



# Installation and Operation Manual

Applicable model: CPS SCA3KTL-PS2/EU CPS SCA3.6KTL-PS2/EU



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# Forward

Dear User,

Thank you so much for your choosing 3K-3.6K, the latest generation of grid-tied PV Strings inverter (hereinafter referred to as the inverter) designed and developed by the company.

This user manual introduces the inverter in terms of its installation, electrical connections, operation, commissioning, maintenance, and troubleshooting. Please read through the manual carefully before installing and using the inverter, and keep the manual well for future reference.

## Application Model

Grid-tied PV string inverter

- CPS SCA3KTL-PS2/EU  
CPS SCA3.6KTL-PS2/EU

## Applicable Personnel

This user manual is intended for photovoltaic (PV) inverter operating personnel and qualified electrical technicians.







**Notes:**

*This user manual is subject to change (specific please in kind prevail) without prior notice.*



## Symbol Conventions

Safety symbols used in this manual, which highlight potential safety risks and important safety information, are listed as follows:

Symbol	Description
 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, could 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	Calls attention to important information, best practices and tips: supplement additional safety instructions for your better use of the PV inverter to reduce the waste of your resource.
 REFER	Refer to documentation (Remind operators to refer to the documentation shipped with the inverter).


# 1 Safety Precautions

Before using the product, please read these safety precautions in User Manual carefully.

## 1.1 Personnel Safety


- a. The PV inverter must be installed, electronically connected, operated and maintained through specially trained technician;
- b. The qualified technician must be familiar with the safety regulations of electrical system, working process of PV power generation system, and standards of local power grid;
- c. The technician must read through this User Manual carefully and master it before any operation.

## 1.2 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.
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- a. Do not tamper with any warning signs on the inverter enclosure because these signs contain important information about safe operation.
- b. Do not remove or damage the nameplate on the inverter's enclosure because it contains important product information.

## 1.3 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.
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- a. Ensure there is no electrical connections around ports of the PV inverter before installation;
- b. 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 Installation)

## 1.4 Electrical Connections

 <b>DANGER</b>	<p>Before installing the inverter, check all electrical ports to ensure no damage and no short circuit. Otherwise personal casualty and/or fire will occur.</p>
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- a. 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.
- b. Before connecting PV modules, ensure that its voltage is within the safe range; when exposed to any sunlight, PV modules can generate high voltage.
- c. All electrical connections must meet the electrical standards of the country or region.
- d. Cables used in electrical connections must be well fixed, under good insulation, and with appropriate specification.

## 1.5 Operating and Commissioning

 <b>DANGER</b>	<p>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.</p>
 <b>WARNING</b>	<p>When the photovoltaic array is exposed to light, it supplies DC voltage to the PCE.</p>


- A. Before getting the permission of electrical power authority in the country/region, the grid-tied PV inverter cannot start power generation.
- b. Follow the procedures of commissioning described in the user manual when commissioning the PV inverter.
- c. Do not touch any other parts'surface except the DC switch when the PV inverter is operating; its partial parts will be extremely hot and can cause burns.

## 1.6 Maintenance

 <b>DANGER</b>	<p>Power OFF all electrical terminals before the inverter maintenance; strictly comply with the safety precautions in this document when operating the inverter.</p>
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- a. For personal safety, maintenance personnel must wear appropriate personal protective equipment (like insulation gloves and protective shoes) for the inverter maintenance.
- b. Place temporary warning signs or erect fences to prevent unauthorized access to the maintenance site.
- c. Follow the procedures of maintenance stipulated in the manual strictly.
- d. Check the relevant safety and performance of the inverter; rectify any faults that may compromise the inverter security performance before restarting the inverter.

## 1.7 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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## 2 Overview of the Inverter

This chapter introduces the inverter and describes its functional model, network application, appearance, dimensions, and working process etc.

### 2.1 Functional Models

#### 2.1.1 Function

This series is a single-phase grid-tied PV string inverter (transformer less) that converts the DC power generated by PV strings into AC power and feeds the power into power grid.

 <b>WARNING</b>	<p>The inverter is transformerless. Add an isolation transformer before grounding the positive/ negative terminal of PV modules (like Thin Film module) for operation.</p>
 <b>WARNING</b>	<p>Do not connect PV modules in parallel to several PV inverters for operation.</p>

#### 2.1.2 Model Description

Figure 2.1 shows a model number of the inverter, using CPS SCA3KTL-PS2/EU as an example.

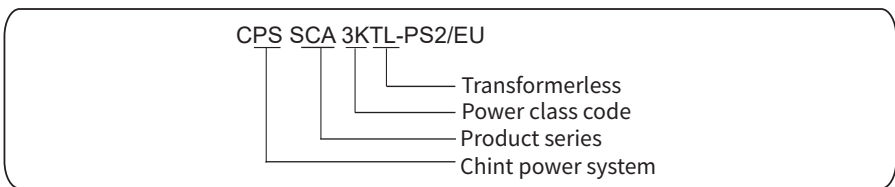


Figure 2.1 Model number descriptions

### 2.2 Network Application

#### 2.2.1 Grid-tied PV Power Systems

The series applies to grid-tied PV power systems for outdoor power stations. Typically, a grid-tied PV power system consists of PV modules, grid-tied inverters, AC distribution units, and low-voltage power grid, as shown in Figure 2.2.

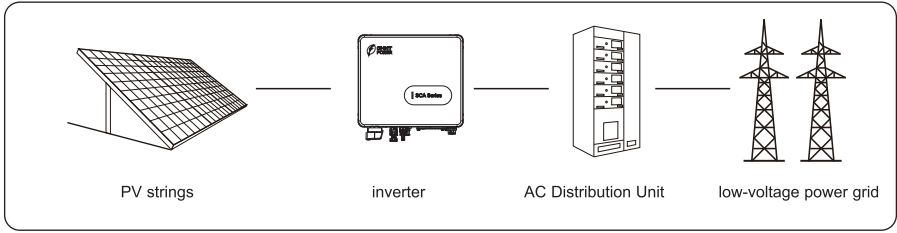


Figure 2.2 a low-voltage grid-tied PV power system

## 2.3 Outline and Dimensions

### 2.3.1 Outline

Figures 2.3 to 2.6 show the outline of the inverters as follows:

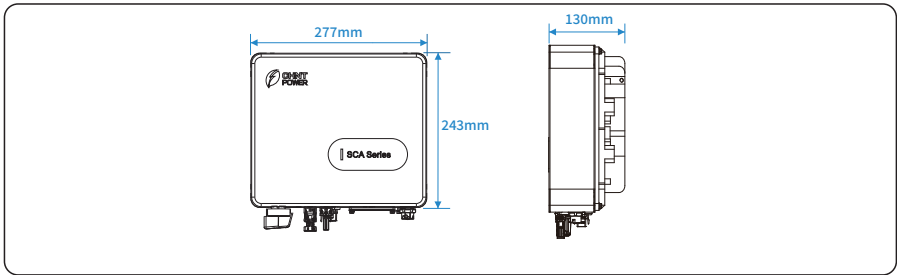


Figure2.3 3K-3.6K PV Inverter with Single MPPT Input (unit: mm)

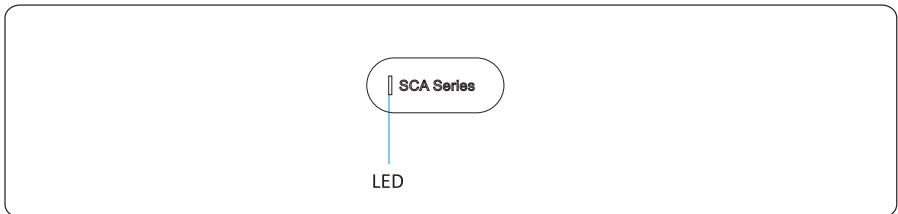
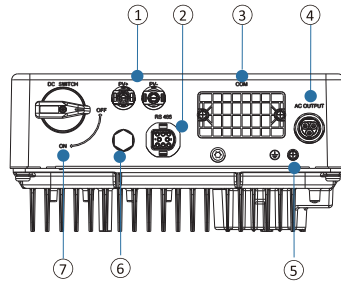


Figure 2.4 The front view and amplification effect of LED indicator area

1. PV input connectors
2. RS-485/CT
3. COM (WIFI/GPRS/Ethernet/ RS-485)
4. AC output connector
5. External protection ground interface
6. Vent valve
7. DC switch



CPS SCA3KTL-PS2/EU CPS SCA3.6KTL-PS2/EU

Figure 2.5 The bottom view of this series of inverter

## 2.4 Working Process

### 2.4.1 Basic principle Description

The 2K-3.6K PV Inverter with Single MPPT Input receives input from only one string of PV panel. Then the input is grouped into one MPPT route inside the inverter to track the maximum power point of the PV panel. The one MPPT power is then converted into DC Bus, then the DC power is converted to AC power through an inverter circuit. Finally the AC power is fed to the Power grid. EMI filter is used on both the DC and AC sides to reduce the electromagnetic inference; Surge protection is supported on AC side.

### 2.4.2 Circuit Diagrams

Figure 2.8 shows the circuit diagram for the 3K-3.6K PV Inverter:

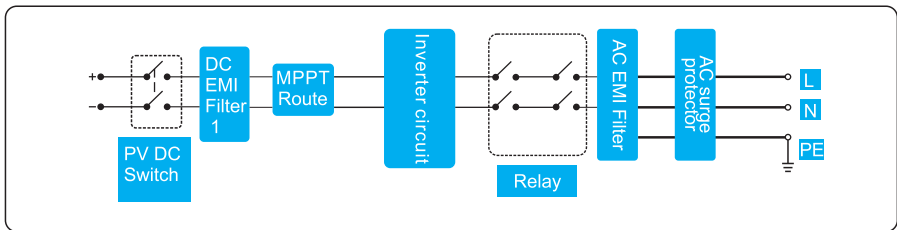


Figure 2.6 circuit diagram




## 2.5 Working Modes

Three working modes of the inverter are shown as follows: standby, operating, and shutdown. Table 2.1 shows the conditions for the inverter to switch between working modes.

Modes	Description
Standby	<p>The PV inverter enters the standby mode when</p> <ul style="list-style-type: none"> <li>&gt;the input voltage of PV Strings can enable auxiliary power supply to run, but cannot meet the inverter operation requirements.</li> <li>&gt;the input voltage of PV Strings can meet the inverter to-start requirements, but cannot meet its minimum power requirements.</li> </ul>
Operating	<p>When the PV inverter is grid-tied and generates electricity, it</p> <ul style="list-style-type: none"> <li>&gt; tracks the maximum power point to maximize the PV String output.</li> <li>&gt; converts DC power from PV strings into AC power and feeds the power to the power grid.</li> </ul> <p>The PV inverter will enter to the shutdown mode if detecting a fault or a shutdown command.</p>
Shutdown	<p>The PV inverter switches from standby or operating mode to shutdown mode if detecting a fault or a shutdown command.</p> <p>The inverter switches from shutdown mode to standby mode if receiving a Startup command or detecting that a fault is rectified.</p>

Table 2.1 Working modes description

 <b>NOTICE</b>	<p>instructions: if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.</p>
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## 3 Storage

This chapter describes the storage requirements for the inverter.

The following storage instructions apply if the PV inverter will not be deployed immediately:

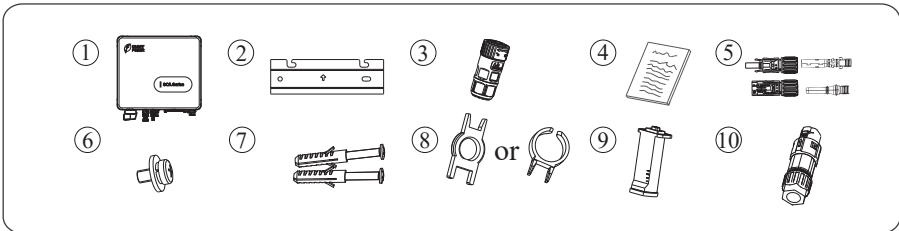
- > Do not unpack the inverter (put desiccant in the original box if the PV inverter is unpacked).
- > Store the PV inverter at a temperature range of  $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  and with the relative humidity of 0% to 100% (no condensing).
- > The PV inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
- > For 3K-3.6K PV Inverter, a maximum of eight layers of inverters can be stacked.
- > 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.

## 4 Installation

 <b>DANGER</b>	Do not install the inverter on flammable building materials or in an area where flammable or explosive materials are stored.
 <b>CAUTION</b>	Do not install the inverter in a place where personnel are likely to come into contact with its enclosure and heat sinks to avoid electrical shock/burn.



### 4.1 Checking the Outer Packing

- When receiving the inverter, check that the packing materials are intact.
- After unpacking, check that the deliverables are complete, intact, and consistent with your order list.
- Examine the PV inverter and its fittings for damage such as scraps and cracks.



Items	Deliverables
①	Inverter
②	Mounting bracket
③	AC output connector
④	File package
⑤	DC terminal connector group
⑥	M6 screw
⑦	Expansion screw group
⑧	Removal tool for PV connector
⑨	Wi-Fi
⑩	RS485 connector

Figures 4.1 The deliverables: The inverter and its fittings

 NOTICE	<p>If any damage mentioned above is found, contact the dealer immediately.</p>
 NOTICE	<p>PV modules for non-isolated inverters. Non-isolated inverters shall be provided with installation instructions that require PV modules that have an IEC 61730 Class A rating. If the maximum AC mains operating voltage is higher than the PV array maximum system voltage then the instructions shall require PV modules that have a maximum system voltage rating based upon the AC mains voltage.</p>

## 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 Figure 4.2.

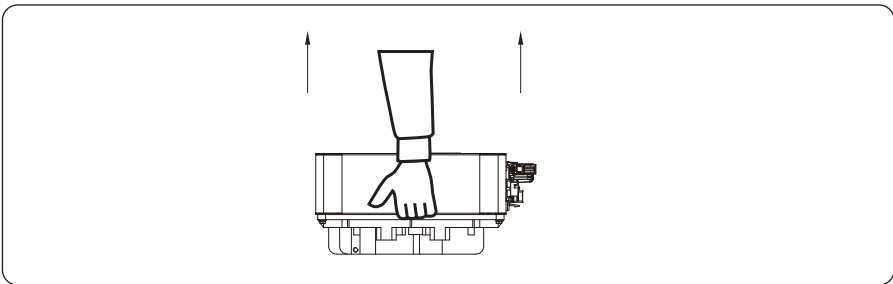



Figure 4.2 Moving the inverter






 CAUTION	<ul style="list-style-type: none"> <li>&gt;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.</li> <li>&gt;When placing the inverter on the floor horizontally, put foam or paper under to protect its enclosure.</li> </ul>
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## 4.3 Identify the PV Inverter

### 4.3.1 Nameplate

After moving the PV inverter from packing box, identify it by reading its nameplate labeled on the side of the inverter. The nameplate contains important product information: the model information, communications/technical specifications, and compliance symbols.

## 4.3.2 Compliance and Safety Symbols

Safety symbol	Description
	<p>Electrical shock! There are residual voltages in the PV inverter. It needs 5 minutes to finish discharge.</p>
	<p>The PV inverter must not be touched when in operation. Its enclosure and heat sinks are extremely hot.</p>
	<p>Electrical shock! This part is charged. Only qualified and/or trained electrical technicians are allowed to perform operations on the inverter.</p>
	<p>If the inverter service life has expired, dispose it in accordance with local rules for disposal of electrical equipment waste. Do not dispose the PV inverter with household garbage.</p>
	<p>The PV inverter is compliant with TUV.</p>

## 4.4 Installation Requirements

Applies to wall-mounting installation, as described below in detail.

### 4.4.1 Determining the Installation Position

- **Basic Requirements**

- The inverter is protected to IP65 and can be installed indoors or outdoors.
- The installation method and position must be appropriate for the weight and dimensions of the inverter.
- Do not install the inverter in a place where personnel are likely to come into contact with its enclosure and heat sinks because these parts are extremely hot during operation.
- Do not install the inverter in an area that stores flammable or explosive materials.

- **Installation Environment Requirements**

- The ambient temperature must be below 50°C to ensure the inverter's optimal operation and extend its service life.

- b. The inverter must be installed in a well ventilated environment to ensure good heat dissipation.
- c. The inverter must be free from direct exposure to sunlight, rain, and snow to extend its service life. It is recommended that the inverter be installed in a sheltered place. If no shelter is available, build an awning, as shown in Figure 4.3.

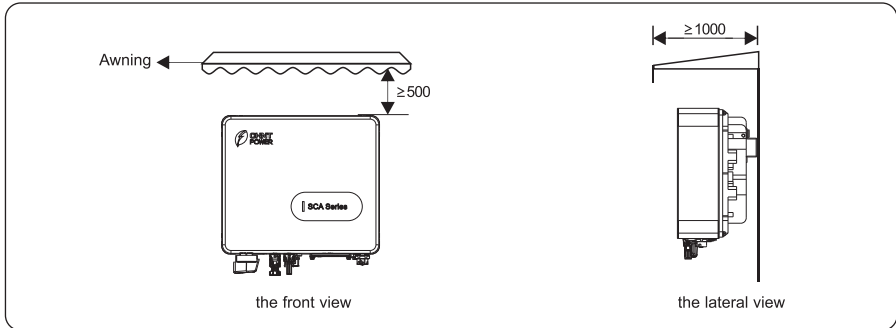


Figure 4.3 Installation environment with awning (unit: mm)

- **Carrier Requirements**

- a. The carrier where the inverter is installed must be fire-proof. Do not install the inverter on flammable building materials.
- b. The wall must be solid enough to bear the weight of the inverter.
- c. 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.

- **Installation Space Requirements**

- a. It is recommended that the inverter be installed at eye level to facilitate operation and maintenance.
- b. Reserve enough clearance around the inverter to ensure sufficient space for installation and heat dissipation, as shown in Figure 4.4.

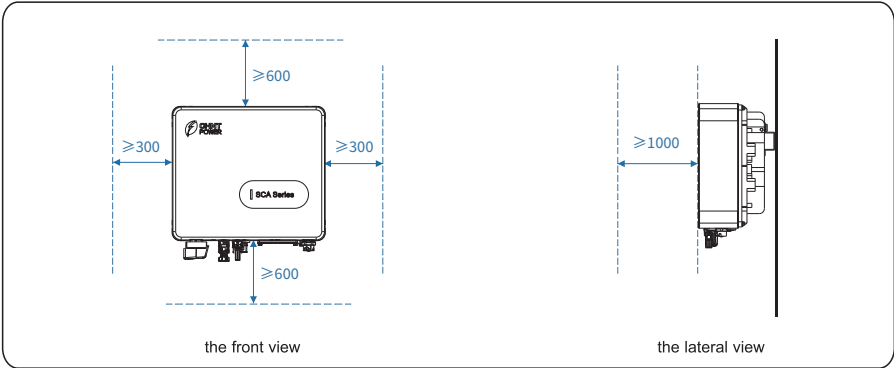


Figure 4.4 Installation Space Requirements (unit: mm)

- c. When installing multiple inverters, install them along the same line (as shown in Figure 4.5) if sufficient space is available, and install them in triangle mode (as shown in Figure 4.6) or in stacked mode (as shown in Figure 4.7) if no sufficient space is available. The installation modes ensure sufficient space for installation and heat dissipation.

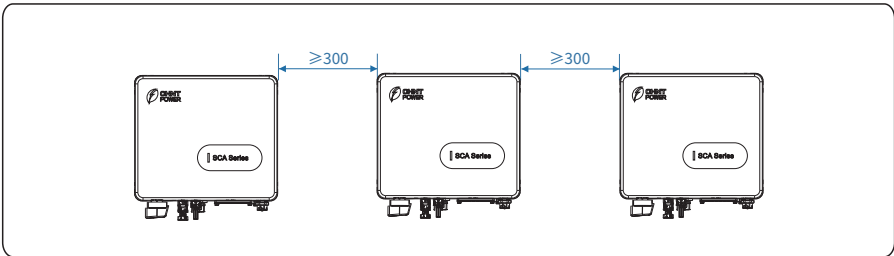


Figure 4.5 Installation along the same line (unit: mm)

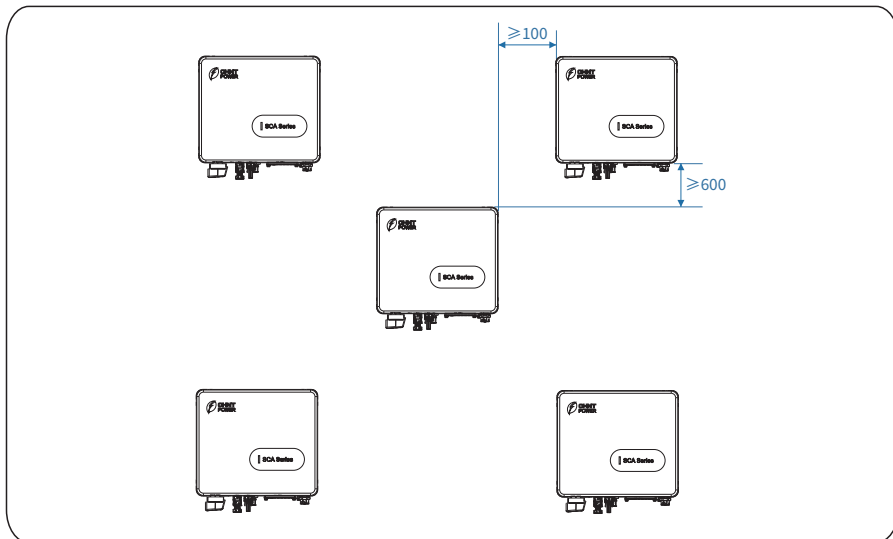


Figure 4.6 Installation in triangle mode (unit: mm)

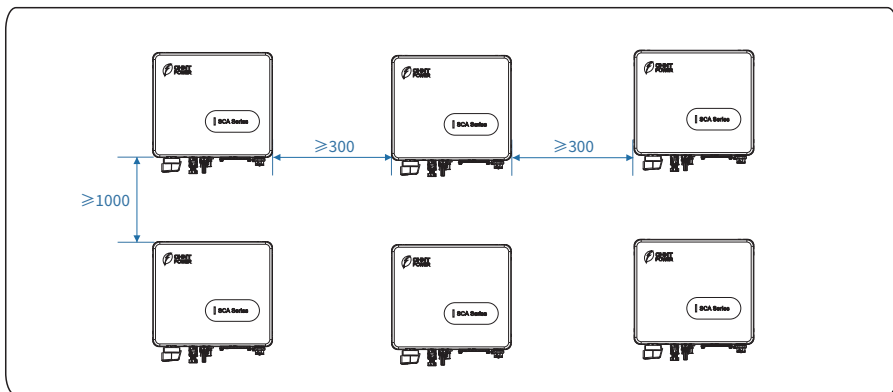


Figure 4.7 Installation in stacked mode (unit: mm)



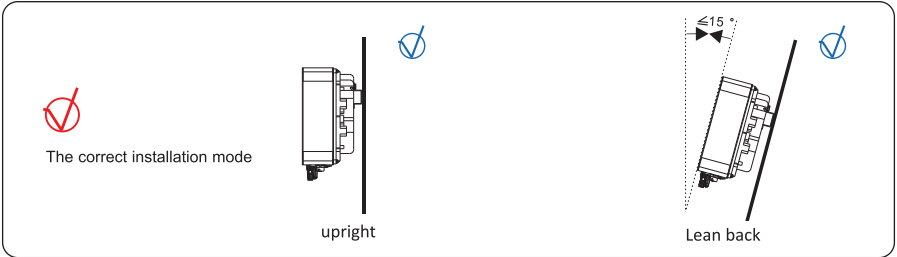
## NOTICE

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



## 4.4.2 Installation Mode Requirements

Install the inverter upright or at a maximum back tilt of 15 degrees to facilitate heat dissipation. Some correct / wrong installation modes are shown in Figures 4.8&4.9 below.



Figures 4.8 The correct installation mode

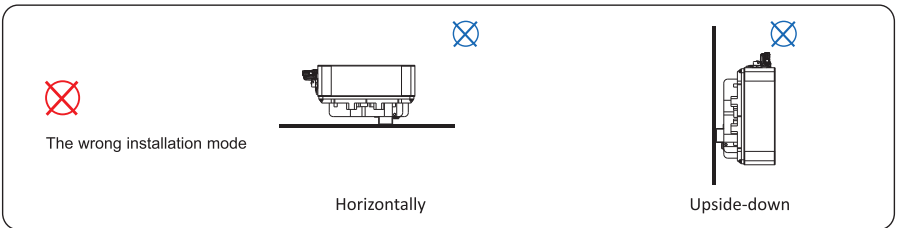


Figure 4.9 The wrong installation modes



NOTICE

The wrong installation will lead to failure of the inverter operation.

## 4.5 Installing a Mounting bracket

Before installing the inverter, secure the **mounting bracket** to a wall.

**Step 1** Move out the **mounting bracket** from the packing case.

**Step 2** Determine the positions for drilling holes (as shown in Figure 4.10) using the **mounting bracket**.

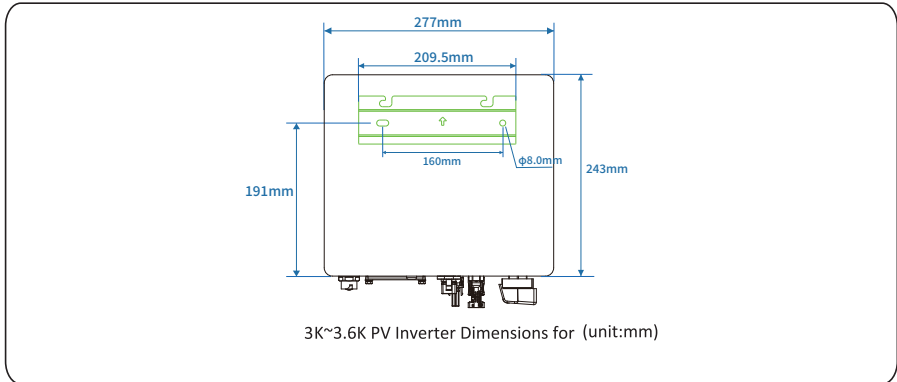


Figure 4.10 Determine the positions for drilling holes (unit: mm)

**Step 3** Level the hole positions using a level gauge, and mark the hole positions using a marker (as shown in Figure 4.11).

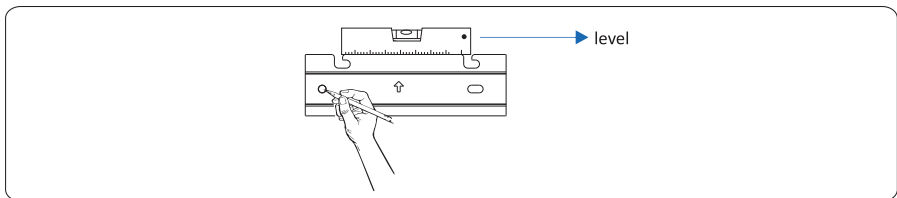


Figure 4.11 Mark the hole positions using a marker

**Step 4** Drill holes using a hammer drill and install expansion bolts, as shown in Figure 4.12.



**DANGER**

Before drilling the hole on the wall, ensure no damage on the electric wire and/or water pipe inside the wall.

- Drill a hole in a marked position to a depth of 60 mm using a hammer drill with a  $\Phi 10\text{mm}$  bit
- Partially tighten an expansion bolt, vertically insert it into the hole, and knock the expansion bolt completely into the hole using a rubber mallet.

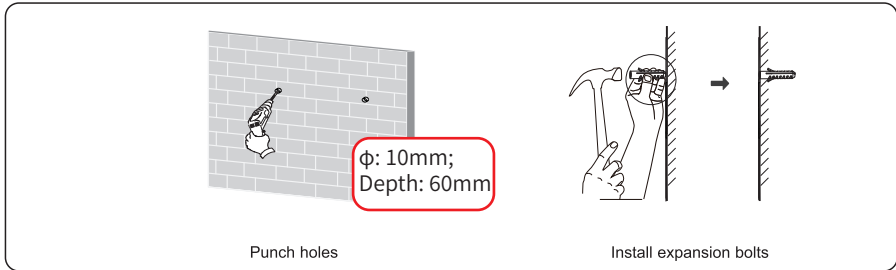


Figure 4.12 Punch holes and install expansion (unit: mm)

Step 5 Align the mounting bracket with the holes, insert expansion bolts into the holes through the mounting bracket, and tighten the expansion bolts to a torque wrench (torque  $2\sim 2.5\text{ N}\cdot\text{m}$ ), as shown in Figure 4.13.

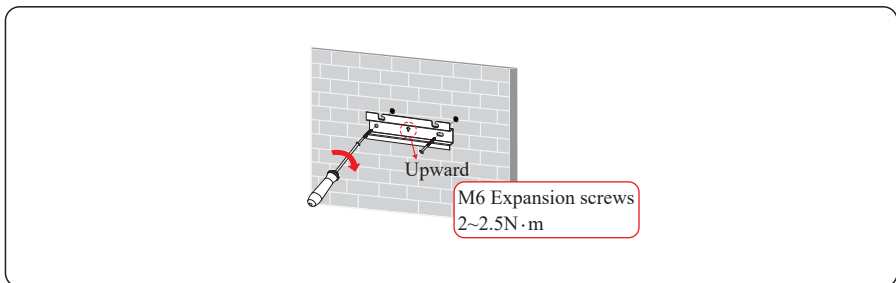


Figure 4.13 Installing the mounting bracket

## 4.6 Installing the inverter

Follow below procedures:

**Step 1** Hold the handles at both sides of the inverter and then lift and stand the inverter.

**Step 2** Mount the inverter on the mounting bracket and keep them aligned with each other, as shown in Figure 4.14.

**Step 3** Tighten the hexagon screw at the right side of the inverter to a torque of  $2.5\sim 3\text{N}\cdot\text{m}$ . Screw specs for 3K-3.6K is M6, as shown in Figure 4.14.

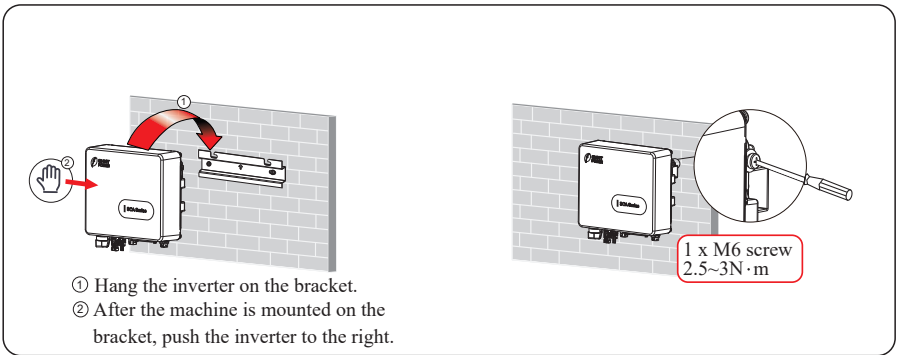


Figure 4.14 Securing the inverter

## 5 Electrical Connections



**DANGER**

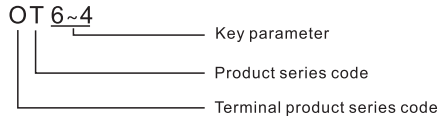
Before performing any electrical connections, ensure that both DC and AC Switches are OFF. Otherwise, high voltage may result in fatal injury.

### 5.1 Connecting Protection Ground (PGND) Cables

#### 5.1.1 Preparation

The ground cable and OT terminals have been prepared.

- a. Ground cable: Outdoor copper-core cables with a cross sectional area of 4 mm<sup>2</sup> or more are recommended.
- b. OT terminal: OT6~4.



**NOTE**

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.

## 5.1.2 Wiring Procedures

**Step 1** Remove an appropriate length of the insulation layer from the PGND cable using a wire Stripper; the length is a little bit longer than that of OT terminal's crimping end by 2mm~3mm, as shown in Figure 5.1.

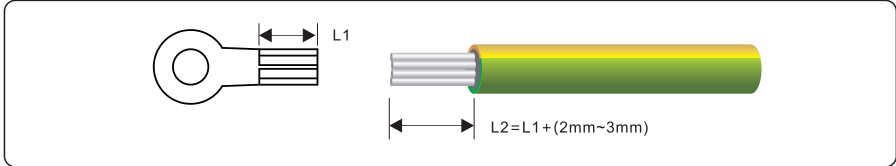


Figure 5.1 Stripped length (unit: mm)

**Step 2** Insert the exposed core wires into the crimping areas of the OT terminal and crimp them using hydraulic pliers, as shown in Figure 5.2.

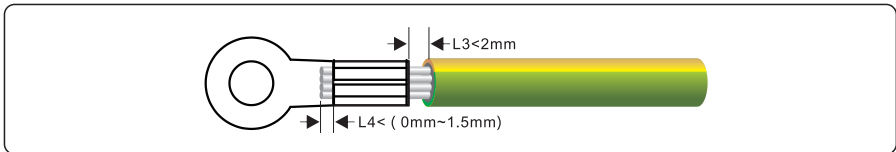


Figure 5.2 Crimping a cable (unit: mm)

**Step 3** Remove the ground screws from the ground points, as shown in Figure 5.3.

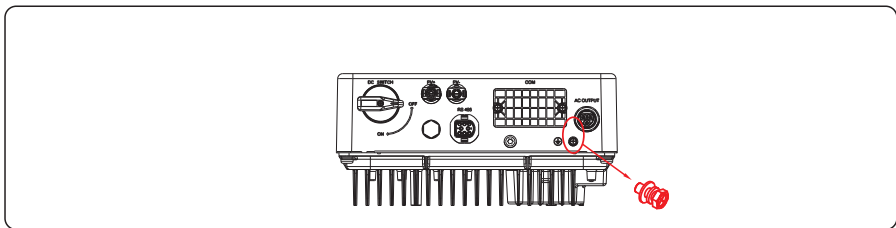


Figure 5.3 Remove the ground screws

**Step 4** Secure the PGND cable (done by step 1 & 2) using the ground screw and tighten the screw using a socket wrench (torque 1.2 N·m), as shown in Figure 5.4.

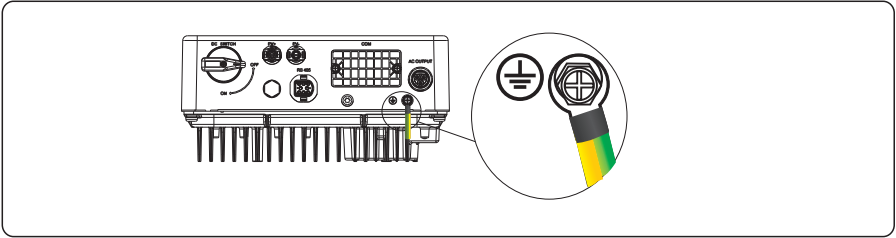


Figure 5.4 Secure the PGND cable

## 5.2 Connecting AC Output Cables

### 5.2.1 Preparation

The AC power cable and AC terminals have been prepared.

a. AC power cable: Outdoor copper-core cables are recommended. Table 5.1 describes the specifications.



Inverter Model	Cable type	Cross-sectional Area(mm <sup>2</sup> )		Cable Outer Diameter (mm)	
		Range	Recommended Value	Range	Recommended Value
CPS SCA3KTL-PS2/EU CPS SCA3.6KTL-PS2/EU	outdoor cable	≤4	2.5	10~14	14

Table 5.1 AC output cable specifications



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

Inverter Model	Recommended Value
CPS SCA3KTL-PS2/EU	25A
CPS SCA3.6KTL-PS2/EU	25A

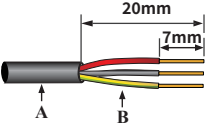

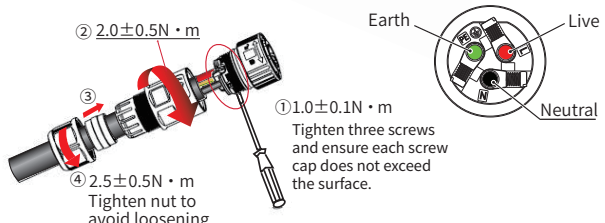
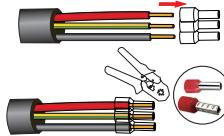
Table 5.2 Circuit breaker specifications

 <b>WARNING</b>	An independent circuit breaker must be installed on the AC side of each inverter to ensure that the inverter can be safely disconnected from the power grid.
 <b>WARNING</b>	Do not connect loads between the AC output terminals of the inverter and circuit breaker.

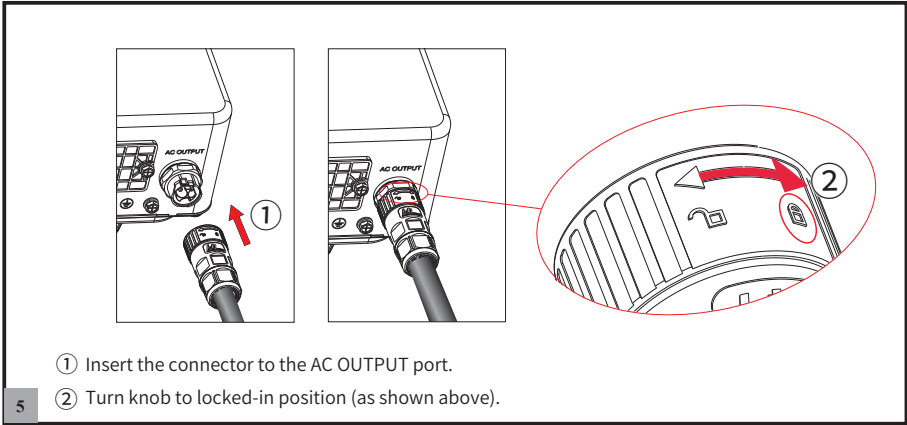
## 5.2.2 Procedure of Connecting AC Cables

 <b>NOTE</b>	There are four types of AC terminals in use. Please refer to the real object in the deliverables.
	

- Step 1** It is recommended to use outdoor dedicated cables with multiple copper cores.  
Remove an appropriate length of the jacket and insulation layer from the AC output cable using a wire stripper.
- Step 2** Crimp the terminals with crimping pliers. Please refer to the following figure2.
- Step 3** Tighten three screws and ensure each screw cap does not exceed the surface, as shown figure4 below.  
Plug the AC connector into the inverter, as shown figure5 below.


 <p>A. Diameter (mm) 10-14</p> <p>B. Cross Section (mm<sup>2</sup>) ≤4 (Range) 2.5(Recommended)</p>	 <p style="text-align: center;"><b>3</b></p>
<p><b>1</b> It is recommended to use outdoor dedicated cables with multiple copper cores.</p>	 <p>① <math>1.0 \pm 0.1 \text{ N} \cdot \text{m}</math> Tighten three screws and ensure each screw cap does not exceed the surface.</p> <p>② <math>2.0 \pm 0.5 \text{ N} \cdot \text{m}</math></p> <p>③</p> <p>④ <math>2.5 \pm 0.5 \text{ N} \cdot \text{m}</math> Tighten nut to avoid loosening.</p> <p>Earth Live Neutral</p>
<p><b>2</b> Crimp the terminals with crimping pliers.</p> 	<p style="text-align: center;"><b>4</b></p>




**NOTICE**

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

## 5.3 Connecting the PV Strings

 <b>DANGER</b>	PV Strings connection requires the following prerequisites; otherwise, an electrical shock can occur.
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.	
Before connecting DC input power cables, ensure that the voltage on the DC side is within the safe range and that the DC SWITCH on the inverter is OFF. Otherwise, high voltage may result in electric shock.	
When the inverter is grid-tied, it is not allowed to maintain DC input power cables, such as connecting or disconnecting a string or a module in a string. Only after the inverter enters in shutdown mode, maintenance of DC input power cables is allowed.	

 <b>WARNING</b>	PV Strings requires the following prerequisites; otherwise, a fire can occur.
PV modules connected in series must be of the same specifications.	
The maximum open-circuit voltage of PV string must be always lower than or equal to voltage permitted range of PV inverter.	
The maximum short circuit current of PV string must be always lower than or equal to current permitted range of PV inverter.	
The positive and negative terminals of PV modules must be connected to the positive and negative DC input terminals of the inverter respectively.	
During the installation of PV strings and the inverter, the positive or negative terminals of PV strings cannot be connected with short circuit.	

### 5.3.1 Preparation

Route collecting for the installation of PV strings and inverter:

Inverter model	Number of Input Route
CPS SCA3KTL-PS2/EU CPS SCA3.6KTL-PS2/EU	Connected to route 1

PV Strings DC input cable and connectors have been prepared; Table 5.3 lists the recommended outdoor copper-core DC input cable specifications.

Inverter model	Cable Type	Cross-sectional Area(mm <sup>2</sup> )		Cable Outer Diameter (mm)
		Range Recommended Value		Range
CPS SCA3KTL-PS2/EU CPS SCA3.6KTL-PS2/EU	Common PV cables in the industry(model:PV1-F)	4~6	4	5~8

Table 5.3 Recommended DC input cable recommended specifications

- Connectors of PV Strings: Positive and negative DC input connectors are used, as shown in Figure 5.5 and Figure 5.6.

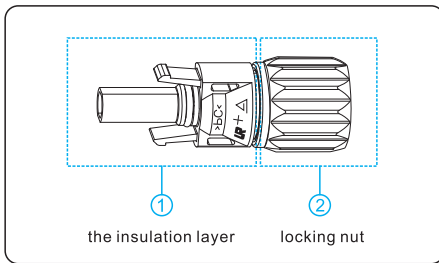


Figure 5.5 Positive connector compositions

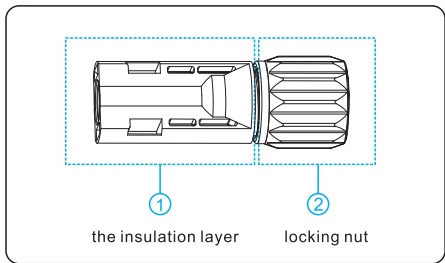


Figure 5.6 Negative connector compositions

- Procedures of connecting the PV Strings

**Step 1** Remove an appropriate length of the insulation layer from the positive and negative power cables using a wire stripper, as shown in below Figure.

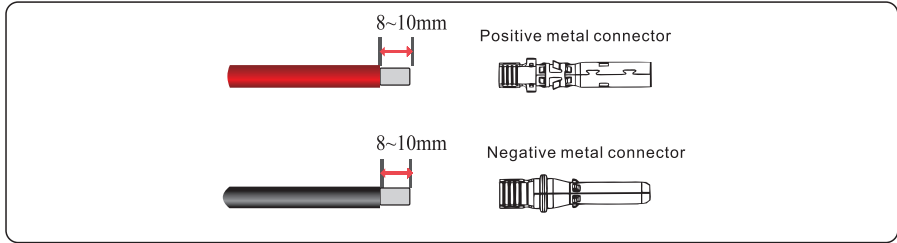


Figure 5.7 Removing insulation layer for DC cable (unit: mm)

**Step 2** Insert the exposed areas of the positive and negative power cables into the metal terminals of the positive and negative connectors respectively and crimp them using a crimping tool, as shown in Figure 5.8.

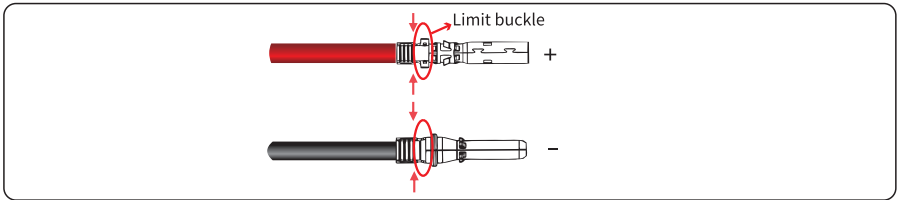


Figure 5.8 Crimping a metal connector

**Step 3** Insert the crimped positive and negative power cables into the corresponding positive and negative connectors until a "click" sound is heard, Tighten the locking nuts on the positive and negative connectors using a tool, as shown in Figure 5.9.

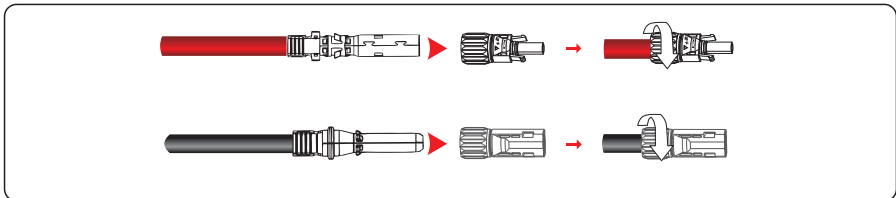


Figure 5.9 Connecting positive and negative connectors

**Step 4** Measure the voltage of PV input using a multimeter. Ensure that the polarities of the PV input power cables are correct, as shown in Figure 5.10.

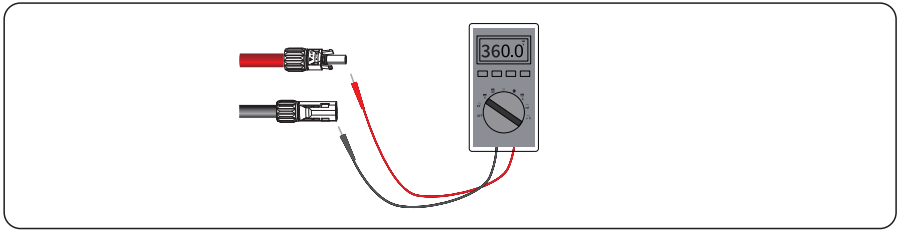


Figure 5.10 Checking the voltage of PV input

**Step 5** Ensure that the DC switch is OFF, as shown in Figure 5.11.

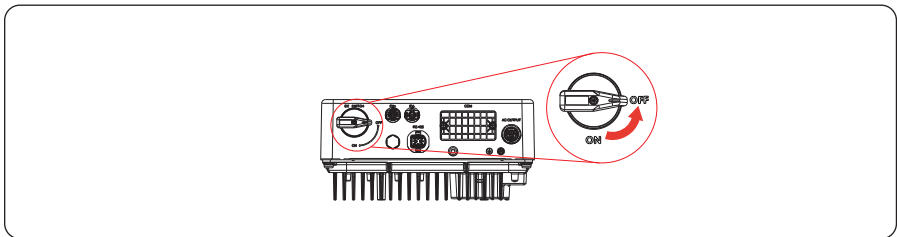


Figure 5.11 check the DC switch

**Step 6** Insert the positive and negative connectors into their corresponding terminals of the inverter until a "click" sound is heard, as shown in Figure 5.12.

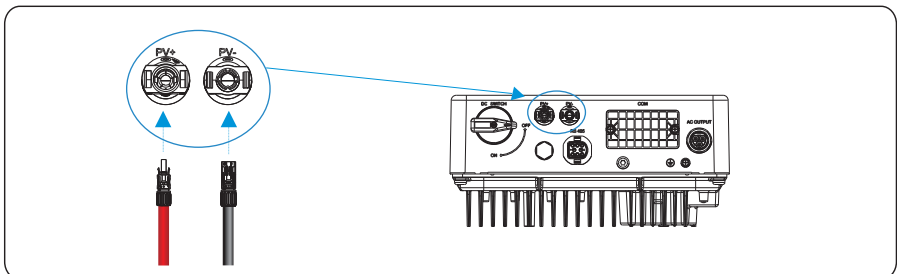


Figure 5.12 Connecting to the inverter

## 5.4 Connecting Communication Cables

### 5.4.1 Communication Mode Description

You can use the following communication modes to implement communication: Bluetooth, WIFI, GPRS 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 chapter 7.2.

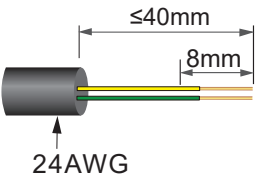
- **WIFI & GPRS Modules**

Following figure show inverter's interface to connect WIFI, GPRS accessory, please refer user manual of accessory for connecting method and its setting.

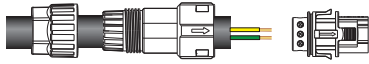
Module	Function description
WIFI	WIFI module implements communication with Cloud server through wireless network to monitor PV inverter's data status. For more details, refer to WIFI Product Application Manual.
GPRS	GPRS module communicates with Cloud server through a mobile phone to monitor PV inverter's data status. For more details, refer to GPRS Product Application Manual.
NOTE	You can choose and buy WIFI/GPRS communication modules from the company.

Table 5.4 WIFI & GPRS Modules Description

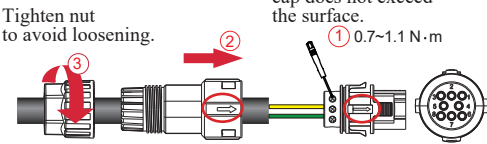
## • RS485 Connection



1 Wires making.



2 Wires threading and crimping.



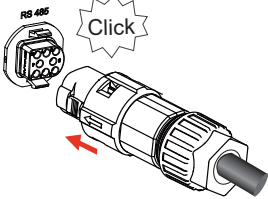
Tighten nut to avoid loosening.

Tighten screws and ensure each screw cap does not exceed the surface.

① 0.7~1.1 N·m

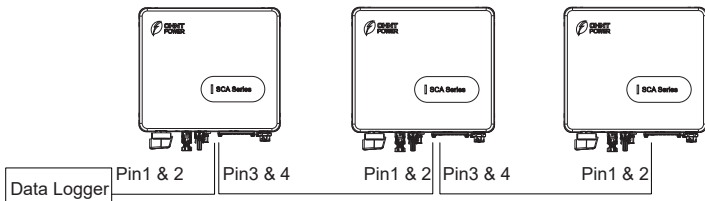
3 Install the terminal.

Pin	Functions
1	RS485_A
2	RS485_B
3	RS485_A
4	RS485_B
5	Power limit_CT+
6	Power limit_CT-
7	None
8	None



4 Open the dust cap and insert the RS485 terminal into RS485 port.

### RS485 communication mode with multiple inverters



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 Pin4 to Pin1 and Pin2 of another inverter.

Note: The baud rate supported by RS485: 9600BPS

## 5.5 Power limit

### 5.5.1 Wiring diagram of Inverter+CT

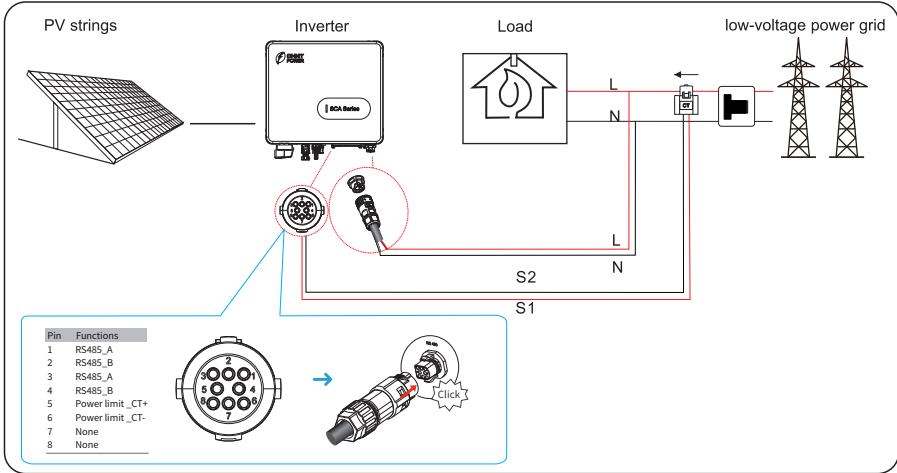


Figure 5.13 Wiring diagram of Inverter+CT

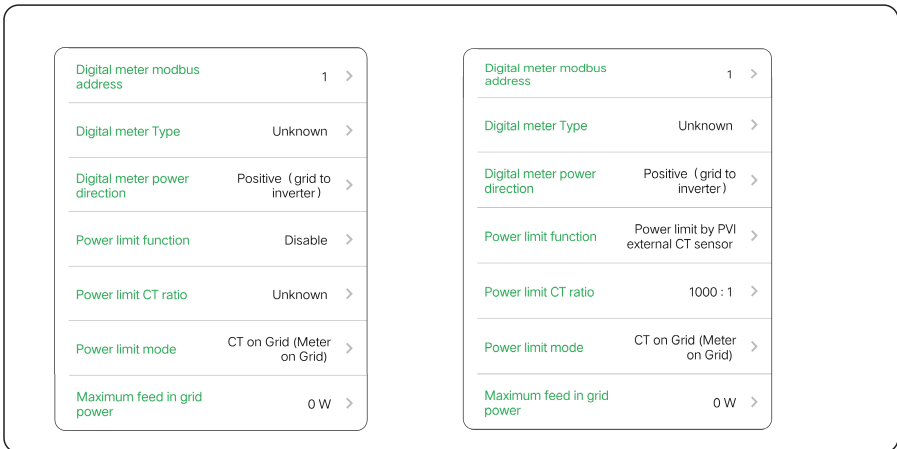


Figure 5.14 Settings via APP

- Power limit function set to “Power limit by PVI external CT sensor”
- Set the CT position base on the meter installed on load or on grid
- Set Power limit CT ratio
- Set maximum feed-in grid power if needed



## 5.5.2 Wiring diagram of Inverter+Meter

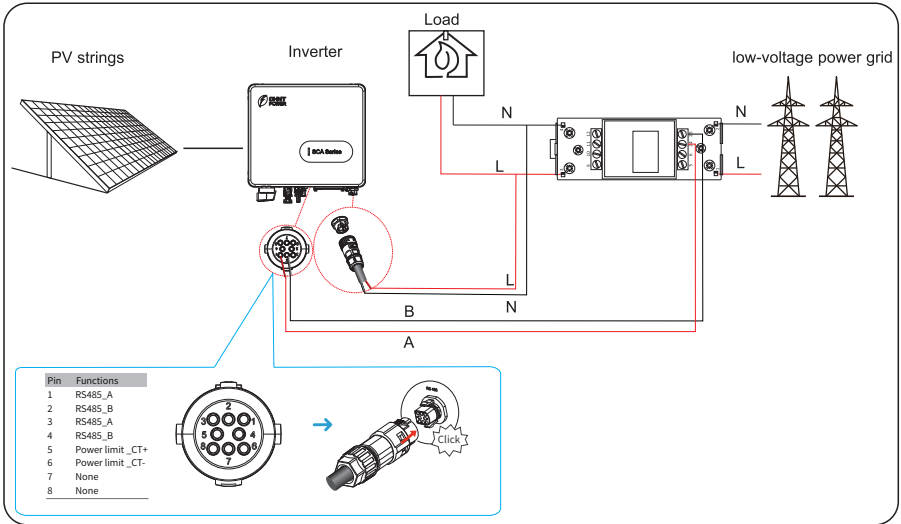



Figure 5.15 Wiring diagram of Inverter+Meter

Digital meter modbus address	1 >
Digital meter Type	Unknown >
Digital meter power direction	Positive (grid to inverter) >
Power limit function	Disable >
Power limit CT ratio	Unknown >
Power limit mode	CT on Grid (Meter on Grid) >
Maximum feed in grid power	0 W >

Digital meter modbus address	1 >
Digital meter Type	CHINT/DDSU666 >
Digital meter power direction	Positive (grid to inverter) >
Power limit function	Power limit by digital meter device >
Power limit CT ratio	1000 : 1 >
Power limit mode	CT on Grid (Meter on Grid) >
Maximum feed in grid power	0 W >

Figure 5.16 Settings via APP

## 5.6 Installation Verification

 <b>WARNING</b>	<p>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).</p>
--	--

Check the following items after the inverter is installed according to Table 5.4.

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. Do not compatible with rapid shutdown methods, devices, or systems.

Table 5.5 Self-check items after installation

## 6 System Operation

### 6.1 Powering ON the Inverter

**Step 1:** Switch ON the AC circuit breaker.

**Step 2:** Turn the DC switch to "ON" state.

**Step 3:** Observe status of LED indicator lights on the inverter according to Table 7.1.



NOTE

When LED status lights display the inverter has entered grid-connecting, it means the inverter is operating well. Any query during operating the PV inverter, call your dealer.

### 6.2 Powering OFF the Inverter

**Step 1:** Run a shutdown command on the mobile APP.

**Step 2:** Switch off the circuit breaker at AC terminal.

**Step 3:** Turn the DC switch to "OFF" state.

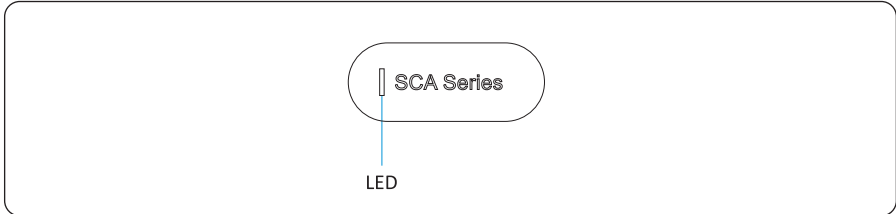


WARNING

After the inverter is power off, the remaining electricity and heat may still cause electrical shock and body burns. Maintenance of the inverter shall begin ten minutes after the power-off.

## 7 User Interface

Display screen of inverter is composed of LED indicator LED contains three color states, blue, green and red respectively. For more details, refer to Table 7.1 HMI specification definition.



### 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.

## 7.1 HMI specification definition

LED Indicator	Description	Status
Blue led	Standby	blink(slowly)
	Normal status	on
Green led	Limited power operation	on
Red led	Refer to the table below	
LED Indicator	Warning Definition	Status
Red led	Grid over voltage	blink(slowly)
Red led	Grid under voltage	blink(slowly)
Red led	Grid absent	blink(slowly)
Red led	Grid over frequency	blink(slowly)
Red led	Grid under frequency	blink(slowly)
Red led	PV over voltage	blink(quickly)
Red led	Insulation resistance abnormal	blink(quickly)
Red led	Leakage current abnormal	blink(quickly)
Red led	Control power abnormal	on
Red led	Arc fault	on
Red led	Dc bias current abnormal	on
Red led	Inverter relay abnormal	on
Red led	Inverter over temperature	on
Red led	Leakage current HCT abnormal	on
Red led	System fault	on
Red led	DC link under voltage	on
Red led	DC link over voltage	on
Red led	Internal Communications Fault	on
Red led	Software version incompatibility	on
Red led	EEPROM fault	on
Red led	Sampling inconsistency	on
Red led	Boost circuit abnormal	on

Table 7.1 HMI specification definition

## 7.2 Bluetooth connection setting

 <p><b>NOTICE</b></p>	<p>After the inverter is installed and powered on, please use the APP (Chint Connect) to connect to the mobile phone Bluetooth to calibrate the time.</p>
--	---

1. Scan the QR code to download "Chint Connect" APP.

Note: Grant all access rights in all pop-up windows when installing the APP or setting your phone.



2. Install WiFi module into the COM1 port of the inverter.

3. Power on the inverter.

4. Open Bluetooth function on your phone, then open the APP and operate as below.

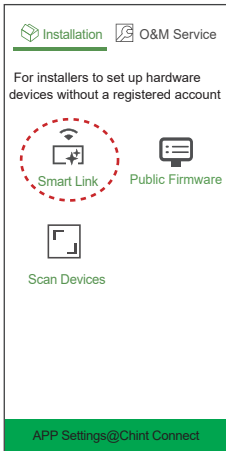
4-1. Touch "Smart Link" icon to enter smart link interface and then click "Next" button to enter "Connect to the adapter" interface.

4-2. Choose correct wireless network name (can be found on the WiFi module) from the Bluetooth List, it will connect to WiFi dongle.

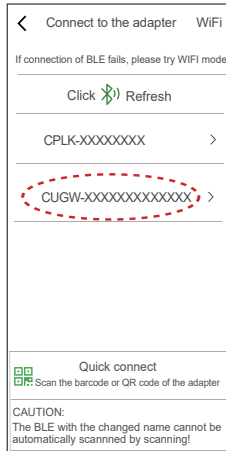
4-3. Click "INV/ESI settings" button to enter inverter setting page.

4-4. Click "Set up the inverter" to set standard code and synchronize local time.

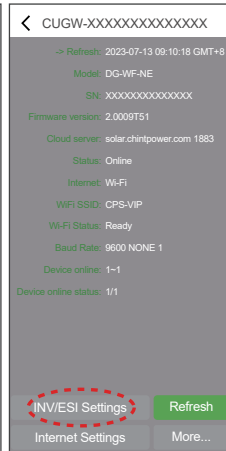
Click "Read/Write Register" and then "Read" button to get current parameter values of the inverter, then you can set or change "Setting parameters", "Zero Export" or other parameters if necessary. Now click "Overview" to see basic information.



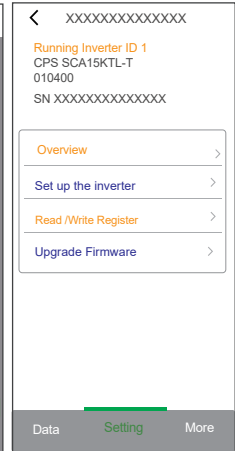
4-1



4-2




4-3



4-4

## 8 Maintenance

 <b>WARNING</b>	<p>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.</p>
--	---

### 8.1 Routine Maintenance

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
PV inverter cleaning	Check periodically and ensure that the heat sink is free from dust and blockage.	Clean periodically the heat sink.	Yearly
PV inverter running status	Check that the inverter is not damaged or deformed. Check for normal sound emitted during inverter operation. Check and ensure that all inverter communications is running well.	If there is any abnormal phenomenon, replace the relevant parts.	Monthly
PV inverter Electrical Connections	Check and ensure that AC, DC, and communication cables are securely connected; Check and ensure that PGND cables are securely connected; 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

Table 8.1 Maintenance checklist and interval

## 8.2 Inverter Troubleshooting

When the inverter has an exception, its basic common warning and exception handling methods are shown in the table 8.2.


Alarm Name	Causes	Measures Recommended
Grid Over Voltage	The grid voltage exceeds its allowable range.	<ol style="list-style-type: none"> <li>1. If the alarm occurs accidentally, the power grid may be abnormal accidentally. No extra action is needed.</li> <li>2. If the alarm occurs repeatedly, contact the local power station. After receiving approval of the local power bureau, revise the electrical protection parameters setting on the inverter through mobileAPP.</li> <li>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.</li> </ol>
Grid Under Voltage		
Over Frequency		
Under Frequency		
PV Over Voltage	PV modules input voltage exceeds the inverter's allowable range.	Check the number of PV modules and adjust it if need.
PV Under Voltage	PV modules input voltage is under the inverter's defaulted protection value.	<ol style="list-style-type: none"> <li>1. When sunlight intensity weakens, PV modules voltage decreases. No action is needed.</li> <li>2. If such phenomena occur when sunlight intensity does not weaken, check if there is short circuit, open circuit etc. in the PV strings.</li> </ol>
Insulation Resistance Abnormal	A short circuit exists between PV strings and protection ground. PV strings are installed in a long-term moist environment.	<ol style="list-style-type: none"> <li>1. Check the insulation resistance against the ground for the PV strings. If a short circuit has occurred, rectify the fault.</li> <li>2. If the insulation resistance against the ground is less than the default value in a rainy environment, set Insulation resistance protection on APP.</li> </ol>



Residual Current Abnormal	The insulation resistance against the ground at the input side decreases during the inverter operation, which causes excessively high residual current.	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol>
PV Strings Abnormal	PV strings have been shielded for a long time. PV strings are deteriorating.	<ol style="list-style-type: none"> <li>1. Check whether the PV string is shielded.</li> <li>2. If the PV string is clean and not shielded, check whether the PV modules are aging or deteriorated.</li> </ol>
PV Strings Reverse	The cables of PV strings are connected reversely during the inverter installation.	Check whether the cables of PV strings are correctly connected. If they are connected reversely, reconnect the cables.
BUS Under Voltage	Abnormal internal energy control imbalance has been triggered by the PV Strings/grid sharp change of working conditions	<ol style="list-style-type: none"> <li>1. If the alarm occurs occasionally, the inverter can automatically recover to the normal operating status after the fault is rectified.</li> <li>2. If the alarm occurs repeatedly, contact your dealer for technical support.</li> </ol>
BUS Over Voltage		
Invert Module Fault		
BOOST Fault		
EEPROM Fault	EEPROM Component damaged	Replace the monitoring board.
Zero power generation and Yellow alarm light illuminating in remote monitor system	Communications outage	If modem or other data logger is used, please reboot it; if still does not work after rebooting, contact your dealer.

remote monitor displays zero power generation	Communications outage	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	Output switch tripping	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. Power grid fault; 2. DC switch tripping	1. Wait till power is restored; 2. Turn DC switch to ON, and if DC switch trips a lot, contact your dealer.
Arc fault detection	Electrical Arcs	1. Check whether the circuit of the solar module is abnormal, including wire integrity, joint tightness. 2. After the faults 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.

Table 8.2 Common troubleshooting measures

 <b>NOTE</b>	If you cannot clear the preceding alarm according the measures recommended, contact your dealer in a timely manner.
---	---

## 8.3 Removing the Inverter

Perform the following procedures to remove the inverter:


**Step 1:** Disconnect all cables from the inverter, including communications cables, DC input power cables, AC output power cables, and PGND cables.

**Notes:**

*When removing DC input connector, insert the removal wrench to the bayonet, press the wrench down, and take out the connector carefully.*

**Step 2:** Remove out the M6 screw .

**Step 3** Remove the inverter from the mounting bracket.

 <b>WARNING</b>	Before removing DC input connector, double check and ensure DC input switch is turned OFF to avoid inverter damage and personal injury.
--	---

## 9 Disposal of 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.

## 10 Technical Specifications

Model	CPS SCA3KTL-PS2/EU	CPS SCA3.6KTL-PS2/EU
Efficiency		
Max. Efficiency	97.8%	97.8%
European Efficiency	97.3%	97.3%
<b>Input(PV)</b>		
Max. PV configuration(STC)	150%	
Max.Input Voltage	500V	
Rated Input Voltage	360V	
Max.Input Current	15A	
Max.Short Circuit Current	20A	
Start Input Voltage	70V	
MPPT Operating Voltage Range	50V-490V	
Max.Number of PV Strings	1	
No. of MPPTs	1	
<b>Output(Grid)</b>		
Rated AC Active Power	3,000W	3,600W
Max. AC Apparent Power	3,300VA	3,600VA
Max. AC Active Power(PF=1)	3,300W	3,600W
Max. AC Output Current	15A	16A
Rated AC Voltage	220V/230V,L+N+PE	
AC Voltage Range	160V-300V (Adjustable)	
Rated Grid Frequency	50Hz/60Hz	
Grid Frequency Range	45Hz-55Hz / 55Hz-65Hz (Adjustable)	
THDI	<3% (Rated Power)	
DC Current Injection	<0.5%In	
Power Factor	>0.99@Rated power (Adjustable 0.8 Leading-0.8 Lagging)	

<b>Protection</b>	
DC Switch	Support
Anti-islanding protection	Support
AC overcurrent protection	Support
AC short circuit protection	Support
DC reverse connection	Support
Surge Arrester	DC Type III (Optional) / AC Type III
Insulation detection	Support
Leakage current protection	Support
<b>General</b>	
Topology	Transformerless
IP Rating	IP65
Night Self Consumption	<1W
Cooling	Natural cooling
Operating Temperature Range	-25°C~+60°C
Relative Humidity Range	0-100%
Max. Operating Altitude	4000m
Noise	30dB
Dimensions (W*H*D)	277mm*243mm*130mm
Weight	4.96 kg
<b>HMI &amp; COM</b>	
Display	Wireless & APP
Communication	WiFi / GPRS (Optional) / RS485(Optional)
<b>Certification</b>	
Safety	IEC62109-1, IEC62109-2
Grid Code	IEC61727 / 62116
Warranty	5 Years

- ☎ Tel : +86 21 3779 1222-866300
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