CROWN®

SOLAR ENERGY

NEXUS

80 KW Three Phase On-Grid Inverter



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1 Overview

This manual provides essential information on the inverter, including product specifications, installation procedures, and operation and maintenance instructions. It is intended for qualified personnel responsible for the installation, commissioning, operation and servicing of the inverter, as well as for end users requiring access to product information.
Please read this manual carefully before installing the product and keep it in an accessible location to ensure that all relevant personnel can consult it when necessary.

This manual is valid for the following PV inverter models:
70 / 75 / 80 / 90 / 100 / 110 / 120 / 125K

1.1 Safety

Please strictly observe the following safety rules during installation and operation.



DANGEROUS

DANGER indicates an immediate hazard that will result in death or serious injury if not avoided.



WARNING

WARNING indicates a potentially hazardous situation that could result in death or serious injury if not avoided.



CAUTION

CAUTION indicates a potentially hazardous situation that may result in minor or moderate injury if not avoided.



NOTE

NOTE indicates a condition that may cause equipment or property damage if not observed.

2 Delivery

2.1 Scope of Supply

The packing box contains the items listed in Table 2-1.
Please check the contents immediately upon receipt.

NO.	Name	Qty	Note
1	PV Inverter	1	------
2	Fixed plate	1	For fixing inverter to mounting surface (solid wall, etc.)
3	document	1	Included Documents: Instruction Manual, Certificate of Quality, Warranty Card, Product Test Report, etc.
4	Mounting plate fixing screws	4	M10×40 Screws, M10 Hex Nuts, M10 Flat Washers
5	fixed screw	2	Used to secure the inverter to the mounting plate.
6	DC connector	20	PV Connectors Used to connect the PV arrays to the inverter. Ensure that the polarity of the PV array matches the polarity of the inverter's DC input terminals. **Note:** The number of connectors supplied varies depending on the inverter model.

Table 2-1: Scope of supply

2.2 Product Acceptance

Although the products are thoroughly tested and inspected before shipment, damage may occur during transit. Please inspect all items upon receipt. If any damage is detected, contact the shipping company or the manufacturer immediately. Provide photos of the damaged parts, and we will respond promptly to ensure timely and effective support.

2.3 Inverter Storage

If the inverter is not put into operation immediately, it should be stored under controlled conditions as follows:

- The inverter must remain in its original packaging, sealed with adhesive tape, and stored in a clean, dry environment to prevent dust and moisture damage.
- The storage temperature should be between **–30 °C and 85 °C**, with relative humidity between **0% and 100%**.
- If stacking is necessary, ensure that the units are properly aligned. **Do not exceed the maximum stacking height**.
- Do not tilt or invert the packaging. Long-term storage should not involve stacking unless strictly controlled.
- After long-term storage, the inverter must undergo a thorough inspection and functional testing by qualified personnel before being put into operation.

3 Description

3.1. Brief Introductions

An grid-tied PV power system typically consists of PV modules, a junction box, an inverter, an ammeter and the utility grid. The core component of the system is the grid-connected PV inverter.

When sunlight reaches the surface of the PV modules, they generate DC power, which is then converted by the inverter into AC power with the same frequency and phase as the grid, and subsequently fed into the utility network.

The PV inverter is a three-phase, transformerless string inverter. Its application within a PV power generation system is illustrated in Figure 3-1.



Sun **PV Arrays** **PV inverter** **Meter** **Utility Grid**

Fig 3-1 Grid-Tied PV Power System

PV arrays may consist of monocrystalline or polycrystalline silicon modules. The inverter may only be connected to PV modules that comply with Protection Class II.

If the PV system capacity exceeds that of a single inverter, multiple inverters can be deployed. The corresponding PV inputs should be connected to each inverter on the DC side, while the AC outputs are connected in parallel to the utility grid.

WARNING

The inverter cannot be connected to PV arrays that require positive or negative grounding.

Do not connect the local load between the inverter and the AC circuit breaker.

The inverter is intended solely for use in grid-connected power generation systems.

It must not be used for any other applications beyond those specified above.

Product performance

- Transformerless design with a maximum efficiency of 98.9%
- Wide input voltage range with MPPT efficiency up to 99.9%
- Active and passive anti-islanding protection technology

- Comprehensive protection for enhanced reliability
- IP66 outdoor-rated enclosure, suitable for harsh environments
- Multi-communication interfaces: RS485, Wi-Fi, GPRS, user-friendly

3.2 General Introduction

Appearance and interface



Fig 3-2 Appearance

Figure 3-2 shows the appearance of the product. The image is for reference only.
All external interfaces are located at the bottom of the unit, including the PV+ input port, PV– input port, WiFi/GPRS communication ports, AC output port and the DC switch.
Figure 3-3 shows the schematic diagram of the external interfaces.

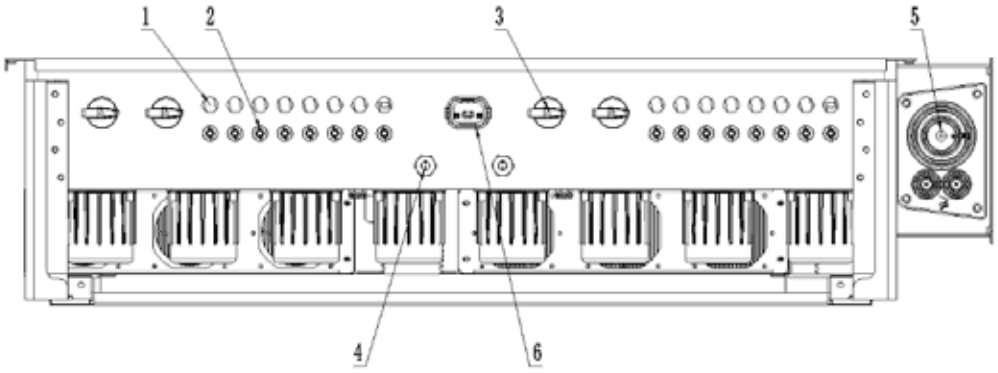


Fig 3-3: External Interface

No.	Name	Description
1	PV input port +	Connects to the positive (+) terminal of the PV array.
2	PV input port -	Connects to the negative (–) terminal of the PV array.
3	DC switch	Used to electrically isolate the inverter from the PV array.
4	RS485 communication port	Connects the inverter to a PC or monitoring device for remote supervision.
5	AC output port	Connects to grid phase lines L1, L2, L3 and neutral (N) through a circuit breaker; connect the protective earth (PE) to the grounding point.
6	USB communication port(selective assembly)	Connects the inverter to a PC for remote monitoring.

Table 3-1: External Interface

3.3 Dimension

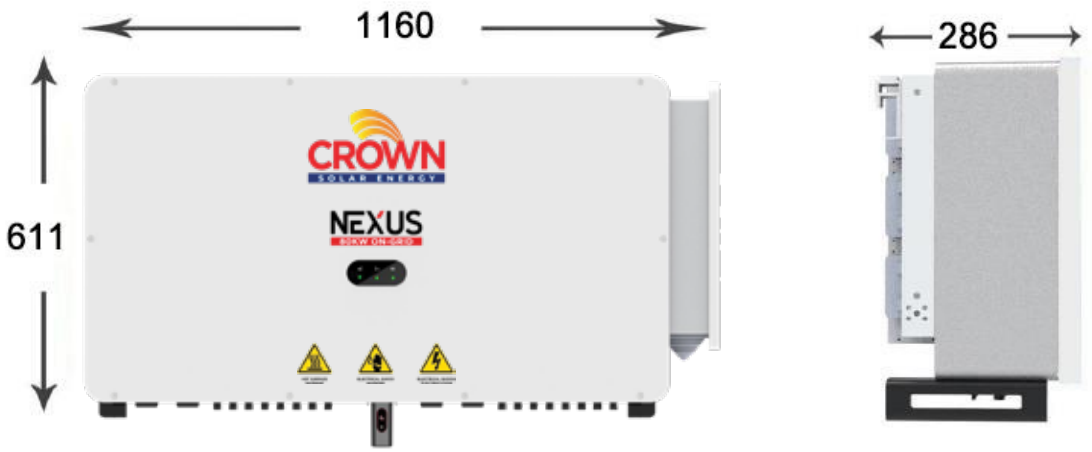


Fig 3-4 Inverter Dimensions

4 Installation

4.1 Installation Procedure

Before installing or operating this product, strictly follow the installation sequence and heed all warning symbols.

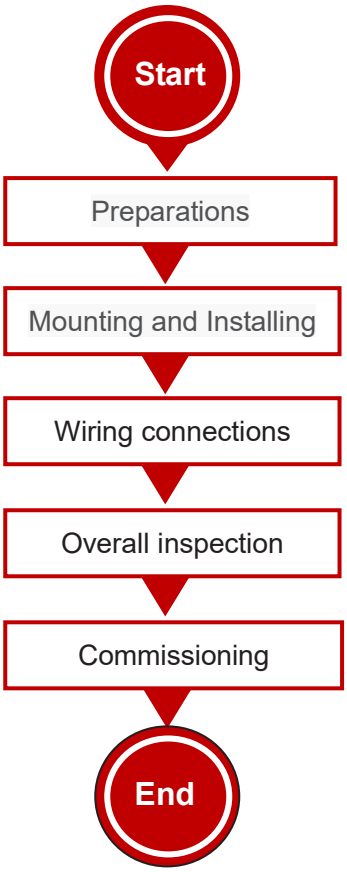


Fig 4-1 Installation procedure

4.2 Preparation for installation

● Unpacking and Inspection

Although the inverter has been carefully tested and inspected before shipment, damage may occur during transportation. Please inspect the inverter before installation. If any damage is found, contact the shipping company or our service team immediately and provide photos of the damaged parts. We will provide prompt and effective support.

Inspection Checklist upon Receipt:

- Check the packaging for any visible damage upon delivery.
- Verify that the contents are complete and match the order according to the packing list.
- After unpacking, inspect the internal components to ensure they are intact.

● Installation Site Selection

WARNING

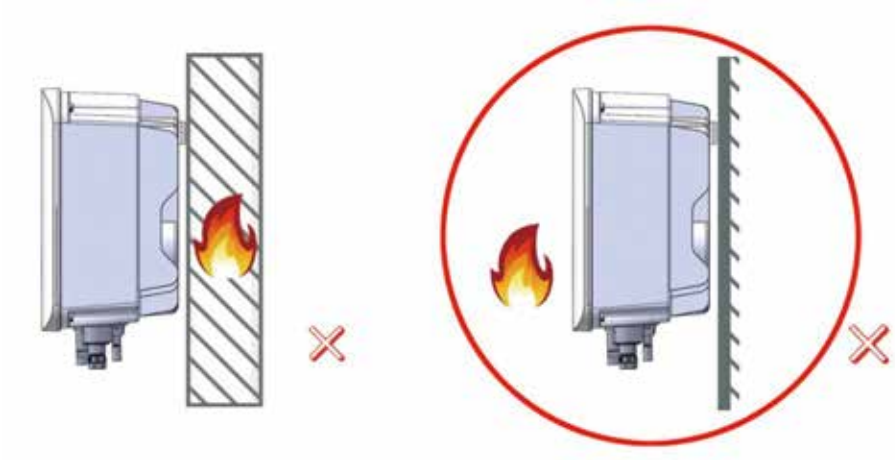
Please read carefully and strictly follow the basic installation requirements below. Failure to comply with these warnings may result in serious injury or death.

WARNING

Poor ventilation in the installation environment may affect system performance. Ensure adequate ventilation during equipment operation. The device must be kept upright, and the heat sink must not be obstructed to maintain proper internal cooling.

The PV inverter has an IP66 protection rating and is suitable for both indoor and outdoor installation. Selecting an appropriate installation location is critical for safe operation, longevity, and optimal performance of the inverter.

1. Ensure that the installation wall can support the weight of the PV inverter over the long term.
2. Install the PV inverter in a location that allows easy access for electrical connections, operation, and maintenance.
3. The installation wall must be fire-resistant, and the surrounding area must be free of flammable materials or gases.



The wall material is flammable

Flammable materials or gases may be present in the installation space.

DANGEROUS

Keep the inverter away from flammable and explosive materials.

4. Do not install the PV inverter in living areas to prevent noise from affecting daily life.
5. Install the PV inverter out of the reach of children.

CAUTION

The inverter gets hot during operation. Do not touch.

6. The installation height should allow the LCD to be at approximately eye level for convenient operation.

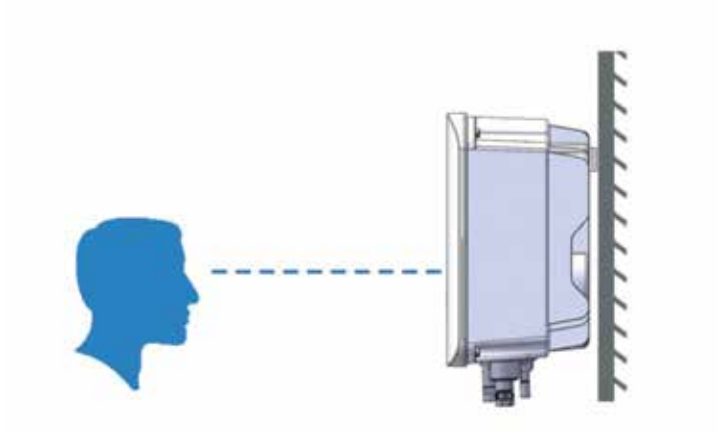


Fig 4-3 Installation height

7. The PV inverter must be installed upright and must not be placed horizontally, upside down, or at an angle.

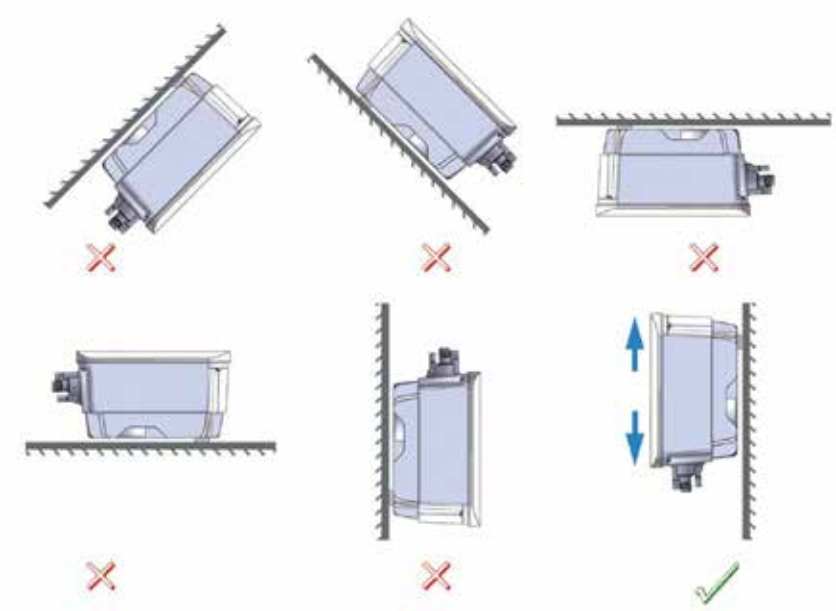


Fig 4-4 Installation Direction

8. The installation environment temperature should be between -25°C and 60°C, with a relative humidity of up to 95%. (Note: When the ambient temperature exceeds 45°C, the output power of the PV inverter may decrease.)



Minimum ambient temperature -25℃



Maximum ambient temperature 60℃



Environmental humidity:0-100% non-condensing

Fig 4-5 Installation environment

NOTE

Operating ambient temperature: -25℃ to +60℃. When the ambient temperature exceeds this range, the inverter's output power will decrease.

9. Sufficient space around the PV inverter is required to ensure proper heat dissipation.

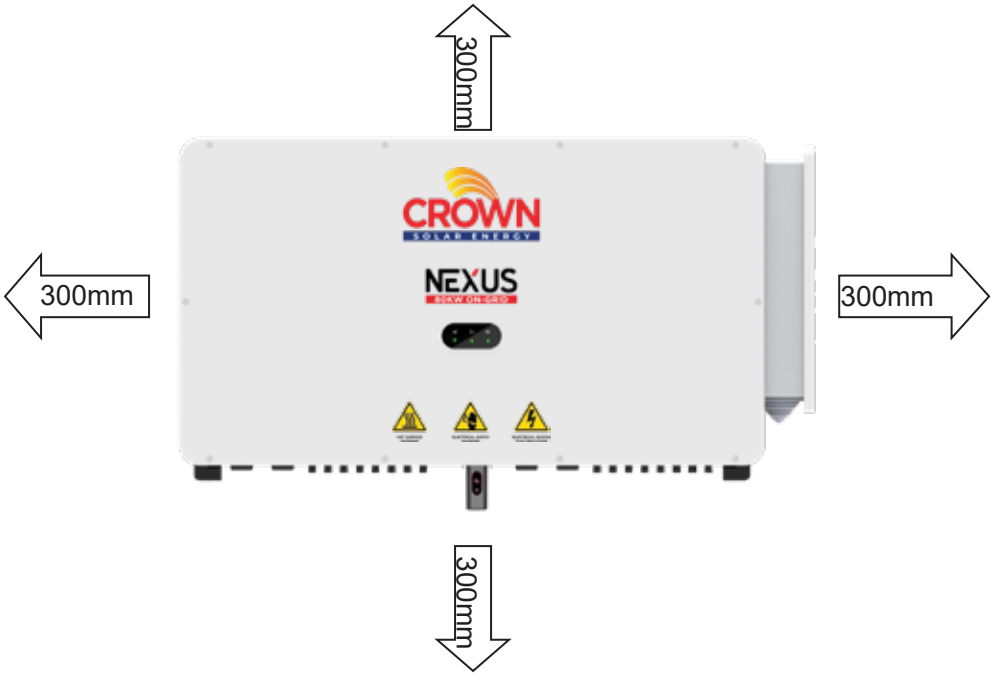


Fig 4-6 Sufficient space

10. Ensure proper ventilation for the PV inverter. Do not install the PV inverter in a closed or confined space, as this may cause abnormal operation and could create a risk of fire or explosion.

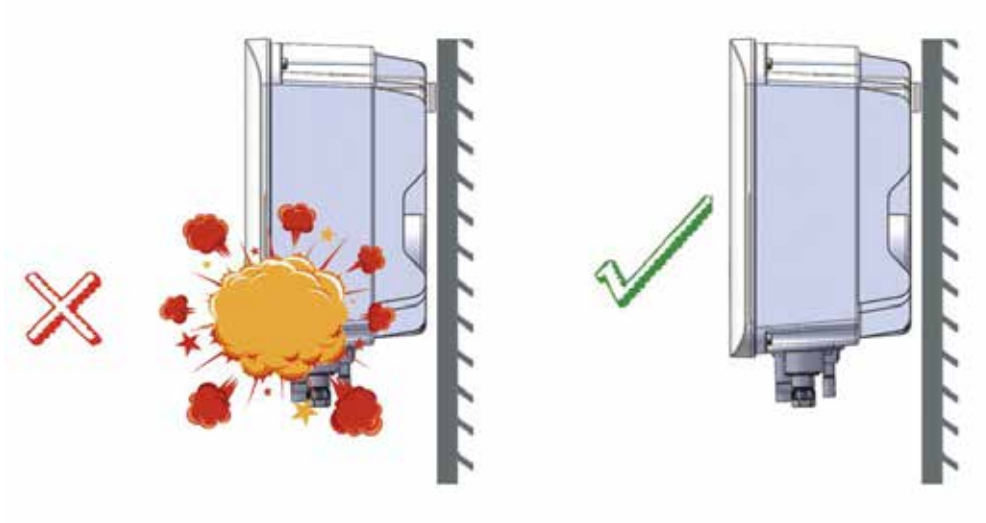


Fig 4-7 Installation Environment

11. When installing multiple inverters side by side in a horizontal arrangement, maintain a minimum distance of 100 cm between their enclosures. Do not place any objects on top of the inverters, and ensure sufficient clearance at the front and rear to facilitate heat dissipation. Staggering the inverters is recommended for optimal airflow.

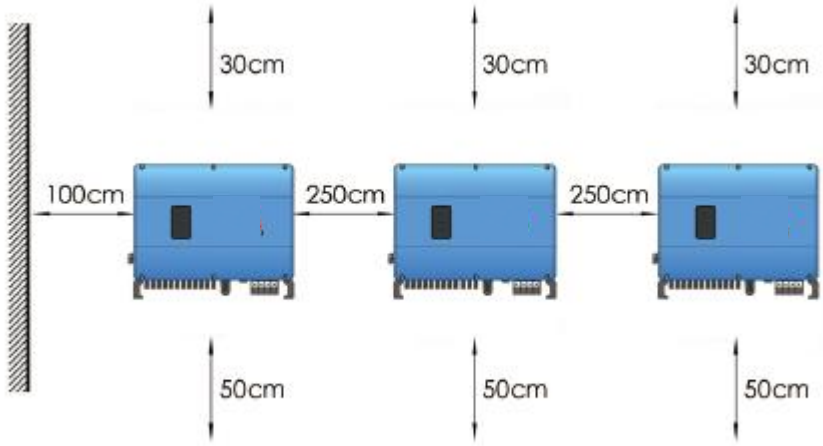


Fig 4-8 Multi-Unit Installation Requirements

12. Install the PV inverter in a location protected from rain, snow, and direct sunlight, as these conditions can directly affect its service life. If protection is not possible, provide adequate shielding to ensure the best operating environment.



Fig 4-9 Equipment Protection

4.3 Mounting and Installing

4.3.1 Setting Tools

- Wrench
- Impact electric drill
- Phillips screwdriver
- Hexagon socket wrench
- Megohmmeter and multimeter

4.3.2 Moving the Inverter

Before installation, remove the inverter from its packaging and transport it to the selected installation site. Follow these instructions when moving the inverter:

- The weight of the 100/110 kW model is approximately 89 kg.
- Move the inverter according to the guidelines in the Quick Installation Instructions.
- At least four people should work together to move the inverter, or use appropriate moving equipment.
- Avoid impacts, knocks, or dropping the inverter during transportation.

4.3.3 Install inverter

1. The fixing plate and expansion bolts included in the accessory bag are used to install the inverter vertically on a wall or metal support.



Fig 4-10 Mounting Dimensions

2. If installing the chassis on a concrete wall, first drill holes according to the fixing plate dimensions. Secure the fixing plate to the wall using expansion bolts, and then hang the chassis on the fixing plate.

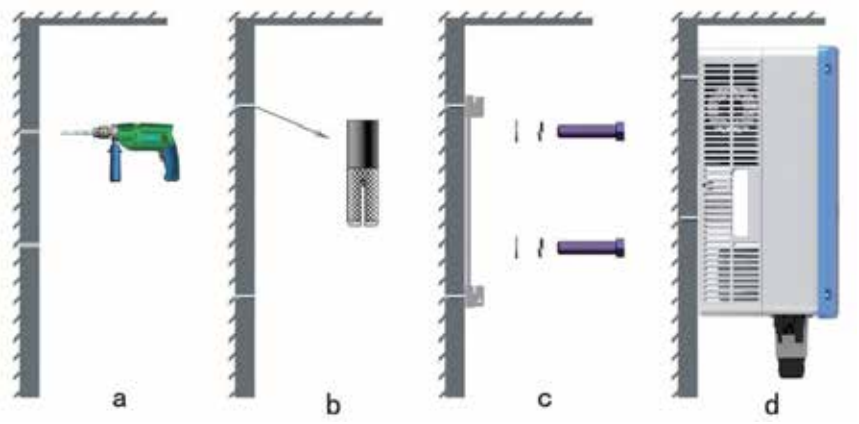
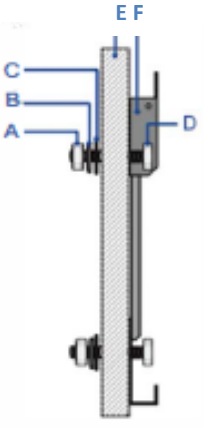


Fig 4-11 Securing Procedures

3. If installing the chassis on a metal support, drill holes in the support according to the fixing plate dimensions. Secure the fixing plate with M8 bolts, and then hang the chassis on the fixing plate.

No.	Name	Model
A	Hexagon nuts	M10
B	Spring gasket	Φ10
C	flat gasket	Φ10
D	Full thread bolt	M10
E	Metal support	
F	Fixing plate	Accessory

Table 4-1 Support list



4. After hanging the inverter on the fixing plate, use screws to fix the inverter on the fixing plate.

NOTE

During installation, ensure the inverter is kept balanced to avoid hitting walls or other obstacles, which may damage the chassis.

4.4 Wiring Connections

4.4.1 Safety

As an electronic device, contact with any live parts may result in fatal injury. The inverter must be installed by qualified electrical and mechanical engineers.

DANGEROUS

High Voltage! Risk of Electric Shock!

The inverter must be installed by qualified professionals. Improper wiring may cause operator injury or permanent damage to the equipment.

Before making any electrical connections, be aware that the inverter has a dual power supply.

Electrical personnel must wear appropriate protective equipment, such as helmets, insulating shoes, and protective gloves.

Precautions:

- During installation, do not touch or move any internal components other than the designated wiring terminals.
- All electrical installations must comply with local regulations and electrical codes.
- If maintenance is required, please contact the equipment supplier.
- Approval from the local power supply authority must be obtained before connecting the equipment to the grid for power generation.

WARNING

Ensure that the input DC voltage does not exceed 1000 V. Excessive input voltage may cause permanent damage to the equipment and lead to additional losses. In such cases, the company will not assume any warranty or liability.

4.4.2 Wiring requirements

After the inverter has been securely installed at the designated location, it may be connected to the PV system. All electrical connections must comply with local laws and regulations. The following sections describe the wiring requirements for the inverter.

- **PV arrays**

The PV array open circuit voltage should not exceed 1000V.

NOTE

Maximum open-circuit voltage of the PV arrays: 900 V.

Maximum power of the PV arrays: refer to Section 10.1 Specification.

- **Power grid**

The inverter continuously monitors the grid to ensure that all grid-connection conditions are met. The following are the grid limits required for grid connection. In addition, approval must be obtained from the local power authority before installing grid-connected PV inverters.

NOTE

70-125K: Grid line voltage: 310-480VAC, grid frequency:45-55HZ/55-65HZ.

70-125K-HV: Grid line voltage: 422-550VAC, grid frequency:45-55HZ/55-65HZ.

- **Cables**

AC and DC cables shall comply with local safety regulations, and their cross-sectional area must be adequate to carry the rated current.

Item	Connected to	Cable size(mm^2)	Torque(N.m)
DC terminal	PV strings.	4~6	NA
Ground terminal	AC ground	25~50	10~12
Grid terminal	Grid	70~185	10~20
RS485 terminal	Communication cable	0.3~4	0.6
COM terminal	Data collector	NA	NA
DC surge	NA	NA	NA

Table 4-2 Cable specification recommendations

- **Breaker**

To ensure the safe installation and operation of the equipment, a manual circuit breaker must be installed. The circuit breaker shall comply with local safety standards and provide basic overcurrent and overvoltage protection. The rated voltage and current of the AC circuit breaker shall be at least 450 V and 200 A, respectively.

NOTE

Multiple inverters must not share a single circuit breaker.

No loads shall be connected between the inverter and the circuit breaker.

- **Leakage protector**

The inverter is equipped with an integrated leakage current monitoring unit, capable of distinguishing between fault currents and capacitor leakage currents. If the detected leakage current exceeds the permissible limit, the inverter will promptly disconnect from the grid.

4.4.3 Inverter wiring connection

- **AC Cable Connections**

The AC terminals are located in the lower half of the inverter's cavity. The AC connection uses a three-phase five-wire configuration: L1, L2, L3, N (neutral may be omitted), and PE.

NOTE

If the PID-lifting function is implemented on the AC side:

- The neutral point of the power grid on the inverter side must not be grounded.
- The AC cables must be rated for 1000 V or 600 V.
- For AC PDC SPD testing, the "3+1" solution is recommended:
  - "3" requires that the U_C is no less than 385 V AC.
  - "1" requires that the DC breakdown voltage Uag > 600 V DC.

If there is no PID-lifting requirement on the AC side and no other special conditions:

- The neutral point of the power grid may be grounded, or the AC output terminal N inside the inverter may be connected to the PE terminal.

■ **Wiring Procedure**

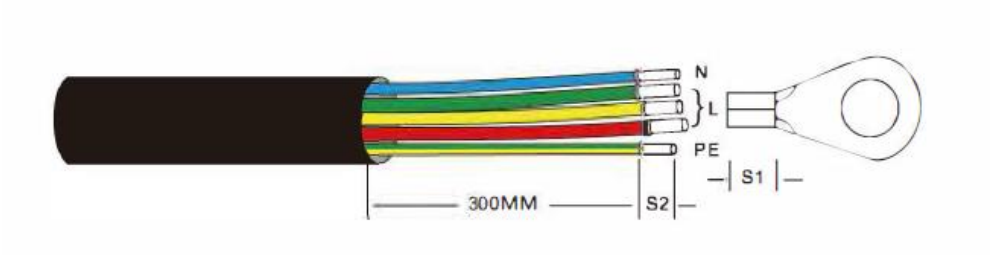


Fig 4-13 AC stripping

1. Disconnect the AC circuit breaker and ensure that the AC cable connected to the terminal is not live. Use a multimeter to measure and confirm.
2. Strip the cable according to the following instructions, as shown in the figure above The following table describes the recommended length ranges based on the cross-sectional area of the AC cable.

AC cable (Cu)(mm²)	AC cable (Al)(mm²)	AC cable length(m)
35	50	0~50
50	70	50~100
70	95	100~150

Table 4-3 AC Cable specification recommendations

3. Strip the insulation from the cable according to the crimping area of the OT terminal, then crimp the terminal using a hydraulic crimping tool. The crimped section must be insulated with heat shrink tubing or insulating tape.

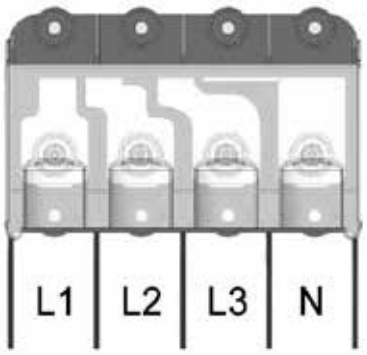


Fig 4-14 AC wiring

NOTE

If aluminum cables are used, copper-aluminum adapter terminals must be employed to prevent direct contact between copper bars and aluminum cables. The copper-aluminum adapters should be selected according to the cables used.

4. Remove the four screws on the inverter junction box and take off the junction box cover. Pass the cables through the nut, sheath, and AC terminal cover. Using a socket wrench, connect the cables to the AC junction box in sequence. Tighten the junction box screws to a torque of 10–20 N·m.

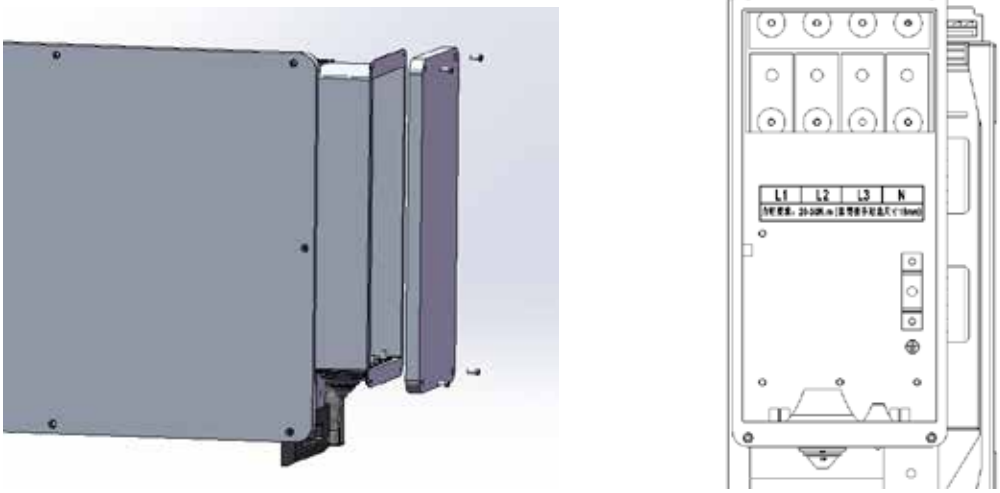


Fig 4-15 Terminal Diagram

WARNING

Do not connect the AC phase lines L1, L2, L3, or the neutral line N to anchors.
Ensure that all cables are securely connected to prevent insulation from being pinched or subjected to stress. Improper connections may cause damage to the inverter.

NOTE

1. Ensure correct AC terminal wiring; reversing the live and neutral wires may prevent proper inverter operation.

2. All terminals, except for the AC terminals, are arranged in-line.

3. Use flexible copper cables for AC connections whenever possible.

4. The grounding conductor must be securely connected and properly earthed.

- **DC Cable Connections**
  - **PV array input configuration**

The inverter features eight PV input channels, labeled DC1 through DC8. Each input channel is equipped with its own MPPT tracker.

DANGEROUS

High Voltage! Risk of Electric Shock!

Take all necessary safety precautions before performing any electrical connections. The PV array generates dangerous voltage whenever it is exposed to sunlight.

Warning

Before connecting the PV arrays to the inverter, ensure that the PV arrays are properly insulated from the ground.

NOTE

The following precautions must be strictly observed; failure to do so may result in damages not covered by the inverter's warranty:

1. When designing the PV array, ensure that the voltage of each PV string does not exceed 1000 V, even at the lowest ambient temperature. Exceeding this limit may cause irreversible damage to the inverter.
2. Ensure that the maximum short-circuit current on the DC side remains within the inverter's rated limits. Exceeding this current may result in permanent damage to the inverter.

The eight PV input channels operate independently, each with its own MPPT tracker. Therefore, the eight PV inputs can differ from one another, including:

- Different types of solar panels
- Different numbers of modules per string
- Different tilt angles
- Different azimuth orientations

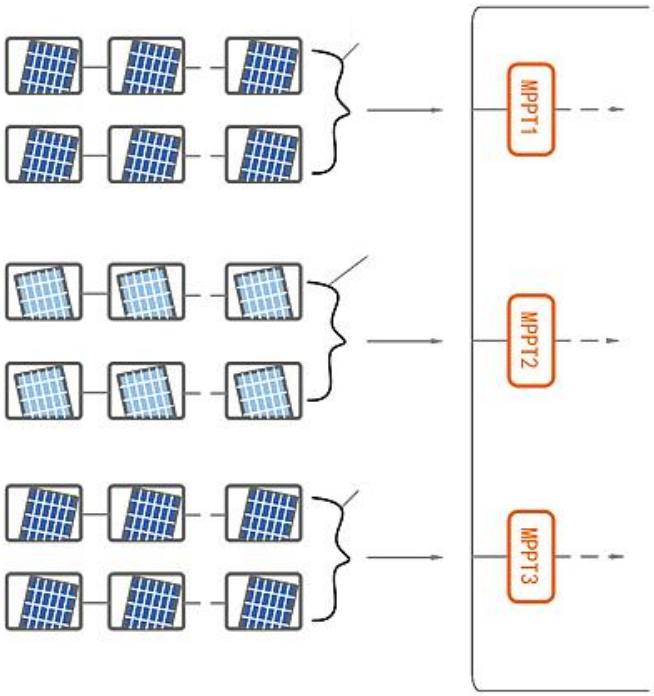


Fig 4-16 PV connection

NOTE

To fully utilize the DC input power, PV arrays connected to the same MPPT input should have a uniform configuration, including: The same solar panel model, The same number of panels per string, The same tilt angle, The same azimuth orientation.

■ **DC cable requirements**

NOTE

To ensure that the inverter achieves an IP66 protection level, only the connectors provided by the supplier or products with an equivalent protection level may be used.

Type	Cross-sectional area(mm^2)		Cable outer diameter
	Range	Recommend	
PV1-F	4~6 (12AWG~10AWG)	4 (12AWG)	5.5~9mm^2

Table 4-4 DC Cable Requirements

■ **DC cable connection steps**

DANGEROUS

High Voltage! Risk of Electric Shock! The PV inverter may contain high voltage. Before performing any electrical work, ensure that all cables are de-energized. Do not close the AC circuit breaker until the PV inverter is fully connected.

1. Strip 7 mm of insulation from all DC cables.

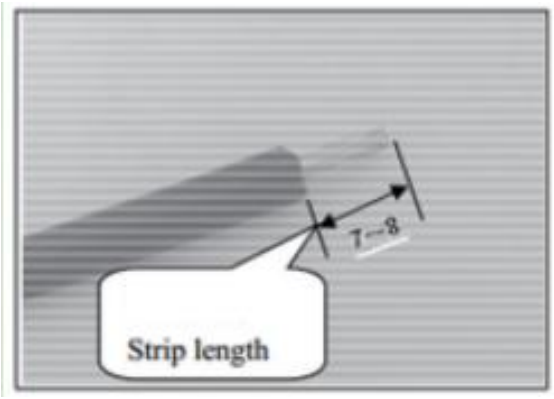
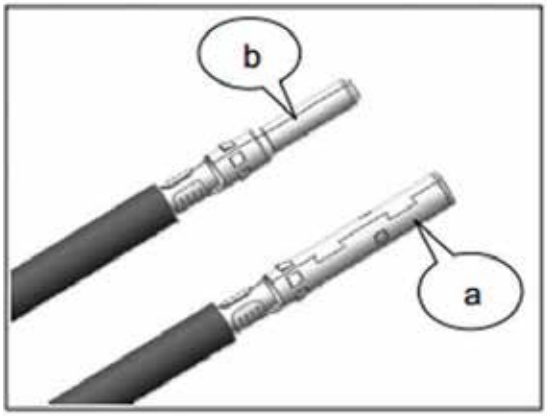


Fig 4-17 DC cable stripping

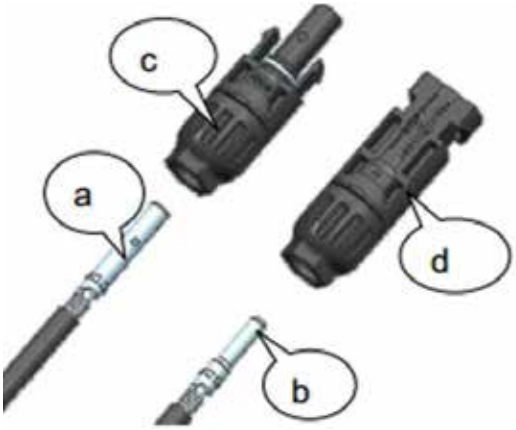
2. Crimp the wiring terminals onto the cable ends using crimping pliers.



a-female terminal
b-male terminal

Fig 4-18 Wiring terminals

3. Route the cable through the cable sealing sleeve.



a-female terminal
b-male terminal
c-male housing body
d-female housing body

Fig 4-19 The housing body

4. After plugging in the cable, tighten the nut using a special or adjustable wrench. For best results, two wrenches can be used together.

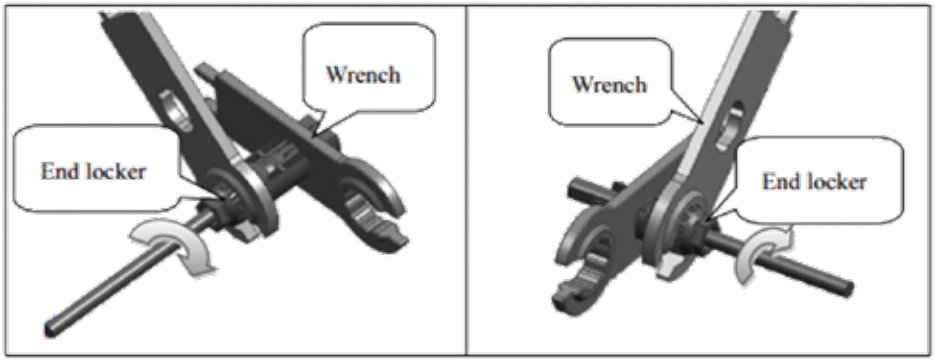


Fig 4-20 Tighten the cable

5. Connect the male and female connectors by aligning the buckle with the groove and inserting. A crisp click will indicate a proper connection.



Fig 4-21 DC Terminal Connection

6. Verify that the polarity of the PV array cables is correct.

NOTE

If the DC input polarity is reversed, the inverter will not work properly.

7. Turn off DC switch

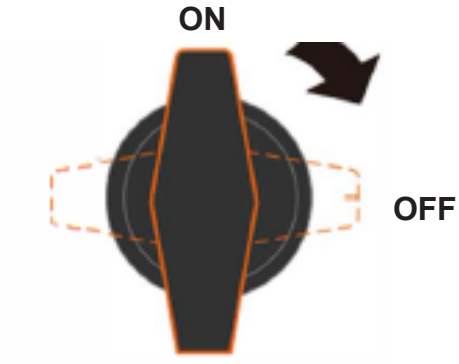


Fig 4-22 DC switch

8. Check that the polarity of the PV string cables is correct, and ensure that the open-circuit voltage does not exceed the inverter's maximum input limit of 1000 V, even at the lowest operating temperature.

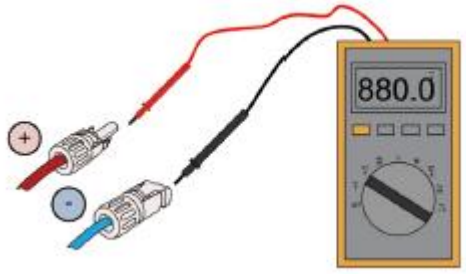


Fig 4-23 Measure the open-circuit voltage.

NOTE

- Before connecting the DC terminals to the inverter, verify the polarity of each PV array and insert the terminals into the corresponding DC input ports at the bottom of the inverter.
- For PV arrays connected to the same MPPT input, reversing the polarity of any individual array is strictly prohibited, as it may result in permanent damage to the system or the inverter.

9. Insert the positive and negative connectors into the DC input terminals at the bottom of the inverter and ensure they are securely latched.

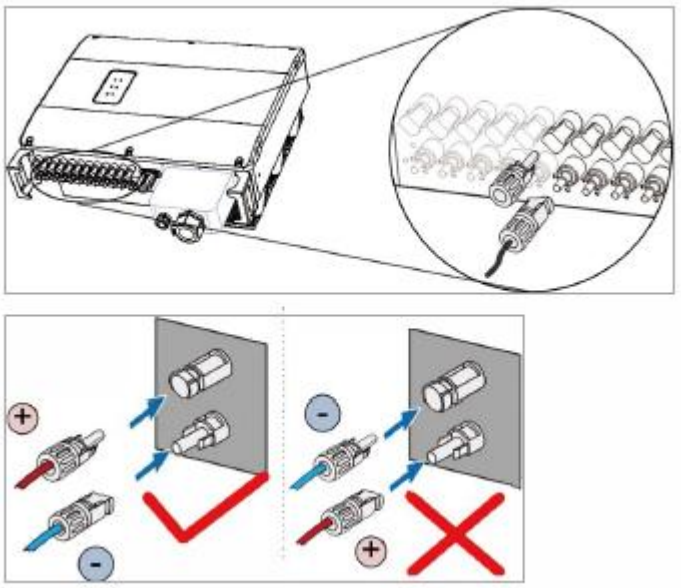


Fig 4-24 DC circuit connection

10. Repeat the above steps to connect the remaining PV arrays.
11. Seal any unused DC terminals with the supplied terminal covers.

- **Grounding**

WARNING

Since the PV inverter is transformerless, the positive and negative poles of the PV string must not be grounded; otherwise, the inverter will not operate properly.

■ **Grounding system**

In this PV power generation system, all non-current-carrying metal components and equipment enclosures (such as PV module mounting frames and the inverter housing) must be properly grounded.

For a single-inverter system, the “PE” cable of the inverter must be connected to the grounding point.

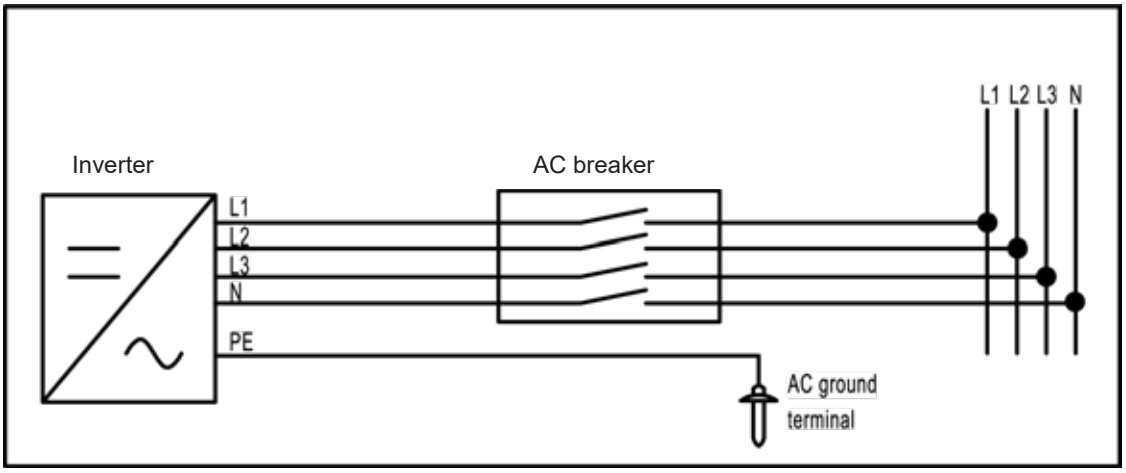


Fig 4-25 Single inverter grounding system

For multi-inverter systems, multi-point grounding is supported; however, all inverter “PE” cables, along with the grounding points of the PV array metal frames, must be connected to an equipotential bonding conductor (as required by site conditions) to ensure equipotential bonding.

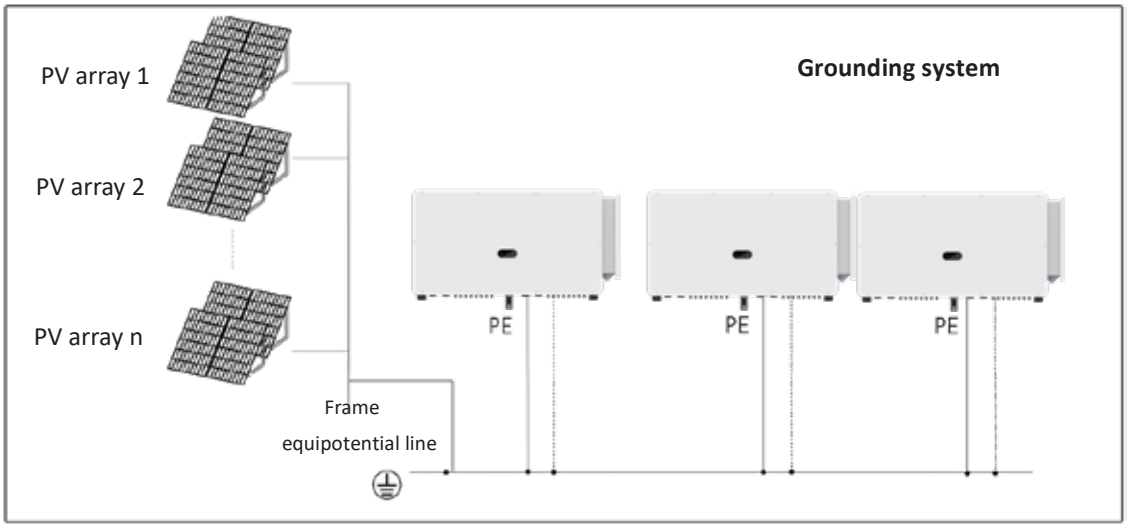


Fig 4-26 Multi-inverter grounding system

■ **Secondary protection grounding**

There is a secondary protection grounding terminal at the bottom of the inverter, which must be grounded.

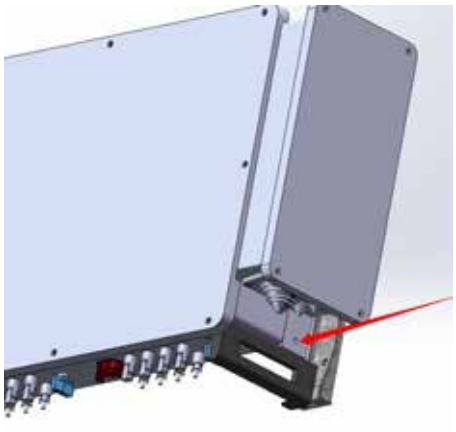


Fig 4-27 Secondary protection grounding terminal

WARNING

- **The grounding connection of the secondary protective grounding terminal cannot replace the grounding of the PE conductor in the AC cable. Ensure that both grounding points are properly and reliably connected. Otherwise, the manufacturer and supplier will not be responsible for any resulting consequences.**
- **Because the inverter is transformerless, neither the positive nor the negative pole of the PV arrays may be grounded; otherwise, the inverter will fail to operate properly.**

■ **Cable grounding**

No.	Item	Model
A	Bolt	M10×20
B	Spring Washer	φ10
C	Flat Washer	φ10
D	Crimp Terminal	
E	Green-Yellow Wire	

Table 4-5 Grounding parts list

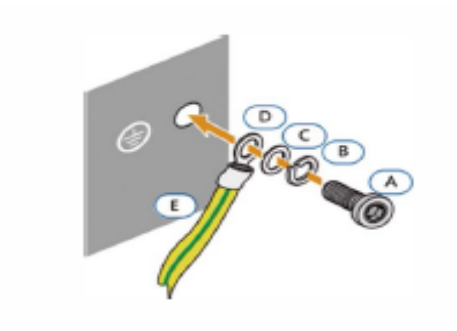


Fig 4-28 Cable grounding

NOTE

- To ensure grounding safety, the green-yellow wire must have the same cross-sectional area as the PE conductor in the AC cable.
- The secondary protection grounding must be connected; connecting parts are not supplied.

4.5 Anti-backflow system

The Anti-Backflow System is designed to prevent reverse current from flowing back into the photovoltaic (PV) array or the power grid. This ensures the safety of the inverter, protects the

PV modules, and prevents energy loss.

To enable the anti-backflow function, first switch off the inverter's DC and AC breakers, then wire the meter following the procedures in this chapter.

This inverter series is compatible exclusively with CHINT DTSU666 meters. Depending on the chosen meter model, two wiring options are available. The specific models and their respective connection methods are listed below:

- 0.4-10(100)A type electric meter, no need for external current transformer

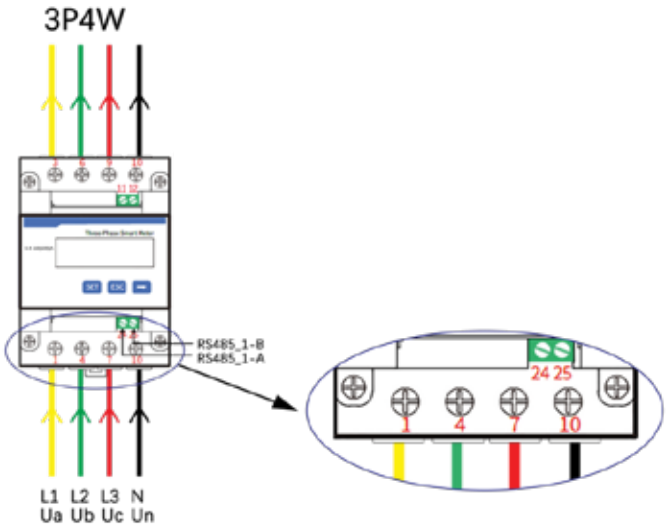


Fig 4-29 Electric meter

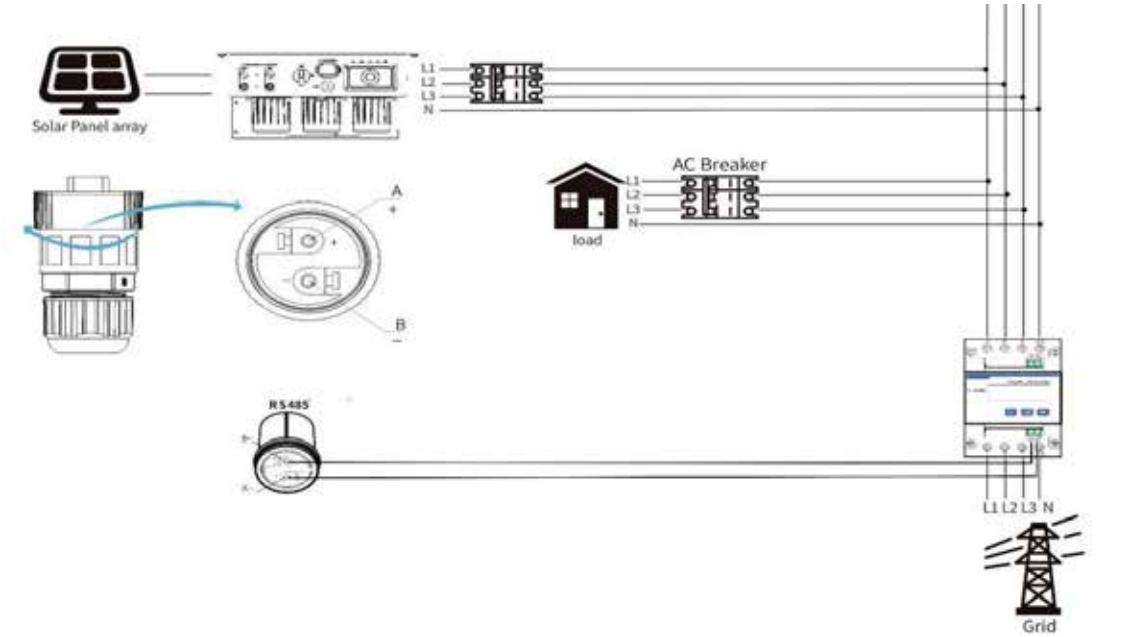


Fig 4-30 Anti-backflow system

- 0.015-1.5(6)A type electric meter，Need to be used with external current transformer.

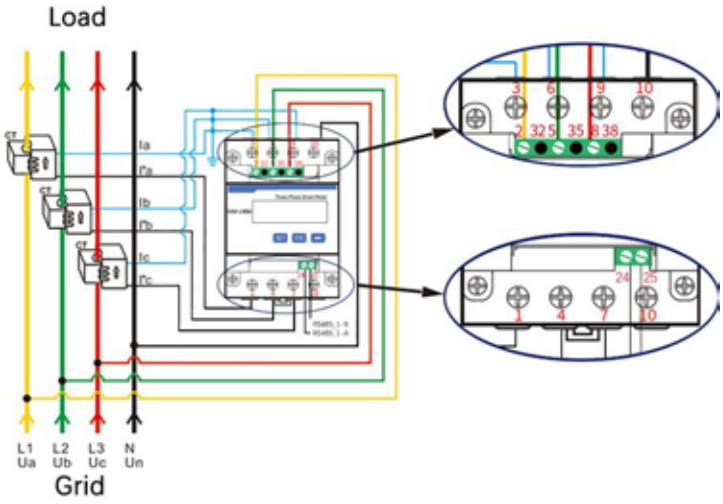


Fig 4-31 Electric meter

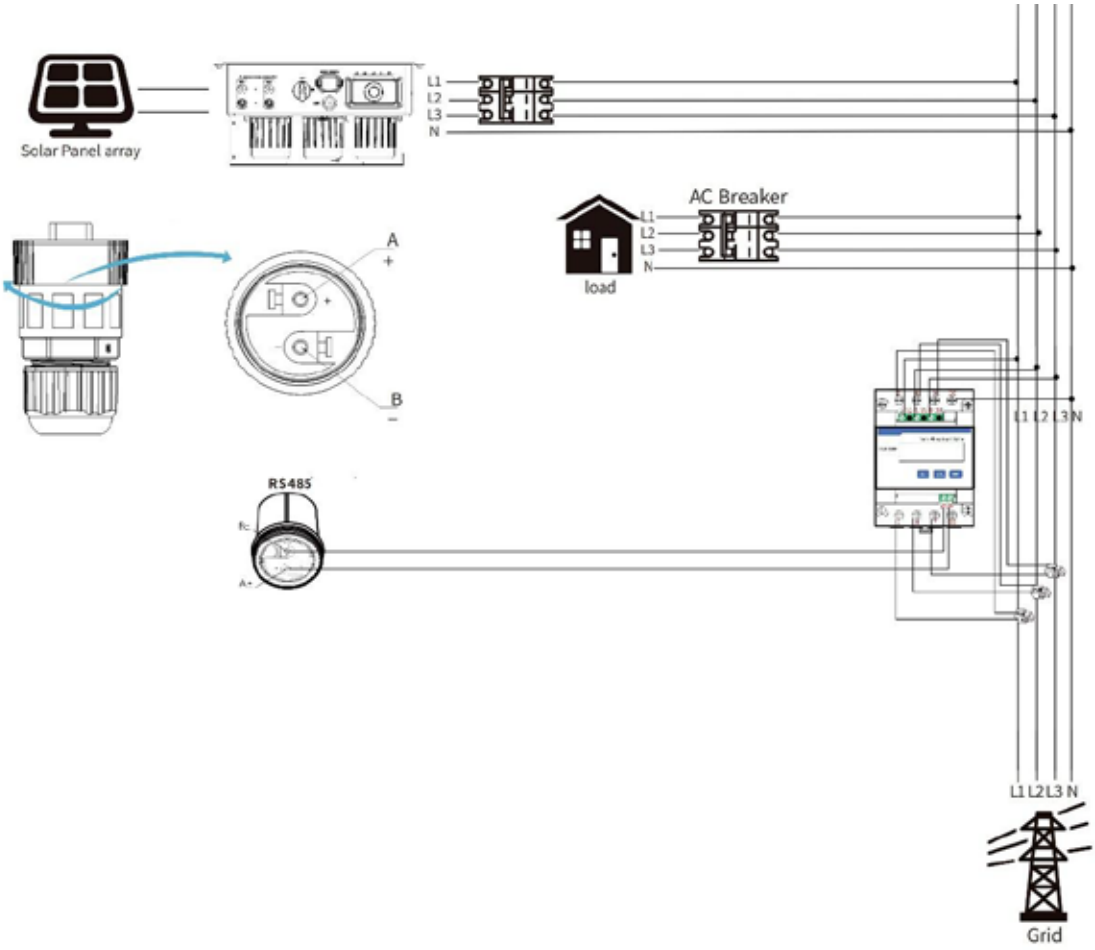


Fig 4-32 Anti-backflow system

4.5.1 Precautions for use

To ensure your safety and the stable operation of the inverter's anti-backflow function, please observe the following recommendations and precautions:

A. It is strongly recommended to install an AC switch between the inverter and the power grid. The switch specifications should be selected based on the load power.
B. Set the reverse power according to your actual needs.
   Reverse power = Reverse percentage × Inverter rated power.
   - If **Reverse power > 0**, the inverter output is allowed to exceed the load power, and the excess energy will be fed back into the grid.
   - If **Reverse power < 0**, the load power is allowed to exceed the inverter output, with the additional power drawn from the grid.
C. The power of the PV array should be greater than or equal to the load power.
D. If you wish to enable the anti-backflow function remotely via the APP, ensure that the WiFi collector is connected to the Internet and the inverter is online.

4.5.2 Use the backflow prevention function

After completing all connections, follow the steps below to use this function:

A. Turn on the DC switch and wait for the inverter LCD to power on.
B. On the **[Set Parameters]** page, double-press and hold to enter the setting page, as shown in Fig 4-33.

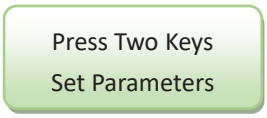


Fig 4-33 Set Parameters page

C. Operate the [∧] and [∨] keys to move the cursor to [EnReflux], as shown in Fig 4-34. Press and hold both keys to enter the anti-backflow status setting. The anti-backflow indicator will begin to flash, and the cursor will disappear, as shown in Fig 4-35. At this point, you can enable or disable the anti-backflow function using the [∧] and [∨] keys. After completing the setting, press and hold both keys again to exit the anti-backflow setting interface. The inverter will automatically save the configured parameters.

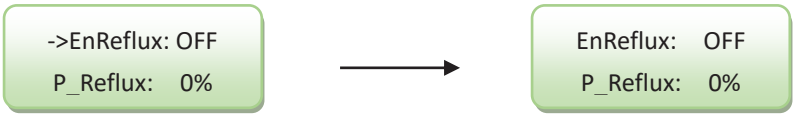


Fig 4-34 Setting the anti-backflow status menu Fig 4-35 Setting the backflow status

D. Press the [∧] and [∨] keys to move the setting cursor to [Exit], as shown in Fig 4-36. Press and hold both keys to exit the settings submenu.



Fig 4-36 Exit the settings page

E. After completing the above settings, turn on the AC switch and wait for the inverter to start. If the PV array power meets the current load demand, the inverter will maintain an output level that offsets the grid power without causing any reverse flow.
F. If you need to adjust the reverse power after completing and testing the above steps, enter the settings submenu again.

Use the [∧] and [∨] keys to move the cursor to [P_Reflux], as shown in Fig 4-37. Press and hold both keys to enter the reverse power setting. The reverse power value will start flashing and the cursor will disappear, as shown in Fig 4-38.
At this point, use the [∧] and [∨] keys to set the desired reverse power percentage. After completing the adjustment, press and hold both keys to exit the reverse power setting. The inverter will automatically save the configured parameters.



Fig 4-37 Menu for setting reverse flow power



Fig 4-38 Setting the reverse flow power

5 Monitoring

5.1 Overview

The inverter supports multiple communication methods. When users need to monitor the operating information of the PV power generation system, we provide the communication system solutions shown in Fig 5-1.

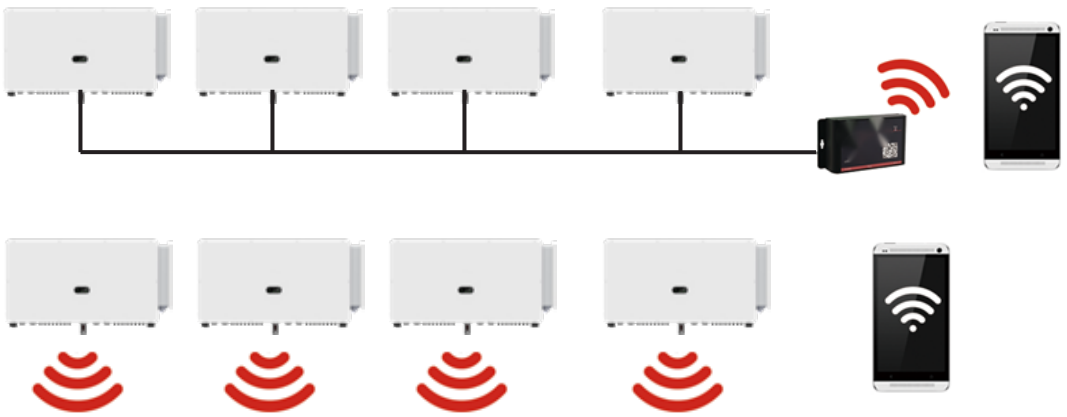


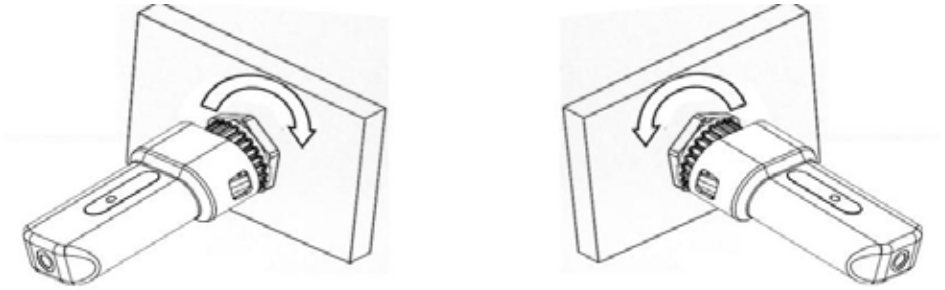
Fig 5-1 WiFi / GPRS communication system mode

After installing the GPRS data collection module or Wi-Fi data collector module, you can monitor the operation of the entire PV system through our mobile App or via our cloud server.

● WIFI/GPRS installation and remove

Insert the module into the slot at the bottom of the PV inverter and fasten it securely.

Installation Remove



Clockwise rotation Counter-clockwise rotation

Fig 5-2 WiFi/GPRS module installation

6 User Interface

6.1 Control Panel

The series grid-connected PV inverter panel features an LCD display and is equipped with four LED indicators and two touch keys to enhance human-machine interaction.



Fig 6-1 Control panel

No.	Item	Description
1	LED indicator	1. Green (Solid): The PV inverter is operating normally. 2. Green (Blinking): The PV inverter is in standby mode.
2	LCD Screen	Display the PV inverter's information.
3	UP & Down keys	1. Short press: Move the cursor up or adjust the value. 2. Long press: Move to the top of the list, quickly increase the value, or move the cursor up. 3.Press and hold both keys simultaneously to enter or exit the current interface.

Table 6-1 Control panel

Indicator	Status	Description
=[	▬	DC Power ON
	———	DC Power OFF
]~	▬	Operating in Grid-Tied Mode
	●●●●●●	Grid-Connected and Activated, Not Operating
	———	Grid Connection – Not Activated
((•))	●●●●●●	Communication Ongoing
	———	No Communication Detected
⚠	▬	Alarm Status
	———	Normal Status
ON: ▬ ▬ Blinking: ●●●●●● OFF: ———		

Table 6-2 LED indicator

The inverter operates in four modes: Start Mode, Run Mode, Settings Mode, and Standby Mode. In each mode, the LCD displays the corresponding information.

6.2 User interface

6.2.1 Start interface

Start interface refers to the condition where the solar irradiance meets the inverter's DC start requirements, but the inverter has not yet begun feeding power to the grid. In this interface, inverter information is displayed sequentially. Once the display sequence is completed and the inverter meets the grid connection conditions, it transitions from Start interface to Run interface; otherwise, it switches to Standby interface.

The display sequence for Start interface is shown in Fig 6-2.

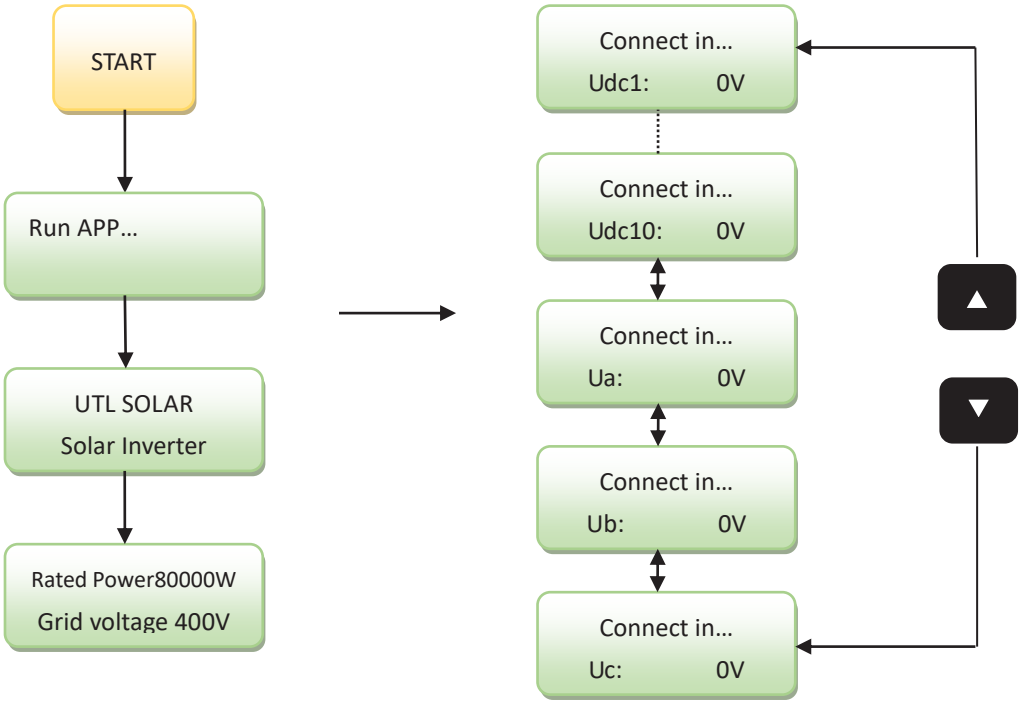


Fig 6-2. Start interface

NOTE

When the PV array voltage exceeds 250 V, the system initiates a 20-second countdown. If the array voltage continuously meets the grid connection requirements throughout this 20-second period, the inverter will transition to Run Mode.

6.2.2 Run interface

In Run interface, the inverter converts the DC power from the PV array into AC power and feeds it into the grid. During this interface, the inverter continuously operates in Maximum Power Point Tracking (MPPT) to maximize energy output.

The LCD screen refreshes its display every 2 seconds, so the information shown is only valid for the current 2-second interval. The screen has a default display, and 5 seconds after

entering normal operation, the LCD will revert to the default interface, as shown in Fig 6-3.

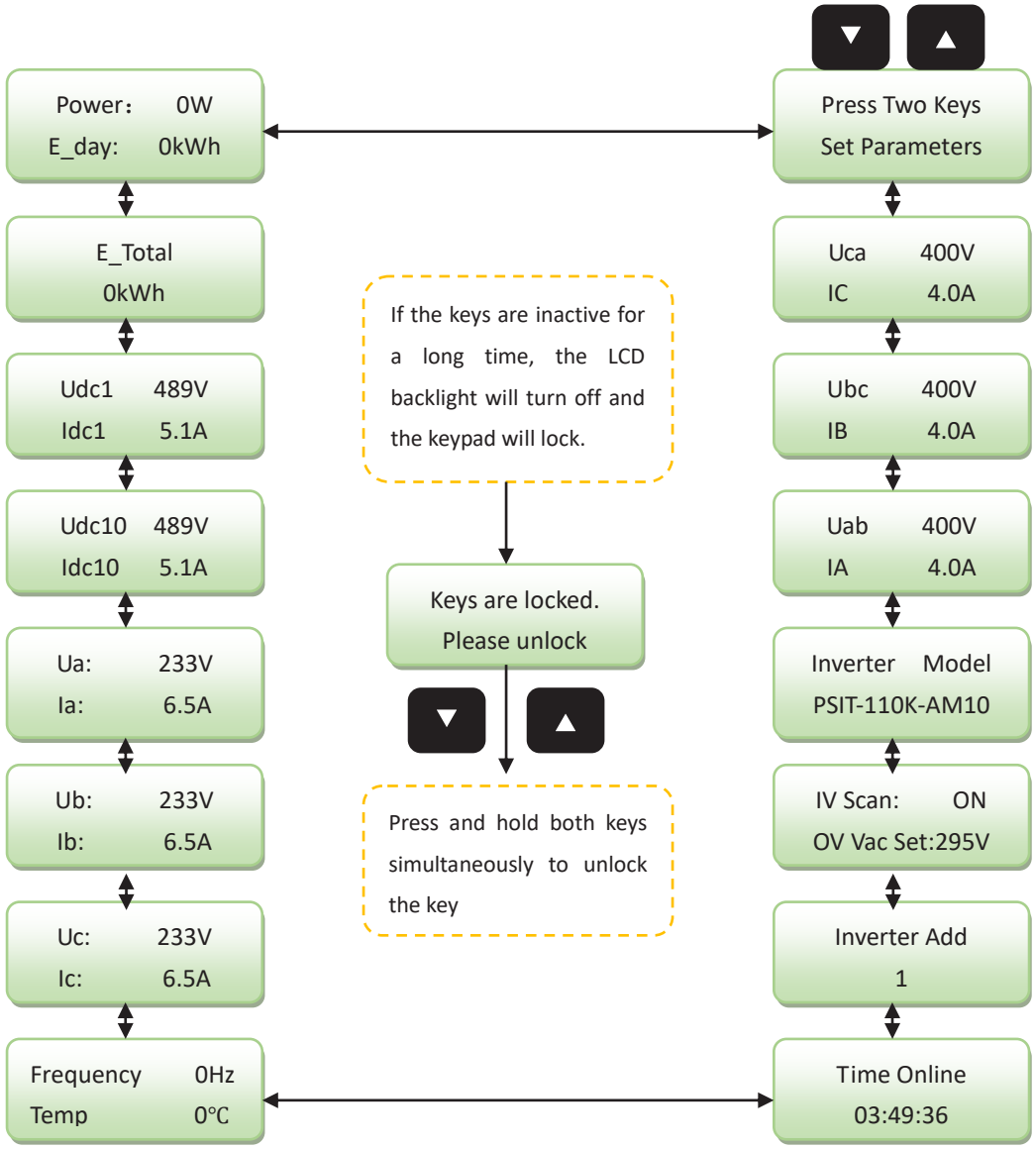


Fig 6-3 Run interface

NOTE

Press the Up and Down keys to switch between the various LCD display screens. If 'KEY IS LOCKING' is displayed, press and hold both the Up and Down keys simultaneously to unlock.

NOTE

If the DC power is turned off and then turned on, the inverter starts a new day, and the daily total energy generation will be reset.

6.2.3 Standby interface

When the DC power is on but the conditions for grid connection are not met, the inverter enters standby interface.

In standby interface, the inverter continuously checks whether the conditions for grid-connected power generation are met. Once the conditions are satisfied, a 20-second countdown begins, and the inverter switches from standby mode to operating mode.

In standby interface, the second line of the inverter's default display screen cycles through standby information. The possible standby messages are shown in Fig 6-4, which may include one or more of these messages.

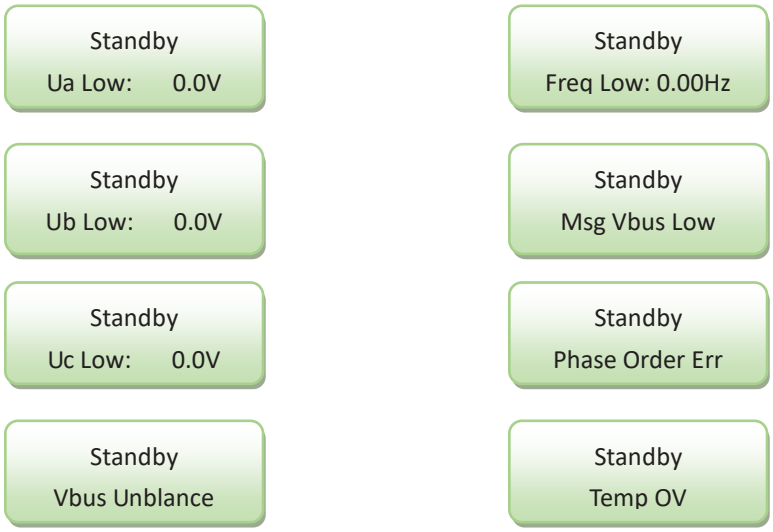


Fig 6-4 Standby interface

6.2.4 Setting interface

The operation steps are shown in the figure. In the setting mode or within a setting item, the LCD will automatically return to the default screen if no action is taken within 10 seconds. After modifying a parameter, you can save and exit immediately. If no changes are made, the system requires a 2.5-second delay before saving and exiting.

NOTE

Use the **Up** and **Down** buttons to switch between the LCD display screens..

NOTE

Down Button: Short press to increase by 1; long press to increase by 5.

Up Button: Short press to decrease by 1; long press to decrease by 5.

Up + Down Buttons: Press simultaneously to enter or exit the setting mode.

NOTE

- **The Inverter Address range is from 1 to 240.**
- **The setting range of OV Vac Set is 250 V to 350 V.**
- **IV Scan can be set to ON or OFF.**
- **The grid frequency range does not require adjustment and is set by default to 45–55 Hz.**

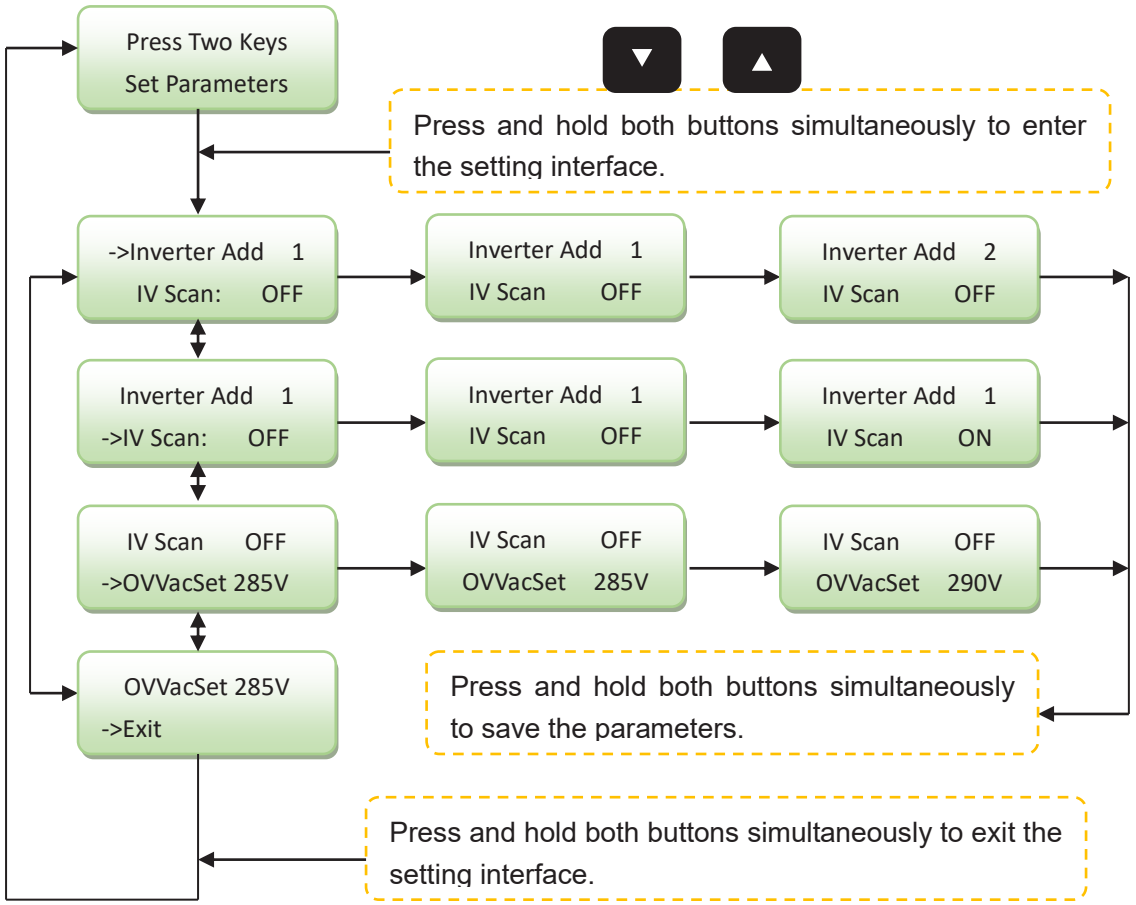


Fig 6-5 Setting interface

6.3 Grid-Connected Power Generation Process

The grid-connected power generation process of the TLC series photovoltaic grid-connected inverters is fully automatic. The grid connection procedure is briefly described below, taking the ASP-110KTLC model as an example:

A. Switch on the DC and AC circuit breakers. The inverter enters start-up mode.

B. When the DC input voltage exceeds 200 V, the AC grid voltage is within the range of 310 Vac to 480 Vac, and the grid frequency is within the permissible limits, a countdown is initiated.

C. After a 20-second countdown, the DC side is energised.

D. Once the DC bus voltage has stabilised, the inverter side starts operating and the inverter connects to the grid to generate power.

6.4 Disconnect from the grid

When any of the following grid abnormalities occur, the inverter shall immediately disconnect from the grid:

A. The grid voltage is outside the normal range of 310 V to 480 V;
B. The grid frequency is outside the normal range of 45–55 Hz / 55–65 Hz;
C. The PV array voltage is outside the inverter’s normal operating range;
D. The ambient temperature is outside the inverter’s normal operating range.

7 Trial run

7.1 Inspection before trial run

Before powering on the PV inverter for the first time, perform the following inspections:
Environmental Inspection:

1. Ensure that the installation location of the PV inverter allows convenient operation and maintenance.
2. Confirm that the PV inverter is securely mounted.
3. Verify that the ventilation conditions are adequate.
4. Ensure no foreign objects or loose parts remain on top of the PV inverter.
5. Check that all accessories around the PV inverter are correctly connected.
6. Ensure all cables are properly routed, well protected, and free from potential mechanical damage.
7. Verify that the AC circuit breaker is correctly selected.
8. Ensure all unused terminals are sealed.
9. Confirm that all safety signs and warning labels on the PV inverter are firmly attached and clearly visible.

7.2 Trial run

If all the above inspections are completed, the PV inverter can proceed with the following initial startup steps:

1. Ensure that all inspection items meet the requirements.
2. Switch the AC-side circuit breaker to the ON position.
3. Turn the DC switch to the ON position.
   If sufficient sunlight is available and grid conditions are met:
   - The PV array initializes and begins supplying power.
   - The grid-connected PV inverter starts charging the DC bus.
   - The PV inverter begins generating AC power and feeding it into the power grid.
4. Observe the status displayed on the control panel.

8 Shut down

8.1 Shut down

During normal operation, it is not necessary to manually shut down the PV inverter. However, the PV inverter must be powered off during maintenance or repair.
To safely disconnect the PV inverter from the AC and DC power supplies, follow the steps below. Failure to do so may result in personal injury, death, or equipment damage.

1. Disconnect the external AC circuit breaker and prevent it from being accidentally reconnected.
2. Turn the DC switch to the OFF position and unplug all DC string inputs.
3. Wait approximately 10 minutes to allow the internal capacitors to discharge.
4. Measure the AC-to-ground voltage at the AC terminals to confirm that the PV inverter's AC output at the circuit breaker is zero.
5. Disconnect the AC connection cables.
6. Disconnect the DC connection cables.

NOTE

Please strictly follow the above steps, otherwise the PV inverter will not work normally.

8.2 Dismantle the PV inverter

The user can dismantle the PV inverter by following the above electrical and mechanical installation procedures in reverse order.

8.3 Discarding the PV inverter

For PV inverters that will no longer be put into operation, users must dispose of them properly. Components such as the control panel, batteries, and modules may be harmful to the environment. Users should dispose of these components in accordance with applicable local laws and regulations.

9 Maintenance

DANGEROUS

Do not open the device. Unauthorized repair may result in electric shock or fire.

9.1 Maintenance

The internal components of the PV inverter may age and wear due to ambient temperature, humidity, dust, and vibration, which can affect its service life. Therefore, regular maintenance should be performed to ensure proper operation and longevity of the PV inverter.

- Frequently clean dust and debris from the radiator.
- If dust accumulates on the photovoltaic array, clean it with water. Perform cleaning during cool weather.
- Regularly inspect the system to ensure all wiring and supply conditions are correct and error-free.
- Always monitor the information on the LCD display to stay informed about changes in the PV inverter's operating status.

WARNING

Never use a pressure washer or any cleaning method that may allow water to enter the PV inverter.

9.2 Troubleshooting

WARNING

Repairs must be performed only by qualified engineers.

Most errors and malfunctions will be displayed on the screen. The following table provides solutions for several possible issues.

No.	Fault Info	Description
1	Udc1 Low	PV1voltage is too low.
2	Udc2 Low	PV2 voltage is too low.
3	Udc3 Low	PV3 voltage is too low.
4	Udc4 Low	PV4voltage is too low.
5	Udc1 OV	PV1 voltage is too high.
6	Udc2 OV	PV2 voltage is too high.
7	Udc3 OV	PV3 voltage is too high.
8	Udc4 OV	PV4 voltage is too high.
9	Idc1 over	PV1 current is too high.
10	Idc2 over	PV2 current is too high
11	Idc3 over	PV3 current is too high
12	Idc4 over	PV4 current is too high.
13	Temp OV	High temperature
14	Ua OV	Phase A voltage is too high.
15	Ub OV	Phase B voltage is too high.
16	Uc OV	Phase C voltage is too high.
17	Ua Low	Phase A voltage is too low.
18	Ub Low	Phase B voltage is too low.
19	Uc Low	Phase C voltage is too low.
20	Ia over	Phase A current is too high.
21	Ib over	Phase B current is too high.
22	Ic over	Phase C current is too high.
23	Freq OV	High frequency
24	Freq Low	Low frequency
25	Vbus OV	High bus voltage
26	Vbus Low	Low bus voltage
27	Msg 7 ILEAK OV	High leakage current
28	Msg 8 GFCI Err	Fast leakage current change
29	Relay Check Fail	Relay anomaly
30	Error1_08	Grounding fault
31	Error0_2	PV Power is too low.
32	Interrupt	Interrupt protection
33	Error0_10	Internal communication failure
34	Vbus Unblance	Midpoint imbalance
35	Phase Order Err	Wrong AC phase sequence
36	String Polarity Err	Wrong DC polarity
37	PLL Flt	AC phase locking failed.

Table.9-1. Troubleshooting

If the fault cannot be resolved or your issue is not listed above, please contact us.

9.3 Quality Assurance

- **Warranty**

The warranty period of this product is defined by the contract.

- **Conditions**

1. We will provide free repair services or replace the product with a new one for faults occurring within the warranty period.
2. The replaced defective product must be returned to us.
3. Customers should allow a reasonable time for us to address the machine fault.

- **We are not liable for the following cases**

1. Damage during transportation.
2. Improper installation.
3. Unauthorized modifications.
4. Incorrect use.
5. Exposure to environments harsher than those specified in this manual.
6. Installation or use that does not comply with relevant international standards.
7. Damage caused by adverse natural conditions.

10 Specification

10.1 Specification

Technical Data	70K	75K	80K	90K	100K	110K	120K	125K
DC Input Data								
Max. DC input power (KW)	105	112.5	120	135	150	165	180	187.5
Max. DC input voltage(VDC)	1100							
Max. DC input current(A)	40/40/20/40/40/20		40/40/20/20/40/40/20/20				45/20/45/20/45/20/45/20	
MPPT voltage range(VDC)	200~1000							
Recommended working voltage(VDC)	600							
MPPT number	6		8					
Max. input strings per MPP tracker	2/2/1/2/2/1		2/2/1/1/2/2/1/1				3/1/3/1/3/1/3/1	
AC Output Data								
Rated output power (KW)	70	75	80	90	100	110	120	125
Max. AC power (KVA)	77	82.5	88	99	110	121	132	137.5
Max. output current(A)	112	121	128	144	160	176	191	196
Rated power grid voltage(Vac)	400							
Power grid voltage range(Vac)	310~480							
Rated power grid frequency	50Hz/60Hz							
Grid frequency range	45～55Hz/55～65Hz							
THD	<2%(Under the rated power)							
Power factor	>0.99(Under rated power)/Adjustable range 0.8(Leading)～0.8（Lagging）							
DC component	<0.5%(Under rated power)							
System Data								
Max. Efficiency(%)	98.6	98.6	98.6	98.6	98.7	98.7	98.7	98.7
Euro. efficiency(%)	98.1	98.1	98.1	98.1	98.1	98.2	98.2	98.2
Humidity	0～100%，No condensation							

Cooling	Fan
Allowed ambient temperature range	-25℃～+60℃
Consumption during night	<1W
Max. altitude	4000m(It needs to be derated when the altitude exceeds 2000m)
Mechanical Data	
Size (width x height x depth)	1160mm×611mm×286mm
Weight	92kg
Protection class	IP66（outdoor）
Display & Communication	
Communication interface	RS485/WIFI(optional)/GPRS(optional)
Display	LCD
Conforming standards	
Standards for grid connection	NB/T32004-2018; IEC61727
Safety standard	NB/T32004-2018; NIEC62109-1/2
EMC	IEC61000-6-2/4

Table 10-1 Technical Data of 70–125K Inverter

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