User Manual for CPS SCH250/275KTL-DO/EU

Grid-tied PV Inverter

Shanghai Chint Power System Co., Ltd.

Version 1.2 May 2023

Table of Contents

0   Preface

Thank you for choosing a Chint Grid-tied PV Inverter (hereinafter referred to as "PV Inverter" or "Inverter") developed by Shanghai Chint Power System Co., Ltd. (hereinafter referred to as "CHINT").

This PV Inverter is a high performance and highly reliable product specially designed for the EU market except North America solar market.

IMPORTANT!

Please read this manual carefully and make sure that you have understood all the contents thoroughly before you start any operation.

Main Contents

This Installation and Operation manual contains important information, safety guidelines, detailed planning and setup information for installation, as well as information about configuration, operation and troubleshooting. Be sure to read this manual carefully before using.

Target Readers

- Plant owner
- Project Engineer
- Installation engineer
- Maintenance engineer

Installation, commissioning, troubleshooting, and maintenance of the inverter must be done only by qualified personnel. If you encounter any problems during the above-mentioned operation, please check the user manual carefully. You can also contact your local dealer or supplier for help if the problem still exists.

Manual Management

Please keep this user manual on hand for quick reference.

Copyrights

CHINT reserves all rights in this manual. Any reproduction, disclosure or copy in whole or in part is forbidden without prior written authorization. This manual is subject to change without prior notice. CHINT doesn't accept any responsibilities whatsoever for potential errors or possible lack of information in this document.

Version

This manual is subject to change or modification without prior notice. Users can get the latest manual from our sales channel or our official website: www.chintpower.com.

1   IMPORTANT SAFETY INSTRUCTIONS

（SAVE THESE INSTRUCTIONS）
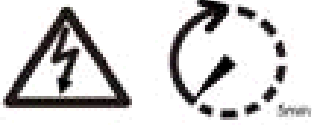
PLEASE READ THIS USER MANUAL CAREFULLY BEFORE THE INSTALLATION AND OPERATION OF THIS PV INVERTER. CPS RESERVES THE RIGHT TO REFUSE WARRANTY CLAIMS FOR EQUIPMENT DAMAGE IF USERS FAIL TO INSTALL THE EQUIPMENT ACCORDING TO THE INSTRUCTIONS IN THIS MANUAL.

FAILURE TO FOLLOW THESE INSTRUCTIONS AND OTHER RELEVANT SAFETY PROCEDURES MAY RESULT IN VOIDING OF THE WARRANTY AND/OR DAMAGE TO THE INVERTER OR OTHER PROPERTY!

1.1 Warnings and Symbols in this Document

Symbols	Meanings
	DANGER! DANGER indicates a hazardous situation with high level of risk which, if not avoided, will result in death or serious injury.
	WARNING! WARNING indicates a hazardous situation with medium level of risk which, if not avoided, could result in death or serious injury.
	CAUTION! CAUTION indicates a hazardous situation with low level of risk which, if not avoided, could result in minor or moderate injury.
	NOTICE! NOTICE indicates a hazardous situation which, if not avoided, could result in equipment working abnormally or property loss.
	IMPORTANT! INSTRUCTION indicates important supplementary information or provides skills or tips that can be used to help you solve a problem or save you time.

1.2 Markings on the Product

Symbols	Meanings
	HIGH VOLTAGE! This equipment works with high voltages. All works on the equipment must only be performed as described in this document.
	HIGH ENERGY! Risk of electric shock from energy stored in capacitor. Do not remove cover until 5 minutes after disconnecting all sources of supply.
	HOT SURFACE! Hot surfaces. To reduce the risk of burns. Do not touch..
	For more details please see the user manual.
	WARNING: For continued protection against risk of fire, replace only with same type and ratings of fuse. Refer to instruction manual for details.
	EARTH GROUND! This symbol marks the location of a grounding terminal, which must be securely connected to the earth through the PE (protective earthing) cable to ensure operational safety.
	RoHS SYMBOL In accordance with 2011/65/EU regulations, the inverter imposes restrictions on the use of specific hazardous substances in electrical and electronic equipment.
	Certification This inverter has passed CE Certification.
	Phase information of the inverter.

1.3 Safety Precautions of Operating the PV Inverter

WARNING!

All operations and connections shall be performed by professional engineering and technical personnel!

To prevent the risk of electric shock during equipment maintenance or installation, please ensure that all DC and AC power has been separated from the equipment, and ensure that the equipment is reliably grounded.

DANGER!

Before opening the inverter housing for maintenance, you must first disconnect the grid-side AC power supply and PV-side DC power supply, and ensure that the high-voltage energy inside the equipment has been completely released!

Generally, you must cut off all connections to the inverter for at least 5 minutes before you can maintain and operate the equipment.

NOTICE!

The inverter is specially designed to integrate the generated AC power into the public grid. Do not directly connect the AC output terminal of the device to private AC power equipment. The inverter does not support battery panel grounding. If grounding is necessary, a transformer must be added to the AC side.

NOTICE!

Please do not install the inverter in a place exposed to direct sunlight, so as not to reduce the conversion efficiency due to high temperature and to ensure the long-term service life of the inverter.

CAUTION!

Please check the wall bracket again before hanging up to make sure that the wall bracket is firmly installed on the supporting surface.

For continued protection against risk of fire, replace only with same type and ratings of fuse. Disconnect supply before changing fuse.

IMPORTANT!

Before choosing a power grid code, please contact your local power supply company. If the inverter is set to work under the wrong grid regulations, the power supply company may cancel the operation permit of the equipment.

Please ensure that the entire system complies with national standards and applicable safety regulations before running the inverter.

2 General Introduction

2.1 Photovoltaic Grid-tied System

CPS SCH250/275KTL-DO/EU series inverters are designed for using with commercial rooftop, and large-scale PV grid-tied systems. The system is generally made up of PV modules, DC power distribution equipment, PV inverter and AC power distribution equipment, as shown in Figure 2-1. The solar energy is converted by PV modules to DC power, and then converted by the inverter to AC power with the same frequency and phase as the AC grid. Now the AC power can be supplied in all or in part to local loads, with the remaining power fed to the grid.
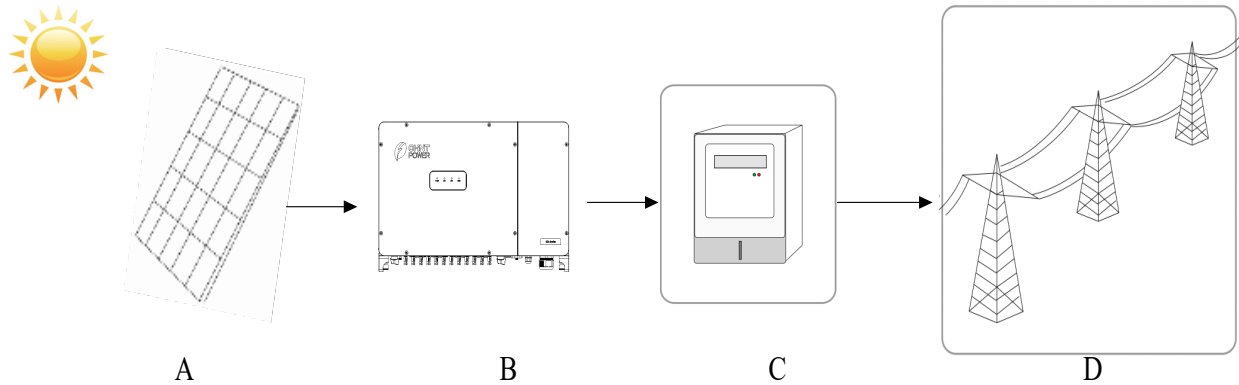
Figure 2-1 Grid-tied PV system

Item	Name	Description
A	PV Module	Monocrystalline, polycrystalline silicon components, non-ground batteries
B	PV Inverter	CPS SCH250/275KTL-DO/EU
C	Metering device	Standard metering device for inverter power generation
D	Public Grid	IT System

Table 2-1 Components of Grid-tied PV system

2.2 Product Dimensions and Appearance
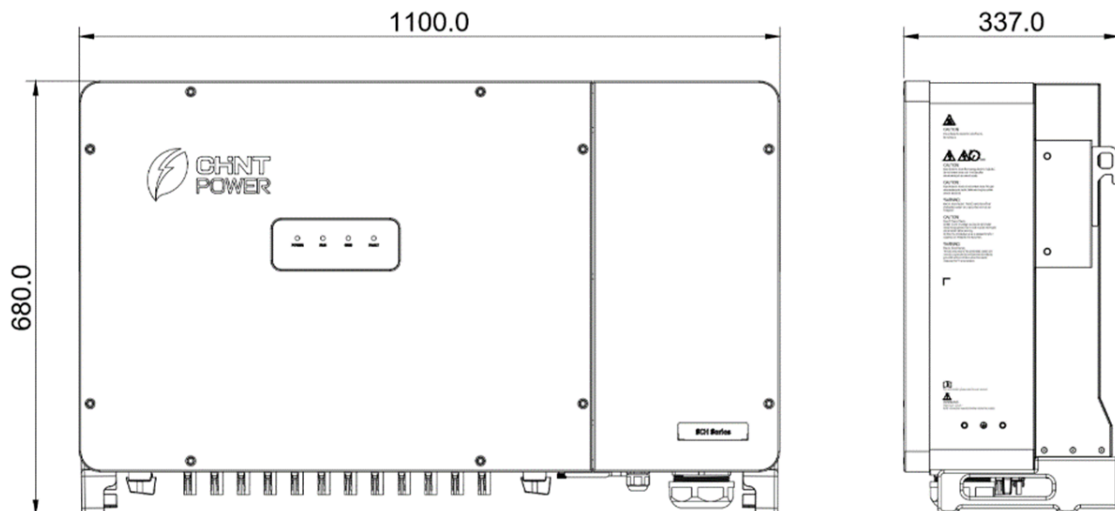
Figure 2-2 Inverter Dimensions
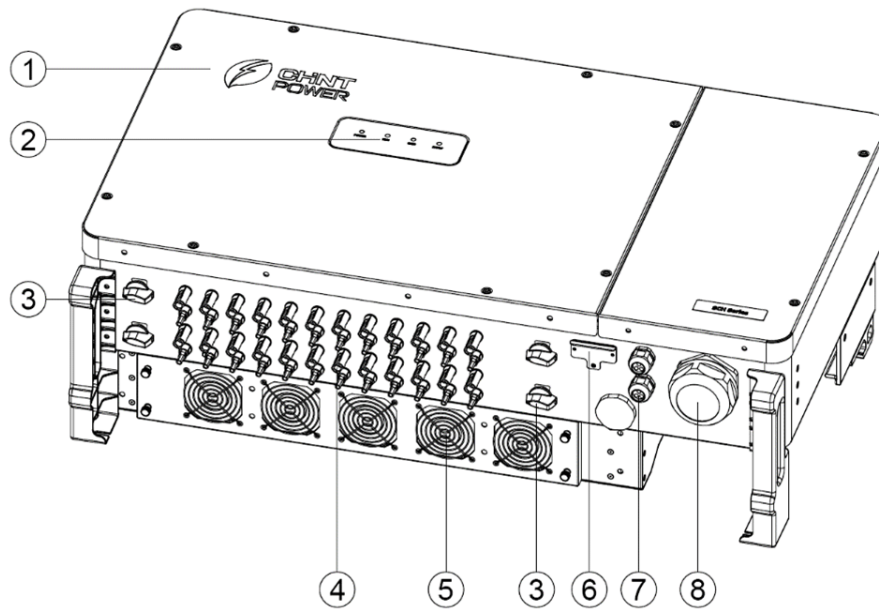
Figure 2-3 Product Appearances of 12MPPT inverters
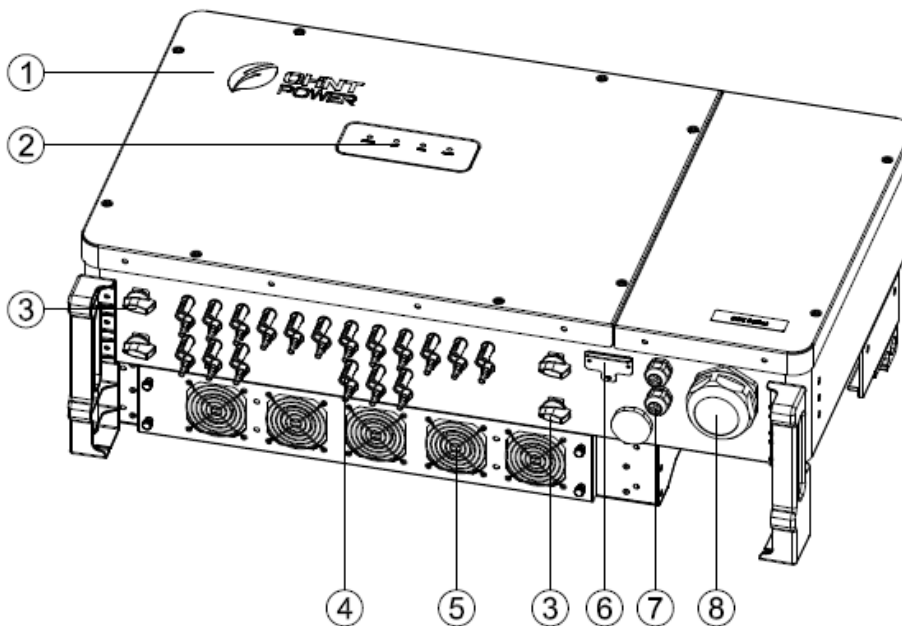
Figure 2-4 Product Appearances of 6 MPPT inverters

No.	Name	Function
1	Inverter	The main device
2	LED Indicator	Indicates operation status of the inverter
3	DC Switch	Safely cut off DC side power supply
4	DC Terminal	Quick plug terminal connector
5	Fan	Forced cooling of the inverter
6	Communication interface	LINKIT communication interface
7	Communication interface	RS485 communication line outlet port
8	AC Outlet	AC Cable outlet port

Table 2-2 Product Components

2.3 Product Protection Functions

- Short circuit protection

- Input to ground insulation resistance monitoring

- Output voltage and frequency monitoring

- Ground leakage current monitoring

- DC component monitoring of output current

- Anti-island protection

- Input and output overvoltage protection

- Input overcurrent protection

- Ambient temperature monitoring

- Module temperature monitoring

3 Mechanical Installation

3.1 Unpacking for Inspection

All the delivery items are shipped in one package, which includes the inverter, mounting bracket, accessory bag and LINKIT module.

Before performing installation, check the product for any obvious damages or if the items on the delivery list are complete. Contact your supplier if any problem is found. The delivery list is as below:

PV Inverter (12 MPPTs)   PV Inverter (6 MPPTs)

Mounting bracket   LINKIT   Accessory Bag (inc. accessories in table below)
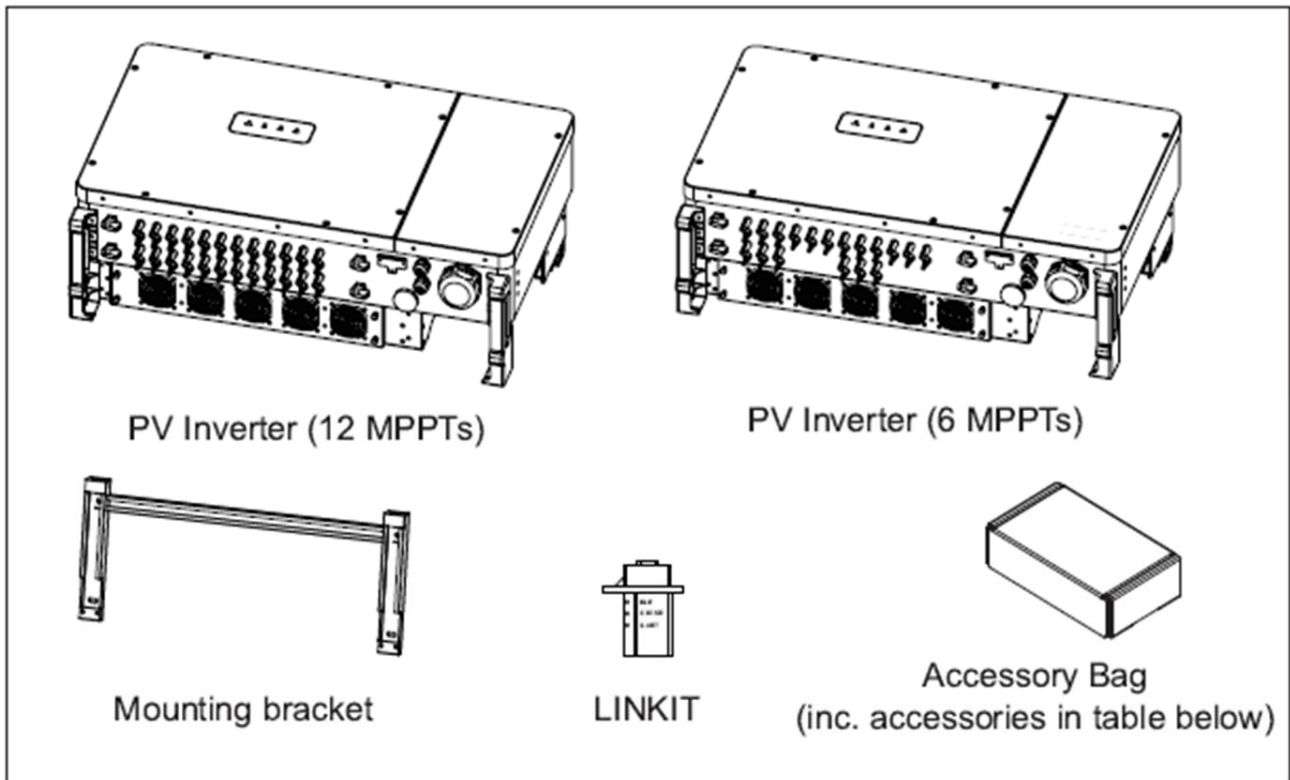
Figure 3-1 Delivery list

No.	Image	Accessories	Amt	Usage
1		Quick guide, Warranty card	2	For quick guidance and warranty service
2		M10 Nut	4	For mounting bracket
3		M10 Spring washer	4	
4		M10 Flat washer	4	
5		Screw M10X50	4	
6		Screw M6X16	4	2 for mounting bracket 2 for grounding terminal
7		Handle	2	Carry the inverter
8		Screw M6X18 with plastic flat washer	1	Spare for front cover
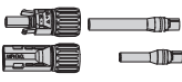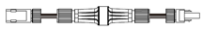
No.	Image	Accessories	Amt	Usage
9		Unlock tool for DC connector	1	Unlock connector
10		M12 Nut	3	For AC output terminal
11		M12 Spring washer	3	
12		M12 Flat washer	3	
13		M12 Big flat washer	3	
14		6 PIN terminal	1	RS485 communication
15		2 PIN terminal	1	CAN communication
16		DC Input Male (+) Connector	24(18)	PV DC quick connector 12 MPPTs: 24(+) &24(-) 6 MPPTs: 18(+) &18(-)
		DC Input Female (-) Connector	24(18)	
17		Lifting eyebolts	2	Lift inverter
18		External fuse component	18	Only for 6-MPPT inverter

Table 3-1 Accessories included in accessory bag

IMPORTANT!

The items on the delivery list above are for the standard configuration. The accessories provided may vary if optional parts are purchased.

3.2 Installation Precautions

- Check that the product environmental specifications (protection degree, operating temperature range, humidity and altitude, etc.) meet the requirements of the specific project location.
- The characteristics of salt mist are easily affected by factors such as seawater, sea breeze, precipitation, relative humidity, terrain, and forest range near the coast. Therefore, inverters should not be installed outdoors in salt affected areas (within 500m from the coast).
- Make sure that the power grid voltage is within the normal range of the Grid Code chosen.
- Ensure that you have been authorized by the local electricity supply authority to connect to the grid.
- Installation personnel must be qualified electricians or those who have received professional training.
- Wear and use proper PPE (personal protective equipment) during installation.

- Sufficient space must be provided to allow the inverter cooling system to operate normally.
- The inverter may generate noise during operation, please do not install it in a place that affects daily life.
- Install the inverter away from flammable and explosive substances.
- Make sure the installation condition doesn't exceed the temperature limits specified for the inverter, to prevent undesirable power loss.
- Do not install the inverter near an electromagnetic source which can compromise the normal operation of electronic equipment.
- The PV Array is not grounded.
- The conduits entries meet the following:
  - ALL Conduit Entries must use water-tight fittings.
  - ALL Conduit Entries should use sealant around wires inside wire-box to prevent moisture ingress.
  - ALL Conduit Fittings should be metal to contain any thermal event in the wire-box – cause by moisture ingress.

For detailed specification ranges and limits, see **Chapter 9**.

3.3 Installation Requirements

3.3.1 Installation Environment

The installation of the inverter shall meet the following environment requirements.
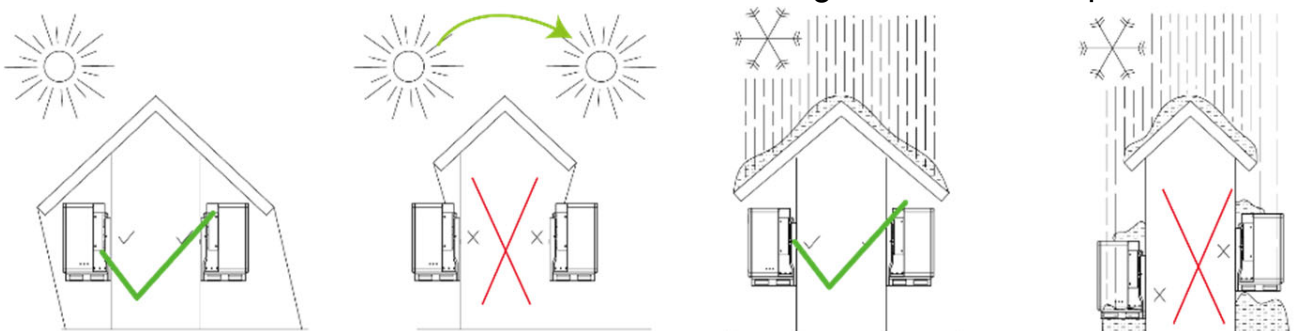
Figure 3-2 Environment requirements

NOTICE!
If the installation environment allows, avoiding direct sunlight from the inverter, avoiding direct rain and snow, can extend the life of the inverter. Direct sun install does not impact warranty.

3.3.2 Installation Modes

The inverter shall be installed following the modes as below:
a)   If the location permits, install the inverter vertically.
b)   If the inverter cannot be mounted vertically, it may be tilted backward by lower than 15 degrees from vertical direction.
c)   Do not mount the inverter leaning forward.
d)   Do not mount the inverter upside down.
e)   Do not mount the inverter horizontally.
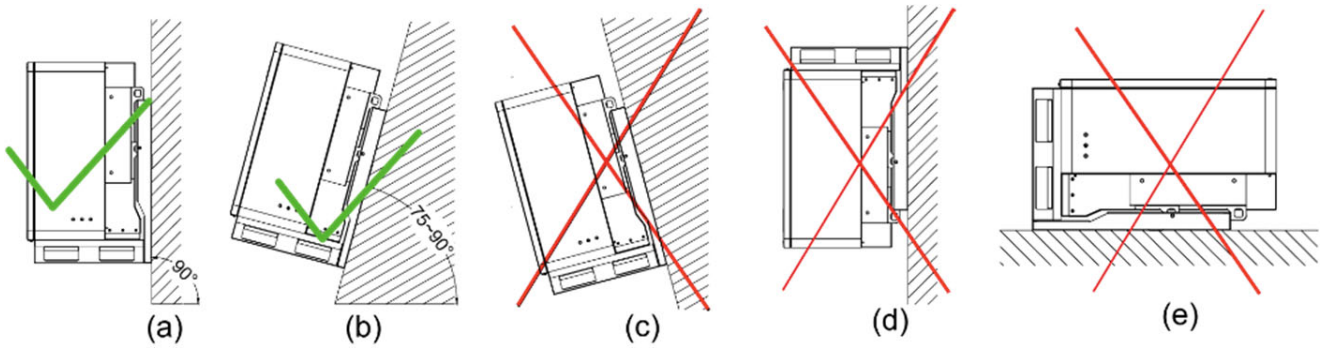
Figure 3-3a Installation modes
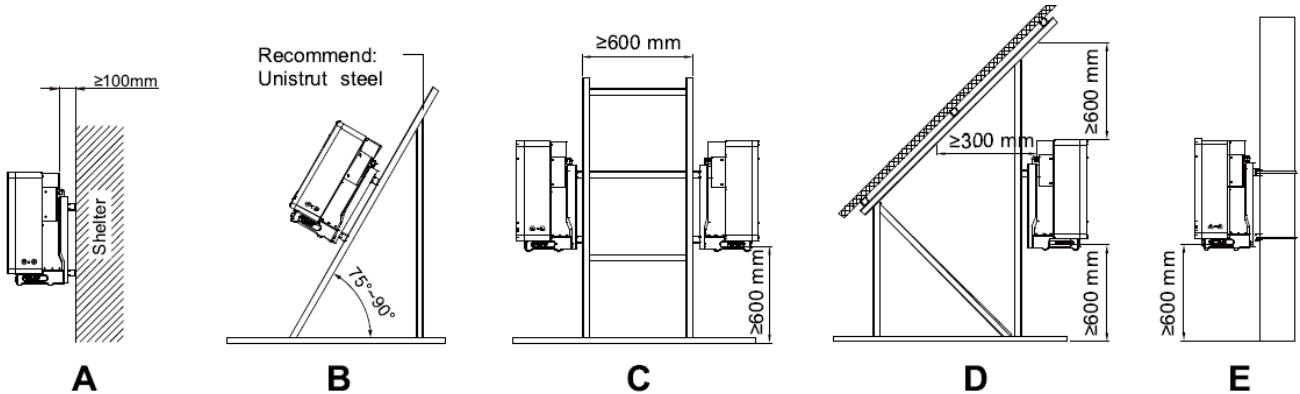
Figure 3-3b Installation requirements for inverter racks

A: Keep a proper distance between the inverter and the shelter to ensure good ventilation.

B: The inverter can be installed at an angle of 75° ~90° while its back shall not be shielded to ensure good ventilation.

C: Two inverters can be installed back to back, and proper distance shall be kept to ensure good ventilation.

D: The inverter can be installed under the panel, while its back and top shall not be blocked to ensure good ventilation.

E: The inverter can be installed on a single column holding rod and shall be checked to confirm a secure installation.

> **NOTICE!**
> Make sure that the mounting structure (bearing wall, rack, etc.) is capable to bear the weight of the inverter.

3.3.3 Space Requirements

The distance between the inverter and surrounding objects should meet the following conditions:
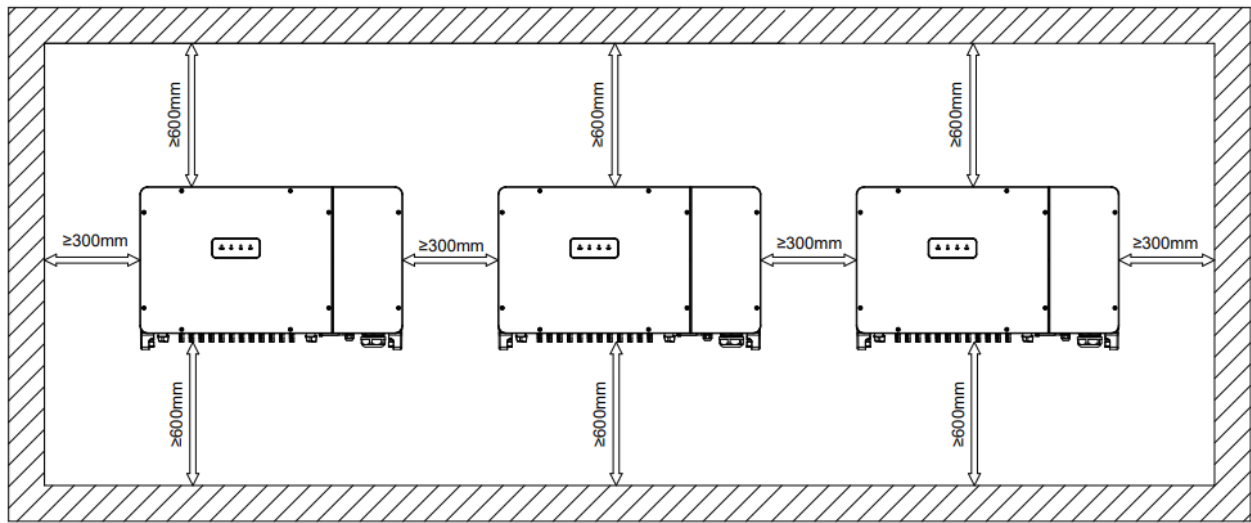
Figure 3-4 Installation space requirements

> **Note:**
> The distance between two parallel inverters must be ≥300 mm, and good ventilation should be ensured. If the surroundings are relatively closed, please increase this distance appropriately.

3.4 Installation Procedures

1. Mark the positions of mounting holes on the installation structure (shelter, steel rack, etc.) according to the size of the mounting brackets.
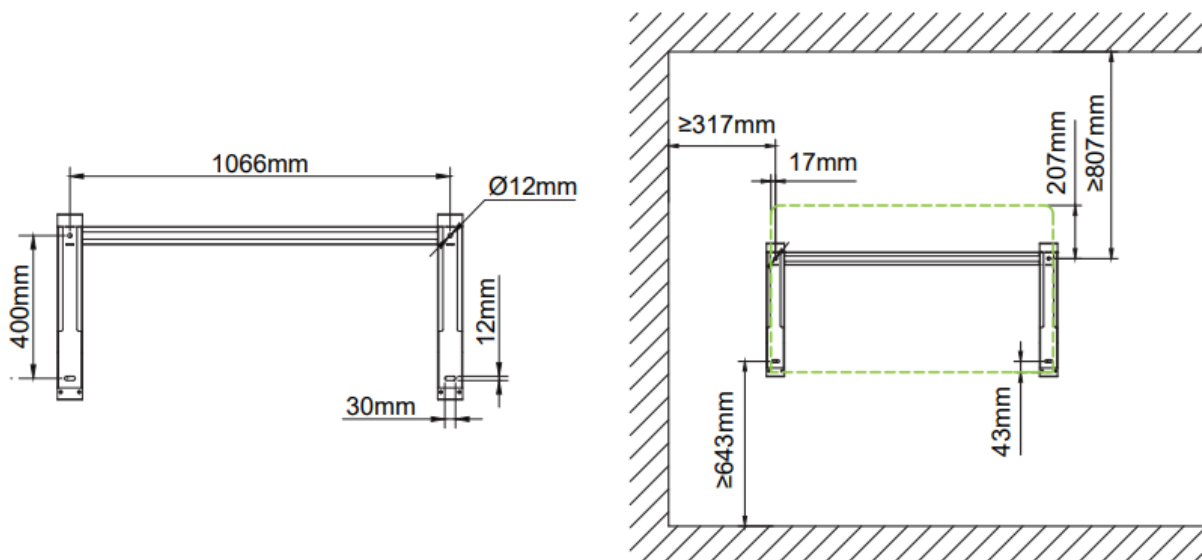
Figure 3-5 Hole position dimensions of mounting bracket

2. Drill holes with a Φ12mm drill at the marked position, and then install the bracket ⑤ with the equipped screws M10X50 ④, M10 spring washer ②, M10 flat washer ③, and M10 nut ①(They are included in the package).

Tools: Electric drill (with Φ12mm drill bit), No. 17 hexagon socket wrench, torque: 230 kgf.cm.
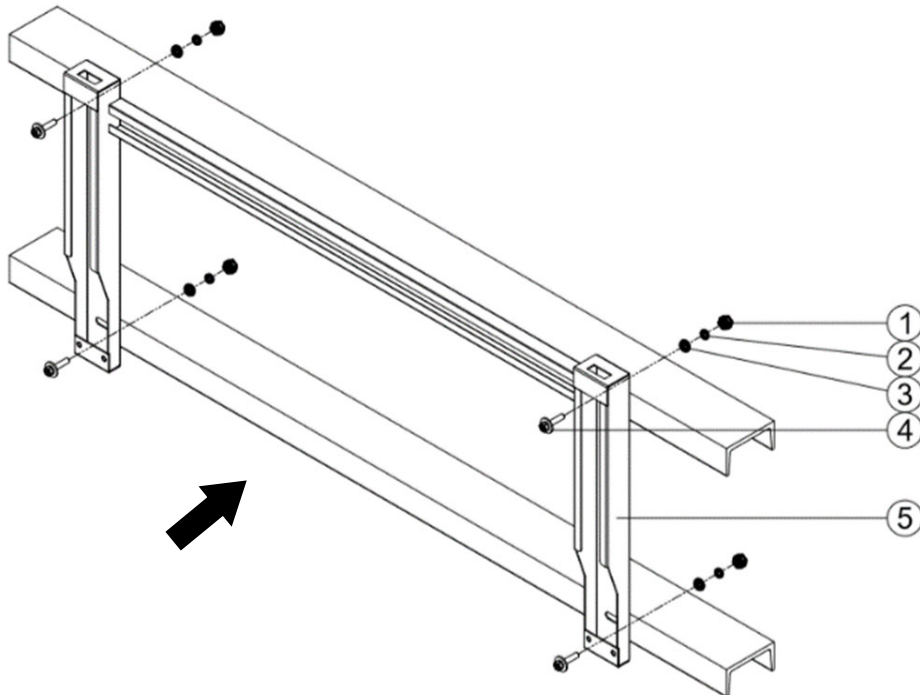
Figure 3-6 Install the mounting bracket

3.   Hang the inverter host on the wall bracket according to Figure 3-7 & Figure 3-8.

   (1) Manual hanging: Three people are needed to properly lift the inverter by the handle positions marked in Figure 3-7, and mount the inverter onto the mounting bracket.
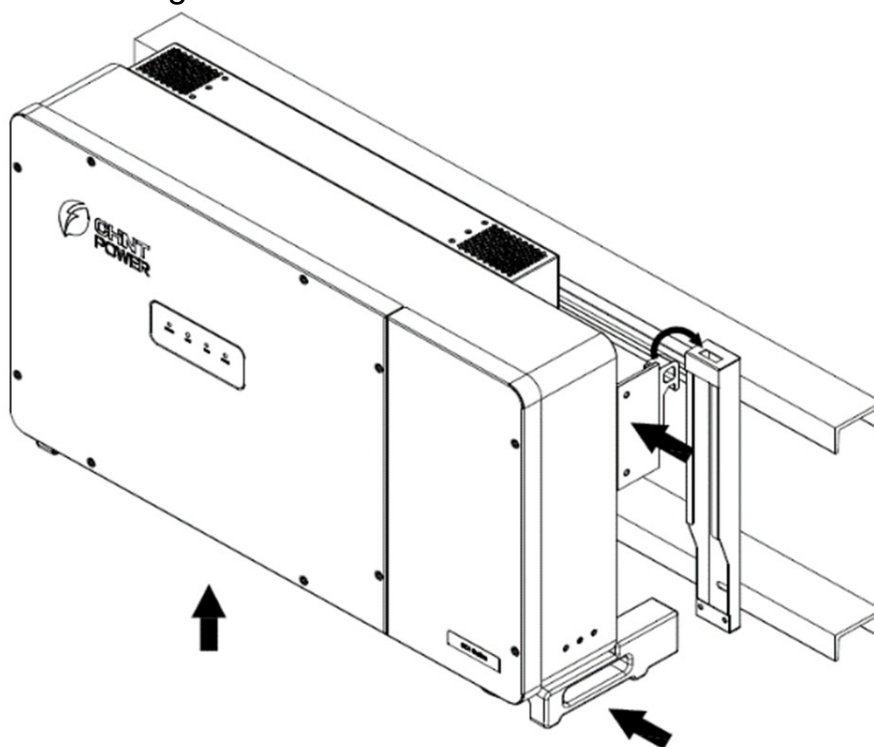
Figure 3-7 Manual hanging

(2) Lift mounting: Screw two M10 lifting eyebolts to the studs at the top of the inverter. Use sling rope or bar (inserted through both lifting eyebolts) to lift the inverter onto the mounting bracket. The minimum angle between the two sling ropes should be less than 90 degrees, as shown in Figure 3-8.
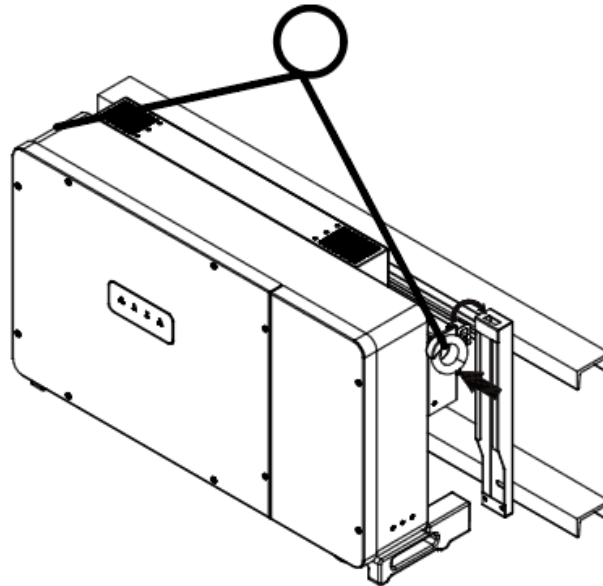
Figure 3-8 Lift mounting

CAUTION!

The total weight of the inverter is approx. 105kg (231.5 pounds).

Ensure the mounting bracket is properly installed before hanging the inverter on the bracket. It is recommended to have at least 3 people to mount the inverter due to the weight of the equipment.

4.   Use two M6X16 screws ⑥ to fasten inverter on mounting bracket.
      Tools required: No.10 hexagon socket wrench, torque: 60kgf.cm.
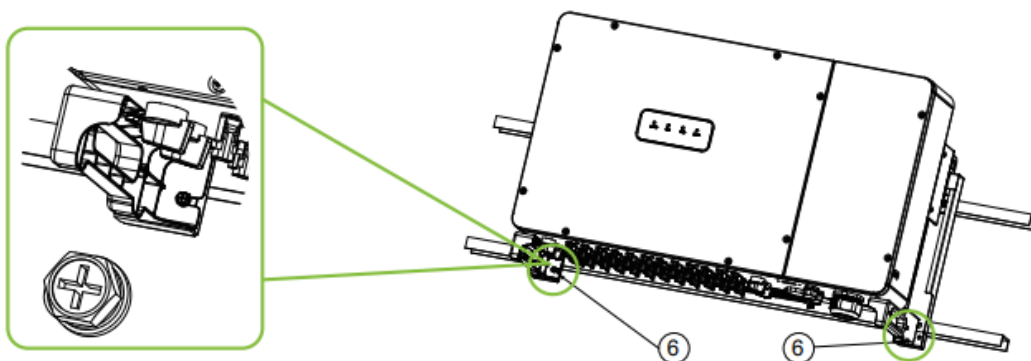
Figure 3-9 Inverter fixed on backplane bracket

3.5 Installation Check

1.   Ensure that the three supporting points (On the rear side of the inverter) align with the three holes of the support.
2.   Ensure that the inverter is well fixed.
3.   Ensure that the inverter is locked on the support and an antitheft lock is installed.

4 Electrical Connection

⚠️ **CAUTION!**

The cables shall be connected in accordance with the National Electrical Code and all other applicable local codes or jurisdictions.

4.1 Schematic Diagram and Circuit Design

The electrical schematic diagram of inverter is as shown in Figure 4-1. PV input goes through the lightning protection circuit and DC EMI filter circuit and then through the previous BOOST circuit to achieve maximum power tracking and boost functions. The inverter uses three-level technology to convert the DC voltage into a three-phase AC voltage, filters out high frequency components through an output filter, and then outputs high-quality AC power through a two-stage relay and an EMI filter. In addition, a string detection function (optional) is added.
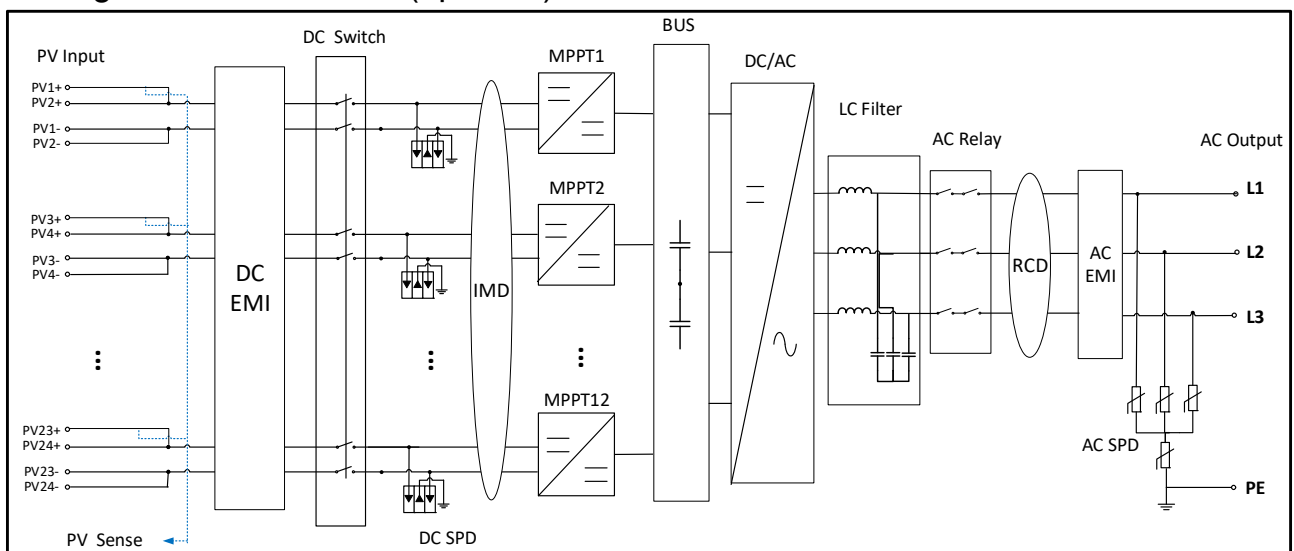
Figure 4-1a Schematic Diagram of the 12MPPT Inverter
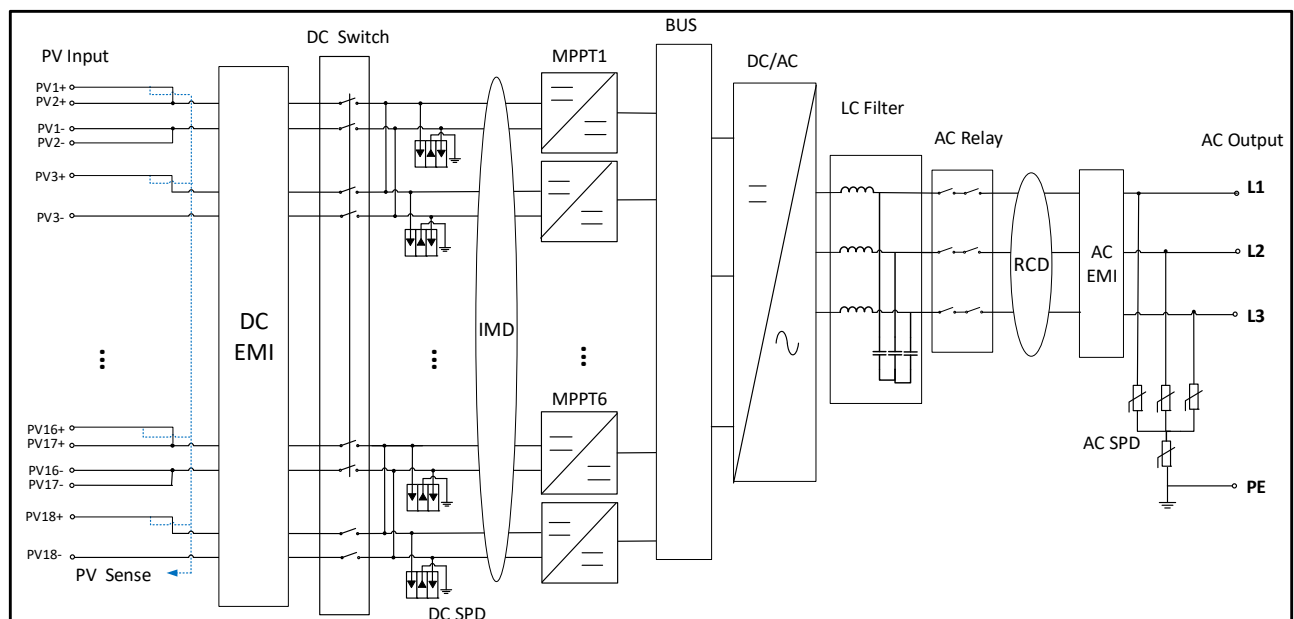
Figure 4-1b Schematic Diagram of the 6MPPT Inverter

4.2 Cable Specification

Cable	Type	Outer dia. (mm)	Conductor CSA (mm^2)
DC cable	PV cables that meet 1500V standard	6~9	4~6
GND	Outdoor copper core wire	/	Phase wire diameter/2
AC cable	Outdoor four-core copper/ aluminum wire	50~66	Copper core cable: L1,L2,L3,(N):70~300 Aluminum alloy cable: L1,L2,L3,(N):95~300 PE: Phase wire diameter/2
	Outdoor four-core copper/ aluminum wire		
Comm	Communication cable UTP CAT-5e	4.5~6	3*0.2~0.75
	Shielded twisted pair		3*1~1.5

Table 4-1 cable specifications

4.3 Tools Required and Torque Values

No	Tools	Usages	Torque
1	5mm hex. wrench	Fixing upper cover of combiner box	30 kgf.cm
2	No.19 hex. socket wrench	Fixing AC output terminal block	320 kgf.cm
3	No.10 hex. socket wrench	Fixing External ground terminal & Internal ground stud	60 kgf.cm
4	1.5mm flat-blade screwdriver	Fixing RS485 comm. terminal	2.0 kgf.cm
5	Diagonal pliers	Making cables	-
6	Wire stripper	Making cables	-
7	Crimping Tool	Making cables	-

Table 4-2 Tools Required and Torque Values

4.4 External Interfaces and Internal Connection Points

You will find the external connection interfaces, internal connection points, as well as their names, positions etc. as shown in figure 4-2 and 4-3 as well as table 4-3.
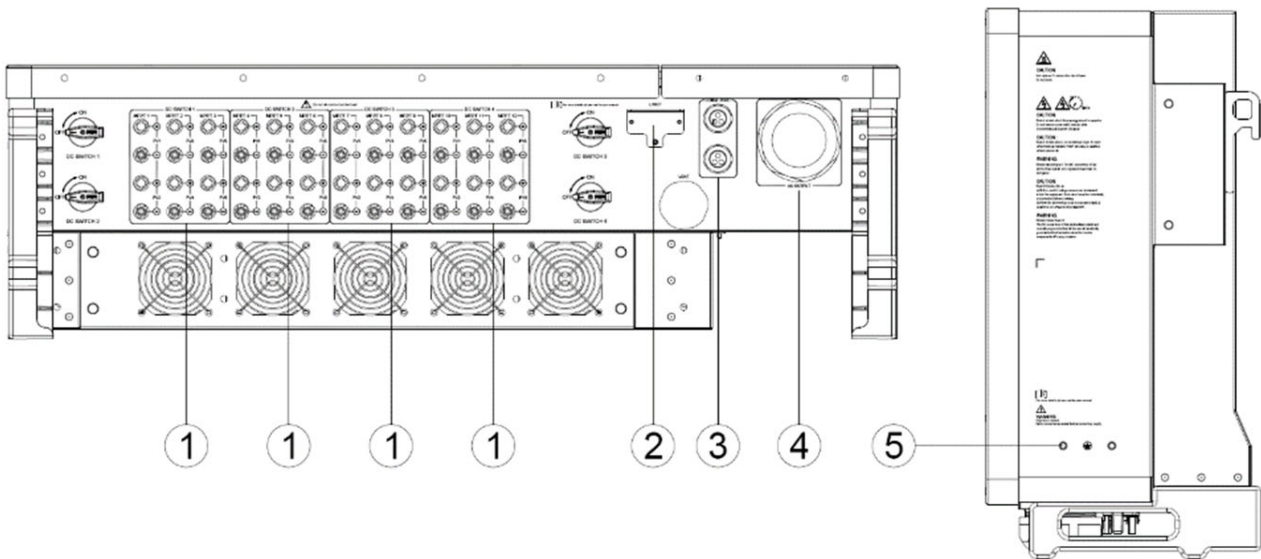
Figure 4-2 External connection interfaces
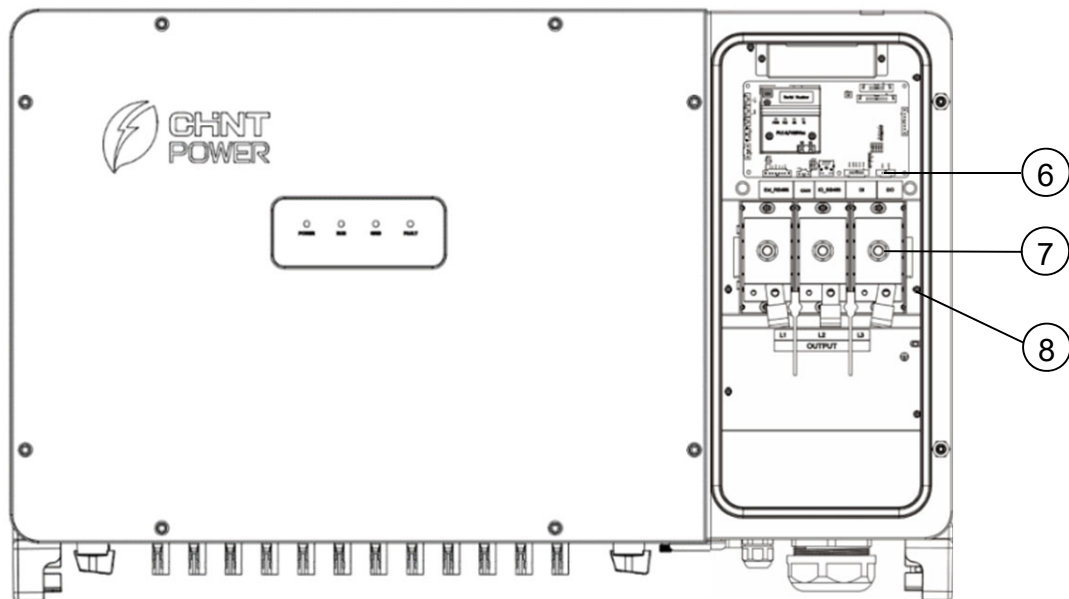
Figure 4-3 Internal Wiring Point

No.	Names
1	DC Input quick connector
2	LINKIT interface
3	RS485 Communication interface
4	AC Output connector
5	External ground screw hole
6	Communication board
7	AC Output terminal block
8	Internal ground stud

Table 4-3 External Interfaces and Internal Connection Points

4.5 Electrical Cable Connection

NOTICE!

- Please read carefully and refer to Chapter 9 Technical Data before wiring.
- Before performing any electrical connection, make sure that both DC and AC switches are OFF. Otherwise, fatal injury may be caused by high voltage.
- During wiring, all interfaces (such as AC, DC, RS485, LINKIT and vent valve) shall keep watertight.
- When device is not running, make sure airtightness of all above interfaces. Never damage their airtightness during wiring and lock wirebox cover in time after finishing wiring process.
- When device doesn't run for a long time, check for water vapor and condensation regularly by opening the wirebox cover, to avoid device damages.

First of all, loosen the 2 screws fixing the front cover of the combiner box with a 5mm hex wrench, and open the front cover.
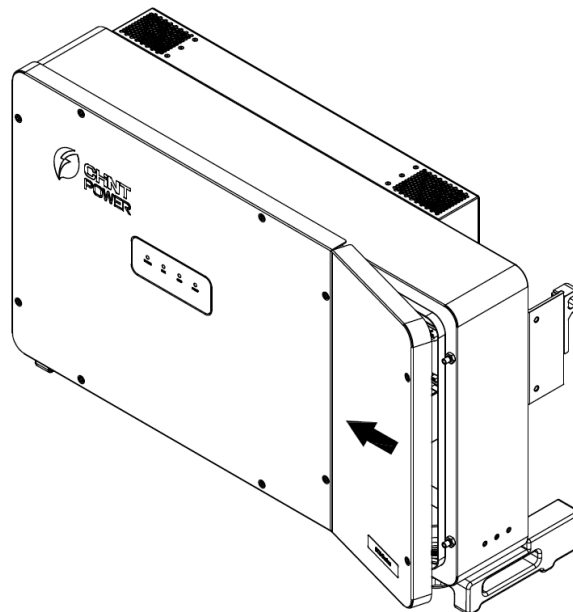
Figure 4-4 Open front cover of combiner box

IMPORTANT!

It is important to use hand tools (e.g. hex wrench) instead of power drivers or other types of screw drivers.

4.5.1 Grounding

There are two kinds of grounding methods for this inverter. You can choose either one way as below:

a) Connect the internal grounding pole located on the right side of the AC terminal, as shown in Figure 4-5 on the left.

b) Connect the external grounding pole located at the bottom of the machine next to the AC port, as shown in Figure 4-5 on the right.
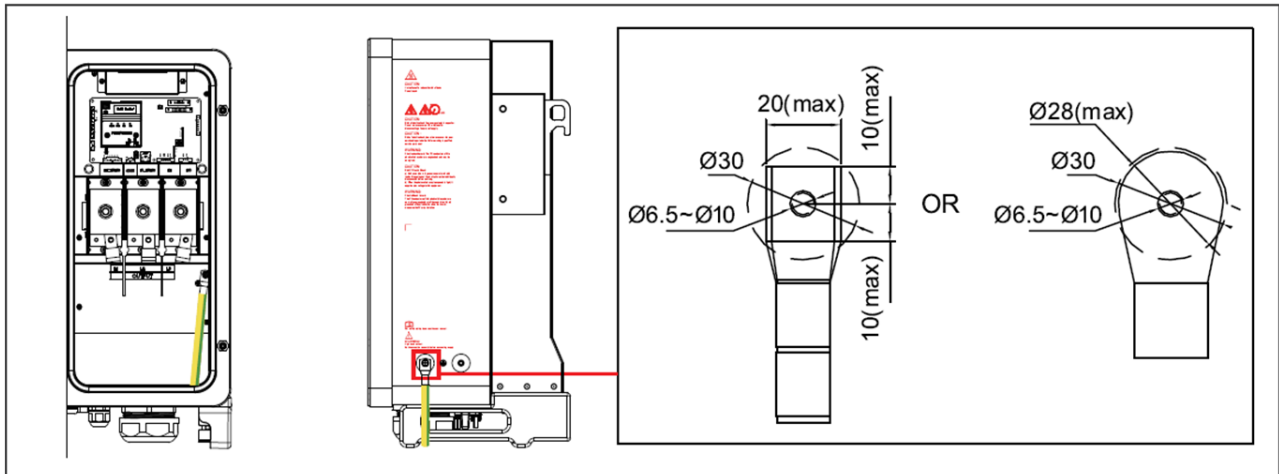
Figure 4-5 Grounding Methods

4.5.2 AC Wiring

You can find the AC output terminals as shown in the Figure 4-6.
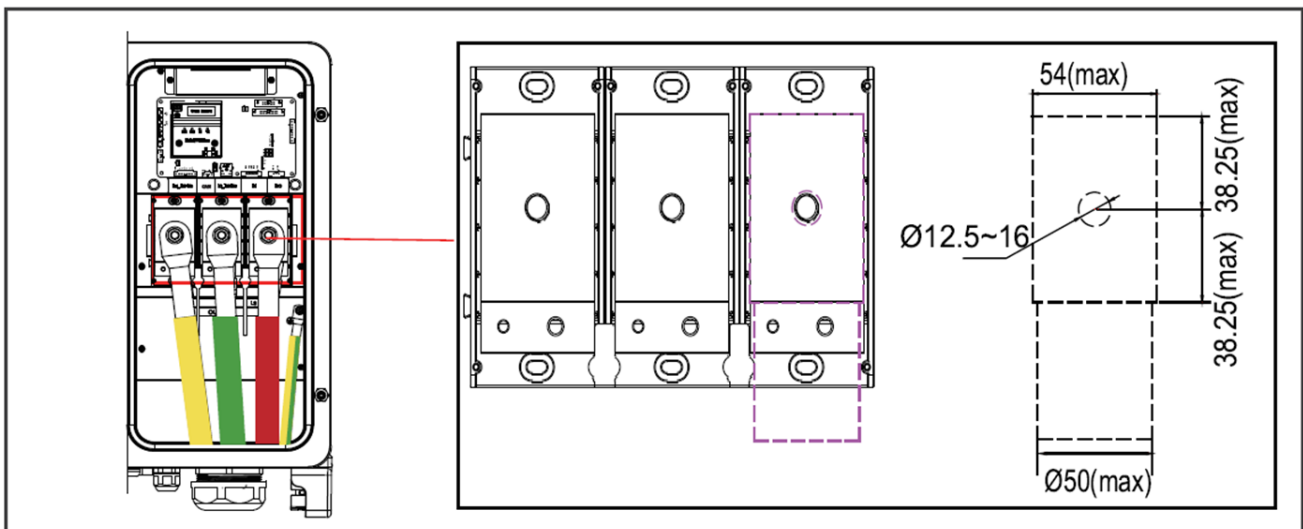
Figure 4-6 AC Output Line Connection

Perform the AC wiring procedures as follows:

1. Remove an appropriate length of the jacket and insulation layer from the AC output cable. Insert the exposed core wires into the crimp area of the OT terminal, wrap the wire crimp area with heat shrink tubing or insulation tape, and crimp them using hydraulic pliers.
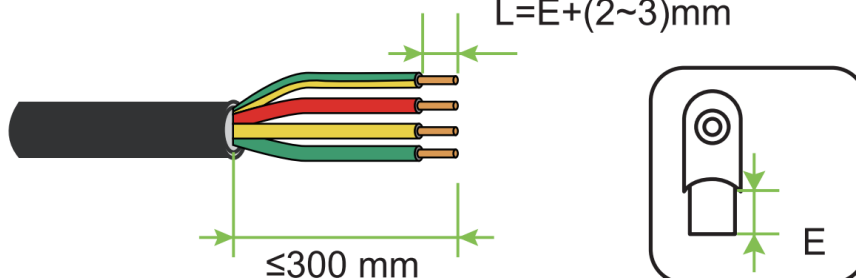
Figure 4-7 AC Wire stripping

2. Loosen the locking cap from the AC output watertight cable connector at the bottom of the inverter and remove the plug from the locking cap.

3. Route the AC output power cable into the locking cap and the AC output connector at the inverter bottom, and connect the AC cable to L1, L2, L3, and E on the AC terminal block, tighten them using screw driver.

4. Tighten the locking cap on the AC output watertight cable connector.

The inverter operates at 800VAC output. Another voltage/configuration is required, a transformer may be necessary. This inverter supports only IT power grid as below.
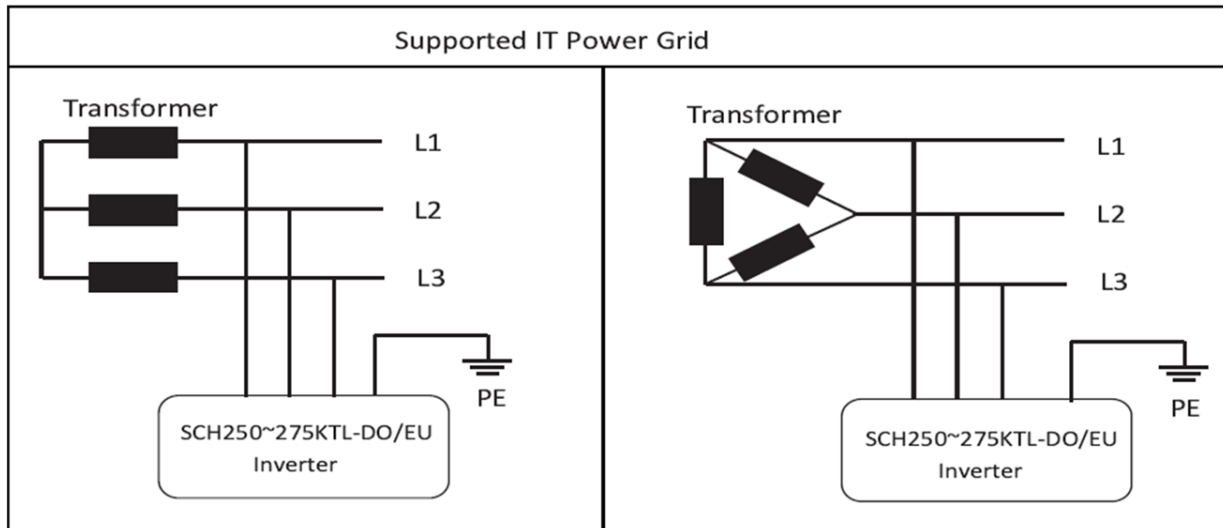
Figure 4-8 Supported IT power grid

NOTICE!

To ensure convenience and safety, it is recommended to use multi-core cables, crimp terminals and proper crimping tool to crimp the cables before wiring.

4.5.3 DC Wiring

4.5.3.1 DC fuse configuration

The inverter is equipped with the external DC fuses. Customers must verify that the appropriate fuses are installed depending on the actual configuration of PV strings.

- Each MPPT DC input that has more than 2 strings requires fuse protection. For MPPT DC input with 2 strings or less, no DC fuse protection is required.
- The rated voltage of the fuse should be 1500VDC.
- The rated current of the fuse is generally 1.56 × short circuit current from the PV strings, rounded up to the next available fuse size.

The following table lists the specifications of the external DC fuses, which are within the rated voltage of PV panels.

Supplier	LEADER	Sinofuse
Types	LEPV-30	RS308
Specification	30A/1500V	32A/1500V

Table 4-4 specifications of the external DC fuses

WARNING!

- Different fuses or incorrectly sized fuses could result in equipment damages or unsafe working conditions.
- Any damage resulting from incompatible fuses is not covered by warranty.

4.5.3.2 DC Cable Connection

To ensure the optimum performance of the inverter, please read the following guidelines before performing any DC connections:

- Confirm the DC configuration and ensure that the maximum open circuit voltage of the PV modules is lower than 1500VDC under any conditions;
- Check the polarity before terminating the DC cables of PV strings according to the following steps, as shown in figure 4-9:
  - i. Use a multi-meter to measure the PV strings' cable ends and check the polarity.
  - ii. The positive (+) terminal of cable should match the positive (+) terminal of inverter's DC input.
  - iii. The negative (-) terminal of cable should match the negative (-) terminal of inverter's DC input.
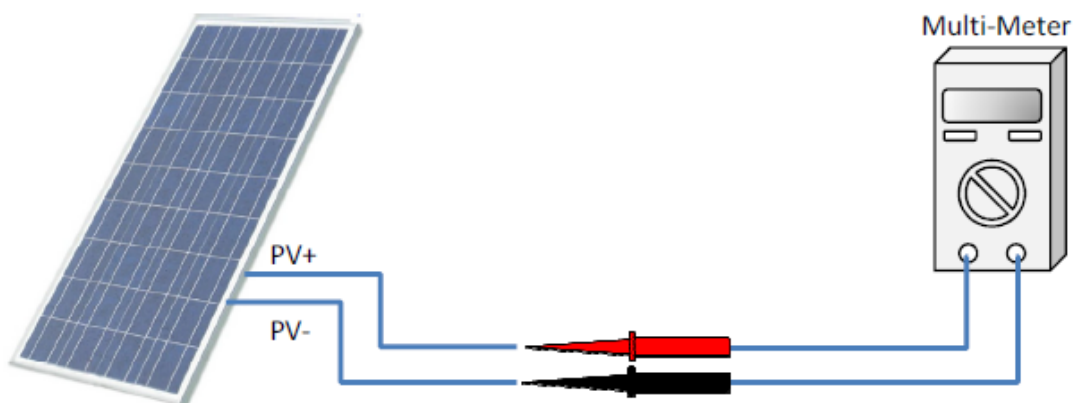
Figure 4-9 Polarity Check

NOTICE!

It is important to use a multi-meter to check the polarity of the DC input cables to avoid any risk of reverse polarity.

WARNING!

- A reversed string is extremely hazardous and will result in a blown fuse when the irradiation is high.
- The voltage across the blown fuse will be 2x Voc and could prevent proper fuse operation resulting in a fire.

Perform cable connection as per the following steps:

1. Remove an appropriate length of the jacket and insulation layer from the DC input cable of PV strings.
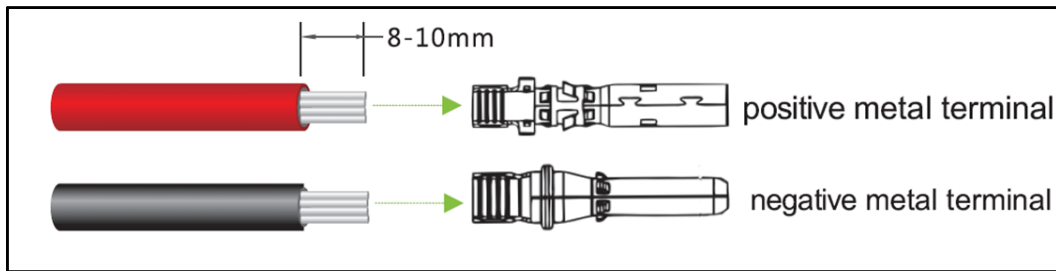
Figure 4-10 DC Wire stripping

2. Insert the exposed areas of the positive and negative power cables into the metal terminals of the male and female connectors respectively and crimp them using a crimping tool.
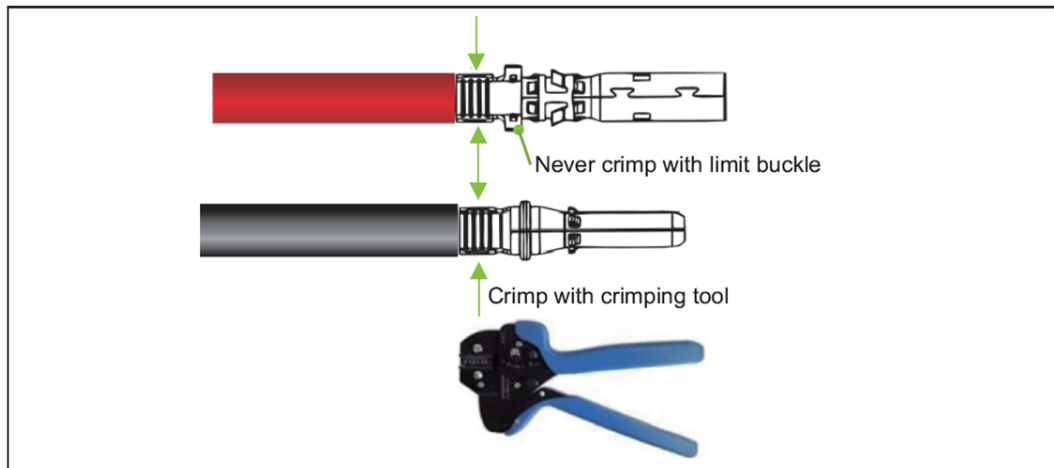
Figure 4-11 Crimp power cables

NOTICE!

The connector used for the DC input must be supplied randomly, or the same model of the same manufacturer. Otherwise, poor contact may occur, affecting normal use.

3. Insert the crimped positive and negative power cables into the corresponding male and female connectors until a "click" sound is heard.
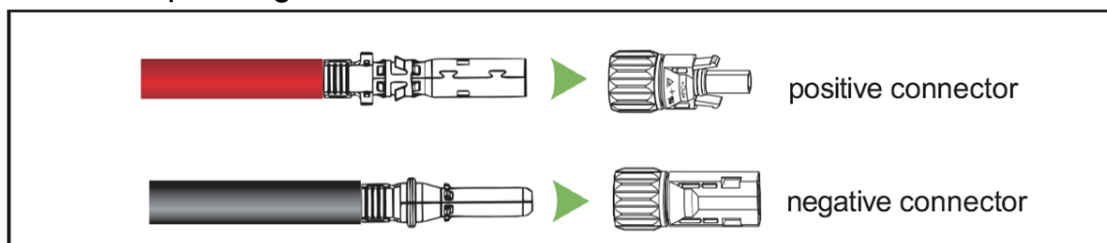
Figure 4-12 Insert power cables to connectors

NOTICE!

• The grounding wire must be connected well.
• The DC switch should be in the OFF state.

4. Measure the cable ends of PV strings using a multimeter. Ensure that the polarities of the DC input power cables are correct.
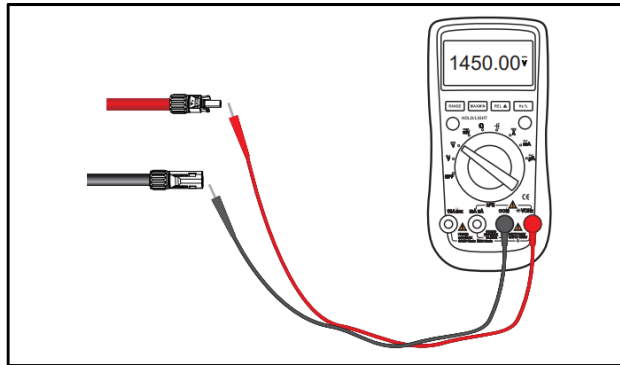
Figure 4-13 Ensure the polarities of the DC cables

5. Insert connectors into the corresponding terminals of the inverter.

(a) For 12-MPPT inverter: Insert the positive and negative connectors into their corresponding terminals of the inverter until a "click" sound is heard.
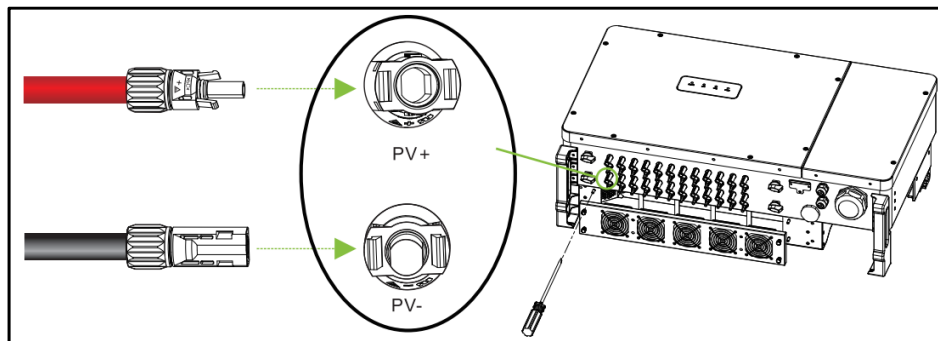
Figure 4-14a Insert connectors into corresponding terminals

(b) For 6-MPPT inverter: Connect the external fuse component to PV positive connector, then insert the positive connector of the fuse component and negative connector into the corresponding terminals of the inverter until a "click" sound is heard.
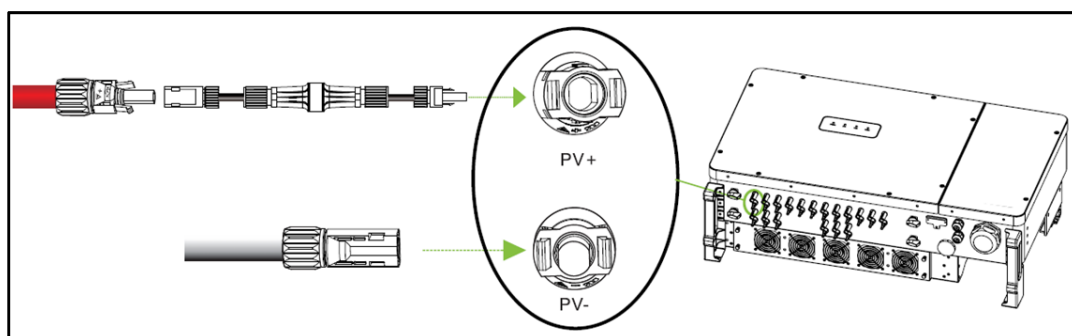
Figure 4-14b Insert connectors into corresponding terminals

NOTICE!

Make marks on all positive and negative power cables to identify their correct strings (such as PV1+, PV1-, PV2+, PV2-). Make sure all strings are connected to corresponding ports according to port names printed on the device, to avoid wrong connection. Otherwise, it may result in device damages or property.

4.6 Communication Connection

4.6.1 Communication Board
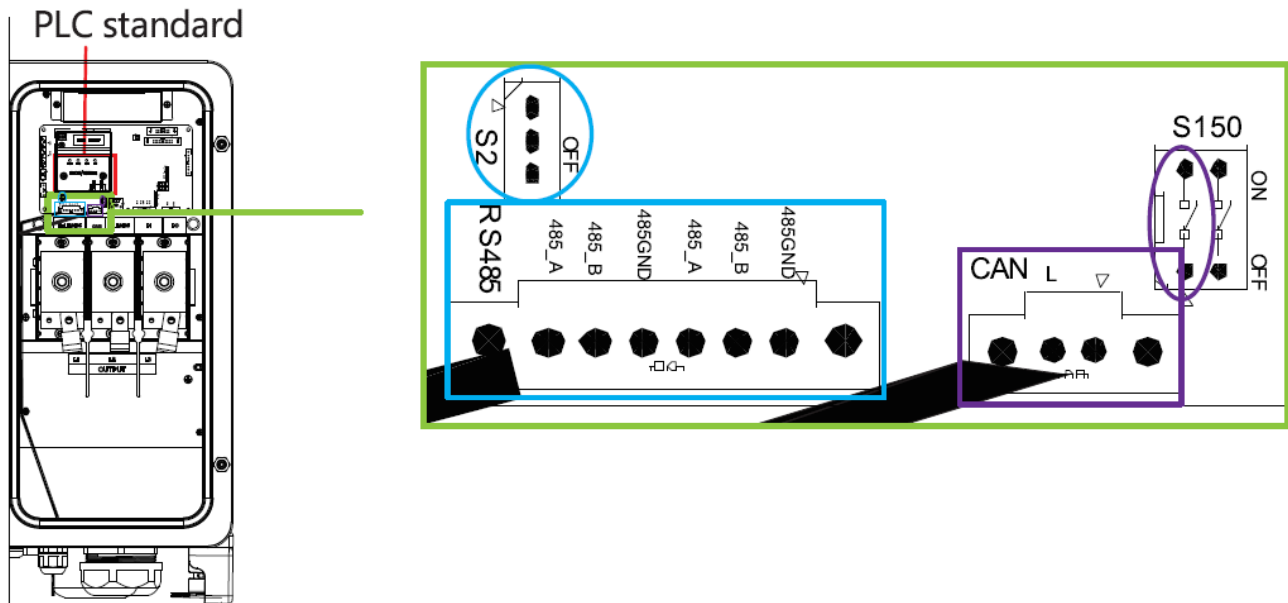
Figure 4-15 Communication Board

No.	Item names	Picture	Configuration
1	RS485 port 6-pin connector plug		1 - RS485_A 2 - RS485_B 3 - RS485_GND (Common) 4 - RS485_A 5 - RS485_B 6 - RS485_GND (Common)
2	S201 Selector switch (set terminal resistor)		OFF - Disable the terminal resistor ON - Enable the terminal resistor
3	CAN port 2-pin connector plug		1 - CAN _L 2 - CAN _H
4	Left S150 switch (set terminal resistor)		OFF - Disable the terminal resistor ON - Enable the terminal resistor

Table 4-5 Communication board Interfaces

4.6.2 Communication Connection

The inverter supports industry standard Modbus RS485, Ethernet, PLC as well as CAN (only available to new communication board) communication modes.

We will introduce most commonly used RS485 and CAN communication methods in detail.

4.6.2.1 RS485 and CAN Cable Connection Methods

1. Crimp RS485 communication cables with the help of 6-pin terminal or CAN communication cables with the help of 2-pin terminal according to the following figures:
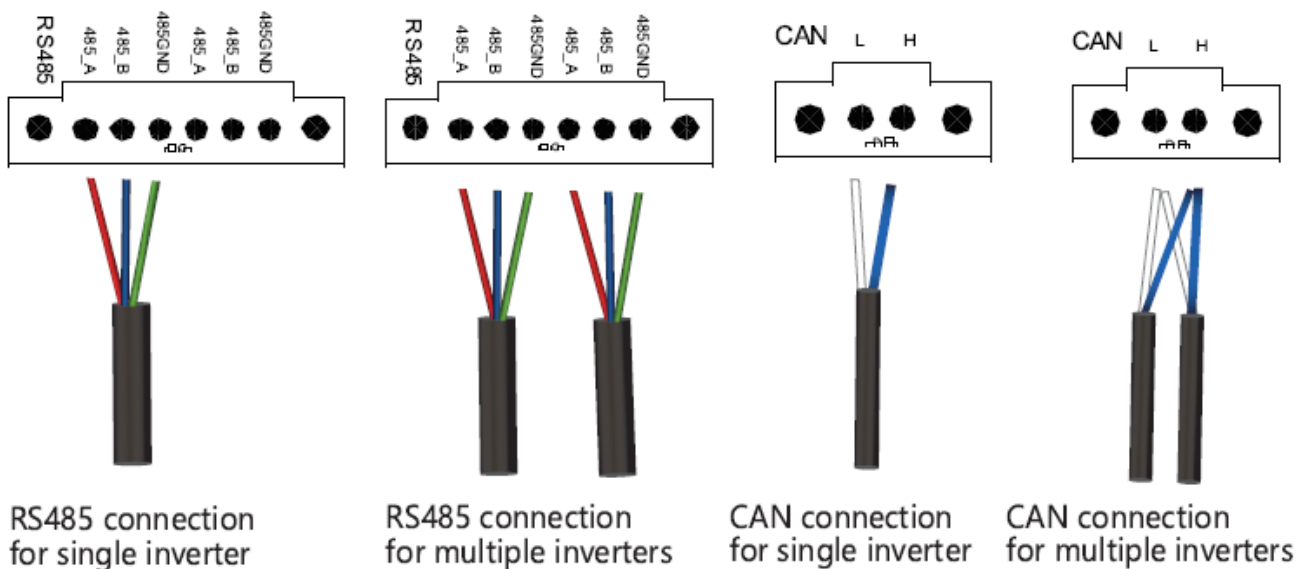
Figure 4-16 Crimp RS485 &CAN communication cables

2. Loosen the compression nut in the cable fastening head at the communication interface, and take out the stopper as shown below.
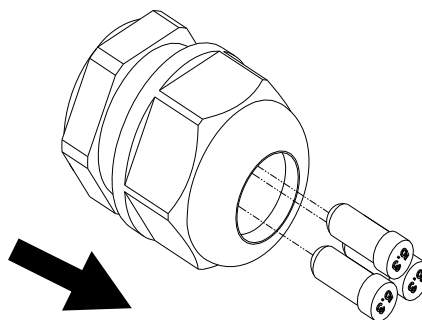
Figure 4-17 Remove the stopper

IMPORTANT!
- RS485 communication (stand-alone), take out 1 stopper.
- RS485 communication (networking), take out 2 stoppers.

3. Insert the crimped 6-pin terminal to 485 communication module and 2-pin terminal to CAN communication module.
4. Tighten the compression nut of the cable fastening head.

4.6.2.2 RS485/CAN Network Connection

When the inverters are monitored via the RS485/CAN communication, a unique RS485/CAN address for each inverter can be set up through the APP interface.

Up to 32 inverters can be connected in a serial fashion in the RS485/CAN communication network. Therefore, the daisy-chain topology shown as below is recommended for the RS485/CAN network connection, which can minimize the noise and bus reflections. Other communication topologies, such as the star networks, are not recommended.
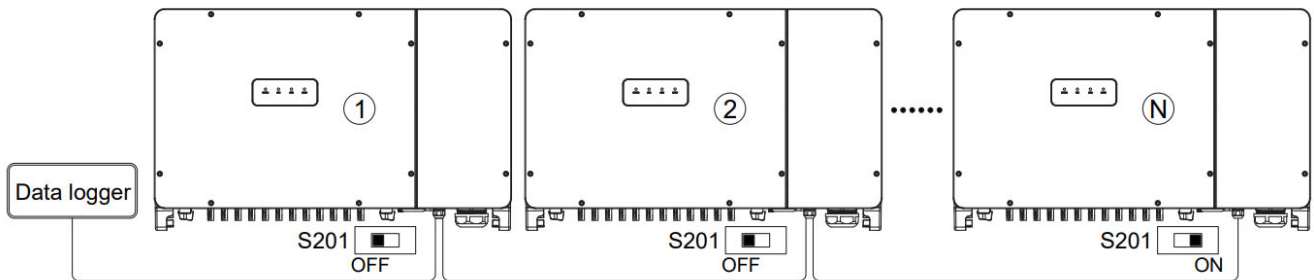
Figure 4-18 R485 Topological structure diagram

If there are multiple inverters in the RS485 network and the last inverter is more than 200 m distant from data logger, the switch S201 of the last inverter in the daisy-chain should be in ON position to enable the 120ohm terminal resistance. While those switches S201 of all other inverters should be in the OFF position to disable the terminal resistance.

If there are multiple inverters in the CAN network and it's more than 200 m distant from data logger, the left switch S150 of the last inverter in the daisy-chain should be in ON position, to enable the 120ohm terminal resistor. The left switch S150 of all other inverters should be in the OFF position to disable the terminal resistor.

WARNING!

- Make sure all DC and AC power has been disconnected before opening the wire box and ensure that hazardous high voltage and power has been discharged to avoid risk of electric shock.
- Wait at least 5 minutes before opening the wire box.

The detailed steps to perform the daisy chain connection are as follows:

1. Open the wire box.
2. Insert the communication cables into the wire box through the knockout holes at the bottom. Conduit and knockouts must be sealed and water-tight to maintain its protection rating.
3. Connect the RS485/CAN wires to their corresponding connectors, ensuring correct polarity and using a shielded twisted pair cable.
4. (a). If the inverter is the **last** Modbus device in the daisy chain and it's more than 200m distant from data logger, make sure the Modbus termination switch S2/ Left S150 is in the ON position to enable Modbus termination; while all other switches shall be in the OFF position.
   (b). If there is only one inverter and it's more than 200m distant from data logger, the Modbus termination switch should also be set to ON, otherwise, it can be set as OFF.

5. The shield of the individual cables must be open (not connected to ground) on one end – the other end of the shield must be grounded.

After completing all the wiring steps, fix the 2 screws on the front cover of the combiner box with a 5mm hex wrench, and lock the front cover. (Torque: 30kgf.cm)
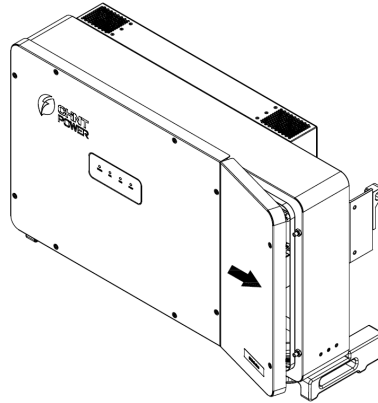
Figure 4-19 Lock front cover of combiner box

IMPORTANT!

- It is important to use hand tools (e.g. hex wrench) instead of power drivers or other types of screw drivers.
- During installation, it is recommended the cover is in alignment with balanced force to avoid thread damage.
- Partially engage the screws into the threaded inserts before tightening.

4.6.3 Install the LINKIT Module

1. Remove the two fixing screws on the connector cover.
2. Rotate the cover to expose the connector and then install the LINKIT module with the two screws just removed. Fasten the module firmly to ensure that the seal watertight.
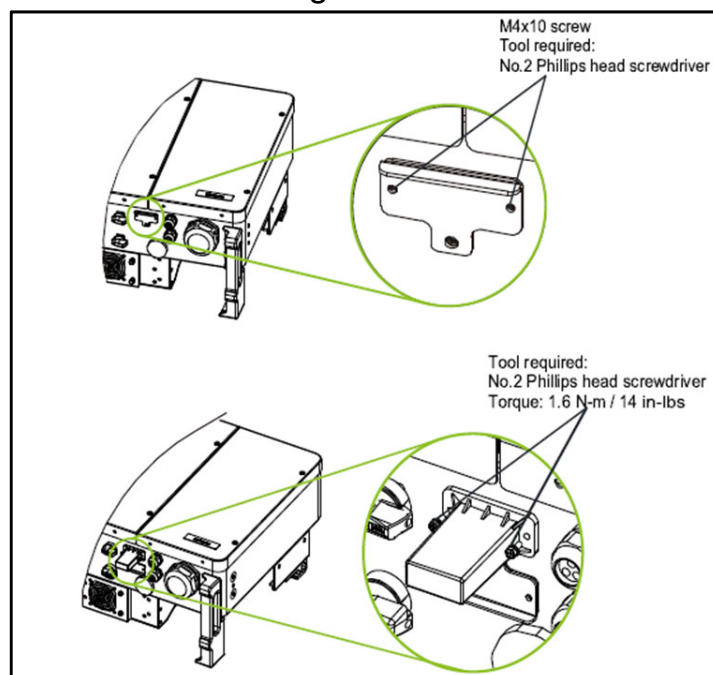
Figure 4-20 Install the LINKIT module

4.7 Cable Connection Notices for Joints and Seals

IMPORTANT!

Pay attention to the following notices when routing cables and sealing the joints.

All the electrical cables and communication cables shall be jointed and sealed properly according to the following requirements to ensure their excellent performance and good water tightness.

• The cable must be vertical to prevent excessive cable stress.
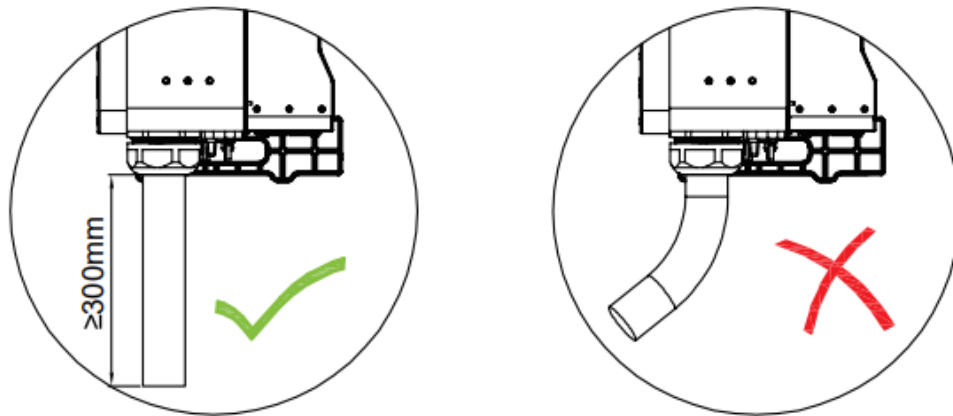
Figure 4-21 Cable must be vertical

• After the cable passes through the fastening head, fireproof putties shall be applied to seal the joint tightly to prevent water vapor from entering.

Fireproof putties   or
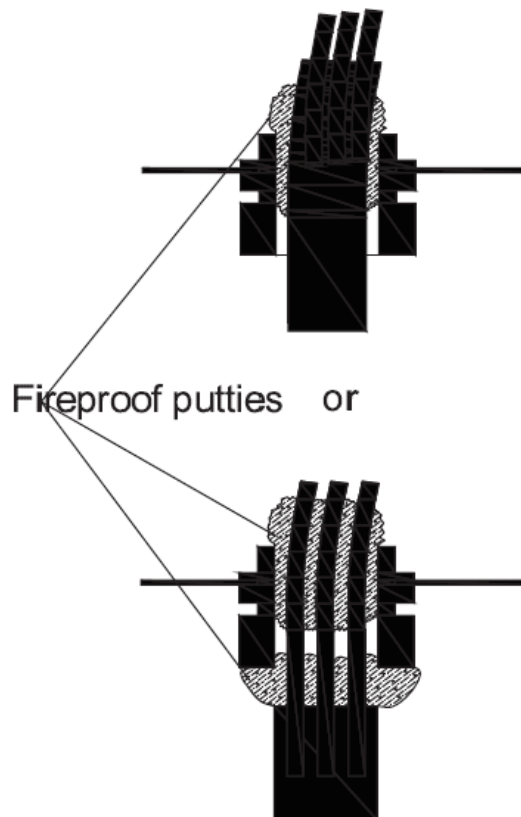
Figure 4-22 Apply fireproof putties

- After tightening the fastening head, watertight sealants shall be applied on its inner surface and outer surface to avoid loosening or prevent water from entering.
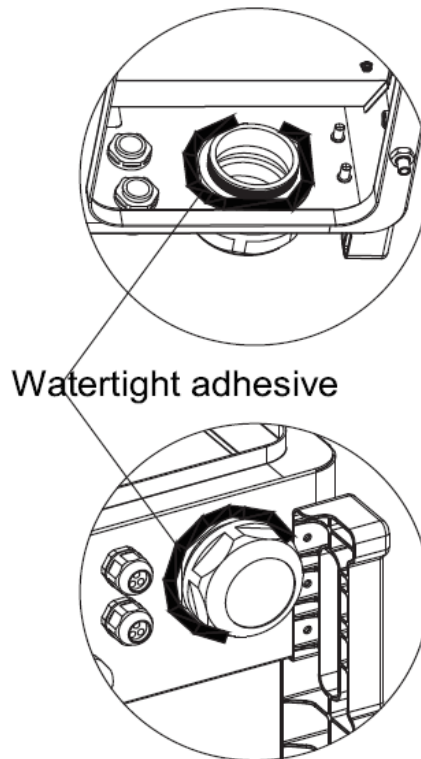
Figure 4-23 Apply watertight sealants

- Before and after tightening the fastening head, check carefully to ensure the watertight cushion is in good condition, i.e. its surface is uniform and unbroken.
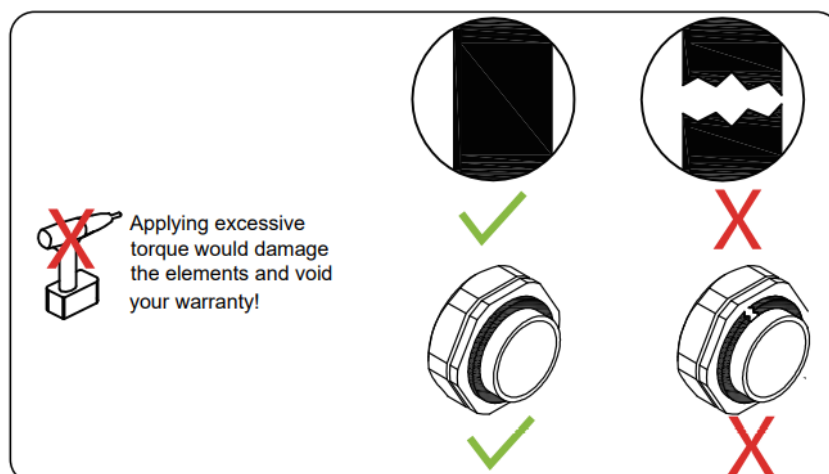
Figure 4-24 Check watertight cushion

5 Inverter Commissioning

> **WARNING!**
>
> Please follow the guidelines below before performing any on-grid operation to eliminate possible dangers.

5.1 Pre-commissioning Checks

5.1.1 Mechanical Installation

Perform the following inspections by referring to chapter 3 Mechanical Installation.

- Make sure all the mounting brackets are secure.
- Make sure all the screws have been tightened to the specified torque values.

5.1.2 Electrical Connections

Perform the following inspections by referring to chapter 4 Electrical Connection.

- Confirm that all cables are connected firmly and reliably and there are no wrong or missing connections.
- The cables are placed reasonably and will not be mechanically damaged.
- Pay special attention to whether the positive and negative polarity of the DC cable on the input side is correct.
- Turn the DC Switch to the "OFF" position.
- Make sure the AC circuit breaker is appropriately sized.
- Test and check that the AC voltage is within the normal operating range.
- Make sure the DC open circuit voltage of input strings is less than 1500V.

5.2 Inverter Commissioning Steps

Complete the test and inspection before operation. Confirm that there is no error. Follow the steps below to test run the inverter.

1. Close the AC side circuit breaker or fused switch disconnect.
2. Close the DC side circuit breaker. (Start from step 3 if no circuit breakers are available.)
3. Set the inverter DC switch to the "ON" position. When the solar array produces enough power, the inverter LED POWER indicator will be lit, and the inverter will enter the self-check state in turn.
4. Perform APP setting acc. to the procedures introduced in section 6.1 and 6.2 to ensure the inverter can generate power successfully.

6 APP Setting and Interface Introduction

6.1 APP Download

The inverter conducts human-computer interaction through the "Chint Connect" mobile APP.

Users can download the iOS version in the Apple store or Android version in the Google store, or directly scan the QR code to download. (Support Android 4.1 and IOS 9.0 system or higher version system).

Chint Connect

6.2 APP Setting

Once powered, the inverter will automatically create a wireless network that can be visible as an Access Point from the user communication devices (tablet, smartphone, etc.). Users can perform the following procedures to set the APP easily. First of all, open your Bluetooth function.
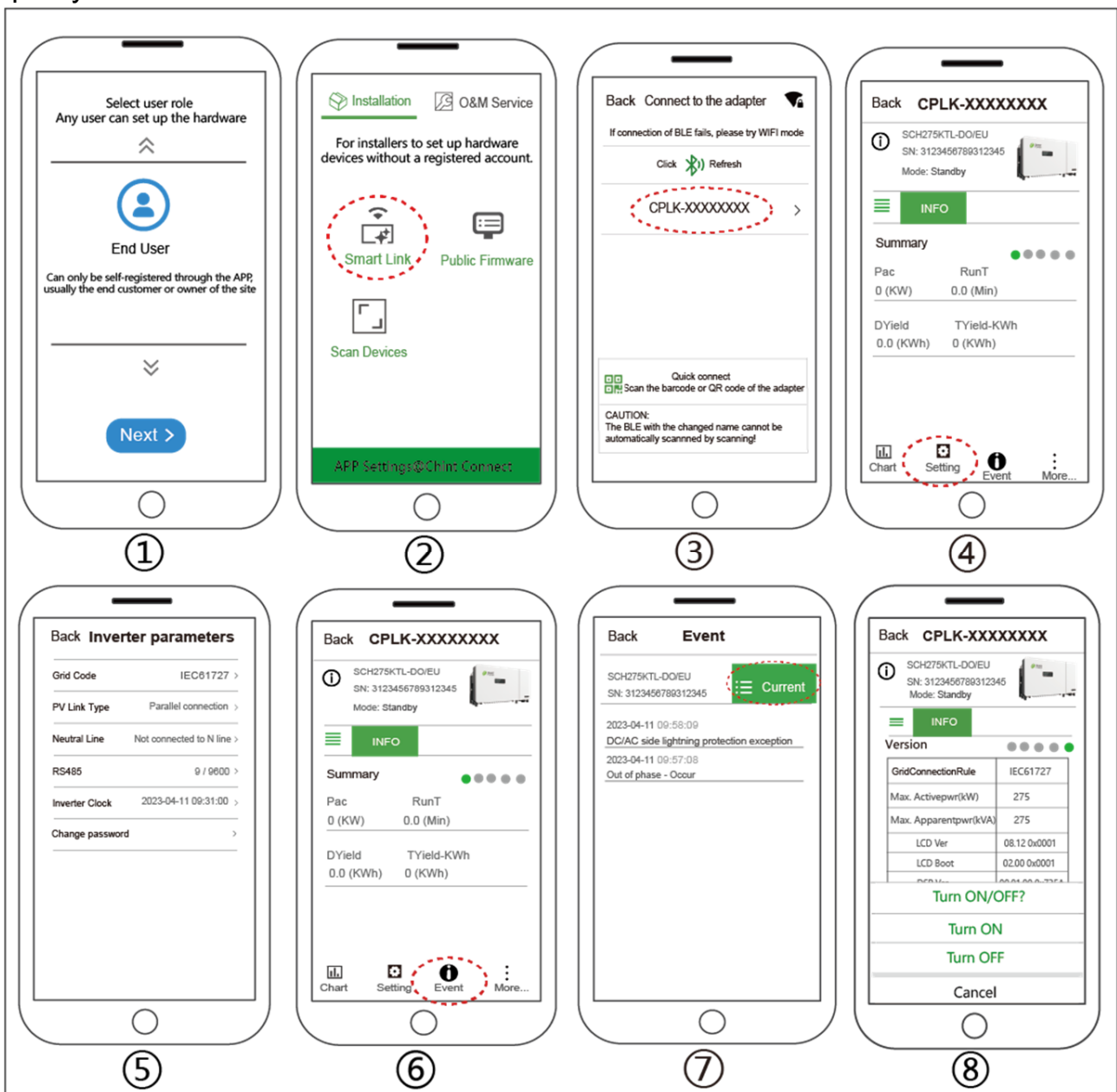
1. Choose the suitable user role and touch "Next".
2. If it is necessary, touch the bottom "APP Setting" to change or user role and then touch the top-right "Save" button to save your changes. Touch "Smart Link" icon to enter "Smart Link" interface and then touch "Next" to enter "Connect to the adapter" interface.
3. Touch wireless network named CPLK-XXXXXXX(XXXXXXX can be found on the LINKIT label) shown in Bluetooth List, or touch the green QR to scan LINKIT bar code, to connect network and enter main interface.
4. Touch "Setting" icon and input password "1111", it goes to "Inverter parameter" page.
5. Set or change inverter parameters if necessary, such as Grid Code, PV Link Type, RS485 etc.
6. When the RUN indicator lights up, it indicates that the device is running normally. You can browse through the real-time data in the APP by sliding the interface left and right. If the inverter cannot run normally, FAULT indicator lights up. Click "Event" icon to see fault information.
7. Touch the top-right icon to check detailed current and history fault information. Troubleshooting related problems and restart. Contact service personnel if there are still faults.
8. Touch "More" icon and input password "1111" to turn on/off device.

IMPORTANT!

- Please check with your local electricity supply company before selecting a Grid Code. If the inverter is operated with a wrong Grid Code, the electricity supply company may cancel the interconnection agreement.

- Placing the inverter into operation before the overall system complies with the national rules and safety regulations of the application is not permitted.

6.3 Overview of App Interface
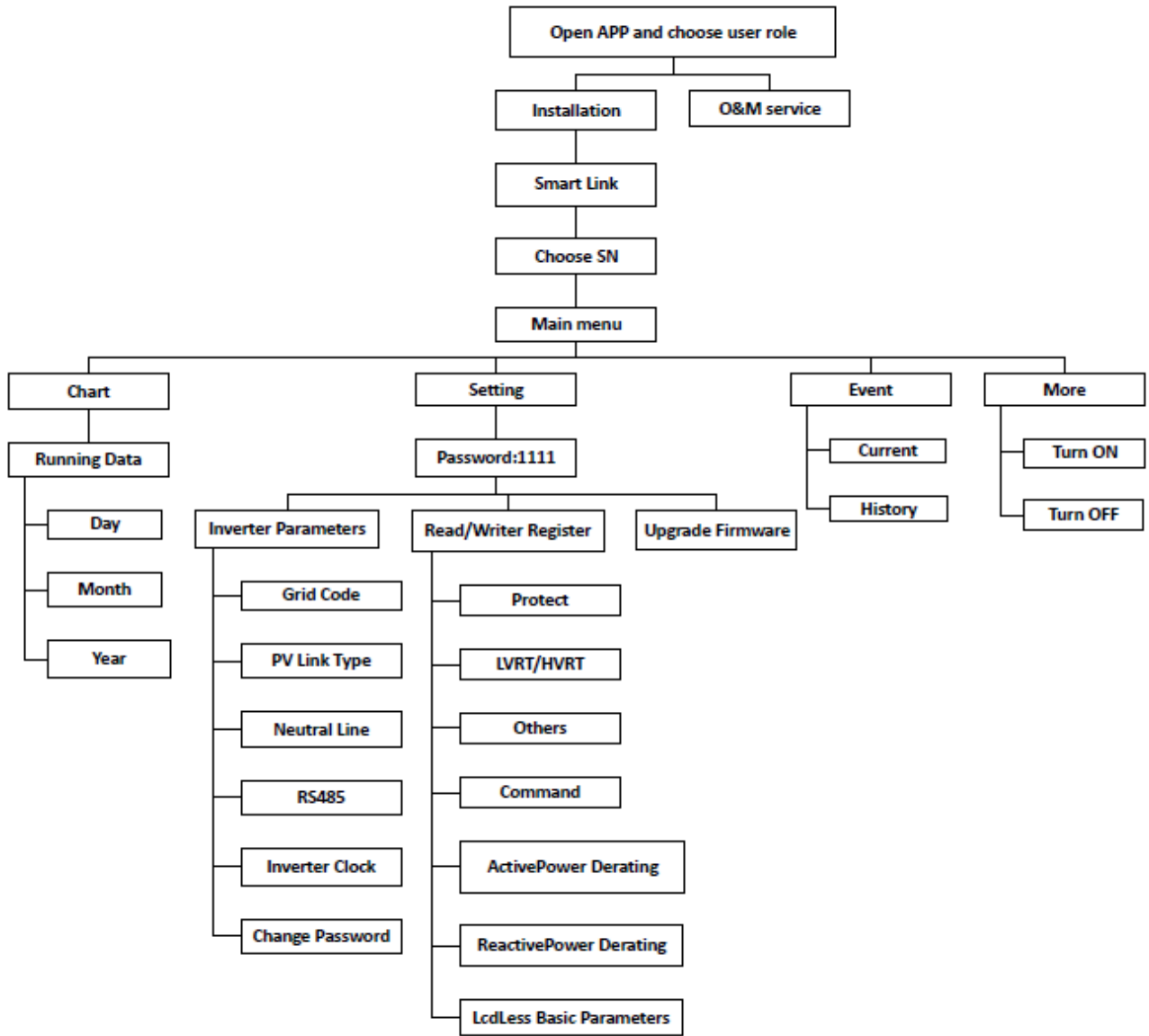
Figure 6-1 Structure tree of App Interface

6.4 APP Main Menu

In the Main interface, you can access the DC, AC, OTHER and VERSION information as shown below.

In addition, you can see the following submenus:

- Chart
- Setting
- Event
- More
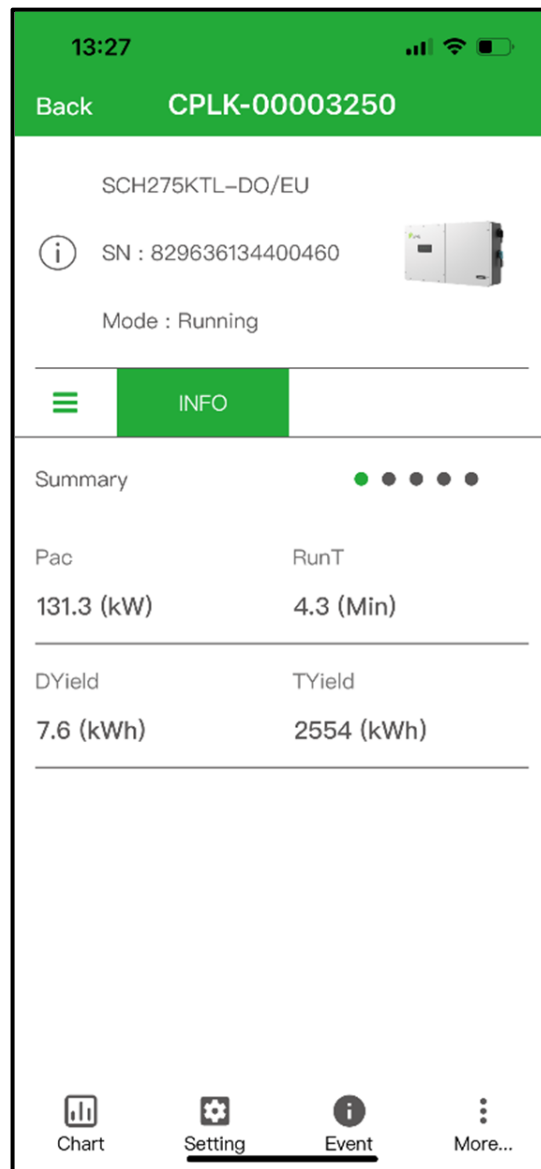
Figure 6-2 Main information on Main Interface

6.4.1 Chart Menu

In the **chart** sub-menu, you can view the power generation situation at different times, such as Current, Today and Total. These data can also be displayed in Day, Month, Year, shown as below in Figure 6-3.
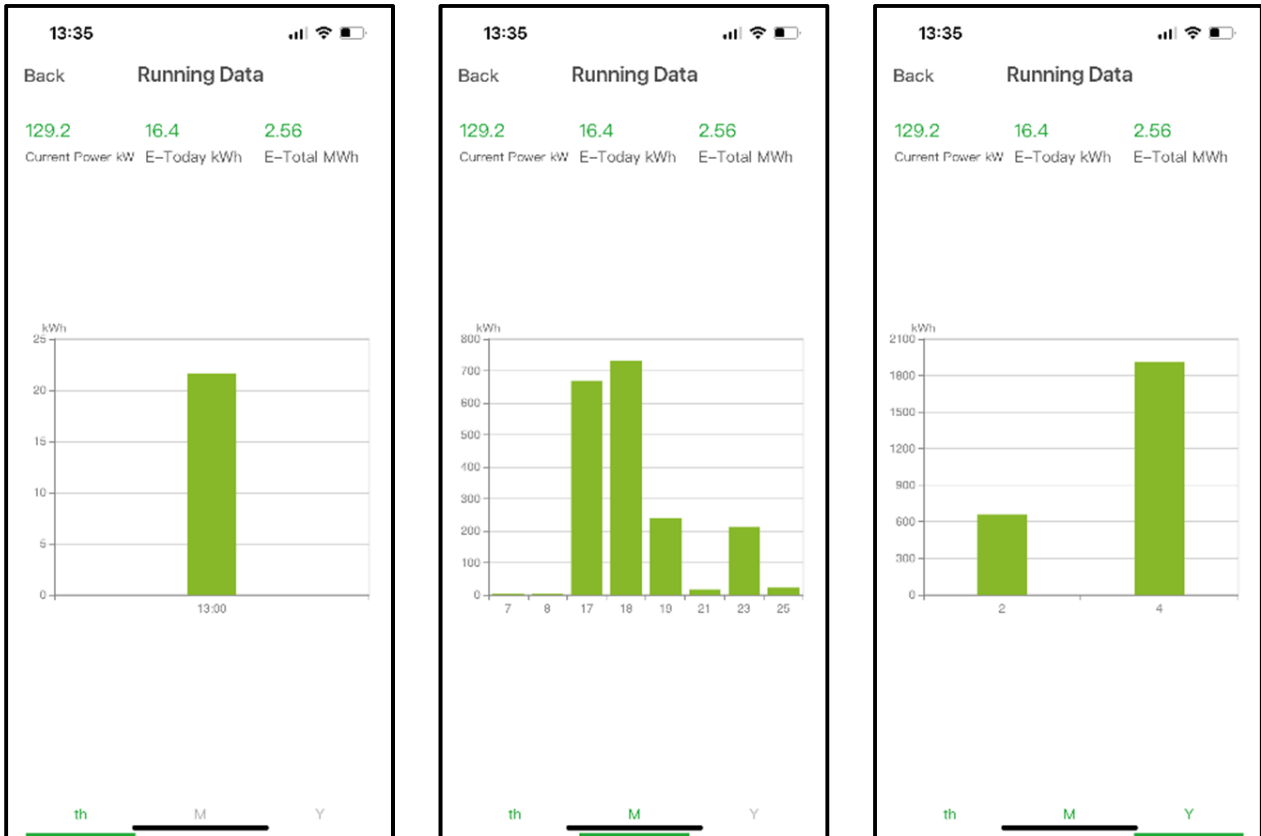
Figure 6-3 power generation situation

6.4.2 Setting Menu

Touch the **Setting** icon and input the password "1111", you will go to the setting interface.

Then it's possible to access the following sub-menus on the setting interface.

- Inverter Parameters
- Read/Write Register
- Upgrade Firmware
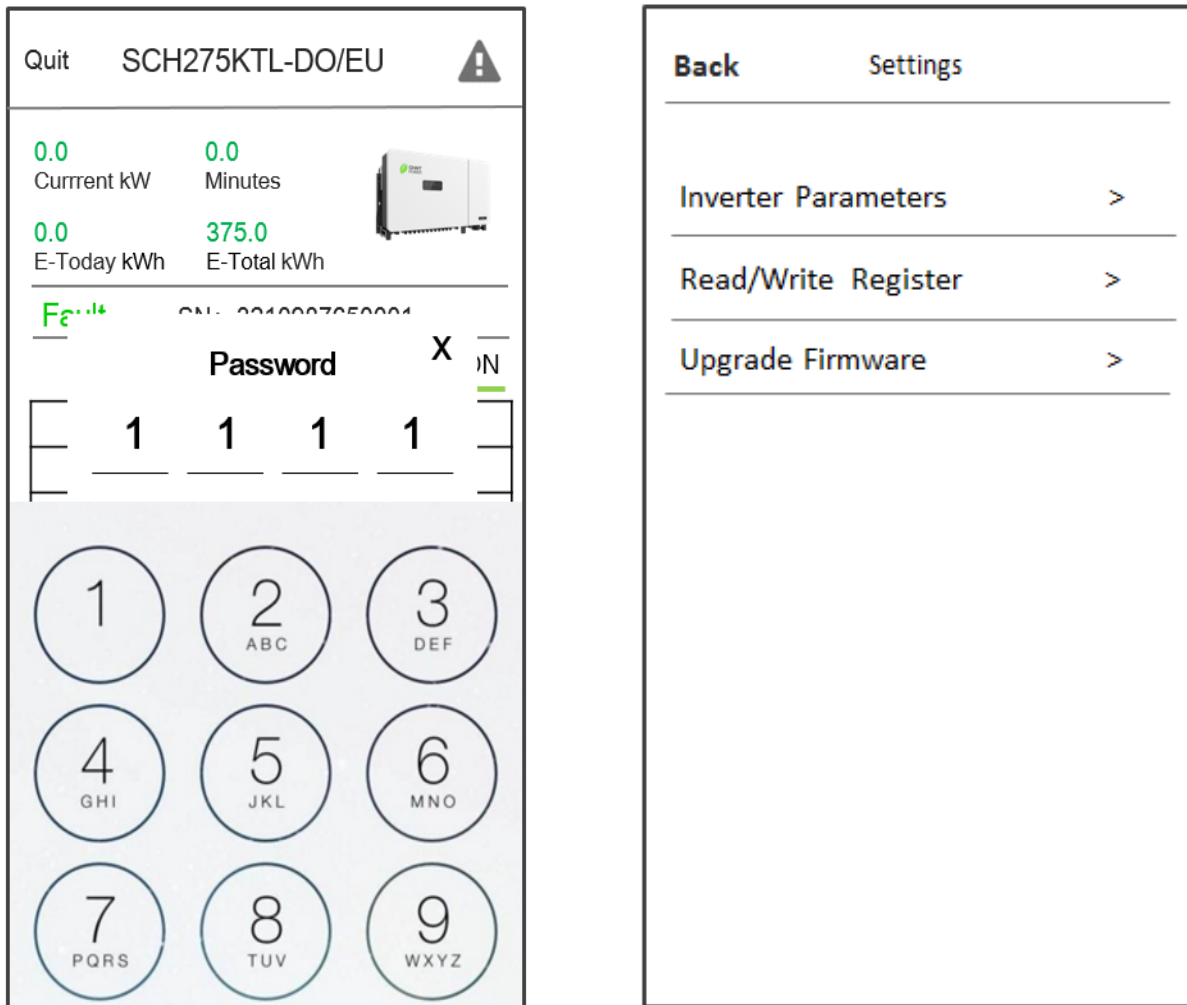
Figure 6-4 Setting interface

6.4.2.1 Inverter Parameters

Touch the **Inverter Parameters** tab, you can find the following sub-menus and set the following parameters.

- Grid Code
- PV Link Type
- Neutral Line
- RS 485
- Inverter Clock
- Change Password
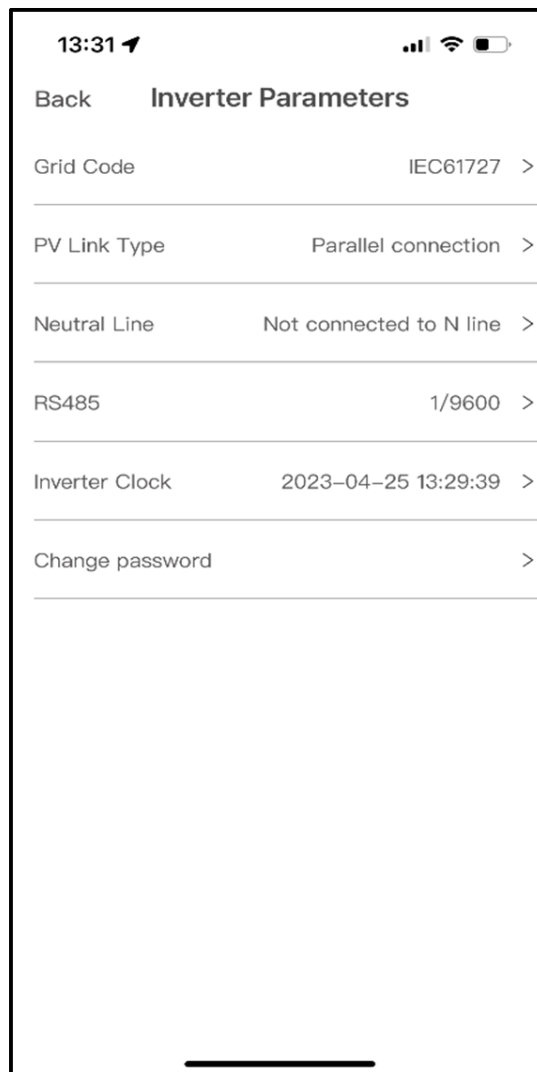
Figure 6-5 Inverter Parameters

IMPORTANT!

Please check with your local electric supply company before selecting a grid code. If the inverter operates with a wrong grid code, the electric supply company may cancel the interconnection agreement.

6.4.2.2 Read/Write Register

In the **Read/Write Register** interface, you can find the following sub-menus:

- Protect
- LVRT/HVRT
- Others
- Command
- ActivePowerDerating
- ReactivePowerDerating
- LcdLess Basic Parameters
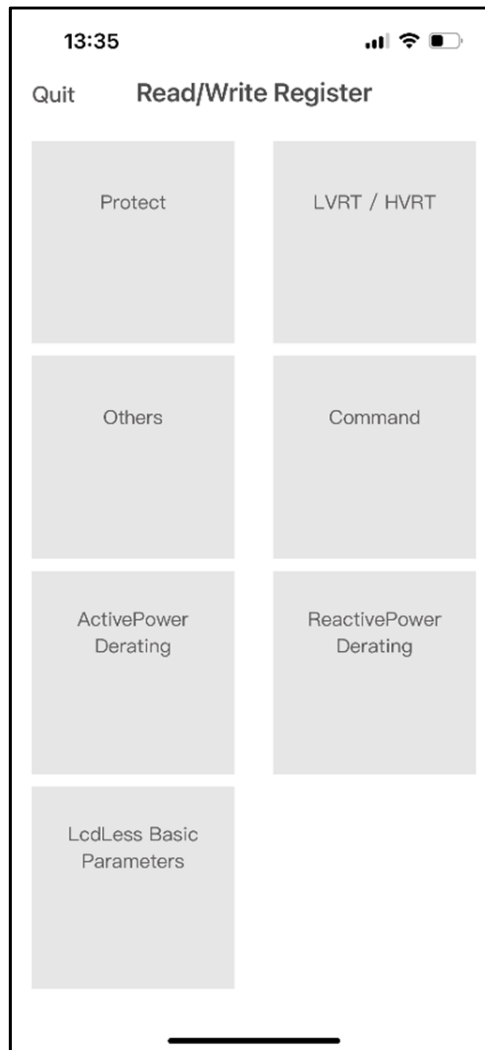
Figure 6-6 Read/Write Register

6.4.2.2.1 Protect

The Protect interface displays the protect parameters of the AC grid voltage, frequency and recovery, etc. In addition, you can find and set the protection levels of over voltage, under voltage, over frequency and under frequency.
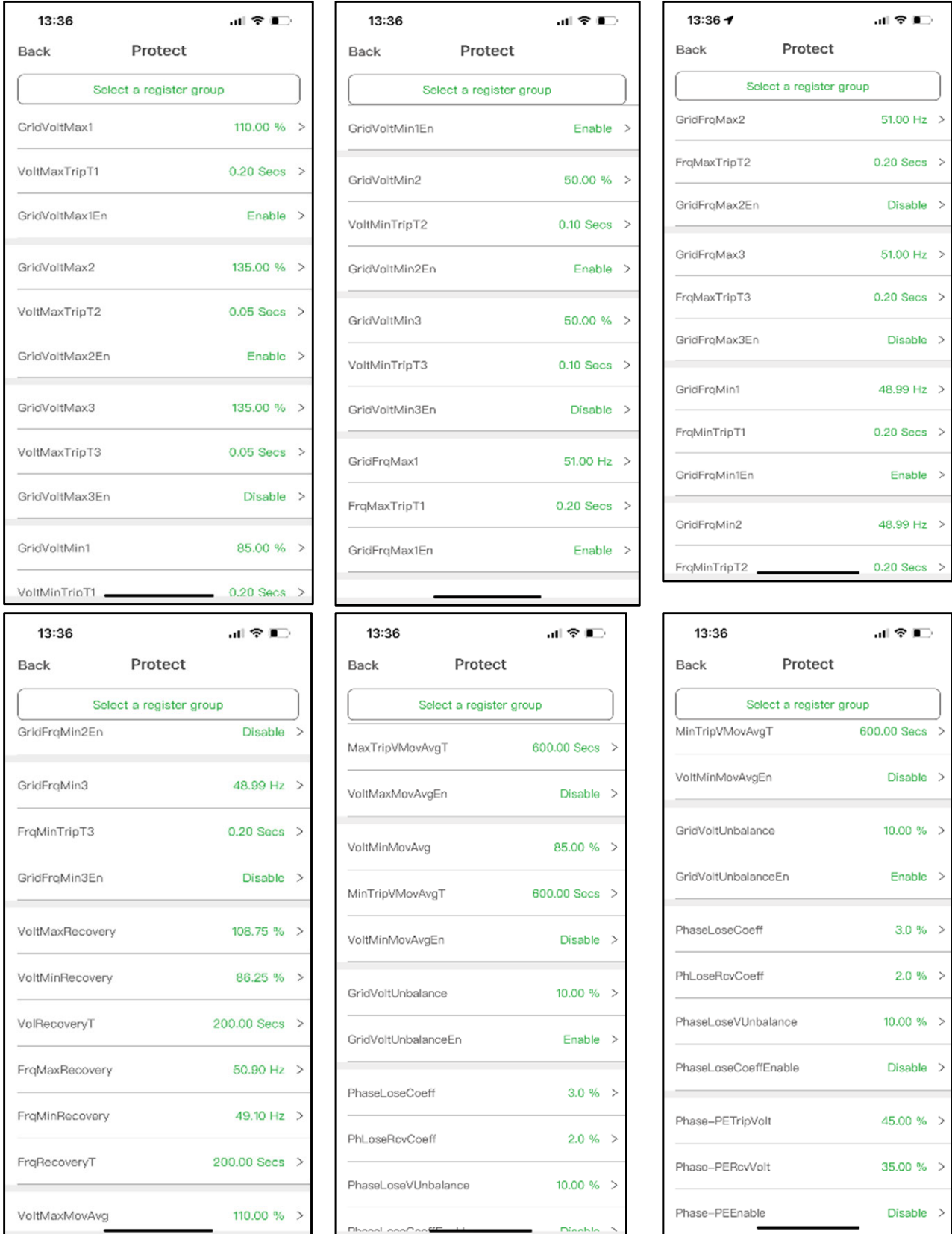
Figure 6-7 Protection Parameters

6.4.2.2.2 LVRT/HVRT

The LVRT/HVRT interface is used to set the LVRT (Low voltage ride through) and HVRT (High voltage ride through) parameters as shown in the following interfaces:
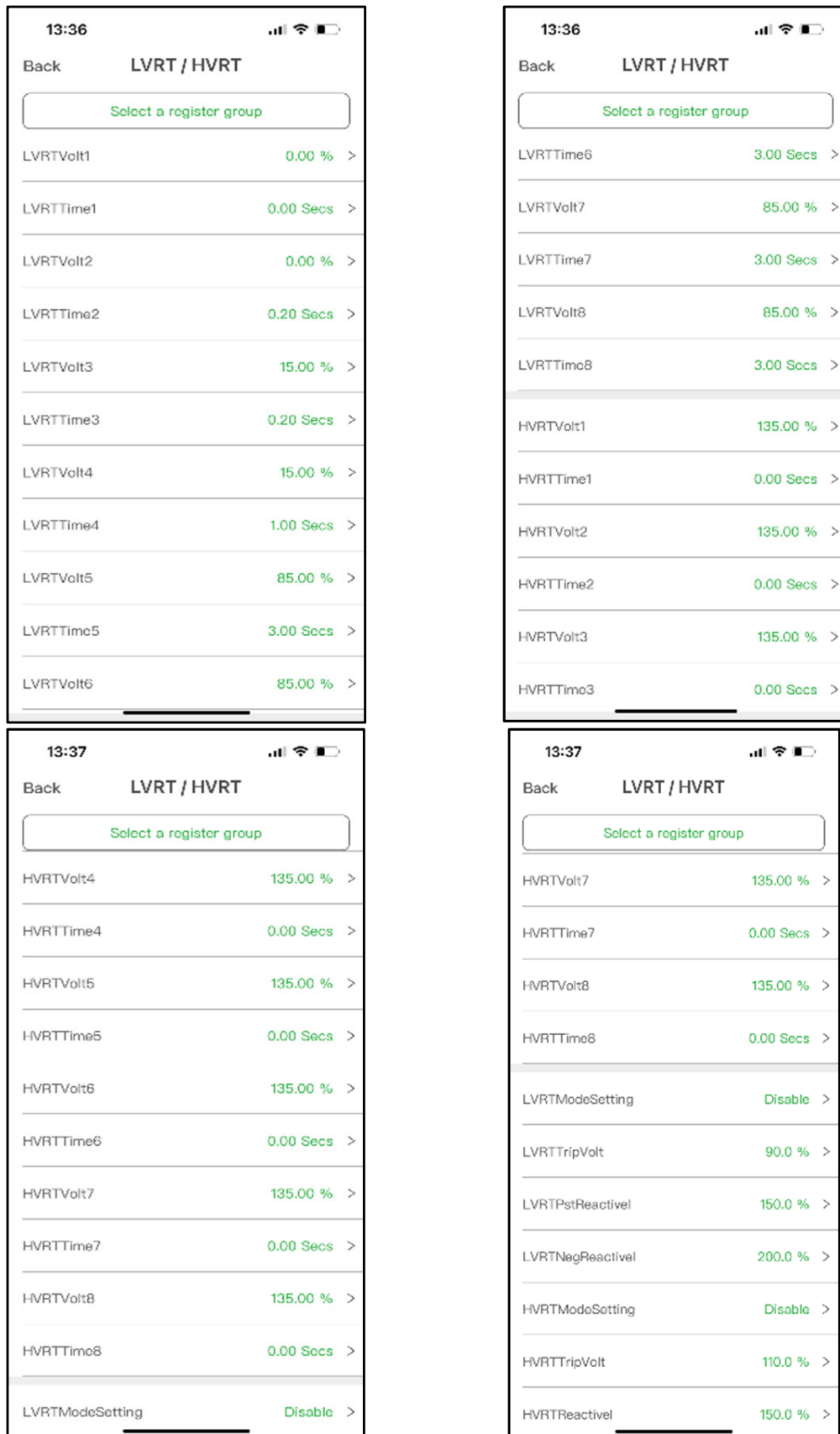
Figure 6-8 LVRT/HVRT interface

You can also see the LVRT Curve in Figure 6-9 and HVRT Curve in Figure 6-10.

Figure 6-9 LVRT Curve
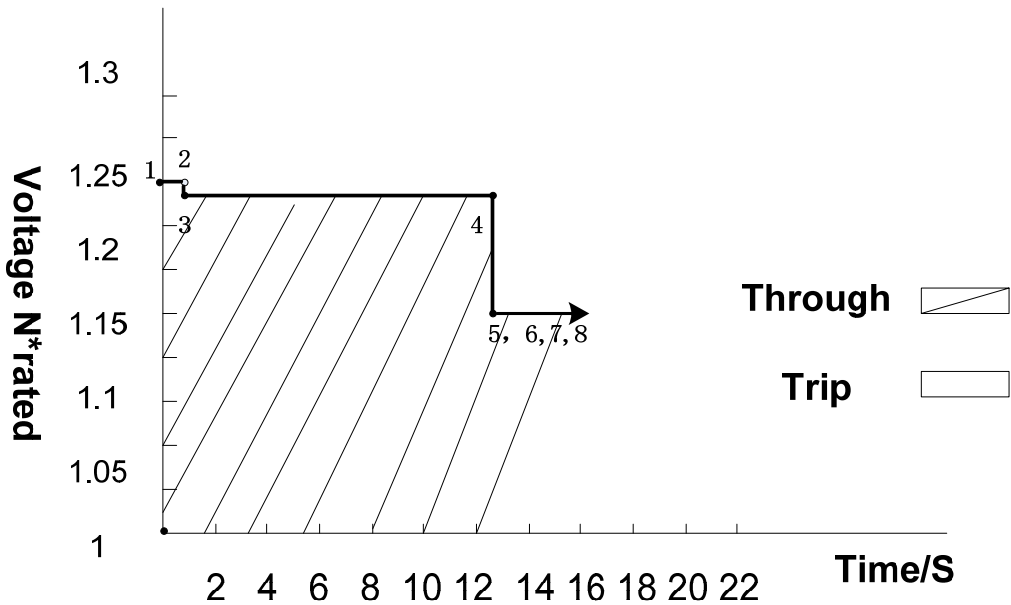
Figure 6-10 HVRT Curve

6.4.2.2.3 Others

In the others interface, you can find following common parameters shown as below.

Back	Others	
Select a register group		
PowerOnDelay	5 Secs	>
ReactiveStep	50.00 %	>
ErrSoftStartP	0.16 %	>
NormSoftStopP	6.00 %	>
NormSoftStopPEn	Enable	
NormSoftStartP	4.00 %	>
NormDeratingStep	6.00 %	>
PVSlowStartStep	10.00 %	>
PVSlowStartPwDelta	5.00 %	>
PVSlowStartSEn	Disable	>
FaultEnvT	83.0 ℃	

Back	Others	
Select a register group		
GFCIStaticValue	2.500 A	>
GFCIStaticT	0.20 Secs	>
GFCIStaticEn	Enable	>
GFCIDynProFactor	100.0 %	>
GFCIDynProEn	Disable	>
DCIProtection1	1.00 %	>
DCIProtectionT1	10.00 Secs	>
DCIProtection1En	Enable	
DCIProtection2	950 mA	>
DCIProtectionT2	1.00 Secs	>
DCIProtection2En	Disable	>

Back	Others	
Select a register group		
PVStartupVolt	550 V	>
MPPTScanPeriod	3600 Secs	>
MPPTScanEn	Disable	
ISOProtection	50 kΩ	>
ISOProtectionEn	Enable	>
StartUpMinTemp	−30.0 ℃	>
DuplicationControl	0 %	>
Article 4 groups, control parameter setting of inverter loop		>
PID Check Settings	Disable	>
Island Protect	Enable	>
FANDetectEn	Enable	

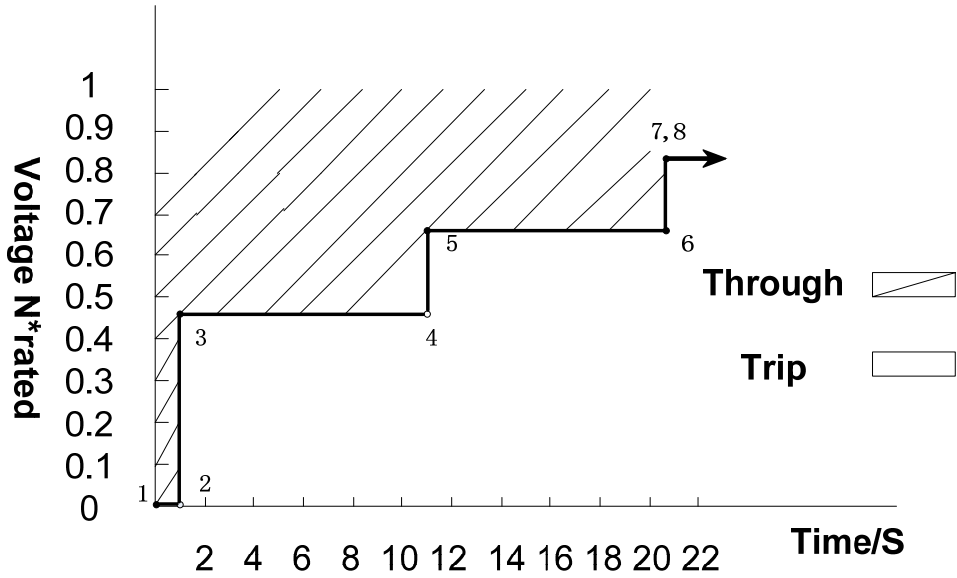| Back	Others	
Select a register group		
ACSPDDetectEnSet	Disable	>
OperationOverVol	120.00 %	>
OperationOverVolEn	Disable	>
VirtualDamping	0.000 Ω	>
MPPTRangEnable	Disable	>
RapidShutdownEnabBit	Disable	
FreqLv2PrtEn(CEI)	0	>
PV1FuseCheckEn	Disable	>
PV2FuseCheckEn	Disable	>
PV3FuseCheckEn	Disable	>
PV4FuseCheckEn	Disable	>

Back	Others	
Select a register group		
PV5FuseCheckEn	Disable	>
PV6FuseCheckEn	Disable	>
PV7FuseCheckEn	Disable	
PV8FuseCheckEn	Disable	>
PV9FuseCheckEn	Disable	>
PV10FuseCheckEn	Disable	>
PV11FuseCheckEn	Disable	>
PV12FuseCheckEn	Disable	>
PV13FuseCheckEn	Disable	
PV14FuseCheckEn	Disable	>
PV15FuseCheckEn	Disable	>

Back	Others	
Select a register group		
PV16FuseCheckEn	Disable	>
PV17FuseCheckEn	Disable	>
PV18FuseCheckEn	Disable	>
PV19FuseCheckEn	Disable	>
PV20FuseCheckEn	Disable	>
PV21FuseCheckEn	Disable	>
PV22FuseCheckEn	Disable	
PV23FuseCheckEn	Disable	>
PV24FuseCheckEn	Disable	>
OptiVoltMinMppt1	500.0 V	>
OptiVoltMaxMppt1	1450.0 V	>

Back	Others	
OptiVoltMinMppt2	500.0 V	
OptiVoltMaxMppt2	1450.0 V	>
OptiVoltMinMppt3	500.0 V	>
OptiVoltMaxMppt3	1450.0 V	>
OptiVoltMinMppt4	500.0 V	>
OptiVoltMaxMppt4	1450.0 V	>
OptiVoltMinMppt5	500.0 V	>
OptiVoltMaxMppt5	1450.0 V	>
OptiVoltMinMppt6	500.0 V	>
OptiVoltMaxMppt6	1450.0 V	
OptiVoltMinMppt7	500.0 V	>

Select a register group

Back	Others	
OptiVoltMaxMppt7	1450.0 V	>
OptiVoltMinMppt8	500.0 V	>
OptiVoltMaxMppt8	1450.0 V	>
OptiVoltMinMppt9	500.0 V	>
OptiVoltMaxMppt9	1450.0 V	
OptiVoltMinMppt10	500.0 V	>
OptiVoltMaxMppt10	1450.0 V	>
OptiVoltMinMppt11	500.0 V	>
OptiVoltMaxMppt11	1450.0 V	>
OptiVoltMinMppt12	500.0 V	>
OptiVoltMaxMppt12	1450.0 V	>

Select a register group

Figure 6-11 Others interface

6.4.2.2.4 Command

In the "Command" interface, you can access the following submenus:
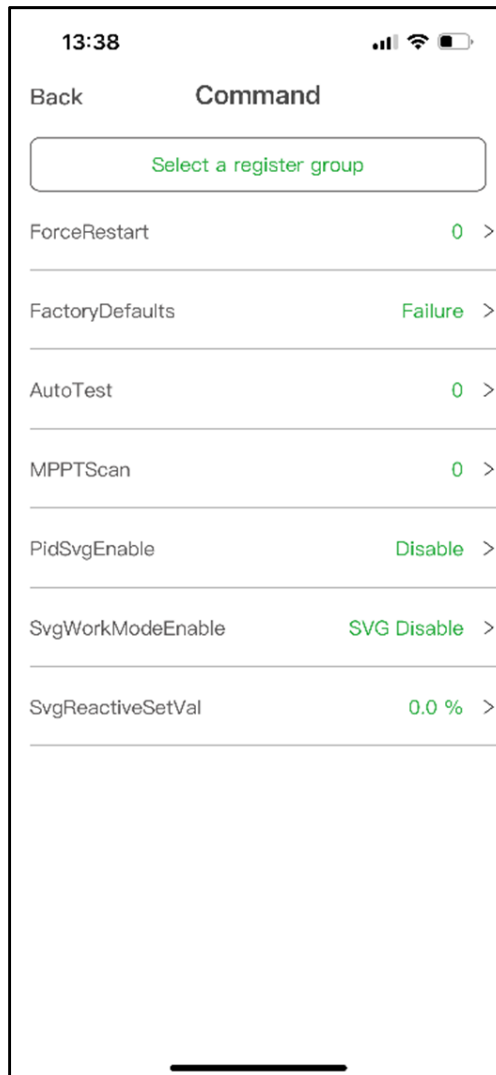
Figure 6-12 Commands interface

- **Force Restart**: If a fault shutdown happens, a severe fault may have occurred inside the inverter. The user can perform a force reboot for one time per Power on in this menu if the user needs to restart the inverter.
- **FactoryrDefaults**: The manufacturer's parameter default values can be restored when the inverter is not in operation mode. Otherwise "Fault Operated" will be reported.
- **AutoTest**: Only for Italian Grid Code.
- **MPPTScan**: It is used to execute the MPPT scanning manually. The device screen will skip to normal operation interface if the MPPT scanning succeeds, or remain on the interface if the scanning fails. MPPT scan function is used for multi-MPP tracking, and is useful if the PV panels are partly shadowed or installed with different angles. The factory setting of MPPT scan is <Enabled, yet can also be set to Disabled. When the MPPT scan function is enabled, the scan period is 60 minutes.

The inverter will scan the maximum power point in the MPPT range, according to the following conditions:

- The total input power is lower than 90% of the active power.
- Once this MPPT scan function is activated on the device, it will search the maximum power point at a voltage step of 5V in the MPPT range for full load, and retrieve the maximum power point.

• **PidSvgEnable**: When the communication between the control board and the communication board is lost in the evening, turn on the PID or SVG working mode. PID function can be set as PidNight, PidDay and PidDayNight; The SVG function can be divided into two modes: SVG Mode 1 and Mode 2, you can choose as required or disable this function.

• **SvgWorkModeEnable:** Using the SVG function or prohibit it.

• **SvgReactiveSetVal:** After choosing to enable SVG function, set the reactive power value acc. to requirements of Electricity Supply Company.

6.4.2.2.5 Active Power Derating

The ActivePower Derating menu is used to set the active power derating parameters, including Active Power Derating, Over Voltage Derating, Over Frequency Derating, etc.

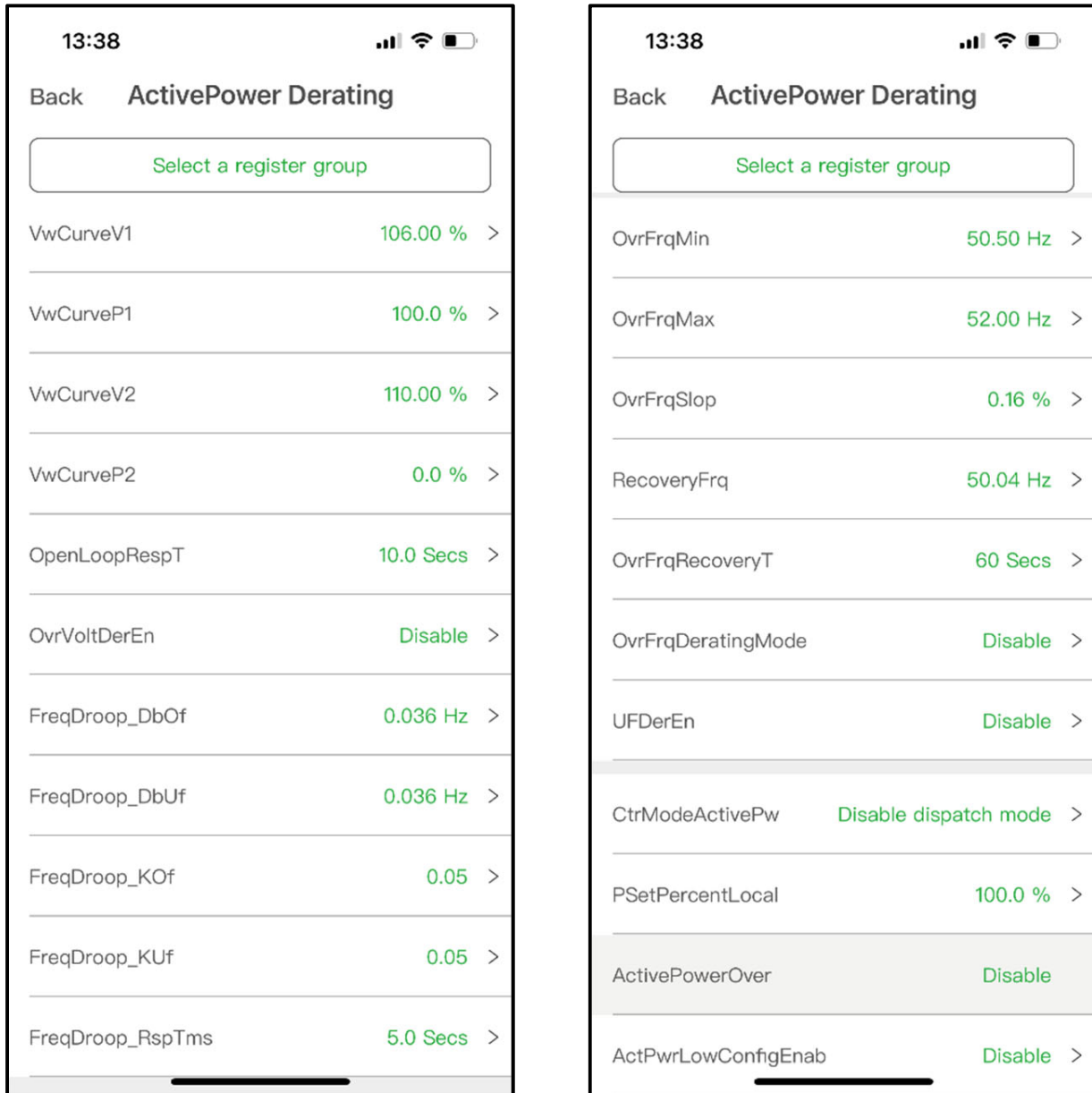In the "ActivePower Derating" interface, you can access and set the following parameters:

Figure 6-13 ActivePower Derating interface

You can see the Curve of over voltage derating in Figure 6-14 and Curve of over frequency derating in Figure 6-15.
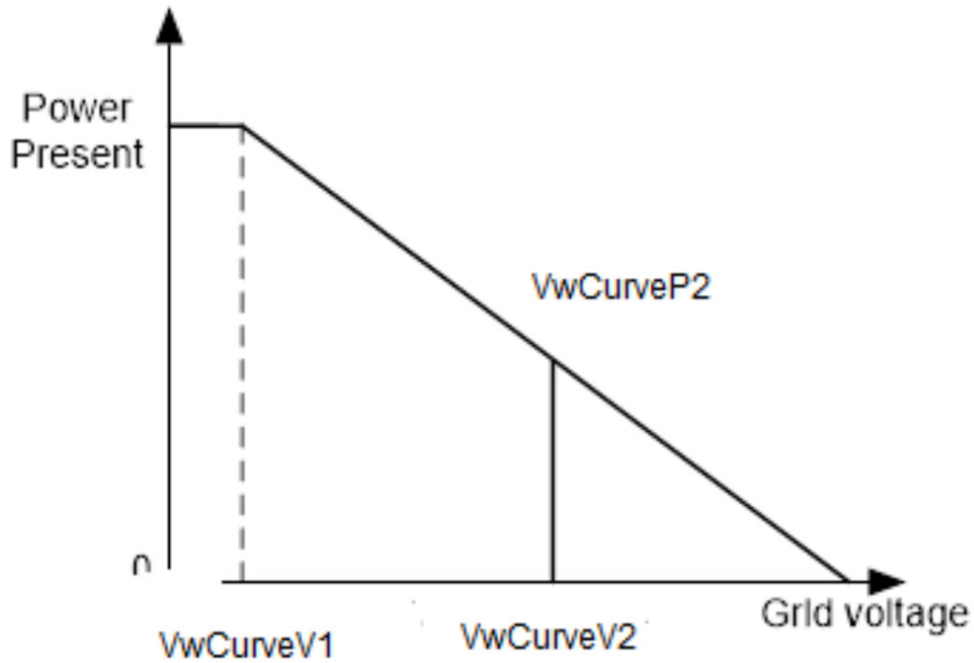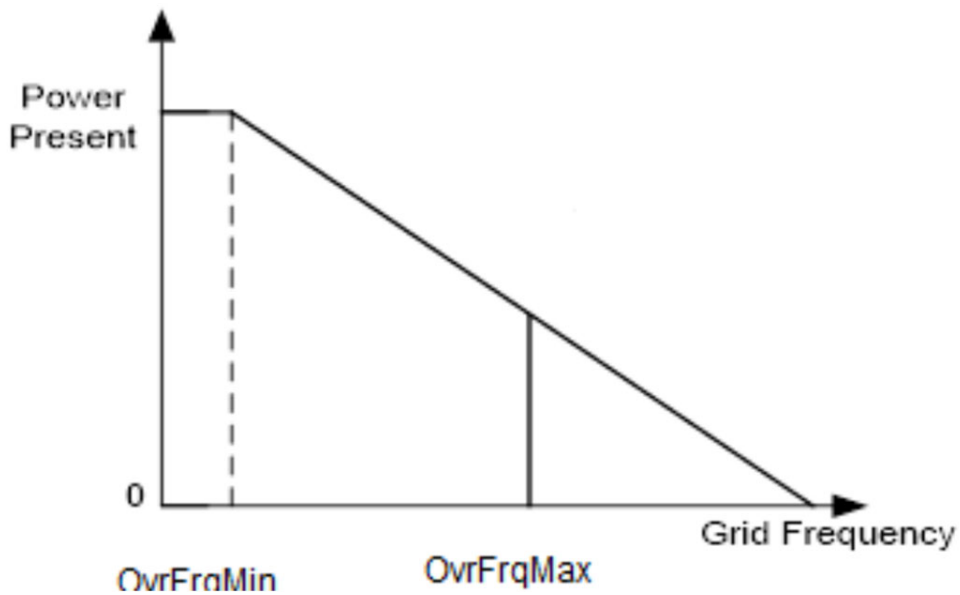

Figure 6-14 Curve of over voltage derating

Figure 6-15 Curve of over frequency derating

6.4.2.2.6 Reactive Power Derating

The ReactivePowerDerating interface is used to set the Grid reactive power derating parameters, including PF parameters and Qu parameters, etc.
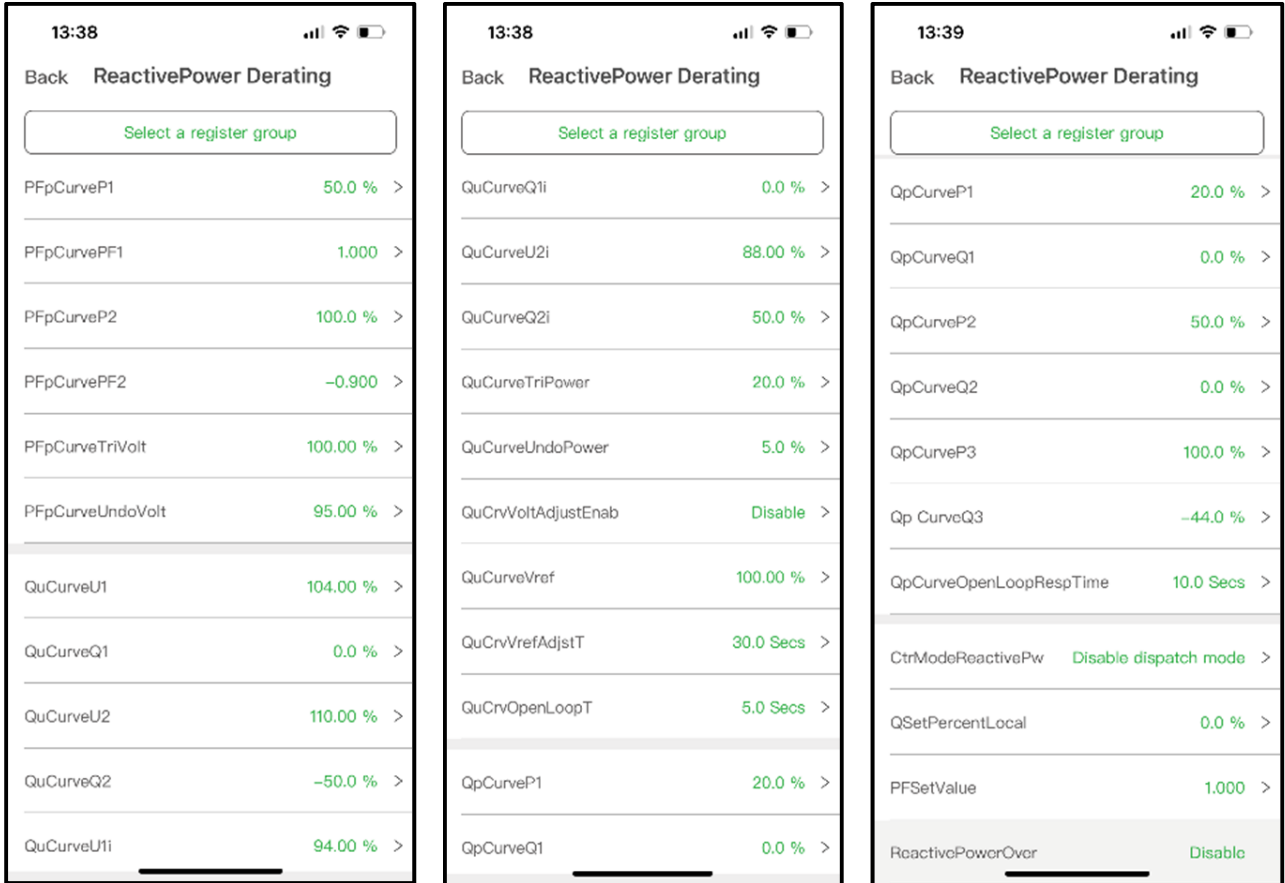
Screen 1 (13:38)

Back	**ReactivePower Derating**	
Select a register group		
PFpCurveP1	50.0 %	>
PFpCurvePF1	1.000	>
PFpCurveP2	100.0 %	>
PFpCurvePF2	−0.900	>
PFpCurveTriVolt	100.00 %	>
PFpCurveUndoVolt	95.00 %	>
QuCurveU1	104.00 %	>
QuCurveQ1	0.0 %	>
QuCurveU2	110.00 %	>
QuCurveQ2	−50.0 %	>
QuCurveU1i	94.00 %	>

Screen 2 (13:38)

Back	**ReactivePower Derating**	
Select a register group		
QuCurveQ1i	0.0 %	>
QuCurveU2i	88.00 %	>
QuCurveQ2i	50.0 %	>
QuCurveTriPower	20.0 %	>
QuCurveUndoPower	5.0 %	>
QuCrvVoltAdjustEnab	Disable	>
QuCurveVref	100.00 %	>
QuCrvVrefAdjstT	30.0 Secs	>
QuCrvOpenLoopT	5.0 Secs	>
QpCurveP1	20.0 %	>
QpCurveQ1	0.0 %	>

Screen 3 (13:39)

Back	**ReactivePower Derating**	
Select a register group		
QpCurveP1	20.0 %	>
QpCurveQ1	0.0 %	>
QpCurveP2	50.0 %	>
QpCurveQ2	0.0 %	>
QpCurveP3	100.0 %	>
Qp CurveQ3	−44.0 %	>
QpCurveOpenLoopRespTime	10.0 Secs	>
CtrModeReactivePw	Disable dispatch mode	>
QSetPercentLocal	0.0 %	>
PFSetValue	1.000	>
ReactivePowerOver	Disable	

Figure 6-16 The ReactivePowerDerating interface

Note: The PF and Q value can be adjusted by remote software if the "Remote" is selected.

- PF Set: Set the PF value. Note: Change the reactive power by adjusting the power factor.
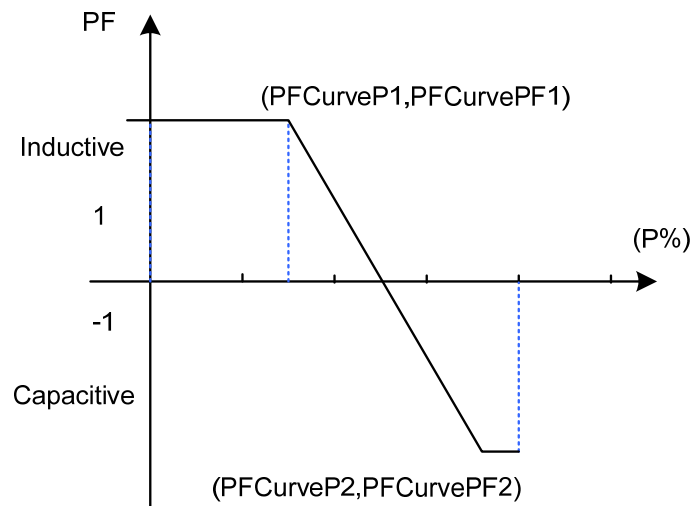- PF(P) Curve：PF curve mode. Note: The power factor changes according to the power change, as shown in Figure 6-17.

Figure 6-17 PF(P) Curve Mode

- Q(u) Curve：Q(u) curve mode.

Note: The reactive compensation changes according to the grid voltage change, as shown in Figure 6-18.
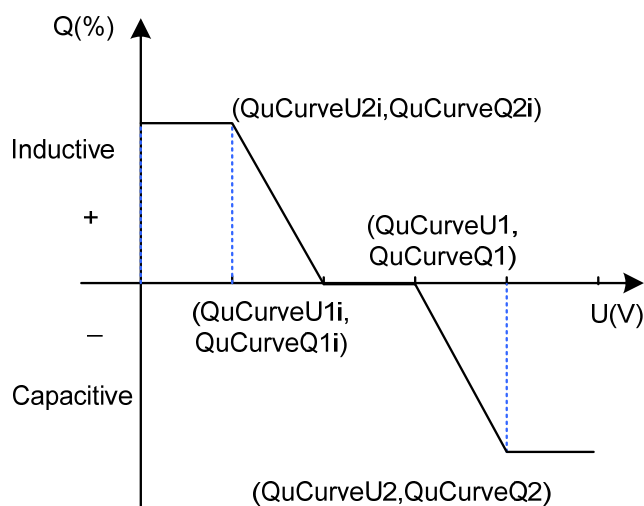

Figure 6-18 Q(u) Curve Mode

6.4.2.2.7 LcdLess Basic Parameters

The LcdLess Basic Parameters interface is used to set the parameters as below.
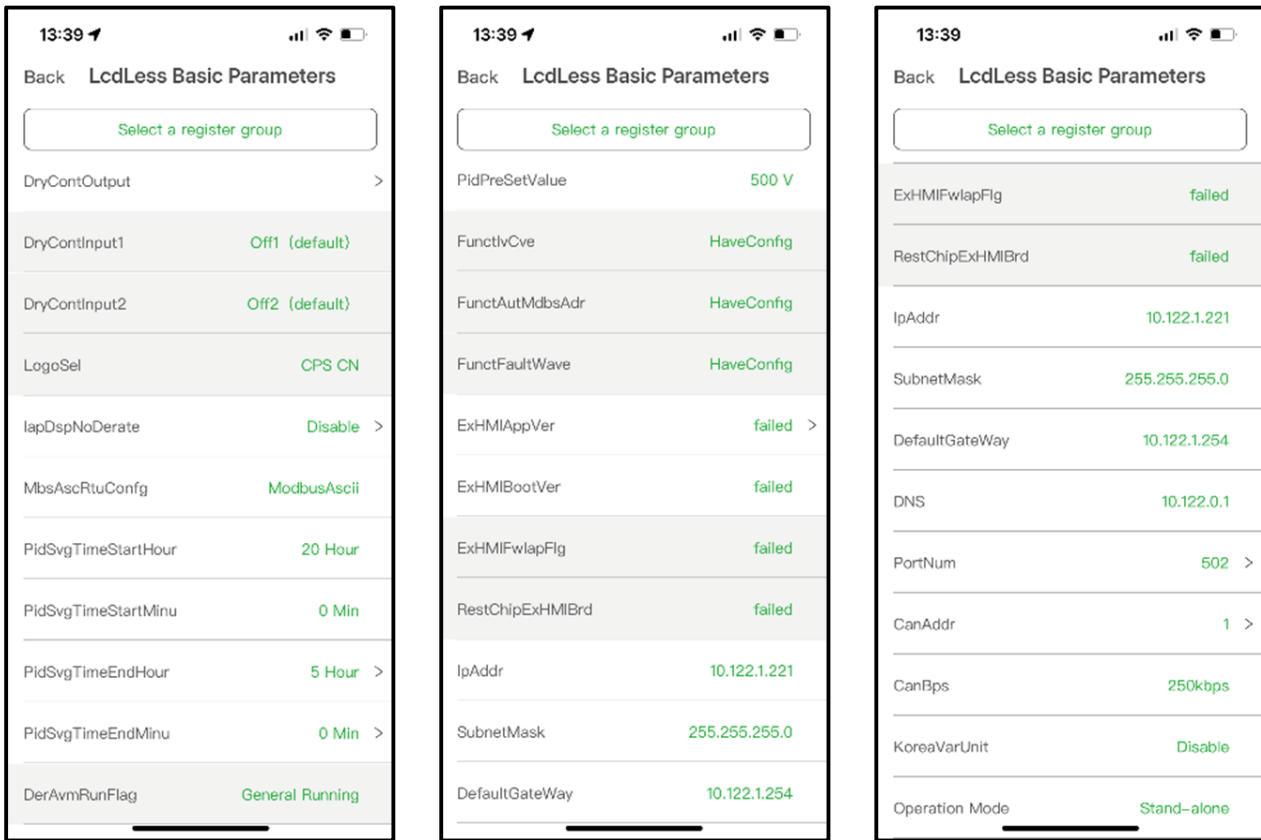

Figure 6-19 LcdLess Basic Parameters interface

All these three registers are configured as standard, and all these parameters are read-only, that means you cannot change them randomly.

6.4.2.3 Software Upgrade

As to the detailed procedures for software upgrade, refer to specific instructions or consult our after-sale support personnel.

6.4.3 Event Menu

Touch the **Event** icon, you can see two options： **Current** and **History**.

If you select the history option, there are 2 submenus in the History menu: "Warning" and "Running Status", as shown below.
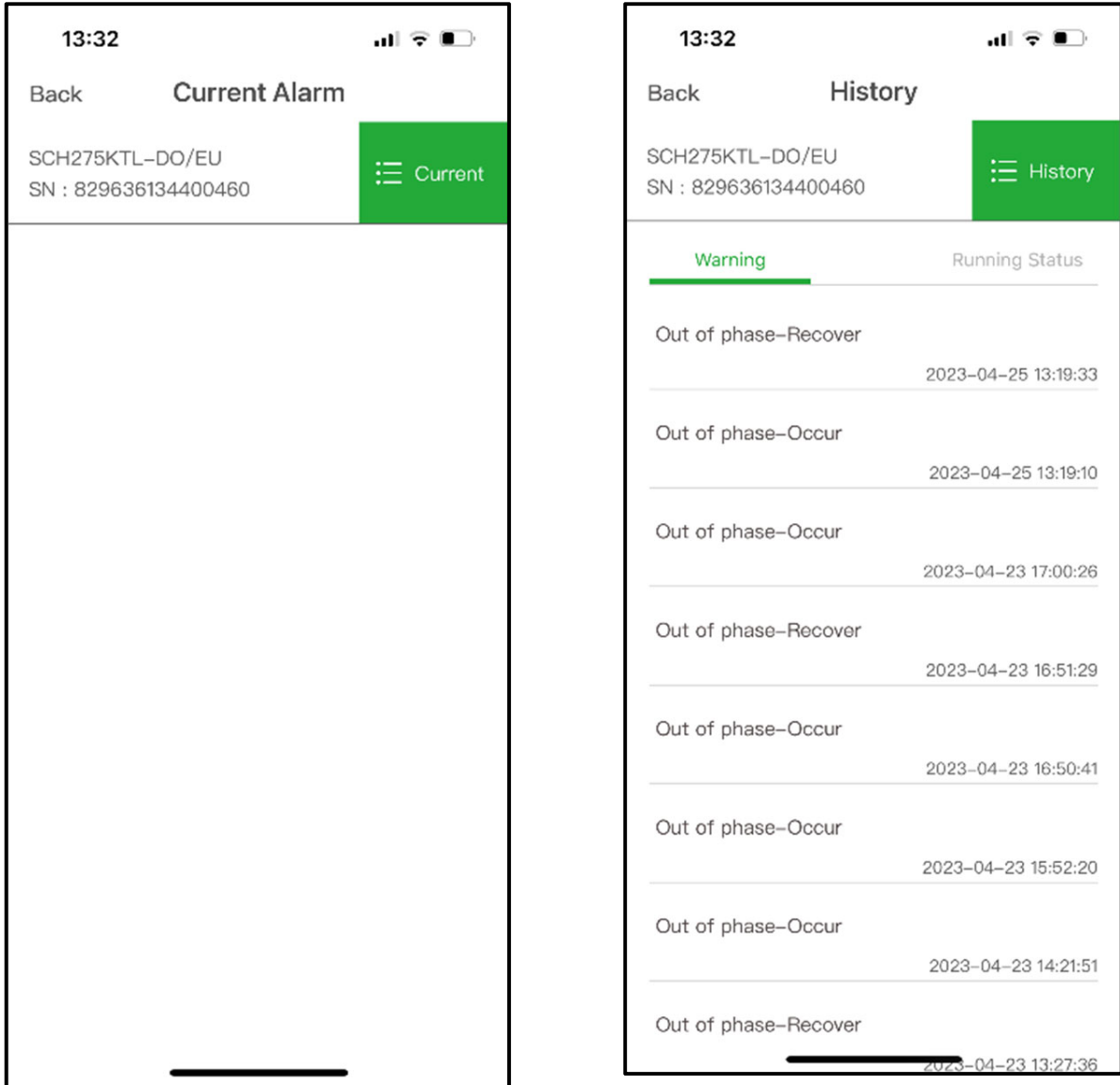

Figure 6-20 Current and History interfaces
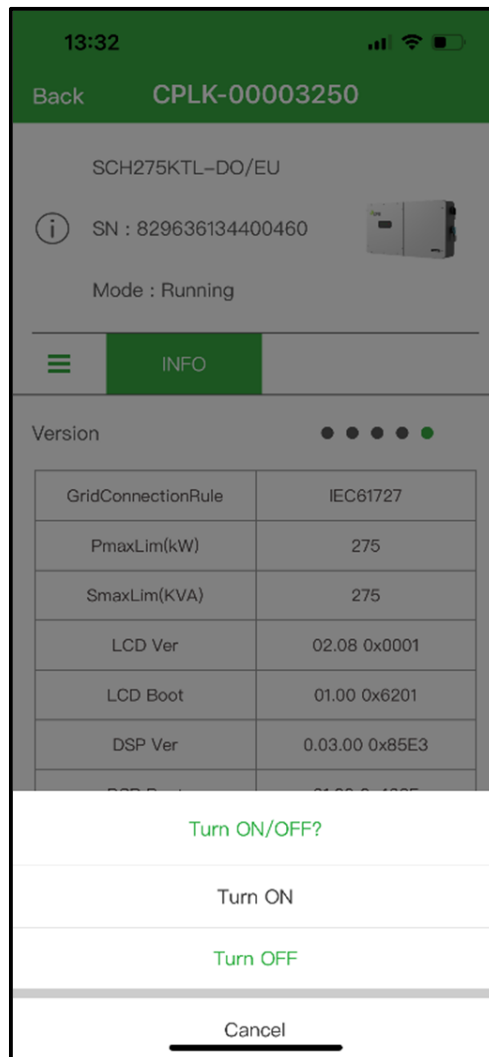
6.4.4 More Menu

Figure 6-21 Turn ON/OFF interface

- **Manual Turn ON/OFF**: Manual Power ON/OFF is required after Grid Code setting or manual (fault) shut-down. Touch to submenu **"**Turn ON/OFF". Then move the cursor to "Turn ON" to start the inverter, the inverter will start up and operate normally if the start-up condition is met. Otherwise, the inverter will go to stand-by mode.
Normally, it is not necessary to Turn OFF the inverter, but it can be shut down manually if Grid Code setting or maintenance is required.
Move the cursor to submenu "Turn ON/OFF". Move the cursor to "Turn OFF" and ensure, then the inverter will be shut down.
- **Automatic Turn ON/OFF**: The inverter will start up automatically when the output voltage and power of PV arrays meet the set value, AC power grid is normal, and the ambient temperature is within allowable operating range.
The inverter will be shut down automatically when the output voltage and power of PV modules are lower than the set value, or AC power grid fails; or the ambient temperature exceeds the normal range.

7 Maintenance and Replace

WARNING!

- Before starting any product maintenance, the inverter should be stopped running, the AC circuit breaker connected to the grid and the PV input on the DC side shall be all disconnected, and then wait at least 5 minutes before starting any operation.
- These servicing instructions are for use by qualified personnel only.
- To reduce the risk of electrical shock, do not perform other servicing other than those specified in the operation instructions unless you are qualified to do so.

7.1 Check Electrical Connections

- Check all the cable connections as a regular maintenance inspection every 6 months or once a year.
- Check the cable connections. If loose, please tight all the cables acc. to section 4.5 Electrical Cable Connection.
- Check for cable damage, especially whether the cable surface is scratched or smooth. Repair or replace the cables if necessary.

7.2 Clean the Air Vent Filter

The inverter can become hot during normal operation. So the inverter uses built-in cooling fans to provide sufficient air flow to help in heat dissipation.

In order to ensure good ventilation and heat dissipation of the inverter, it is necessary to check the air inlet and outlet regularly.

Ensure that air inlets and outlets are not blocked and clean the vent with soft brush or vacuum cleaner if necessary.

7.3 Replace the Cooling Fans

If the internal temperature of the inverter is too high or abnormal noise is heard assuming the air vent is not blocked and is clean, it may be necessary to replace the external fans.

IMPORTANT!

Please disconnect the AC & DC power before replacing the fans.

Refer to the following procedures for replacing the cooling fans.

1. Use a No.2 Phillips head screwdriver to remove the 4 screws fixing the fan tray as shown in Figure 7-1.
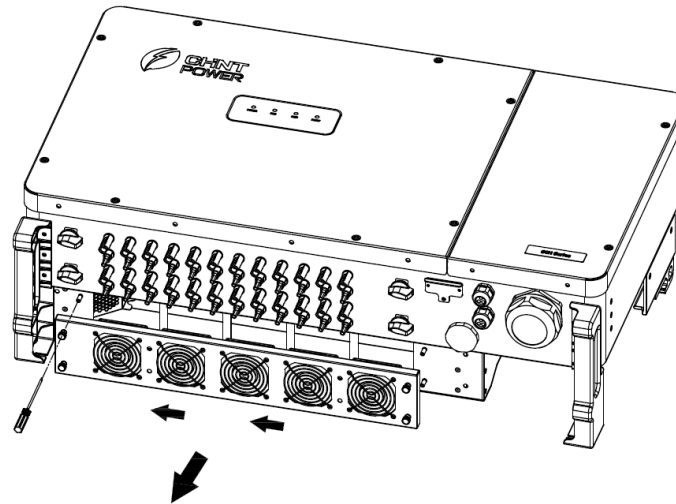
Figure 7-1 Remove the fan tray and fan

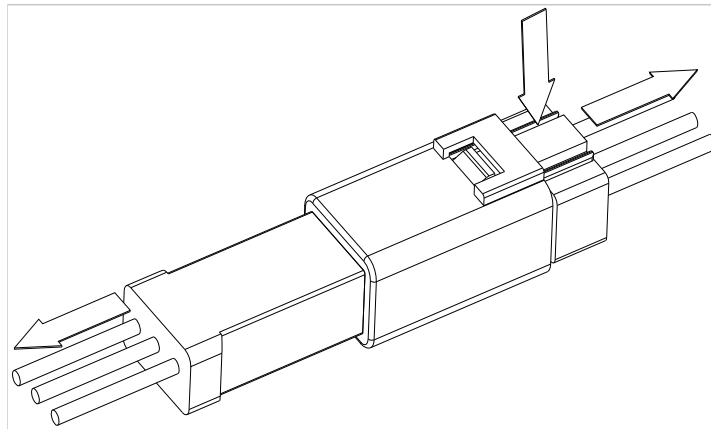2.　Disconnect the watertight cable connector from cooling fan, as shown in Figure 7-2.

Figure 7-2 Disconnect the watertight cable connector

3.　Use a No.2 Phillips head screwdriver to remove the 4 screws fixing every fan. (Figure 7-3)
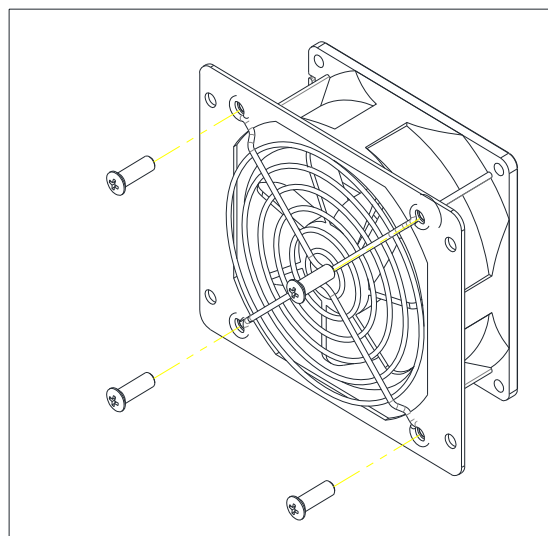

Figure 7-3 Replace cooling fans

4. Place the new cooling fans on the fan tray, and fasten the cable on the fan tray with cable ties. Tools required: No.2 Phillips head screwdriver, torque value: 14~18kgf.cm

5. Reinstall the assembled fans onto the inverter. Tools required: No.2 Phillips head screwdriver, torque value: 16kgf.cm.

7.4 Replace the Inverter

IMPORTANT!

Make sure the AC breaker and DC switch of inverter are turned off.

Replace the inverter in reverse order relative to the installation steps in section 3.4 Installation Procedures.

1. Use a #3 Philips head screwdriver to remove the two M6X16 screws.
2. Remove the inverter from its mounting bracket with the coordination of 3 people.
3. Replace the new inverter on the mounting bracket and fasten it.

8 Troubleshooting

8.1 LED Indicator Troubleshooting
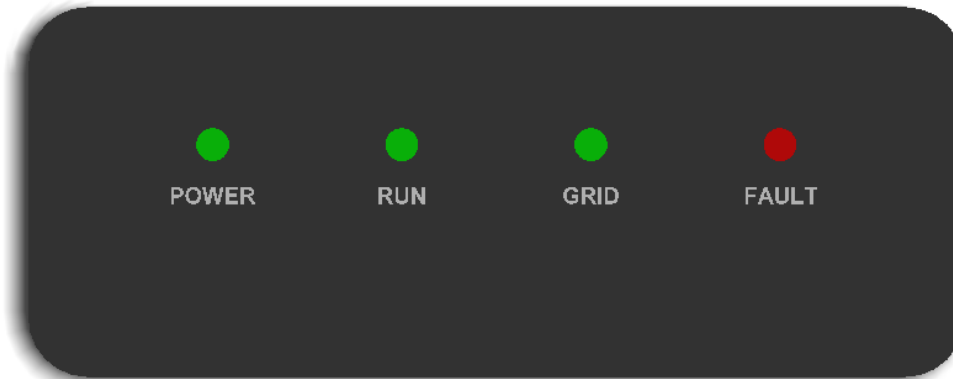
LED display of the inverter is shown as follows:

Figure 8-1 LED display of the inverter

Indicators and their indications are shown in Table 8-1.

LED Icon	Name	Status	Meaning
POWER (Green)	Working Power Indicator	On	Has working power
		Off	No working power
RUN (Green)	Grid Operation Indicator	On	In the state of Grid-tied power generation
		Flash	Derating operation status (on for 0.5 seconds, off for 1.6 seconds)
		Off	In other running state or no working power
GRID (Green)	Grid Status Indicator	On	Grid is normal
		Flash	The power grid is abnormal (on for 0.5 seconds, off for 1.6 seconds)
		Off	No power supply
FAULT (Red)	Fault Status Indicators	On	Permanent failure
		Quick Flash	General failure (on for 0.5 seconds, off for 0.5 seconds)
		Slow Flash	Alarm failure (on for 0.5 seconds, off for 2 seconds)
		Off	No fault or no working power supply
ALL	Upgrade status	Flash	LCD or DSP upgrading

Table 8-1 LED Indicators and their indications

If the LED light indicates any faults, please perform troubleshooting according to the Table 8-2.

LED status	Solutions
Neither the Power LED nor the LCD screen lights up.	• Turn off the external AC breaker. • Switch the DC switch to OFF position. • Check the PV input voltage and polarity.
The GRID LED is blinking.	• Turn off the external AC breaker. • Switch the DC switch to OFF position. • Check if the grid voltage is normal. • Check if the cable connection of AC side is correct and secure.
The RUN LED lights off or FAULT LED lights up.	• Refer to Table 8-3 for troubleshooting.

Table 8-2 Troubleshooting based on LED Lights

8.2 Common Fault and Troubleshooting

DANGER!
• Please disconnect the inverter from AC grid and PV modules before opening the equipment. Make sure hazardous high voltage and energy inside the equipment has been discharged.
• Do not operate or maintain the inverter until at least 5 minutes after disconnecting all sources of DC and AC.

The inverter will be shut down automatically if the PV power generation system fails, such as output short circuit, grid overvoltage/under voltage, grid over frequency/under frequency, high environmental temperature or internal malfunction of the machine. The fault information will be displayed on the APP interface.

The troubles can be identified and resolved based on the definitions, possible causes and recommended solutions listed in the following table. There are generally 3 types of fault: warning, protection and hardware fault. Proper analysis is recommended before contacting after-sales service.

Fault Codes	Solutions
CommErr	Definition: Communication inside inverter fails
	Possible causes: Terminal block connecters of internal communication wires have poor contact
	Recommended solutions: 1. Observe for 5 minutes and see whether the alarm will be

	eliminated automatically;
	2. Switch off 3-phase working power supply and then reboot the system;
	3. Contact after-sales service personnel.
ExtFanErr	Definition: Cooling fan failure by visual check
	Possible causes: 1. Fan is blocked; 2. Fan service life has expired; 3. Fan socket connecter has poor contact.
	Recommended solutions: 1. Observe for 5 minutes and see whether the alarm will be eliminated automatically; 2. Check for foreign objects on fan blades; 3. Switch off 3-phase work power supply and then reboot the system; 4. Contact after-sales service personnel.
IntFanErr	Recommended solutions: 1. Observe for 5 minutes and see whether the alarm will be eliminated automatically; 2. Check for foreign objects on fan blades; 3. Switch off 3-phase work power supply and then reboot the system; 4. Contact after-sales service personnel.
Warn0030 (EepromErr)	Definition: Internal alarm
	Recommended solutions: 1. Observe for 5 minutes and see whether the alarm will be eliminated automatically; 2. Contact after-sales service personnel.
Warn0040 (DC SPD fault)	Recommended solutions: The alarm is reserved now. The alarms in field can be ignored.
Warn0050 (TempSensorErr)	Recommended solutions: 3. Observe temperature display; 4. Switch off 3-phase working power supply and then reboot the system; 5. Contact after-sales service personnel.
Warn0100 (AC SPD fault)	Recommended solutions: The alarm is reserved now. The alarms in field can be ignored.

Table 8-3 Troubleshooting list of warning faults

Fault Codes	Solutions
Protect0090 (Bus over voltage)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
Protect0070 (Bus imbalance)	1. Raise limit of IDCmax (for example, 400mA) to allow inverter more room to adjust in transient condition to cope with imbalance of impedance and voltage between Grid phases 2. If after adjustment, alarm still occurs, replace inverter
Protect0030 (Inverter Over Current)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
GridV.OutLim	1. Make sure the grid connection is good. 2. Restart the inverter again.
GridF.OutLim	1. Check the AC wires connection and AC frequency is in range; 2. Check the measurement value in LCD, if the grid frequency is in limit, restart the inverter.
Protect0020 (Grid relay error)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
TempOver (Over-temperature protection)	1. Confirm that external ambient temperature is within the specified range of operating temperature; 2. Check whether air inlet is blocked; 3. Check whether fan is blocked; 4. Check whether the location of installation is appropriate or not; 5. Observe for 30 minutes and see whether the alarm will be eliminated automatically; 6. Contact after-sales service personnel.
Protect0180 (The sampling offset of DCI)	1. If the inverter can start up, then recalibrate. 2. If the inverter always report this alarm and cannot start up, then replace inverter.
Protect0170 (DCI high)	1. Raise limit of DCImax (for example, 400mA) to allow inverter more room to adjust in transient condition to cope with imbalance of impedance and voltage between Grid phases 2. After raising limit, if inverter cannot clear fault, replace inverter.
IsolationErr (Insulation resistance low)	Check wires of PV and ground: 1. Turn OFF AC switch to disconnect inverter from Grid. 2. Open fuse drawers to de-couple PV strings from each other. Test strings with string test set. 3. Add one PV string at a time, and start up inverter to see if alarm occurs.

	4. If there is no alarm, turn OFF AC switches to disconnect from Grid and add in the next string. Startup inverter again.
	5. Continue until you can find the string that triggers the alarm. Trace wirings of faulted string to find any leakage to Earth Ground.
	6. The parameter ISOResist in hidden menu can be adjusted a bit.
GFCIErr (leakage current high)	Check wires of PV and ground: 1. Turn OFF AC switch to disconnect inverter from Grid. 2. Open fuse drawers to de-couple PV strings from each other. Test strings with string test set. 3. Add one PV string at a time, and startup inverter to see if alarm occurs. 4. If there is no alarm, turn OFF AC switches to disconnect from Grid and add in the next string. Startup inverter again. 5. Continue until you can find the string that triggers the alarm. Trace wirings of faulted string to find any leakage to Earth Ground.
Protect0150 (Mini MCU Fault)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
Protect0110 (BUS over voltage (firmware))	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
Protect0100 (The sensor fault of leakage current)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace filter board or inverter.
Reverse PVx electrode (x=1,2…18 / 24)	1. Turn DC Switch OFF 2. Open Fuse holder to isolate PV strings 3. Use meter to find out which PV string is connected in reverse polarity. 4. Correct PV string connection. 5. Contact after-sales service personnel.
High PVx Input current (x=1,2…18 / 24)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. Contact after-sales service personnel.
High PVx Input voltage (x=1,2…18 / 24)	1. Check if its input voltage is within 1100V; 2. Restart inverter by recycle both AC and DC switches. 3. Wait for 1 minute between OFF and ON for all energy to

		discharge.
	4.	Contact after-sales service personnel.
PVVoltOver	1.	Measure voltage at DC terminals in wiring box and compare with reading in Measurement menu. PV voltage must be less than 1000V in open circuit condition.
	2.	If display reading is not within 2% of meter reading, replace inverter.
	3.	If display reading is within 2% of meter reading, adjust number of panels in the string.
Protect0230 (Inverter open-loop self-test fault)	1.	Restart inverter by recycle both AC and DC switches.
	2.	Wait for 1 minute between OFF and ON for all energy to discharge.
	3.	If inverter cannot clear fault, replace inverter.

Table 8-4 Troubleshooting list of Protection faults

Fault Codes	Solutions
Fault0130 (Bus over total voltage)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
Fault0110 (Bus imbalance)	1. Raise limit of IDCmax (for example, 400mA) to allow inverter more room to adjust in transient condition to cope with imbalance of impedance and voltage between Grid phases 2. If after adjustment, alarm still occurs, replace inverter.
Fault0100 (Grid relay fault)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.
Fault0090 (Static leakage current high)	Check wires of PV and ground: 1. Turn OFF AC switch to disconnect inverter from Grid. 2. Open fuse drawers to de-couple PV strings from each other. Test strings with string test set 3. Add one PV string at a time, and startup inverter to see if alarm occurs. 4. If there is no alarm, turn OFF AC switches to disconnect from Grid and add in the next string. Startup inverter again. 5. Continue until you can find the string that triggers the alarm. Trace wirings of faulted string to find any leakage to Earth Ground.
Fault0060 (CPLD Fault)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace Control Board or inverter.
Fault0020 (Bus over volt Hardware)	4. Restart inverter by recycle both AC and DC switches. 5. Wait for 1 minute between OFF and ON for all energy to discharge. 6. If inverter cannot clear fault, replace inverter.
Fault0150 (Open-loop self-check failure)	1. Restart inverter by recycle both AC and DC switches. 2. Wait for 1 minute between OFF and ON for all energy to discharge. 3. If inverter cannot clear fault, replace inverter.

Table 8-5 Troubleshooting list of hardware faults

9 Technical Data

Model Name	CPS SCH275KTL-DO/EU		CPS SCH250KTL-DO/EU	
DC Input				
Max DC input voltage	1500Vdc			
MPPT operating voltage range	500-1450Vdc			
Start Voltage/Power	550Vdc/500W			
Rated DC Voltage	1190V			
Number of MPPT	12	6	12	6
Number of DC Connection Sets per MPPT	2	3	2	3
Max DC Current per MPPT	30A	60A	30A	60A
Max. DC short-circuit current per MPPT	50A	90A	50A	90A
DC Disconnection Type	Integrated Switch			
AC Output				
Rated AC Power	275kW		250kW	
Maximum AC power	275kVA			
Rated AC voltage	800V			
Rated AC voltage range	680-880Vac			
Grid Connection Type	3Φ / PE			
Maximum AC current	198.5A		180.4A	
Grid Frequency	50Hz/60Hz			
Grid Frequency Range	47-53Hz/57-63Hz			
Power factor (cosφ)	>0.99(±0.8 adjustable)			
Current THD	<3%			
AC disconnect type	-			
System parameters				
Topology	Transformerless			
Max. Efficiency	0.99			
Euro Efficiency	0.985			
Consumption at Standby/Night	<30W / <6W			
Environmental parameters				
Ingress Protection	IP65		IP66	
Cooling Method	Cooling Fans			
Operating temperature	-30°C - +60°C (Derate from +45°C)			
Operating humidity	0-100%			
Operating altitude	4000m			
Display and communication				
Display	LED+APP (Bluetooth)			
Communication	PLC / Wi-Fi / RS485(Standard) & 4G (Optional)			
Structural parameters				
Dimensions (WxHxD) (mm)	1100x680x337			
Weight (kg)	105			
Safety				
Safety and EMC standards	IEC/EN 62109-1/2；IEC/EN 61000-6-2/4			
Grid-tied specification	IEC 61727,IEC 62116,IEC 60068-2,IEC 61683, EN50549,NC RfG			

Table 9-1 Datasheet

10 Quality Assurance

10.1 Liability Exemption

1. Damage during transportation;
2. Operate in an environment beyond the provisions of this manual;
3. Incorrect or inappropriate use of the product (including installation and use);
4. Unauthorized modification of the product or provided software;
5. Ignore the safety warnings and relevant statutory safety regulations contained in the product and documentation;
6. Unforeseen disasters or irresistible accidents occur.

10.2 Warranty Clauses

1. For products that fail during the warranty period, our company will repair or replace new products free of charge;
2. The unqualified product under replacement should be returned to our company;
3. It is necessary to provide a reasonable time for the company to overhaul the equipment.
4. For more warranty terms, refer to the applicable standard warranty policy in place at time of purchase

11 Recycling

Distributors or installers should contact the inverter manufacturer after removing the inverter from the photovoltaic module and follow the instructions.

The inverter cannot be disposed of as household waste.

When the inverter's service life expires, please dispose of it in accordance with the electrical waste disposal laws applicable to the installation location.

You can contact the inverter manufacturer or distributor for handling.

12 Appendix

12.1 Appendix A: Figure list

12.2 Appendix B: Table list

Shanghai Chint Power Systems Co., Ltd.

Headquarters: Building 4, No. 3255, Sixian Road, Songjiang District, Shanghai, China

Switchboard: +86-21-37791222-866000

Customer Service Hotline: +86-21-37791222-866300

Fax: +86-021-37791222-6001

Website: www.chintpower.com

Email: service.cps@chint.com