormal	1. If the alarm occurs accidentally, possibly the external circuits are abnormal accidentally. The inverter automatically recovers to the normal operating status after the fault is rectified. 2. If the alarm occurs repeatedly or lasts a long time, check whether the insulation resistance against the ground of PC strings is too low.
PV under voltage	1. When sunlight intensity weakens, PV modules voltage decreases. No action is needed. 2. If such phenomena occur when sunlight intensity does not weaken, check if there is short circuit, open circuit etc. in the PV strings.
PV string reverse	Check and modify the positive and negative polarity of the input string.
Internal power supply abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No extra action is needed. 2. If the alarm occurs repeatedly. Please contact customer service.
Arc fault detection	1. Check whether the circuit of the solar module is abnormal, including wire integrity, joint tightness. 2. After trouble removal, turn off the AC/DC switch and start the inverter again, or click AFD Reset function on the APP page to eliminate the alarm. Note: When an arc fault detection alarm occurs, the inverter will disconnect from the grid and automatically reconnect after 5 minutes. If there are more than 5 cumulative arc fault detection alarms on the same day, the inverter will not be reconnected to the grid on the same day, but will be reconnected and counted again the next day.
Inverter over dc-bias current	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Inverter relay abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, for single-phase inverter, check whether the live line and neutral line on the AC side is reversed. For three-phase inverter, check the voltage of the live line and neutral line to the ground. If the grid side is normal, please contact customer service to report a repair.
Inverter over temperature	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, please check whether the installation site has direct sunlight, bad ventilation, or high ambient temperature (such as installed on the parapet). Yet, if the ambient temperature is lower than 45 °C and the heat dissipation and ventilation is good, please contact customer service.

Alarm Name	Measures Recommended
GFCI abnormal	1. If the alarm occurs occasionally, it could have been an occasional exception to the external wiring. The inverter can be automatically recovered. No action is required. 2. If it occurs repeatedly or cannot be recovered for a long time, please contact customer service.
System type error	If the alarm occurs, and the inverter cannot work, please restart the inverter. If the alarm continues, please contact customer service.
Fan abnormal	1. If the alarm occurs occasionally, please restart the inverter. 2. If it occurs repeatedly or cannot be recovered for a long time, check whether the external fan is blocked by other objects. Otherwise, please contact customer service.
Dc-link over voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Internal communication error	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Software incompatibility	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Internal storage error	Replace the monitoring board.
Data inconsistency	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Inverter abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Boost abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.
Data logger lost	1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service.

Alarm Name	Measures Recommended
Meter lost	If the alarm occurs, please check the RS485 connection. a. If it is abnormal, please revise the connection; b. if it is normal, please contact customer service.
Remote monitor displays zero power generation	If modem or other data logger is used, please reboot it; if still does not work after rebooting, contact your dealer.
Remote monitor displays no output voltage	Check if DC switch is damaged, and if not, switch it to ON. If it still doesn't work, contact your dealer.
Inverter off grid	1. Wait till power is restored; 2. Turn DC switch to ON, and if DC switch trips a lot, contact your dealer.
 NOTE	If you cannot clear the preceding alarm according to the measures recommended, contact your dealer timely.

7.2 Routine Maintenance

Table 7-1. Maintenance checklist and interval

Check Item	Check Content	Maintain content	Maintenance Interval
Inverter output status	Statistically maintain the status of electrical yield, and remotely monitor its abnormal status.	NA	Weekly
Inverter appearance	Check periodically and ensure that the heat sink is free from dust and blockage.	Clean periodically the heat sink.	Yearly
Inverter running status	1. Check that the inverter is not damaged or deformed. 2. Check for normal sound emitted during inverter operation. 3. Check and ensure that all inverter communications are running well.	If there is any abnormal phenomenon, replace the relevant parts.	Monthly
Inverter electrical connections	1. Check and ensure that AC, DC, and communication cables are securely connected; 2. Check and ensure that PGND cables are securely connected; 3. Check and ensure that cables are intact and free from aging;	If there is any abnormal phenomenon, replace the cable or re-connect it.	Semiannually

8 Decommissioning

8.1 Disassembling the Inverter

Inverter uninstll requires below procedure:



WARNING

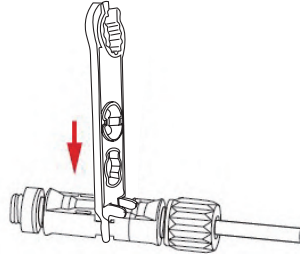
Before uninstalling all electric connections, DC input connector, AC output cables and the PGND cables, please ensure that both the AC terminal and the DC terminal are powered off. And the DC switch is OFF to avert equipment damage or personal injury.

Step 1 Disconnection all electric connections including these of communications cables, DC input cables, AC output cables and the PGND cables.



NOTE

When uninstalling DC input connectors, insert removal wrench into the bayonet shown in the right figure, press the wrench down, and take out the connector.



Step 2 Remove the inverter from its mounting bracket.

Step 3 Remove the mounting bracket.

--End

8.2 Disposing the Inverter

The PV inverter and its packing case are made from environment-friendly materials. If the inverter service life has expired, do NOT discard it with household garbage; dispose the inverter in accordance with local environmental laws and regulations.

9 Technical Specifications

MODEL	SE-TH02 2.0TL1	SE-TH02 3.0TL1	SE-TH02 3.6TL1	SE-TH02 4.0TL1
Input(PV)				
Max. DC Voltage	550 V			
MPPT Range	(40 to 540) V			
MPPT Range (Full load)	(110 to 500) V	(160 to 500) V	(190 to 500) V	(210 to 500) V
Nominal Input Voltage	360 V			
Max. DC Current	20 A			
Max. Short Circuit Current	30 A			
MPP Tracker No.	1			
String No.	1			
Output				
Nom. Power (Output)	2000 W	3000 W	3600 W	4000 W
Maximum Power (Output)	2200 W	3300 W	3960 W	4400 W
Apparent Power (Output)	2200 VA	3300 VA	3960 VA	4400 VA
Nominal Voltage	220 V / 230 V / 240 V			
Rated grid frequency	50 Hz / 60 Hz			
Maximun Current (Output)	10.0 A	15.0 A	18.0 A	20.0 A
Power Factor Adjustment Range	0.8 leading to 0.8 lagging			
THD	< 3 %			
Efficiency				
Max. Efficiency (PV to Grid)	97.10 %			97.20 %
Eur. Efficiency (PV to Grid)	95.20 %	95.90 %	96.10 %	96.20 %
General				
Temp. Range	-25 °C to +60 °C			
Max. operation altitude	4000 m			
Topology	Transformerless			
Protection	IP66			
Noise emission	30 dB			
Humidity	(0 to 100) %			
Cooling	Natural cooling			
HMI & COM				
Display	APP + LED, LCD (Optional)			
Communication interface	RS485/WIFI/4G/LAN (Optional)			
Protection				
Anti-islanding protection	YES			
AC over-current protection	YES			
AC short-circuit protection	YES			
AC over-voltage protection	YES			
PV Reverse Polarity Protection	YES			
Residual Current Monitoring	YES			
SPD	DC/AC TypeII			
Insulation detection	YES			
GFCI	YES			
AFCI	Optional			

MODEL	SE-TH02 2.0TL1	SE-TH02 3.0TL1	SE-TH02 3.6TL1	SE-TH02 4.0TL1
Mechanical				
W x H x D	266 mm x 251 mm x 135 mm			
Weight	5.2 kg			
DC switch	YES			
AC Connection	Plug and play connector			
PV Connection	H4/MC4			
Compliance				
Grid	IEC 61727, IEC62116 IEC60068, IEC61683 VDE 0126-1 PORTARIA Nº 140+515			
Safety	EN 62109-1/2			
EMC	EN 61000-6-1/2/3/4			
Warranty				
Period (Years)	5 Years			

MODEL	SE-TH02 5.0TL1	SE-TH02 6.0TL1	SE-TH02 6.6TL1
Input(PV)			
Max. DC Voltage	550 V		
MPPT Range	(40 to 540) V		
MPPT Range (Full load)	(130 to 500) V	(160 to 500) V	(180 to 500) V
Nominal Input Voltage	360 V		
Max. DC Current	20 A + 20 A		
Max. Short Circuit Current	30 A + 30 A		
MPP Tracker No.	2		
String No.	1 + 1		
Output			
Nom. Power (Output)	5000 W	6000 W	6600 W
Maximum Power (Output)	5500 W	6600 W	7260 W
Apparent Power (Output)	5500 VA	6600 VA	7260 VA
Nominal Voltage	220 V / 230 V / 240 V		
Rated grid frequency	50 Hz / 60 Hz		
Maximun Current (Output)	25.0 A	30.0 A	33.0 A
Power Factor Adjustment Range	0.8 leading to 0.8 lagging		
THD	< 3 %		
Efficiency			
Max. Efficiency (PV to Grid)	97.00 %		
Eur. Efficiency (PV to Grid)	96.20 %		
General			
Temp. Range	-25°C to +60°C		
Max. operation altitude	4000 m		
Topology	Transformerless		
Protection	IP66		
Noise emission	30 dB		
Humidity	(0 to 100) %		
Cooling	Natural cooling		
HMI & COM			
Display	APP + LED, LCD (Optional)		
Communication interface	RS485/WIFI/4G/LAN (Optional)		
Protection			
Anti-islanding protection	YES		
AC over-current protection	YES		
AC short-circuit protection	YES		
AC over-voltage protection	YES		
PV Reverse Polarity Protection	YES		
Residual Current Monitoring	YES		
SPD	DC/AC TypeII		
Insulation detection	YES		
GFCI	YES		
AFCI	Optional		

MODEL	SE-TH02 5.0TL1	SE-TH02 6.0TL1	SE-TH02 6.6TL1
Mechanical			
W x H x D	297 mm x 282 mm x 145 mm		
Weight	7.2 kg		
DC switch	YES		
AC Connection	Plug and play connector		
PV Connection	H4/MC4		
Compliance			
Grid	IEC 61727, IEC62116 IEC60068, IEC61683 VDE 0126-1 PORTARIA N° 140+515		
Safety	EN 62109-1/2		
EMC	EN 61000-6-1/2/3/4		
Warranty			
Period (Years)	5 Years		



NOTE

Due to the multi-supplier strategy for some parts, the actual weight may deviate by about $\pm 8\%$. Please refer to the delivered products.

As technology is constantly updated and improved, the technical parameters in this document are for reference only. The contents (including technical parameters) herein are subject to change without prior notice.