

# GOODWE



## User Manual

**Grid-Tied PV Inverter**

**DNS Series**

**2.9-6kW**

V1.9-2022-11-15

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# 1 Symbols



Failure to observe warnings indicated in this manual may result in injury.



Recyclable materials



Danger of high voltage & electric shock



This side up - The package must always have the arrows point up



Don't touch, hot surface!



No more than six (6) identical packages be stacked on each other.



Special disposal instructions



Fragile



Keep Dry



Refer to operation instructions



Wait at least 5 minutes after disconnecting the inverter before touching internal parts



CE mark

## 2 Safety Measures & Warning

The DNS series inverter of GoodWe Technologies Co., Ltd. (hereinafter referred to as GOODWE) strictly conforms to related safety rules in design and test. Safety regulations relevant to the location shall be followed during installation, commissioning, operation and maintenance. Improper operation pose a risk of electric shock or damage to equipment and property. (DNS Dual-MPPT, Single-Phase)

- Installation and connection of inverters must be performed by qualified personnel, in compliance with local electrical standards, regulations and the requirements of local power authorities and/or companies.
- To avoid electric shock, DC input and AC output of the inverter must be disconnected for at least 5 minutes before performing any installation or maintenance.
- The temperature of some parts of the inverter may exceed 60°C during operation. To avoid being burnt, do not touch the inverter during operation. Let it cool before touching it.
- Keep children away from the inverter.
- Do not open the front cover of the inverter, except operating the wiring terminal (as instructed in this manual). Touching or changing components without authorization may cause injury to people, damage to inverters and annulment of the warranty.
- Static electricity may damage electronic components. Appropriate methods must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty annulled.
- Ensure the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty annulled.
- When exposed to sunlight, the PV array generates dangerous high DC voltage. Please operate according to our instructions, or it will result in danger to life.
- PV modules should have an IEC61730 class A rating.
- If the equipment is used in a way not specified by the manufacturer, the protection provided by the equipment's design may be impaired.
- To completely isolate the equipment: switch off the DC switch, disconnect the DC terminal, and disconnect the AC terminal or AC breaker.
- Insert or pull the AC and DC terminals when the inverter is powered on is prohibited.

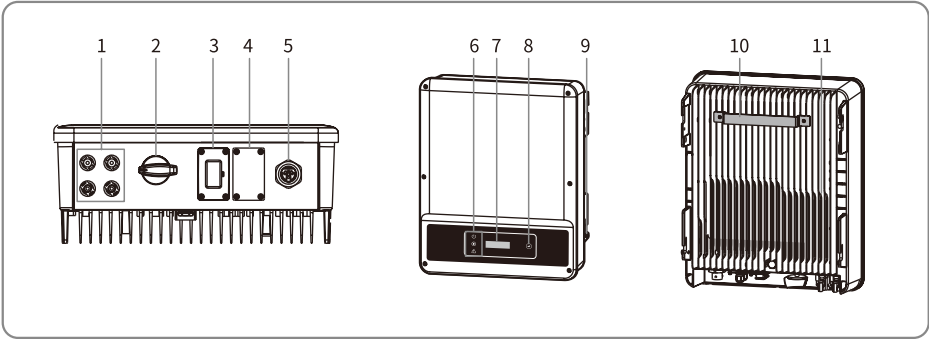
- If there are more than 3 PV strings on input side, additional fuse installation will be suggested.
- An earthing photovoltaic system requires the connection of an Arc fault detector on DC side.
- The inverter can exclude the possibility of DC residual currents, where an external RCD is required in addition to the built-in RCMU, type B RCD must be used to avoid tripping.
- The PV- is not grounded as default configuration.
- Inverters should not be used in multiple phase combinations.

To ensure IP65, inverters must be sealed well, please install the inverters within one day after unpacking. Please seal all used terminals / holes, any unused terminals / holes are not allowed to be kept open. Make sure that there is no risk of water or dust entering terminals / holes.

GOODWE provides standard manufacture warranty to inverter products, which will be delivered with the product. We also provide prepaid warranty extension solution to our customer. You can find the details about the terms and solutions from official website: <https://en.goodwe.com/warranty.asp>.

# 3 Product Introduction

## 3.1 Inverter Overview



1. PV Input Terminal

2. DC Switch

3. WiFi/4G/LAN/GPRS Communication Module Port or RS485 Communication Cable Port
4. DRED/CT/Remote Shut down Communication Cable Port

5. AC Output Terminal

6. LED
7. LCD

8. Button

9. PE Terminal
10. Mounting Plate

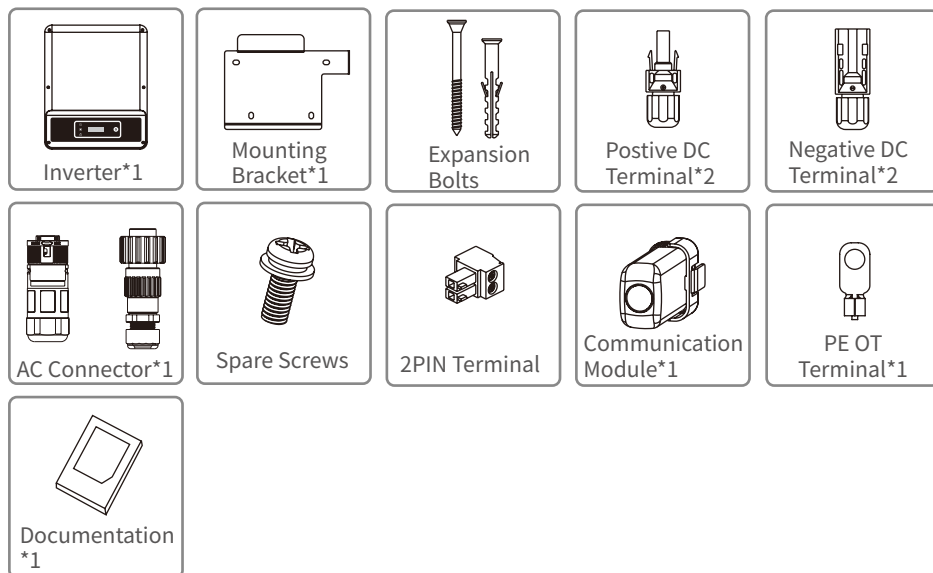
11. Heat Sink

Item	Name	Description
1	PV Input Terminal	For PV string connection
2	DC Switch	During normal operation, it can shut down the inverter after it is disconnected from the grid by the AC breaker.
3	Communication Module Port	For 4G/LAN/GPRS communication; RS485 communication
4	Communication Cable Port	For CT/DRED/RSD Communication
5	AC Output Terminal	For AC cable connection
6	LED	Display the state of the inverter
7	LCD	Operation data viewing and parameter configuration.
8	Button	For configuration and viewing parameters.
9	Ground Terminal	Connect the invter to the ground and avoid electric hazard.
10	Mouting Plate	Hang the inverter on the wall.
11	Heat Sink	For heat dissipation.

## 3.2 Package

The units have been thoroughly tested and strictly inspected before delivery. Damage may still occur during shipping.

1. Check the package for any visible damage upon receiving.
2. Check the inner contents for damage after unpacking.
3. Check the package list below.



Note: Number of expansion bolts, screws, and terminals are various depending on the different inverters. The actual accessories may differ.

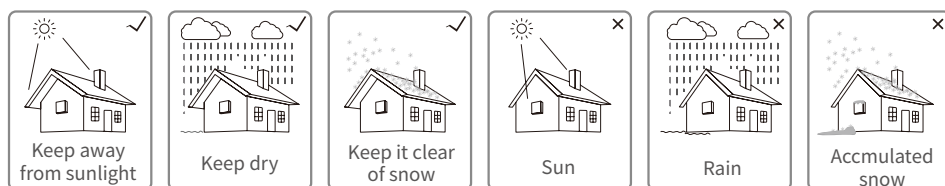
Communication module types: WiFi/4G/LAN/GPRS. The actual module delivered depends on the communication method of the selected inverter.

2PIN terminal is used to connect CT communication cable.

## 4 Installation

### 4.1 Mounting Instructions

1. In order to achieve optimal performance, the ambient temperature should be lower than 45°C.
2. For easy maintenance, we suggest to install the inverter at eye level.
3. Inverters should not be installed near flammable and explosive items. Strong electro-magnetic charges should be kept away from installation site.
4. Product labels and warning symbols should be put at a place that is easy to read by the users.
5. Shelter the inverter from direct sunlight, rain and snow.

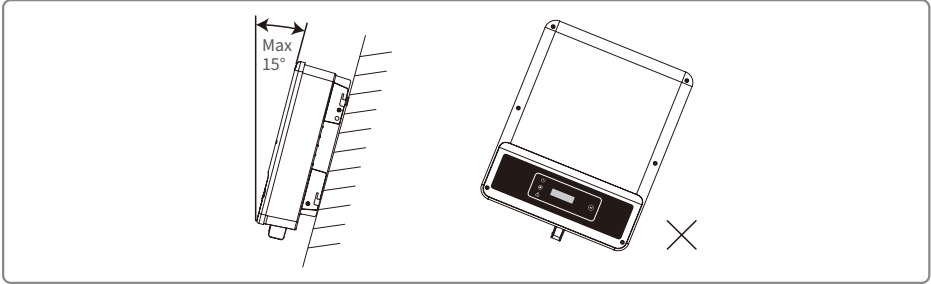


## 4.2 Equipment Installation

### 4.2.1 Select installation location

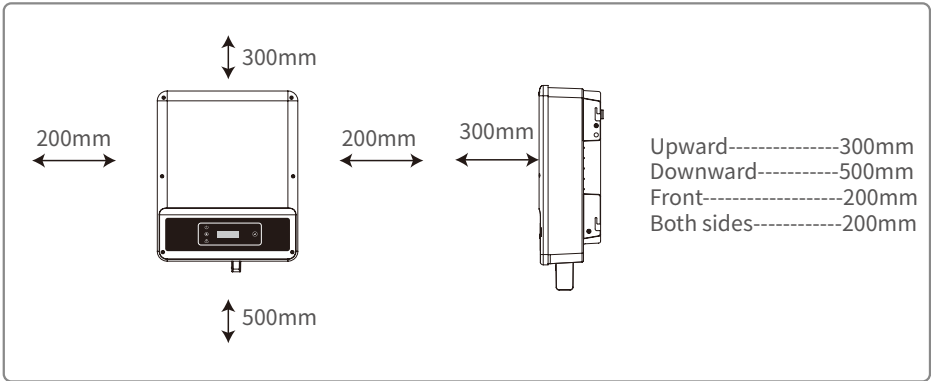
Please take the following points into consideration when you are selecting a proper location to install the inverter.

- Please choose appropriate mounting methods and installation location in terms of weight and dimensions of the inverter.
- The place must be well ventilated and sheltered from direct sunlight.
- Install the inverter vertically or with a backward tilt within 15 degrees. No lateral tilt is allowed. The area of the connectors should point downwards.



For convenient dismantling and heat dissipation, the clearance around the inverter must follow the below diagram.

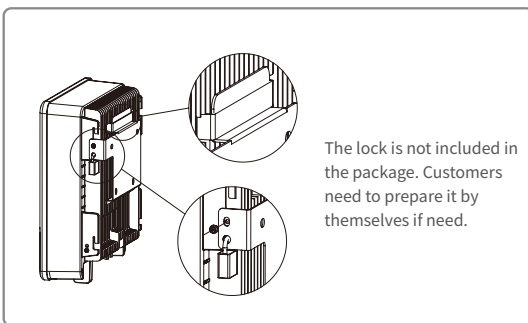
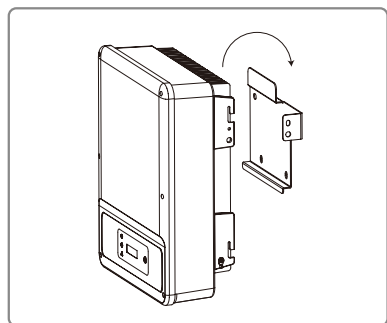
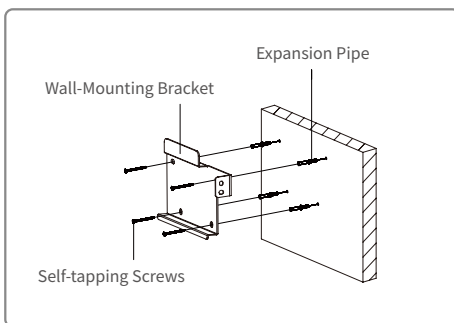
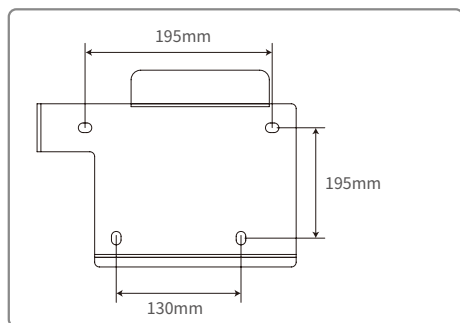
The installation position shall not block access to the disconnection means.



### 4.2.2 Mounting procedure

1. Use the mounting bracket as a template and drill holes (diameter 10mm, depth 80 mm) on the wall.
2. Fix the mounting bracket on the wall with the expansion bolts in the accessories bag.
3. Hold the inverter by the side groove.
4. Mount the inverter on the wall-mount bracket.





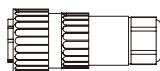
## 4.2 Equipment Installation

### 4.2.1 Select installation location

1. Check the grid voltage and frequency to see whether it complies with the required voltage and frequency.
2. Add the breaker or fuse to AC side, the specification should be at least 1.25 times rated AC output current.
3. The PE cable of the inverter should be connected to the ground. Make sure the impedance of the neutral wire and the ground cable is less than 10 ohm.
4. Disconnect the breaker or fuse between the inverter and the utility.
5. Connect the inverter to the grid as follows:

There are 3 AC connector brands for inverter, VACONN, WIELAND and Exceedconn.

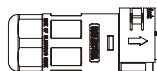
6. About construction of the AC cable, if the cord slip from its anchorage and place a strain on conductors, the protective earthing conductor should be the last one to take the strain. So the PE cable should be longer than L and N.



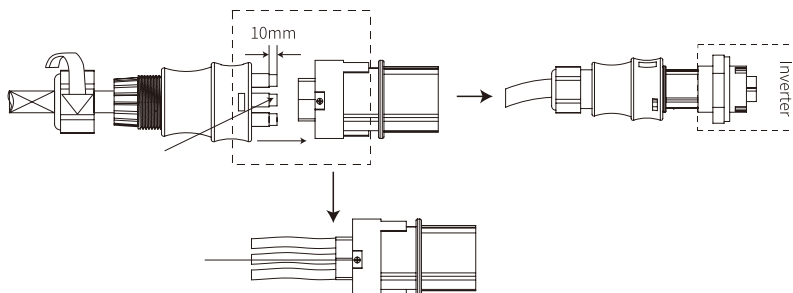
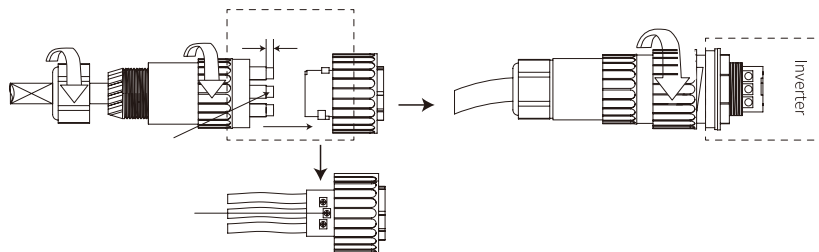
VACONN Series



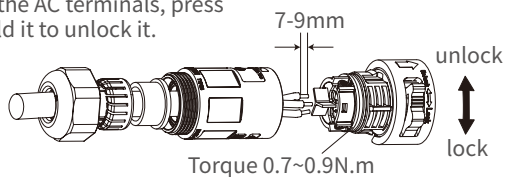
WIELAND Series



Exceedconn

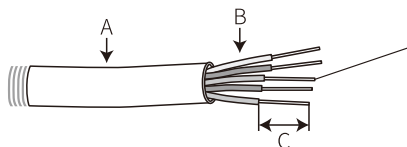


When unplugging the AC terminals, press the button and hold it to unlock it.



Make sure the terminal is rotated to the lock position before the inverter started.

AC cable illustration :



Grade	Description	Value
A	O.D	10~12mm
B	Section area of conduction material	2.5~4mm <sup>2</sup>
C	Length of Bare wire	10mm around

Note:

1. Neutral conductor shall be blue, line conductor shall be black or brown (preferred), protective earth cable shall be yellow-green.
2. Fix (moment: 0.6N.m) the connector of AC cable to the corresponding terminals.

4.3.2 AC Circuit Breaker And Residual Current Protection Device

An AC circuit breaker shall be installed on the AC side to make sure that the inverter can safely disconnect the grid when an exception happens. Select the appropriate AC circuit breaker in compliance with local laws and regulations. Recommended AC circuit breakers:

Inverter model	Recommended circuit breaker specifications
GW3000D-NS/GW3600D-NS/GW3000T-DS/GW3600T-DS	20A
GW4200D-NS/GW4200T-DS	25A
GW5000D-NS/GW5000T-DS/GW5KBD-NS	30A
GW6000D-NS/GW6000T-DS/GW6KBD-NS	35A

Select and Install RCD depending on local laws and regulations.Type A RCDs (Residual Current Monitoring Device) can be connected to the outside of the inverter for protection when the DC component of the leakage current exceeds the limit value. The following RCDs are for reference:

Model	RCD specifications
GW2900D-NS	300mA
GW3000D-NS	
GW3600D-NS	
GW4200D-NS	
GW5000D-NS	
GW6000D-NS	
GW3000T-DS	
GW3600T-DS	
GW4200T-DS	
GW5000T-DS	
GW6000T-DS	
GW5KBD-NS	
GW6KBD-NS	



Note: Multiple inverters are not allowed to share one circuit breaker.

The integrated leakage current detection device of the inverter can detect external leakage current in real time. When the detected current exceeds the limit value, the inverter will immediately disconnect from the grid. If the leakage current protection device is installed externally, the action current should be 300mA or higher.

### 4.3.3 Earth Terminal Connection

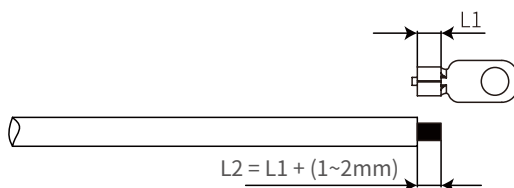
The inverter is equipped with earth terminal according to the requirement of EN 50178.

All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system must be grounded.

Please follow the steps below to connect PE cable to ground.

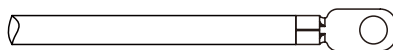
#### Step 1

Strip the wire insulation layer to a suitable length using a wire stripper.



#### Step 2

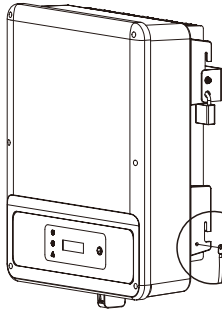
Insert the stripped wire into the terminal and compress it tightly using crimping pliers.



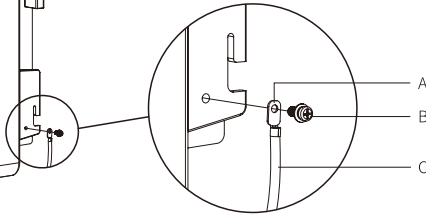
### Step 3

Fix the ground cable on the equipment.

In order to improve the corrosion resistance of the terminal, it is recommended to apply silica gel on the earth terminal for corrosion protection after the ground cable assembling is completed.



NO.	Name	Explanation
A	Cold-pressed terminal	
B	Screw	M5*14
C	Yellow and green line	4mm <sup>2</sup> / 10AWG



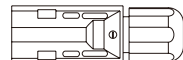
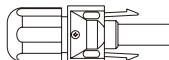
#### 4.3.4 DC side Connection

1. Before connecting the PV strings, please ensure the plug connectors are connected to the correct polarity. Incorrect polarity could permanently damage the unit.
2. The open circuit voltage of the PV strings cannot exceed the maximum input voltage of the inverter.
3. Only DC connectors provided by GoodWe are permitted.
4. Do not connect the positive and negative pole to the PE cable (Ground cable). Otherwise, the unit may be damaged.
5. Do not connect the positive or negative pole of PV string to PE cable. Otherwise it will cause damage to inverter.
6. Positive wire shall be red, negative wire shall be black.
7. The minimum insulation resistance of the PV panels for DST series to ground must exceed 19.3K ohms ( $R = 58/30 \text{ mA}$ ). There is a risk of shock hazard if the requirement of minimum resistance is not met.

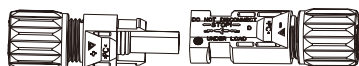
There are four types of DC connectors, DEVALAN, MC4, AMPHENDL H4 and QC4.10 series.



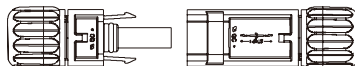
DEVALAN SERIES



MC4 SERIES



AMPHENOL SERIES



QC4.10 SERIES

Note: The actual DC connector used is as shown in the accessory box.

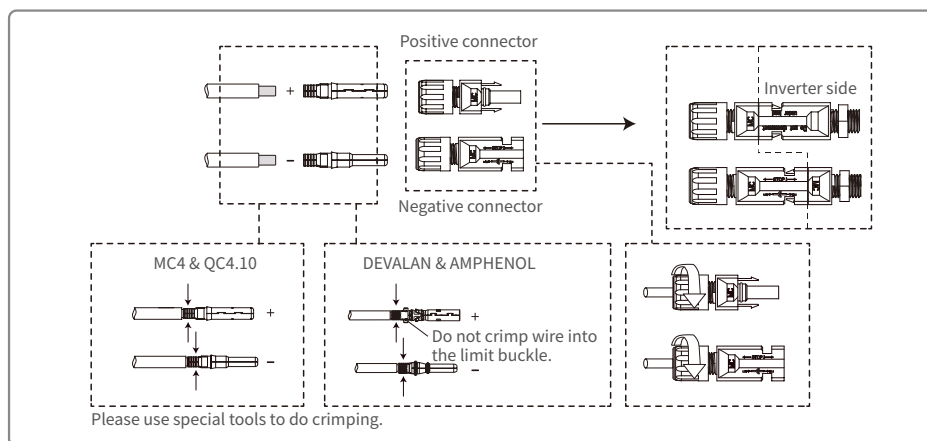
DC cable specification:



NO.	Name	Explanation
A	Cold-pressed terminal	
B	Screw	M5*14
C	Yellow and green line	4mm <sup>2</sup> / 10AWG

Note: The DC Cable should be dedicated PV cable.

The installation method of DC connector.

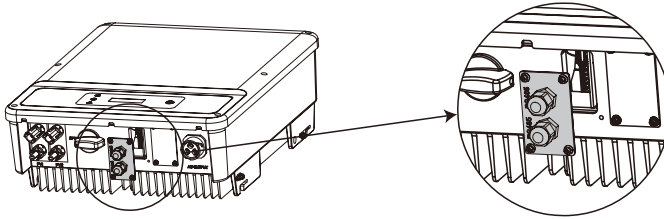


## 4.4 Communication Connection

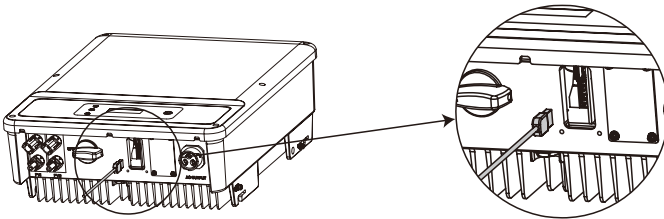
### 4.4.1 USB Connection

USB interface is used for after-sales service team to repair inverter only. Not allowed for any other purposes.

**Step 1:** Unscrew this plate from inverter.



**Step 2:** Insert the USB data cable.

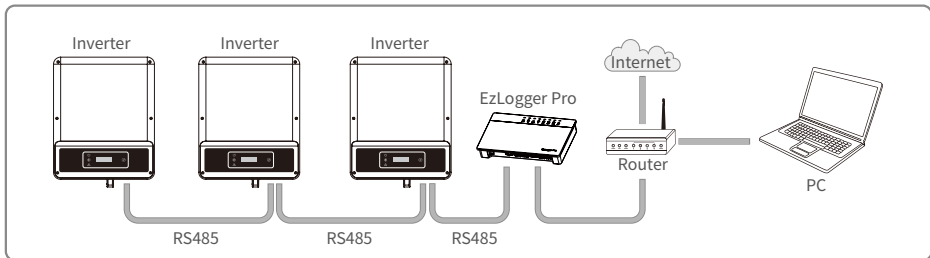


### 4.4.2 RS485 Communication

This function is only applied to inverters with RS485.

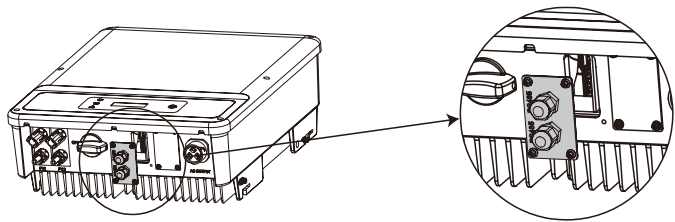
The RS485 interface is used to connect EzLogger Pro and the maximum total length of all connecting cables should not exceed 800m.

Communication cables must be separated from other power cables to prevent interference to the communication. RS485 connection is shown as below.



Please follow the steps below to complete RS485 communication connection.

**Step 1:** Unscrew this plate from inverter.

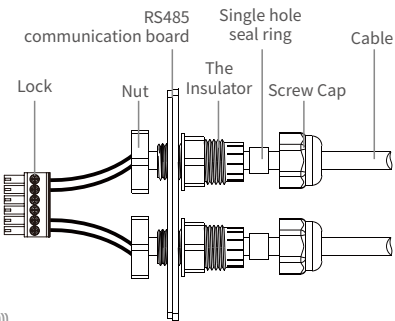
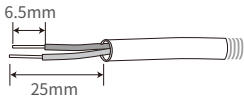


**Step 2:**

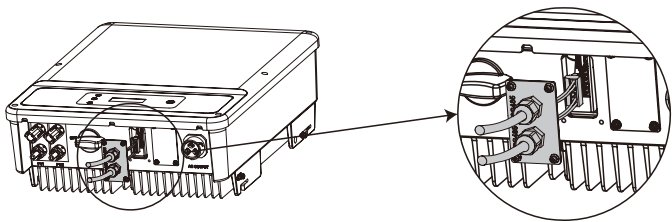
Thread the cable through the plate, and connect the RS485 cable on the 6-pin terminal.

16AWG-26AWG cables are recommended.

No.	Function
1	RS485+
2	RS485-
3	Reserved
4	Reserved
5	RS485+
6	RS485-



**Step 3:** Connect the terminal to the right position of the inverter and screw the plate.



Connect the inverter to the Ezlogger Pro using communication cables of RS485. Connect the Ezlogger Pro to the interchanger or the router using UTP (Unshielded Twisted Pair).

**4.4.3 Wi-Fi Communication**

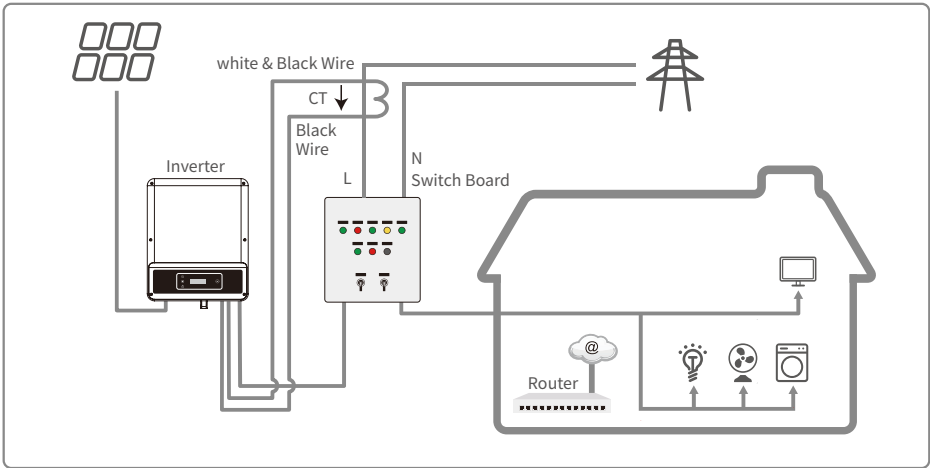
The Wi-Fi Communication function is only applied for WiFi Module, for detailed configuration instruction please refer to "Wi-Fi Configuration Instruction" in the accessory box.



After configuration, please create PV station using the monitoring portal website.

**4.4.4 Export Power Limit Connection Diagram**

Connect the Power Limiting device CT shown below.



**4.4.5 DRED / Remote Shutdown / CT (Power Limit Device) Connection**

DRED (Demand response enabling device) is only for Australian and New Zealand installations, in compliance with Australian and New Zealand safety requirements. And DRED is not provided by the manufacturer.

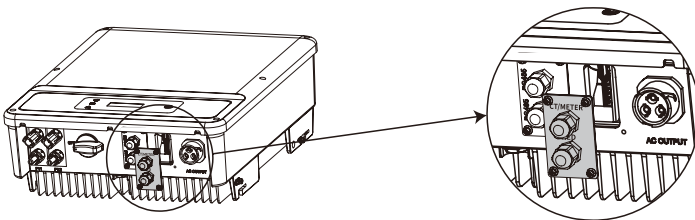
DRED function is off by default. Start this function via SolarGo App if it's needed.

Remote shutdown is only for Europe installations, in compliance with European safety requirements. And Remote shutdown device is not provided by the manufacturer.

Remote shutdown function is off by default. Start this function via SolarGo App if it's needed.

Please follow the steps below to complete the connection.

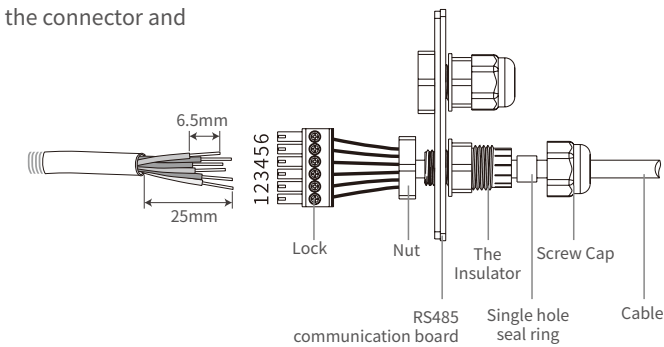
**Step 1:** Unscrew this plate.



**Step 2-1 For DRED:**

Thread the cable through the connector and connect to the terminal.

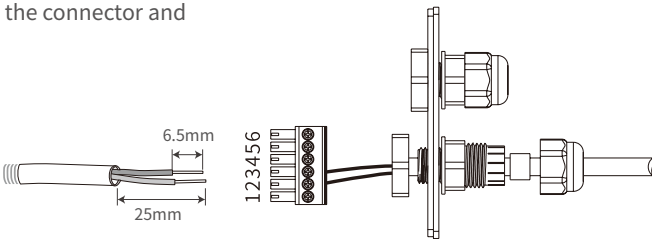
No.	Function
1	COM/DRM0
2	REFGEN
3	DRM4/8
4	DRM3/7
5	DRM2/6
6	DRM1/5



**Step 2-2 For remote shutdown:**

Thread the cable through the connector and connect to the terminal.

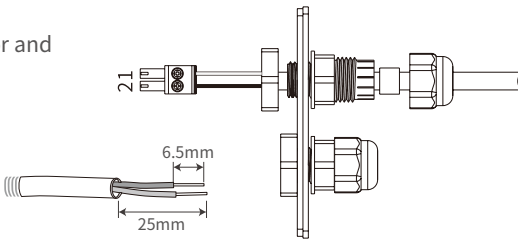
No.	Function
2	REFGEN
3	DRM4/8



**Step 2-3 For CT:**

Thread the cable through the connector and connect to the terminal.

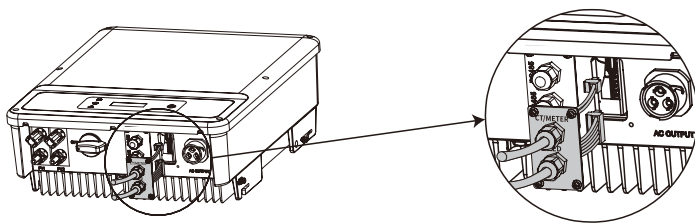
No.	Function
1	CT-
2	CT+



Note:  
Connect the CT using two cables. Connect CT+ to the CT+ port of the inverter, and CT- to the CT- port of the inverter. The color of the CT+ cable can be white, black and white, or red. The color of the CT- cable is black. Connect the CT cable properly, otherwise, the CT cannot work.

**Step 3:**

Connect the terminal to the right position of the inverter.



Note:

1. Compatible DRED commands are DRM0, DRM5, DRM6, DRM7, DRM8.
2. Please set up power limit function at local setting page once all connection steps are done.
3. The CT is directional. Please make sure the limit buckle is connected to the output live wire (L) of the inverter.
4. If the CT is not well connected, "CT disconnected" will be displayed on the LCD. If the CT is reversely connected, "CT Reverse" will be displayed when connected to the grid.

#### **4.4.6 Earth Fault Alarm**

In compliance with the section 13.9 of IEC62109-2, the DST series inverter is equipped with an earth fault alarm. When earth fault occurs, the fault indicator on the front LED screen will light up. For inverters with Wi-Fi communication, the system will send an email with the fault notification to the customer. For inverters without Wi-Fi, the buzzer of the inverter will keep ringing for one minute and ring again after half an hour until the problem is solved. (This function is only available in Australia and New Zealand).

#### **4.4.7 SEMS Portal**

SEMS Portal is an online monitoring system. After completing the installation of communication connection, you can visit [www.semsportal.com](http://www.semsportal.com) or download the App by scanning the QR code to monitor your PV plant and device.

Please contact the after-sales for more operations of SEMS Portal.

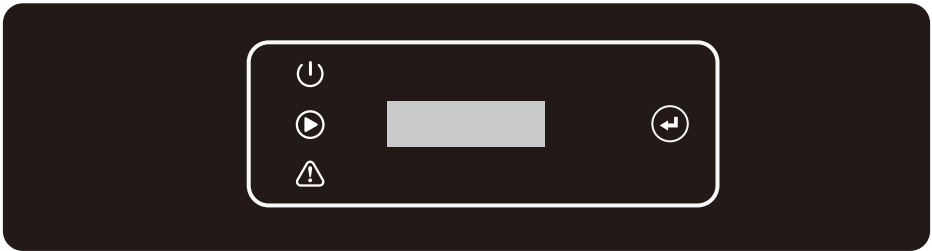
#### **4.4.8 AFCI**

AFCI is available in models support arc detection only. For more details, please refer to user manual of SolarGo APP.

# 5 System Operation

## 5.1 LCD Panel And LED

### 5.1.1 Indicator Lights



Indicator lights in Yellow/Green/Red correspondently refer to: / /

Indicator	Status	Explanation
 Power		ON = WiFi connected/active
		BLINK 1 = WiFi system resetting
		BLINK 2 = Not connect to router
		BLINK 3 = WiFi server problem
		BLINK = RS485 connected
		OFF = WiFi not active
 Operating		On = Inverter is feeding power
		OFF = Inverter is not feeding power at the moment
 Alarming		On = Fault occurred
		OFF = No fault

## 5.1 User Interface And System Configuration

### 5.2.1 Operation Method

There are two modes of button operation: Short press the button and long press the button.

If no action is taken, the backlight of the LCD will be off and the LCD will automatically revert to the first item of the main menu. Also, any modifications made to the data will be stored in the internal memory.

5.2.2 Set Safety Country

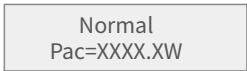
After powering on for the first time, the inverter prompts Select Country/Region, please short press until "GW3000D-NS Pac=\*\*\*\*.0W" is displayed, and then set the safety region. The inverter cannot be connected to the grid before the safety-related area is set.

If display shows "GW3000D-NS Pac=\*\*\*\*.0W", then long press the button to enter the second level menu. Short press to browse the countries available. Please wait after choosing the suitable country's safety setting, the display will show "setting..." and skip to "Set OK" or "Set Fail".

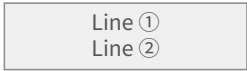
NOTE: For the Australian market, to comply with AS/NZS 4777.2:2020, please select from Australia Region A/B/C, please contact your local electricity grid operator on which Region to select. After the safety area setting is completed, some parameters in the inverter system will take effect according to the corresponding safety regulations, such as PU curve, QU curve, trip protection, etc. If you need to change the configuration parameters, please refer to the SolarGo APP user manual.

5.2.3 LCD

A schematic of the LCD is shown as below:



The display area is divided as follows:



5.2.4 Display Area

Line 1 --- Working status information

Line 2--- Real-time power generated by the inverter.

- This area displays the status information. "Waiting" indicates the inverter is standing by for power generation; "Checking \*\*S" (checking time is based on the safety country, and varies from country to country) indicates the equipment is self-checking, counting down and preparing for power generation. "Normal" indicates the inverter is generating power. If any condition of the system is abnormal, the screen will display an error message.
- Through button operation, the screen can display different information such as operation parameters and power generation status. There are two levels of menus, and the flow chart of the menus is shown below.

5.2.5 Use Of The LCD

The LCD display allows configuring the basic parameters. All the language, time and country settings can be configured by pressing the button. There are two levels of menu shown on the LCD screen. Short or long press the button to switch the menus. Items without sub menu are locked. For these items,long press the button for two seconds, the LCD will display "Lock", followed by data relating to the main menu item. The locked menu can only be unlocked when switch system mode, fault occurs or operate the button.

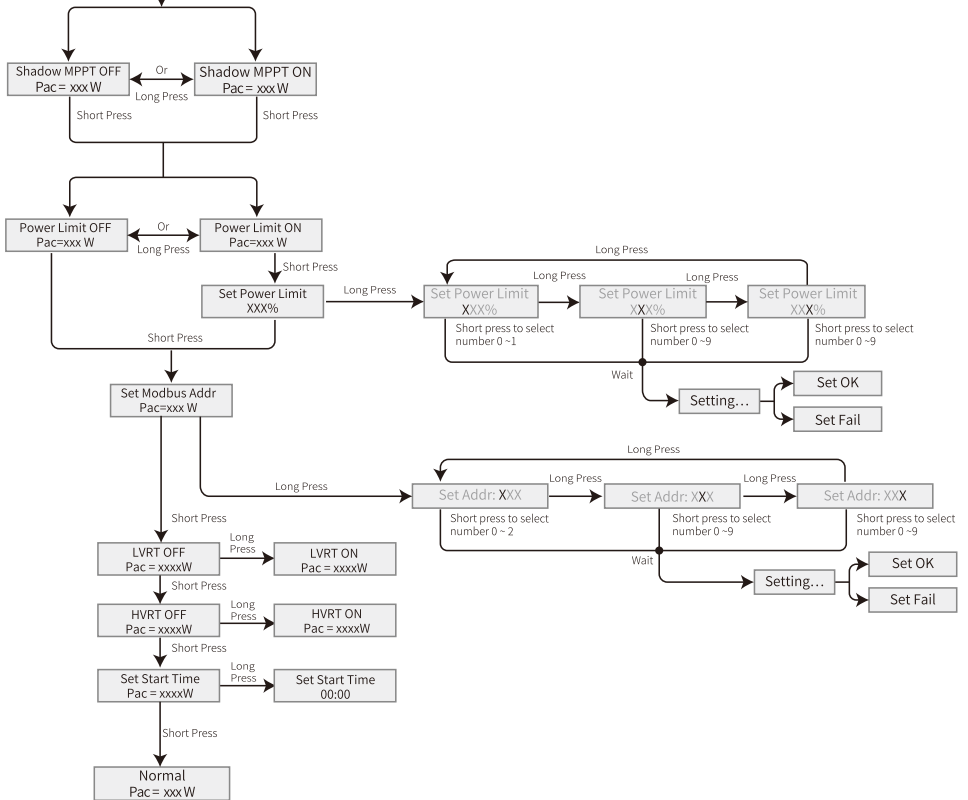
### 5.2.6 Menu Introduction

- When the PV panel is feeding power to the inverter, the LCD displays the main menu.
- The initial display is the first item to the main menu, and the interface displays the current status of the system. In the initial state, the LCD displays "Waiting". Under power generation mode, the LCD displays "Normal". If there is something wrong with the system, an error message will be displayed. Please refer to "5.3 Error Message".  
Check PV voltage, PV current, grid voltage, current and frequency:
- Short press the button to enter the "E-Today" menu, which displays the total power generation for today.
- Short press the button to enter the "E-Today" menu, which displays the total power generation until today.
- Short press the button to enter the "Vpv" menu, which displays the PV voltage in "V".
- Short press the button to enter the "Ipc" menu, which displays the PV current in "A".
- Short Press the button to enter the "Vac" menu, which displays the grid voltage in "V".
- Short Press the button once more to enter the "Iac" menu, which display the grid current in "A".
- Short Press the button once more to enter the "Frequency" menu, which displays the grid frequency in "Hz".
- Check error code  
Short press the button once more to enter the "Error Code history" menu.  
Long press the button to enter the sub menu of error detection. Short press the button to see the newest three inverter records in the sub menu. The records including error codes (EXX) and error times (110316 15:30).
- Check the model name and reconfigure safety country:  
Short press the button when it is on the error code history item in the main menu to see the model name. If you want to change the safety country, please long press the button, then the LCD will enter the sub menu. Short press the button in the sub menu to change the safety country.  
After selecting the safety country, the inverter will store the chosen safety country if there is no input for 20 seconds. If there is no exact proper country code, please choose "50Hz Grid Default" or "60Hz Grid Default" accordingly.
- Check software version  
Short press the button when it is on the model name item in the main menu to see the software version. The current software version can be checked here.

### 5.2.7 Basic Setting

[illegible]

Previous page





- Set language

Short press the button to enter "Set Language". Long press the button to enter the sub menu. Short press the button to browse the languages available.

- Set time

Short press the button to switch from "Set Language" to "Set Time". Then long press the button to enter the sub menu. The initial display is "2000-00-00 00:00", in which the first four digitals represent the year (e.g. 2000~2099); the fifth and sixth digitals represent the month (e.g. 01~12); the seventh and the eighth digitals represent the date (e.g. 01~31). The remaining digitals represent the time.

Short press the button to increase the number in the current position, and long press to move the cursor to next position.

- Set protocol:

This function can be set by service personnel only. Setting a wrong protocol could lead to communication failure. Short press the button to switch from "Set Time" to "Set Protocol Display". Long press the button to enter sub menu, which includes two protocols. Short press the button to choose the protocol.

- MPPT function for shadow:

The default setting for shadow optimizer is disabled.

Please enable shadow optimizer when there is shadow on PV panel. This function allows the system generating more power under shadowing condition. Please disable the function when there's no shadow on the panel, otherwise less power would be generated. Press the button until it enters the shadow optimize menu. When LCD displays "Shadow MPPT OFF", it means the MPPT function for shadow is off. Long press the button to enable the function. If LCD displays "Shadow MPPT ON" it means the shadow optimizer is on. Long press the button to disable the function.

- 70% rated power limit

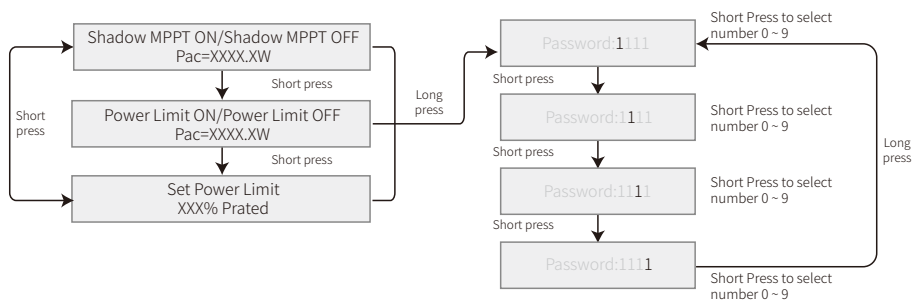
This function is only available for inverters in Germany. It can only be set by network operators. Otherwise a loss of power generated from the PV plant will be caused.

Press the button till the LCD displays the 70% rated power menu. If LCD displays 70% rated disable, it means the function to limit the inverter working under 70% of rated output is off. Long press the button to enable this function. If LCD displays recover rated power, it means the inverter is working under 70% of rated output power. Long press the button to recover the limit to 100% of its rated output power.

### 5.2.8 Power Limiting Function Setting

- Enter Password:

Please enter the password (valid for 10 minutes) before changing the power limiting state (the default is OFF) and the power limiting setting (the default is 2% rated power): Long press the button to enter the password input menu. The initial display "1111" is the default password. Short press the button to increase the number in current position and long press to move to the cursor to the next position. The operations are shown as below.

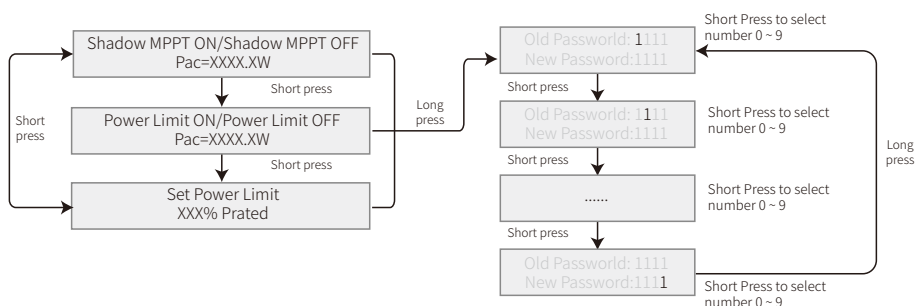


- Change the Password:

Long press the button to enter the password change menu. Short press to increase the number in current position, long press to move the cursor to the next position. If the old password is right, the new password will be saved in 20 seconds without any input.

Note: You can only enter the new password when the login is within the effective time period (10 minutes).

The operations are shown as below.



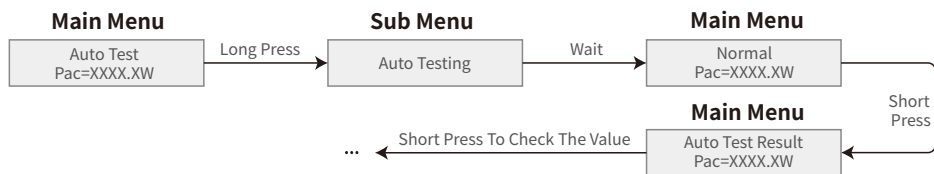
- Power limiting function setting

If the power limiting function is ON, the maximum output power of the inverter will be limited at the power limit setting value, even when the inverter is not equipped with a power limiting device (such as a CT/Meter) or when the power limiting device is out of order.

## 5.2.9 Auto-Test

The auto test function is disabled by default and is available in Italy only. Short press the button until LCD displays "Auto Test", and long press the button to start this function.

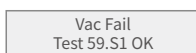
if auto test is finished, short press the button until LCD displays "Auto Test Result", and long press the button to check the result.



Choose auto test type between "Remote" and "Local" before starting the test. Under "Remote" mode, the default setting is 1 and cannot be modified. Under "Local" mode, the default setting is 0 and can be set to 0 or 1 by calibrating the software. If it is 1 under "Local" mode, the testing order will be 59.S1, 59.S2, 27.S1, 81>S1, 81<S1. Otherwise, the testing order will be 59.S1, 59.S2, 27.S1, 81>S2, 81<S2.

Connect AC, then the auto test will start after the inverter relay breaks off successfully: output power is zero and LCD shows the information about testing.

If sub test finishes and LCD displays "Test \*\*\*\*\* Ok", the inverter relay will break off and reconnect to grid automatically according to CEI 0-21 requirement. Then the next test starts.



If sub test fails, the inverter relay breaks off and enter wait mode. To retry, the inverter needs to be totally powered off and be restarted.

### 5.2.10 Operation Of Display When Commissioning

The LCD starts to work when the input voltage reaches the inveter's turn-on voltage. Then the yellow light will be on and the LCD will display "Waiting". In a few seconds, more information will be displayed. After the inveter connected to the grid, the LCD will display "Checking 30" and start a 30s countdown. When the countdown goes to "00S", you will hear the relay trigger 4 times and see "Normal" display. The instant power output is displayed at the left bottom of the screen.

## 5.3 Error Message

An error message will be displayed on the LCD once a fault occurs.

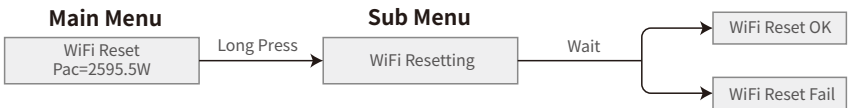
Error code	Error message	Description
03	Fac Fail	Grid frequency out of permissible range
14	Isolation Fail	The grund insulation impedance is too low
15	Vac Failure	Grid voltage out of permissible range
17	PV Over Voltage	Overvoltage at DC input
19	Over Temperature	The temperature is too high
23	Utility Loss	Utility is unavailable

### 5.4 Wi-Fi Reset & Wi-Fi Reload

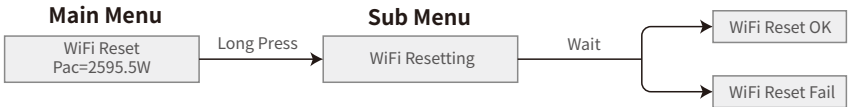
These functions are only available for Wi-Fi model inverters.

Wi-Fi reload function is used to reconfigure the Wi-Fi to default. Please configure the Wi-Fi again after using the function.

Short press the button until the LCD displays "Wi-Fi Reset", then long press the button until the LCD displays "Wi-Fi Resetting...". Stop pressing until the LCD displays "Wi-Fi Reset OK" or "Wi-Fi Reset Failed".



Short press the button until the LCD displays "Wi-Fi Reload", then long press the button until the LCD displays "Wi-Fi Reloading...". Stop pressing until the LCD displays "Wi-Fi Reload OK" or "Wi-Fi Reload Failed".

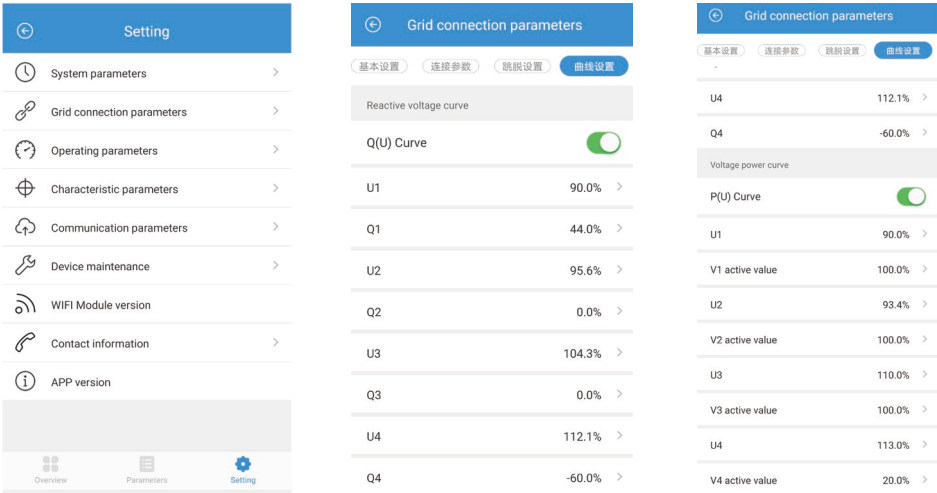


### 5.5 Precaution For Initial Startup

1. Make sure the AC circuit is connected and the AC breaker is off.
2. Make sure the DC cable between the inverter and the PV string is connected, and the PV voltage is normal.
3. Turn on the DC switch, and set safety country according to the local regulation.
4. Turn on the AC breaker. Check whether the inverter can work normally.

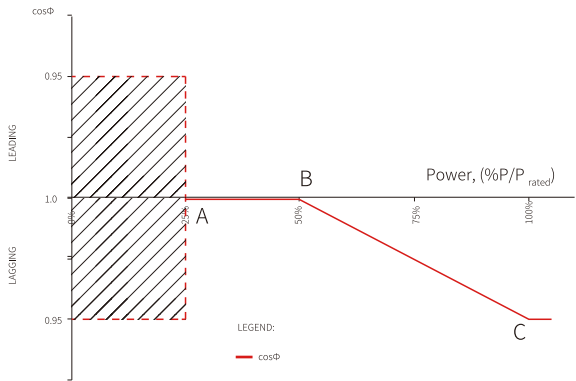
## 5.6 Special Adjustable Setpoints

The inverter has a field in which the user can set functions, such as trip points, trip times, reconnect times, active and inactive QU curves and PU curves. It is adjustable through SolarGo app.



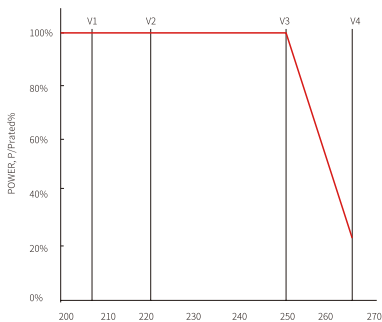
### 5.6.1 PF Power Curve Mode

PF power curve mode can be modified by Modbus communication method, specifically according to the machine Modbus address and Modbus register value, according to the set range to set the corresponding value.

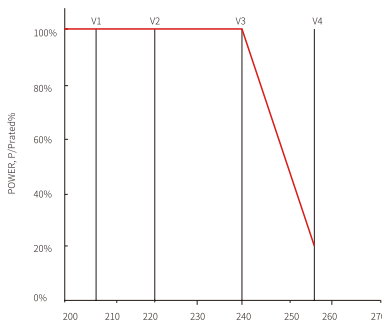


5.6.2 PU Curve Mode

The PU curve mode can be modified by Modbus communication method, specifically according to the machine Modbus address and Modbus register value, according to the set range to set the corresponding value.



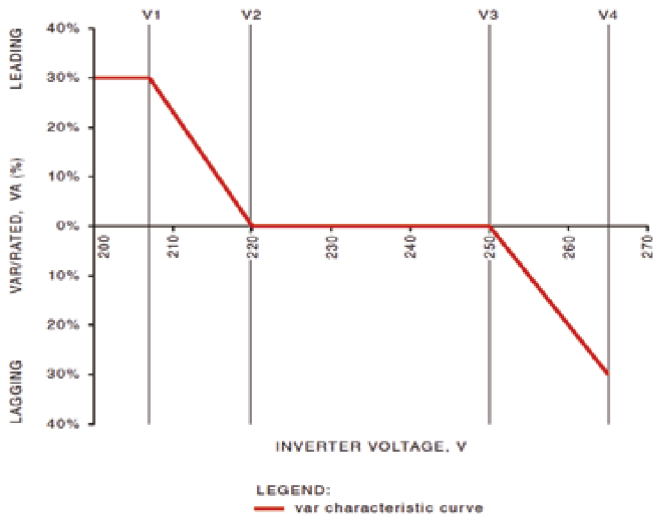
Example curve for a volt-watt response mode (Australia)



Example curve for a volt-watt response mode (New Zealand)

5.6.3 QU Curve Mode

QU curve mode can be modified by Modbus communication, specifically according to the machine Modbus address and Modbus register value, according to the set range to set the corresponding value.



# 6 Troubleshooting

In most situations, the inverter requires very little maintenance. However, if the inverter is not working properly, please try the following troubleshooting solutions:

- When a problem occurs, the red (fault) LED indicator on the front panel will light up and the LCD screen will display the type of fault. The following table lists error messages and solutions to the faults.

Fault		Troubleshooting
System Failure	Isolation Failure	1. Check the impedance between the ground and PV (+) & PV (-) . The impedance value must be greater than 100kΩ. Make sure the inverter is grounded. 2. Contact local service office for help if the problem still persist.
	Ground I Failure	1. The ground current is too high. 2. Unplug the inputs from the PV generator and check the peripheral AC system. 3. When the problem is solved, reconnect the PV panel and check the Inverter status. 4. Contact local service office for help if the problem still persist.
	Vac Failure	1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid voltage conforms with the specification. 3. Make sure neutral (N) wire and PE cable are connected well. 4. Contact local service office for help if the problem still persist.
	Fac Failure	1. Not connected to the grid. 2. Check if the power grid is connected to cable. 3. Check the availability of power grid.
	Utility Loss	1. Not connected to the grid. 2. Check if the power grid is connected to cable. 3. Check the availability of power grid.
	PV Over Voltage	1. Check if the PV open circuit voltage is higher than or too close to the maximum input voltage. 2. If the problem still persist when PV voltage is less than the maximum input voltage, contact local service office for help.
	Over Temperature	1. The internal temperature is higher than normal. 2. Decrease ambient temperature. 3. Move the inverter to a cool place. 4. If the problem still exists, contact local service office for help.

Inverter Failure	Relay-Check Failure	<ol style="list-style-type: none"> <li>1. Turn off DC switch of the inverter.</li> <li>2. Wait till the LCD light is off.</li> <li>3. Turn on the DC switch and make sure it is connected.</li> <li>4. If the problem still exists, contact local service office for help.</li> </ol>
	DCI Injection High	
	EEPROM R/W Failure	
	SPI Failure	
	DC BUS High	
	GFCI Failure	
Others	No display	<ol style="list-style-type: none"> <li>1. Turn off the DC switch and unplug the DC connector, then measure the voltage of the PV array.</li> <li>2. Plug in the DC connector, and turn on the DC switch.</li> <li>3. If PV array voltage is lower than 250V , please check configuration of inverter module.</li> <li>4. If voltage is higher than 250V , please contact local service office for help.</li> </ol>
AFCI-Fault		<ol style="list-style-type: none"> <li>1: Turn off the DC switch of the inverter.</li> <li>2: Ensure the DC connector is the right model and is properly connected.</li> <li>3: Turn on the DC switch and make sure it is connected.</li> <li>4: If the problem still exists, contact local service office for help.</li> </ol>

Note:

When the sunlight is insufficient, the PV inverter may consecutively start up and shut down automatically due to insufficient power generation from the PV panels, which would not lead to inverter damage.

Fault	Explanation
ConsistentFail	Consistence failure between two DSP chips in inverter which check simultaneously grid voltage and frequency and other variables. Consistence error occurs when there is much difference in the results detected by both chips.
DCI High	The DC current injection exceeds the threshold and triggers protection.
EEpromR/W Fail	Error in reading/writing from/into the memory card data storage such as SN, generation.
SPI Fail	Error of abnormal data transmission between two DSP chips.
Ref 2.5v Fail	The reference voltage limitation is exceeded, which leads to detection deviation of voltage and current.
AC HCT Fail	Error in AC current sensor



## 7 Technical Parameters

Technical Data	GW2900D-NS	GW3000D-NS	GW3600D-NS	GW4200D-NS	GW5000D-NS	GW6000D-NS
<b>Input</b>						
Max. Input Power (W) <sup>*1</sup>	4,000	3,900	4,680	5,460	6,500	7,200
Max. Input Voltage (V)	535	600	600	600	600	600
MPPT Operating Voltage Range (V)	80-435	80~550	80~550	80~550	80~550	80~550
MPPT Voltage Range at Nominal Power (V)	N/A	150~550	180~550	210~550	240~550	280~550
Start-up Voltage (V)	80	80	80	80	80	80
Nominal Input Voltage (V)	230	360	360	360	360	360
Max. Input Current per MPPT (A)	12.5	11	11	11	11	11
Max. Short Circuit Current per MPPT (A)	15.6	13.8	13.8	13.8	13.8	13.8
Max. Backfeed Current to The Array (A)	0	0	0	0	0	0
Number of MPPT	2	2	2	2	2	2
Number of Strings per MPPT	1	1	1	1	1	1
<b>Output</b>						
Nominal Output Power (W) <sup>*2,3</sup>	2,900	3,000	3,680	4,200	5,000	6,000
Nominal Output Apparent Power (VA) <sup>*4</sup>	2,900	3,000	3,680	4,200	5,000	6,000
Max. AC Active Power (W)	2,900	3,000	3,680	4,200	5,000	6,000
Max. AC Apparent Power (VA)	2,900	3,000	3,680	4,200	5,000	6,000
Nominal Power at 40°C (W)(For Brazil only)	2,900	3,000	3,600	4,200	5,000	6,000
Max Power at 40°C (Including AC Overload) (W)(For Brazil only)	2,900	3,000	3,600	4,200	5,000	6,000
Nominal Output Voltage (V)	127	220/230	220/230	220/230	220/230	220/230
Nominal AC Grid Frequency (Hz)	60	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	22.9	13.6	16.0	19.0	22.8	27.3
Nominal Output Current (A)	22.9	13.6/13.0	16.0/15.6	19.0/18.2	22.8/21.7	27.3/26.1
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)					
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	42	42	42	42	42	50
<b>Efficiency</b>						
Max. Efficiency	96.0%	97.8%	97.8%	97.8%	97.8%	97.8%

European Efficiency	95.6%	97.5%	97.5%	97.5%	97.5%	97.5%
Protection						
PV Insulation Resistance Detection	Integrated					
Residual Current Monitoring	Integrated					
PV Reverse Polarity Protection	Integrated					
Anti-islanding Protection	Integrated					
AC Overcurrent Protection	Integrated					
AC Short Circuit Protection	Integrated					
AC Overvoltage Protection	Integrated					
DC Switch	Optional					
DC Surge Protection	Type III (Type II OptionI)	Type III	Type III	Type III	Type III	Type III
AC Surge Protection	Type III					
Emergency Power Off	Optional					
Remote Shutdown	Optional					
General Data						
Operating Temperature Range (°C)	-25~+60					
Relative Humidity	0~100%					
Max. Operating Altitude (m) <sup>5</sup>	4000					
Cooling Method	Natural Convection					
User Interface	WiFi,RS485 or 4G or 2G or LAN (Optional)					
Communication	RS485 / WiFi / LAN					
Weight (kg)	13.0	13.0	13.0	13.0	13.0	13.5
Dimension (W×H×D mm)	354×433×147					
Noise Emission (dB)	<25	<25	<25	<25	<25	<50
Topology	Non-isolated					
Self-consumption at Night (W)	<1					
Ingress Protection Rating	IP65					
Anti-corrosion Class	C4					
DC Connector	MC4					
AC Connector	Plug and play connector					
Environmental Category	4K4H					
Pollution Degree	III					
Overvoltage Category	DC II / AC III					
Protective Class	I					

The Decisive Voltage Class (DVC)	PV:C AC:C Com:A
Active Anti-islanding Method	AFDPF + AQDPF *6
Country of Manufacture (For Australia only)	China

Technical Data	GW3000T-DS	GW3600T-DS	GW4200T-DS	GW5000T-DS	GW6000T-DS
<b>Input</b>					
Max. Input Power (W) <sup>1</sup>	3,900	4,680	5,460	6,500	7,200
Max. Input Voltage (V)	600	600	600	600	600
MPPT Operating Voltage Range (V)	80~550	80~550	80~550	80~550	80~550
MPPT Voltage Range at Nominal Power (V)	130~550	150~550	170~550	200~550	240~550
Start-up Voltage (V)	80	80	80	80	80
Nominal Input Voltage (V)	360	360	360	360	360
Max. Input Current per MPPT (A)	13	13	13	13	13
Max. Short Circuit Current per MPPT (A)	16.3	16.3	16.3	16.3	16.3
Max. Backfeed Current to The Array (A)	0	0	0	0	0
Number of MPP Trackers	2	2	2	2	2
Number of Strings per MPPT	1	1	1	1	1
<b>Output</b>					
Nominal Output Power (W) <sup>2,3</sup>	3,000	3,680	4,200	5,000	6,000
Nominal Output Apparent Power (VA) <sup>4</sup>	3,000	3,680	4,200	5,000	6,000
Max. AC Active Power (W)	3,000	3,680	4,200	5,000	6,000
Max. AC Apparent Power (VA)	3,000	3,680	4,200	5,000	6,000
Nominal Power at 40°C (W)(For Brazil only)	3,000	3,600	4,200	5,000	6,000
Max Power at 40°C (including AC overload) (W) (For Brazil only)	3,000	3,600	4,200	5,000	6,000
Nominal Output Voltage (V)	220/230	220/230	220/230	220/230	220/230
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	13.6	16.0	19.0	22.8	27.3
Max. Output Fault Current (Peak and Duration) (A)	35	35	35	35	35
Inrush Current (Peak and Duration) (A)	60	60	60	60	80
Nominal Output Current (A)	13.6/13.0	16.0/15.6	19.0/18.2	22.8/21.7	27.3/26.1
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%	<3%

Maximum Output Overcurrent Protection (A)	42	42	42	42	50
Efficiency					
Max. Efficiency	97.8%	97.8%	97.8%	97.8%	97.8%
European Efficiency	97.5%	97.5%	97.5%	97.5%	97.5%
Protection					
PV Insulation Resistance Detection	Integrated				
Residual Current Monitoring	Integrated				
PV Reverse Polarity Protection	Integrated				
Anti-islanding Protection	Integrated				
AC Overcurrent Protection	Integrated				
AC Short Circuit Protection	Integrated				
AC Overvoltage Protection	Integrated				
DC Switch	Optional				
DC Surge Protection	Type III(Type II Optional)				
AC Surge Protection	Type III				
AFCI	Optional				
Emergency Power Off	Optional				
Remote Shutdown	Optional				
General Data					
Operating Temperature Range (°C)	-25~+60				
Relative Humidity	0~100%				
Max. Operating Altitude (m) <sup>15</sup>	4000				
Cooling Method	Natural Convection				
User Interface	LED, LCD, WLAN+APP				
Communication	WiFi, RS485 or 4G or 2G or LAN (Optional)				
Weight (kg)	13	13	13	13	13.5
Dimension (W×H×D mm)	354×433×147				
Noise Emission (dB)	<25	<25	<25	<25	<50
Topology	Non-isolated				
Self-consumption at Night (W)	<1				
Ingress Protection Rating	IP65				
Anti-corrosion Class	C4				
DC Connector	MC4				
AC Connector	Plug and play connector				
Environmental Category	4K4H				
Pollution Degree	III				
Overvoltage Category	DC II / AC III				
Protective Class	I				
The Decisive Voltage Class (DVC)	PV:C AC:C Com:A				

Active Anti-islanding Method	AFDPF + AQDPF <sup>16</sup>
Country of Manufacture (For Australia only)	China

Technical Data	GW5KBD-NS	GW6KBD-NS
<b>Input</b>		
Max. Input Power (W) <sup>1</sup>	6,500	7,200
Max. Input Voltage (V)	600	600
MPPT Operating Voltage Range (V)	80~550	80~550
MPPT Voltage Range at Nominal Power (V)	200~550	240~550
Start-up Voltage (V)	80	80
Nominal Input Voltage (V)	360	360
Max. Input Current per MPPT (A)	13	13
Max. Short Circuit Current per MPPT (A)	16.3	16.3
Max. Backfeed Current to The Array (A)	0	0
Number of MPP Trackers	2	2
Number of Strings per MPPT	1	1
<b>Output</b>		
Nominal Output Power (W) <sup>2,3</sup>	5,000	6,000
Nominal Output Apparent Power (VA) <sup>4</sup>	5,000	6,000
Max. AC Active Power (W)	5,000	6,000
Max. AC Apparent Power (VA)	5,000	6,000
Nominal Power at 40°C (W)(For Brazil only)	5,000	6,000
Max Power at 40°C (including AC overload) (W) (For Brazil only)	5,000	6,000
Nominal Output Voltage (V)	220	220
Nominal AC Grid Frequency (Hz)	60	60
Max. Output Current (A)	22.8	27.3
Max. Output Fault Current (Peak and Duration) (A)	35	35
Inrush Current (Peak and Duration) (A)	60	80
Nominal Output Current (A)	22.7	27.3
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	
Max. Total Harmonic Distortion	<3%	<3%
Maximum Output Overcurrent Protection (A)	42	50
<b>Efficiency</b>		
Max. Efficiency	97.8%	97.8%
European Efficiency	97.5%	97.5%
<b>Protection</b>		
PV String Current Monitoring	Integrated	
PV Insulation Resistance Detection	Integrated	
Residual Current Monitoring	Integrated	

PV Reverse Polarity Protection	Integrated	
Anti-islanding Protection	Integrated	
AC Overcurrent Protection	Integrated	
AC Short Circuit Protection	Integrated	
AC Overvoltage Protection	Integrated	
DC Switch	Optional	
DC Surge Protection	Type III	
AC Surge Protection	Type III	
AFCI	Optional	
Remote Shutdown	Optional	
General Data		
Operating Temperature Range (°C)	-25~+60	
Relative Humidity	0~100%	
Max. Operating Altitude (m) <sup>*5</sup>	4000	
Cooling Method	Natural Convection	
User Interface	LED, LCD, WLAN+APP	
Communication	WiFi, RS485 or 4G or 2G or LAN (Optional)	
Weight (kg)	13.0	13.5
Dimension (W×H×D mm)	354×433×147	
Noise Emission (dB)	<25	<50
Topology	Non-isolated	
Self-consumption at Night (W)	<1	
Ingress Protection Rating	IP65	
Anti-corrosion Class	C4	
DC Connector	MC4	
AC Connector	Plug and play connector	
Environmental Category	4K4H	
Pollution Degree	III	
Overvoltage Category	DC II / AC III	
Protective Class	I	
The Decisive Voltage Class (DVC)	PV:C AC:C Com:A	
Active Anti-islanding Method	AFDPF + AQDPF <sup>*6</sup>	
Country of Manufacture (For Australia only)	China	

\*1: For Australia/New Zealand Max. Input Power (W) GW3000D-NS or GW3000T-DS is 4000, GW3600D-NS or GW3600T-DS is 4800, GW4200D-NS or GW4200T-DS is 5600, and GW5000D-NS or GW5000T-DS is 6667.

\*2: For CEI 0-21 Nominal Output Power GW3000T-DS or GW3000D-NS is 2700, GW3600T-DS or GW3600D-NS is 3350, GW4200T-DS or GW4200D-NS is 3800, GW5000T-DS or GW5000D-NS is 4540, and GW6000T-DS or GW6000D-NS is 5450.

\*3: For Australia/New Zealand Nominal Output Power (W) GW5000D-NS is 4999.

\*4: For Australia/New Zealand Nominal Output Apparent Power (VA) GW5000D-NS is 4999.

\*5: For Australia Max. Operating Altitude (m) is 3000.

\*6: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.

Note:

**Overvoltage Category Definition**

Category I	Applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level
Category II	Applies to equipment not permanently connected to the installation. Examples are appliances, portables tools and other plug- connected equipment
Category III	Applies to a fixed equipment downstream of and including the main distribution board. Examples are switchgear and other equipment in an industrial installation
Category IV	Applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board). Example are electricity meters, primary over-current protection equipment and other equipment connected directly to outdoor open lines

**Moisture Location Category Definition**

Moisture Parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40°C	-33~+40°C	-20~+55°C
Humidity Range	5%~85%	15%~100%	4%~100%

**Environment Category Definition**

Environment Condition	Ambient Temperature	Relative Humidity	Applied to
Outdoor	-20~50°C	4%~100%	PD3
Indoor Unconditioned	-20~50°C	5%~95%	PD3
Indoor Conditioned	0~40°C	5%~85%	PD2

**Pollution Degree Definition**

Pollution Degree I	No pollution or only dry, non-conductive pollution occurs.
Pollution Degree II	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.
Pollution Degree III	Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected.
Pollution Degree IV	Persistent conductive pollution occurs, for example, the pollution caused by conductive dust, rain and snow.

## 8 Maintenance

Regular maintenance ensures a long operating life and optimal efficiency of the entire PV plant.  
Caution: Before maintenance, please disconnect the AC breaker, and disconnect DC breaker then.  
Wait for 5 minutes until the residual voltage totally released.

## 9 Power off the inverter

When operating and maintaining the inverter, please power off the inverter. Operating the equipment with power on may cause damage to the inverter or risk of electric shock.  
After the inverter is powered off, there is a delay in the discharge of internal components. Please wait until the equipment is completely discharged according to the required label time.

Step 1: (Optional) Issue a shutdown command to the inverter.

Step 2: Disconnect the AC switch between the inverter and the grid.

Step 3: Disconnect the DC switch of the inverter.

Step 4: (Optional) Disconnect the DC switch of the inverter and PV string paper.






Offical Website

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