

**GOODWE**



# **User Manual**

**Grid-Tied PV Inverter**

HT Series  
(225-250kW)

V1.1-2022-07-20

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**Notice**

The information in this user manual is subject to change due to product updates or other reasons. This manual cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the manual are for guidance only.

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# 1 About This Manual

This manual describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this manual before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This manual is subject to update without notice. For more product details and latest documents, visit [www.goodwe.com](http://www.goodwe.com).

## 1.1 Applicable Model

This manual applies to the listed inverters below (HT for short):




Model	Nominal Output Power	Nominal Output Voltage
GW250K-HT	250kW	800, 3L/PE
GW250KN-HT	250kW	
GW225K-HT	225kW	
GW225KN-HT	225kW	

## 1.2 Target Audience

This manual applies to trained and knowledgeable technical professionals. The technical personnel has to be familiar with the product, local standards, and electric systems.

## 1.3 Symbol Definition

Different levels of warning messages in this manual are defined as follows:

 <b>DANGER</b>
Indicates a high-level hazard that, if not avoided, will result in death or serious injury.
 <b>WARNING</b>
Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>
Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b>
Highlight and supplement the texts. Or some skills and methods to solve product-related problems to save time.

## 1.4 Updates

The latest document contains all the updates made in earlier issues.

### V1.0 2022-05-04

- First Issue.

### V1.1 2022-07-20

- Updated technical parameters and electrical connections.

## 2 Safety Precaution

### Notice

The inverters are designed and tested strictly complies with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the inverters are electrical equipment.

### 2.1 General Safety

#### Notice

- The information in this document is subject to change due to product updates or other reasons. This manual cannot replace the product labels or the safety precaution unless otherwise specified. All descriptions here are for guidance only.
- Before installations, read through the user manual to learn about the product and the precautions.
- All installations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment when operating the equipment to ensure personal safety. Wear anti-static gloves, cloths, and wrist strips when touching electron devices to protect the inverter from damage.
- Strictly follow the installation, operation, and configuration instructions in this manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, visit <https://en.goodwe.com/warranty.asp>.

### 2.2 DC Side:

#### DANGER

Connect the DC cables using the delivered DC connectors and terminals. The manufacturer shall not be liable for the equipment damage if other connectors or terminals are used.

#### WARNING

- Ensure the component frames and the bracket system are securely grounded.
- Ensure the DC cables are connected tightly and securely.
- Measure the DC cable using the multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- The PV modules used with the inverter must have an IEC61730 class A rating.
- If there are more than 3 PV strings on input side, an additional fuse installation will be suggested.
- To avoid damage the inverter, do not connect one PV string to multi inverters.
- When exposed to sunlight, the PV array will generate very high voltage which can cause electrical shock hazard. Please strictly follow the instruction we provided.

### 2.3 AC Side









**WARNING**

- The voltage and frequency at the connecting point should meet the on-grid requirements.
- An additional protective device like the circuit breaker or fuse is recommended on the AC side. Specification of the protective device should be at least 1.25 times the AC output rated current.
- Make sure that all the groundings are tightly connected. When there are multiple inverters, make sure that all the grounding points on the enclosures are equipotential bonding.
- You are recommended to use copper cables as AC output cables. If you prefer aluminum cables, remember to use copper to aluminum adapter terminals.

### 2.4 Inverter Installation

**DANGER**

- Terminals at the bottom of the inverter cannot bear much load. Otherwise, the terminals will be damaged.
- All labels and warning marks must be clear and distinct after the installation. Do not block, alter, or damage any label.
- Warning labels on the inverter are as follows.

	High voltage hazard. Power off the inverter before any operations.		Potential risks exist. Wear proper PPE before any operations.
	Read through the user manual before any operations.		Delayed discharge. Wait until the components are completely discharged after power off
	High-temperature hazard. Do not touch the equipment to avoid being hurt.		Do not dispose of the product as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
	CE marking		Grounding point. Indicates the position for connecting the PE cable.

### 2.5 Personal Requirements

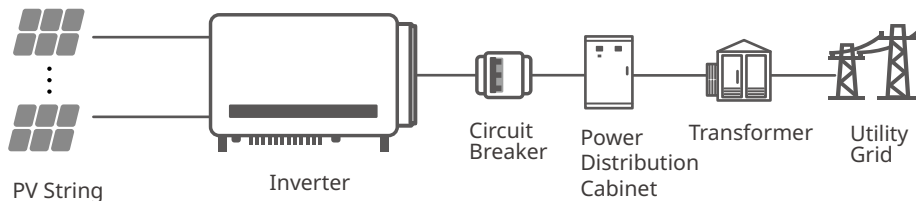
**NOTICE**

- Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

### 3 Product Introduction

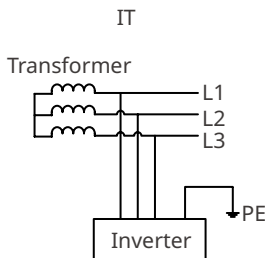
#### 3.1 Application Scenarios

The HT inverter is a three-phase PV string grid-tied inverter. The inverter converts the DC power generated by the PV module into AC power and feeds it into the utility grid. The intended use of the inverter is as follows:



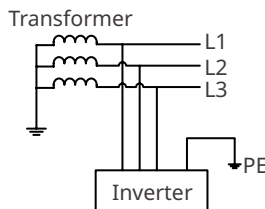
#### 3.2 Supported Grid Types

The grid structures supported by HT series GW250K-HT, GW250KN-HT, GW225K-HT and GW225KN-HT are IT, as shown in the figure below:



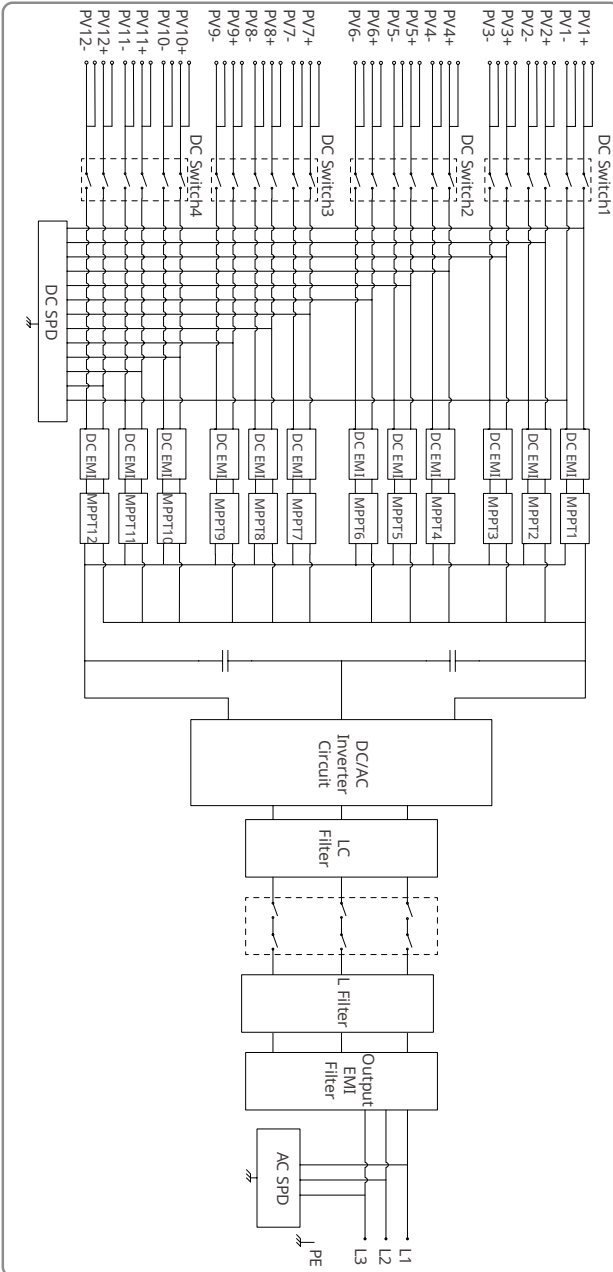
**NOTICE**

The HT series inverter can also apply to the AC power system with the neutral point grounding of the step-up transformer. The HT series inverter itself does not connect to any neutral wire.

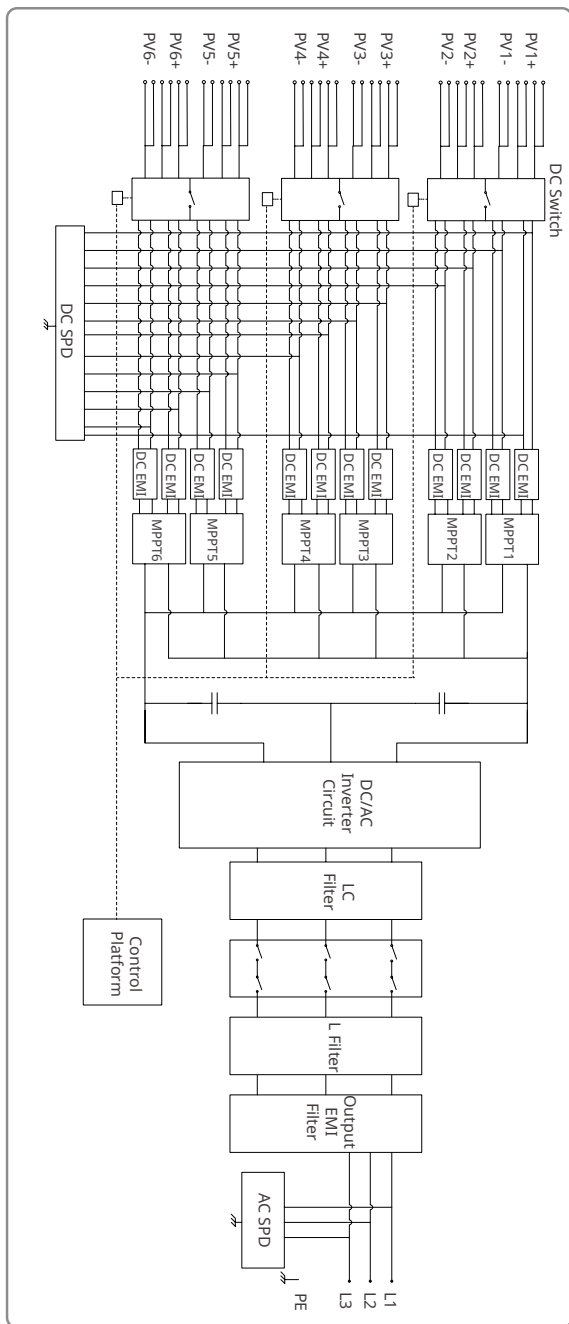


### 3.3 Circuit Diagram

The circuit diagram of GW250K-HT , and GW225K-HT are as follows.

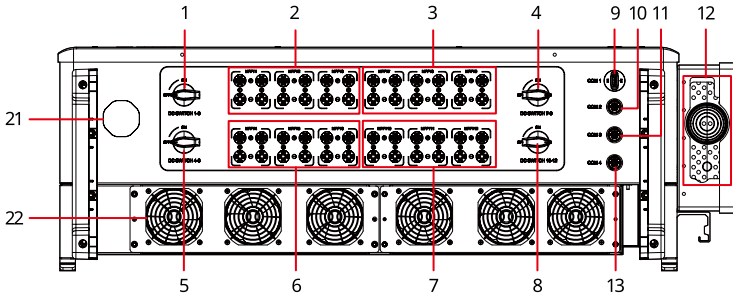


The circuit diagram of GW225KN-HT, and GW250KN-HT are as follows.

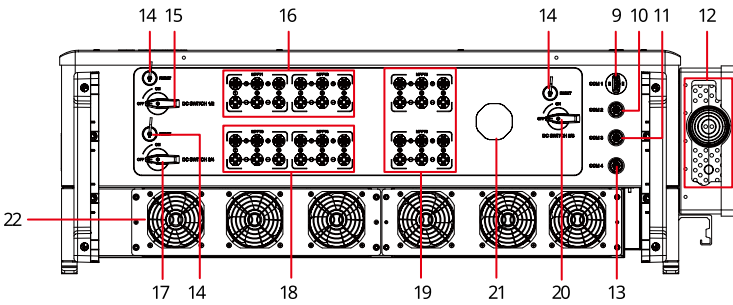


### 3.4 Appearance

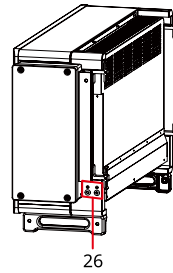
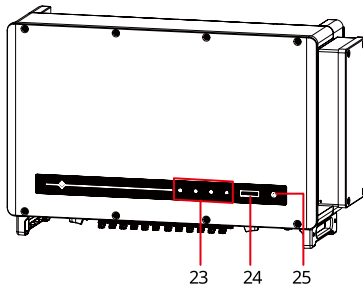
#### 3.4.1 Parts



GW250K-HT , and GW225K-HT



GW225KN-HT, and GW250KN-HT

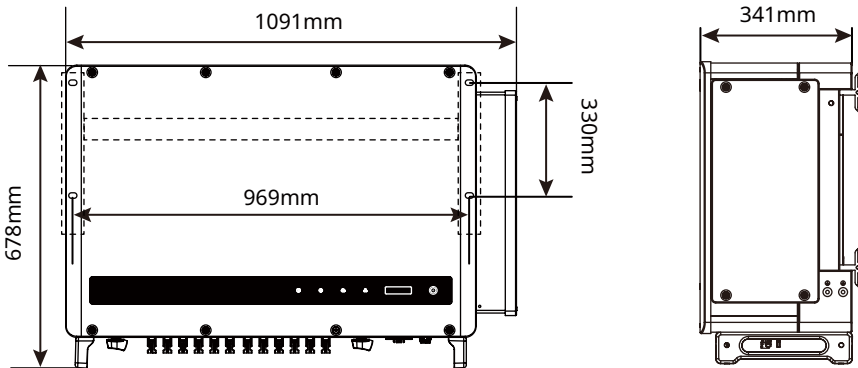









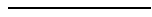












No.	Parts	Description
1	DC Switch 1-3	Control PV input terminal 1-3, to connect or disconnect the PV string.
2	PV Input Terminal 1-3 (Controlled by DC Switch 1-3)	Used to connect the PV strings.
3	PV Input Terminal 7-9 (Controlled by DC Switch 7-9)	Used to connect the PV strings.
4	DC Switch 7-9	Control PV input terminal 7-8, to connect or disconnect the PV string.
5	DC Switch 4-6	Control PV input terminal 4-6, to connect or disconnect the PV string.
6	PV Input Terminal 4-6 (Controlled by DC Switch 4-6)	Used to connect the PV strings.
7	PV Input Terminal 10-12(Controlled by DC Switch 10-12)	Used to connect the PV strings.
8	DC Switch 10-12	Control PV input terminal 10-12, to connect or disconnect the PV string.
9	USB Port (Bluetooth)	Used to connect the Bluetooth communication module.
10	Communication Port (RS485)	Used to connect the RS485 communication cable.
11	Meter COM Port	Used to connect the Meter cable.
12	AC Cable Outlet Hole	To connect AC cables.
13	Communication Port (Remote Shutdown / Emergency Power Off)	Used to connect the Remote Shutdown communication cable.
14	DC Reset Switch	Reset the DC switch if it is tripped due to the inverter fault. Press the RESET button using the reset tool and turn the switch from OFF to ON.
15	DC Switch 1/ 2	Control PV input terminal 1-2, to connect or disconnect the PV string.
16	PV Input Terminal 1-2	Used to connect the PV strings.
17	DC Switch 3/ 4	Control PV input terminal 3-4, to connect or disconnect the PV string.
18	PV Input Terminal 3-4	Used to connect the PV strings.
19	PV Input Terminal 5-6	Used to connect the PV strings.
20	DC Switch 5/ 6	Control PV input terminal 5-6, to connect or disconnect the PV string.

No.	Parts	Description
21	Ventilation valve	-
22	External Fan	Used to cool the inverter.
23	Indicator	Indicates working state of the inverter.
24	LCD (optional)	Optional. Used to check the parameters of the inverter.
24	Button (optional)	Optional. Used to control contents displayed on the screen.
26	Grounding Point	Used to connect the PE cable.

### 3.4.2 Dimensions



### 3.4.3 Indicators

Indicator	Status	Description
		ON = EQUIPMENT POWER ON
		OFF = EQUIPMENT POWER OFF
		ON = THE INVERTER IS FEEDING POWER
		OFF = THE INVERTER IS NOT FEEDING POWER
		SINGLE SLOW FLASH = SELF CHECK BEFORE CONNECTING TO THE GRID
		SINGLE FLASH = CONNECTING TO THE GRID
		ON = WIRELESS IS CONNECTED/ACTIVE
		BLINK 1 = WIRELESS SYSTEM IS RESETING
		BLINK 2 = WIRELESS ROUTER PROBLEM
		BLINK 4 = WIRELESS SERVER PROBLEM
		BLINK = RS485 IS CONNECTED
		OFF = WIRELESS IS NOT ACTIVE
		ON = A FAULT HAS OCCURRED
		OFF = NO FAULT

### 3.4.4 Nameplate

The nameplate is for reference only.

<b>GOODWE</b>	
<b>Product: Grid-Tied PV Inverter</b>	
<b>Model : *****</b>	
PV Input	UDCmax: ****Vd.c.
	UMPP: ***Vd.c.
	IDC,max: ****Ad.c.
	ISC PV: ****Ad.c
Output	UAC,r: **/*/* or **/*~**Va.c.
	fAC, r: **Hz
	PAC,r: **kW
	IAC,max: **Aa.c.
	Sr: **kV A
	Smax: **kV A
P.F.: Default >***.cap...ind Toperating: ~** °C Non-isolated, IP66, protective Class I, OVC DCII/ACIII	
S/N:	
GoodWe Technologies Co., Ltd. E-mail: service@goodwe.com No.90 Zijin Rd., New District, Suzhou, 215011, China      S/N	

Goodwe trademark, product type, and product model

Technical parameters

Safety symbols and certification marks

Contact information and serial number

## 4 Check and Storage

### 4.1 Check Before Receiving

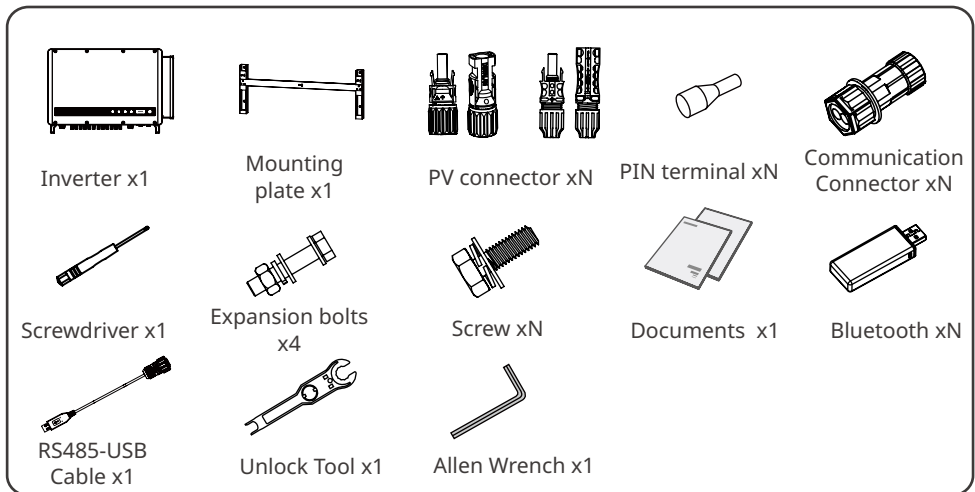
Check the following items before receiving the product.

1. Check the outer packing box for damage, such as holes, cracks, deformation, and others signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the inverter model. If the inverter model is not what you requested, do not unpack the product and contact the supplier.
3. Check the deliverables for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.

### 4.2 Deliverables

#### NOTICE

- The number of PV connectors and the PV terminals in the inverter is the same.
- The type and number of the communication connector are decided by the selected communication method.
- Communication module types: Bulethooth, etc. The actual module delivered depends on the communication method of the selected inverter.
- The number of expansion bolts, screws, pin terminals are various depending on different inverters. The actual accessories may differ.
- The Unlock Tool will only be delivered in Korea.
- The RS485-USB cable and Unlock Tool will only be delivered in Brazil.



## 4.3 Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

1. Do not unpack the outer package or throw the desiccant away.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.
3. The height and direction of the stacking inverters should follow the instructions on the packing box.
4. The inverters must be stacked with caution to prevent them from falling.
5. If the inverter has been long term stored, it should be checked by professionals before being put into use.

## 5 Installation

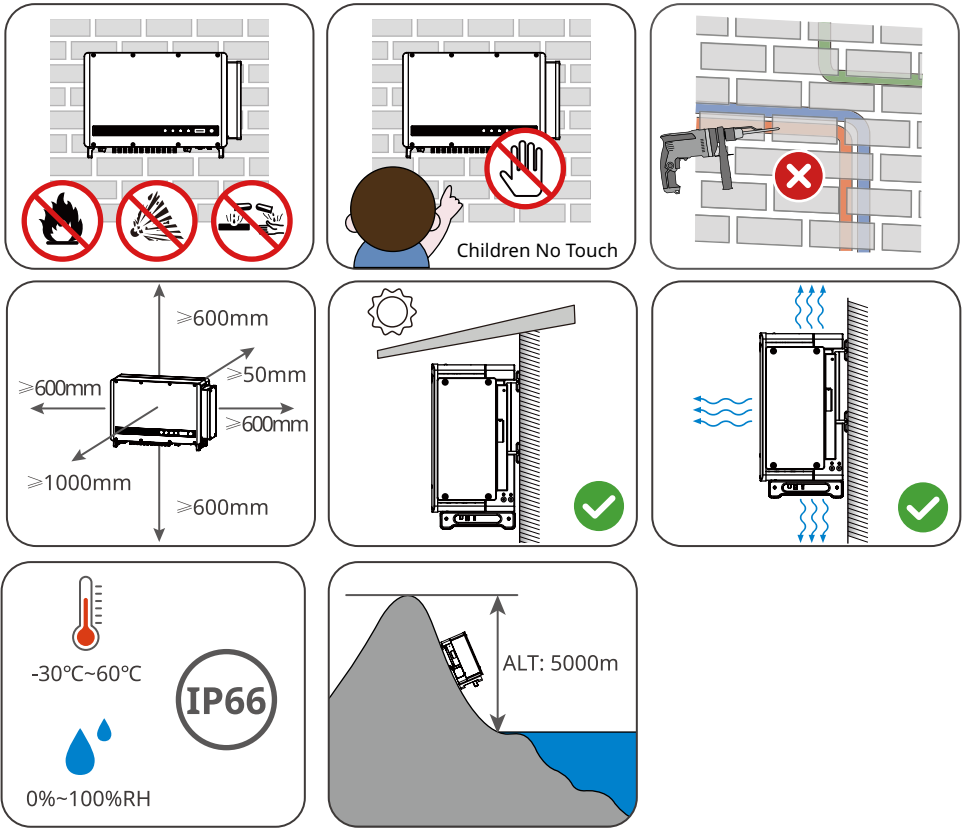
### 5.1 Installation Requirements

#### Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Install the equipment on a surface that is solid enough to bear the inverter weight.
3. Install the equipment in a well-ventilated place to ensure good dissipation. Also, the installation space should be large enough for operations.
4. The equipment with a high ingress protection rating can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
5. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
6. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. Install the inverters far away from noise-sensitive areas, such as the residential area, school, hospital etc., in order to avoid the noises bothering people nearby.
9. Install the inverter away from high magnetic field to avoid electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz near the inverter, you have to:
  - Install the inverter at least 30m far away from the wireless equipment.
  - Add a low pass EMI filter or a multi winding ferrite core to the DC input cable or AC output cable of the inverter.

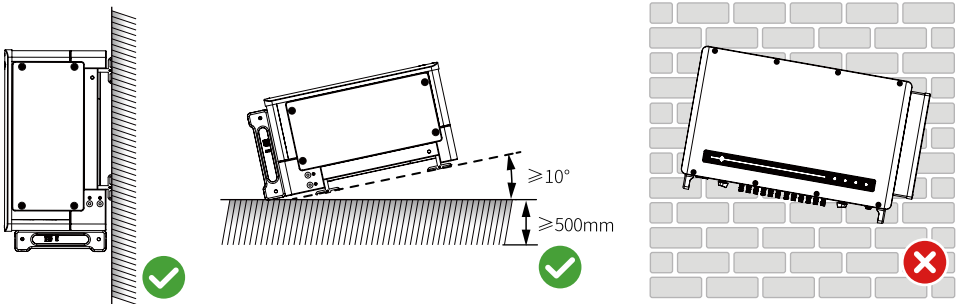
#### Mounting Support Requirements

1. The mounting support shall be nonflammable and fireproof.
2. Make sure that the support surface is solid enough to bear the product weight load.
3. Do not install the product on the support with poor sound insulation to avoid the noise generated by the working product, which may annoy the residents nearby.



### Installation Angle Requirements

- Install the inverter vertically or at a minimum back tilt of 10 degrees.
- Do not install the inverter upside down, forward tilt, back forward tilt, or horizontally.





## Installation Tool Requirements

The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

				
Goggles	Safety shoes	Safety gloves	Dust mask	RJ45 crimping tool
				
Diagonal pliers	Wire stripper	Hammer drill	Heat gun	DC terminal crimping tool
				
Marker	Level	Heat shrink tube	Rubber hammer	Vacuum cleaner
		 M6/M5	 M8/M12	
Multimeter	Cable tie	Torque wrench	Vacuum cleaner	

## 5.2 Inverter Installation

### 5.2.1 Moving the Inverter

#### CAUTION

Move the inverter to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.

1. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.
2. Wear safety gloves to avoid personal injury.
3. Keep balance when moving the equipment.

### 5.2.2 Installing the Inverter

#### NOTICE

- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Prepare and secure the mounting bracket if you want to install the inverter on the bracket.
- If you need to use the handles or hoisting rings, please contact after-sale service for purchase.

**Step 1** Put the mounting plate on the wall horizontally and mark positions for drilling holes.

**Step 2** Drill holes to a depth of 65mm using the hammer drill. The diameter of the drill bit should be 13mm.

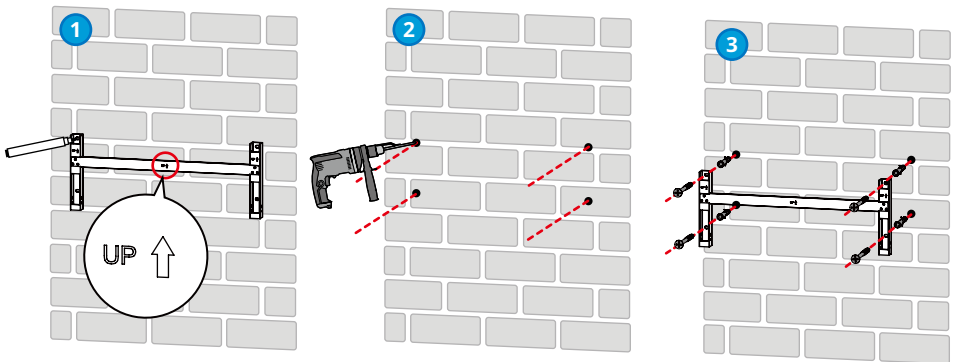
**Step 3** Fix the mounting plate on the wall or the bracket.

**Step 4** Install the handles or the hoisting rings.

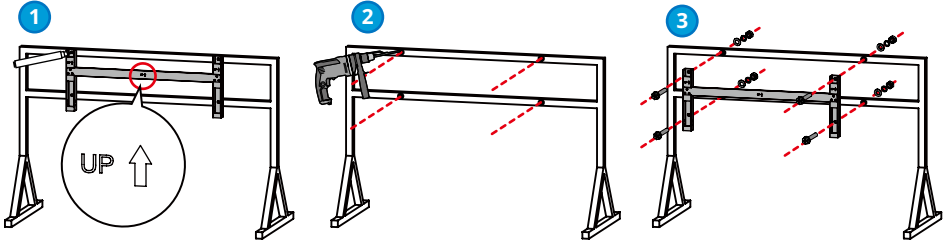
**Step 5** Grab the handles to lift the inverter or hoist the inverter to place it on the mounting plate.

**Step 6** Tighten the nuts to secure the mounting plate and the inverter.

#### Mounting on the wall



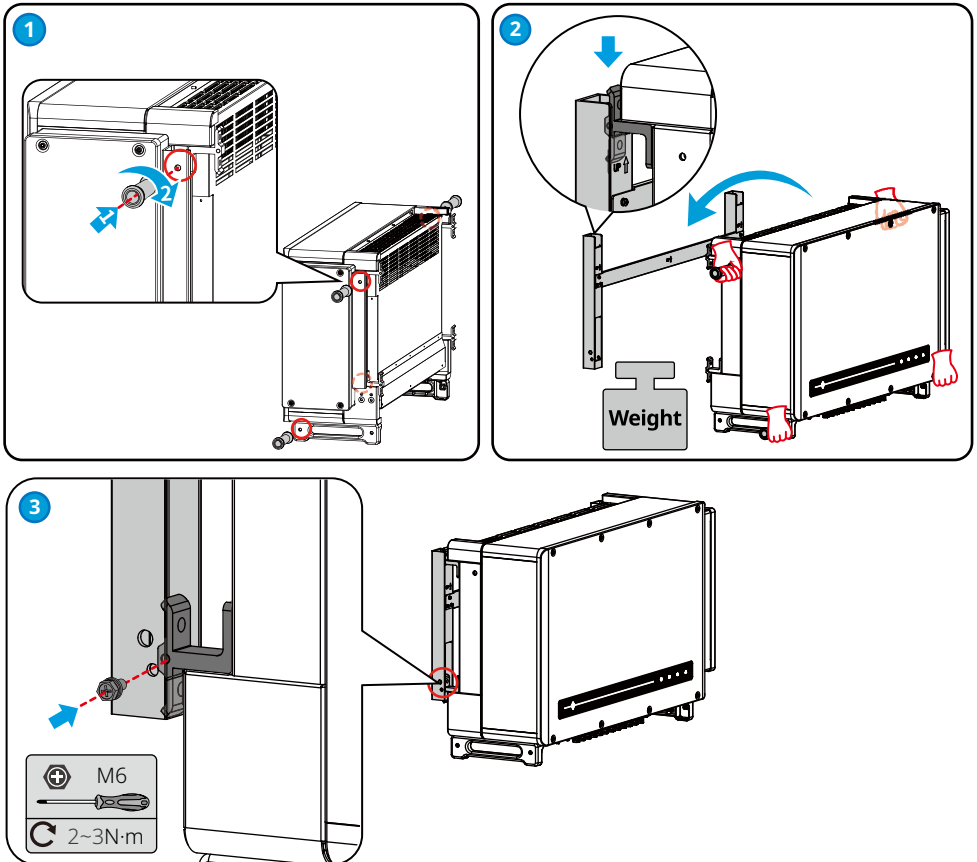
### Mounting on the plate



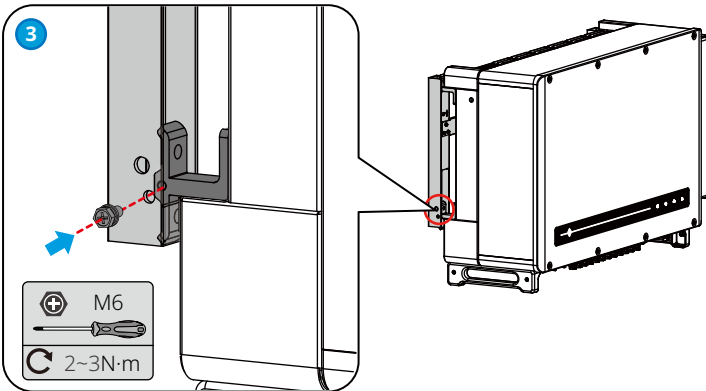
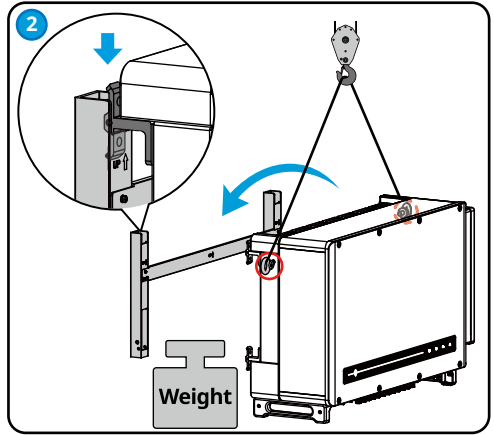
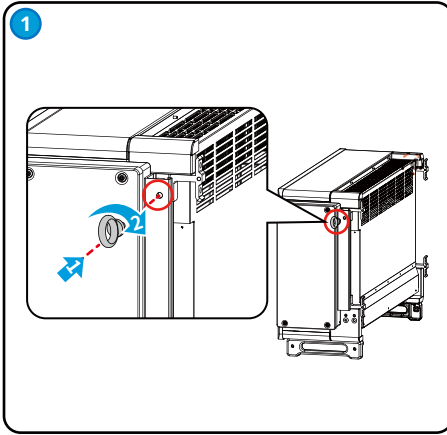
#### NOTICE

- Contact the dealer or the after sales center to purchase the handle if it is needed.
- The hoist ring should be prepared by customers.

### Lifting the Inverter



### Hoisting the Inverter



## 6 Electrical Connection

### 6.1 Safety Precautions

#### DANGER

- Disconnect the DC switch and the AC output switch of the inverter to power off the equipment before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- Perform electrical connections in compliance with local laws and regulations. Including operations, cables, and component specifications.
- If the tension is too large, the cable may be poorly connected. Reserve a certain length of the cable before connecting it to the inverter cable port.

#### NOTICE

- Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only. The cable specifications should meet local laws and regulations.

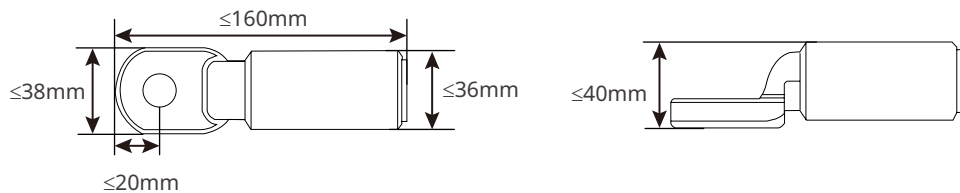
No.	Cable	Type	Cable Specification
1	PE cable	Outdoors Cable	Cross sectional area $S_{PE} \geq S/2$ . S is the cross sectional area of the output phase wire.
2	DC cable	PV standard cable that meets 1500V standard.	<ul style="list-style-type: none"> <li>• Conductor cross-sectional area: 4~6mm<sup>2</sup></li> <li>• Cable outer diameter: 5.5mm~8mm</li> </ul>
3	AC cable (multi-core)	Multi-core outdoor cable	<ul style="list-style-type: none"> <li>• Cable outer diameter: 22mm~67mm</li> <li>• Copper cable conductor cross sectional Area: <math>70 \leq S \leq 240\text{mm}^2</math></li> <li>• Aluminum alloy cable or copper-clad aluminum cable conductor cross sectional area: <math>95 \leq S \leq 240\text{mm}^2</math></li> </ul>
4	AC Cable (single-core)	Single-core outdoor cable	<ul style="list-style-type: none"> <li>• Cable outer diameter: 11mm~35mm</li> <li>• Copper cable conductor cross sectional Area: <math>70 \leq S \leq 240\text{mm}^2</math></li> <li>• Aluminum alloy cable or copper-clad aluminum cable conductor cross sectional area: <math>95 \leq S \leq 240\text{mm}^2</math></li> <li>• PE conductor cross sectional area <math>S_{PE} \geq S/2</math></li> </ul>
5	RS485 communication cable	Outdoor shielded twisted pair. The cable should meet local requirements.	Cable length $\leq 1000\text{m}$
6	Remote shutdown cable	Outdoor shielded twisted pair. The cable should meet local requirements.	N/A

**Note:**

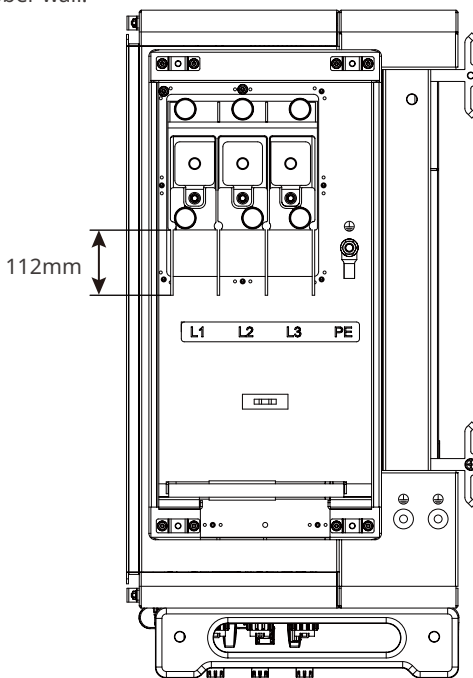
The values in this table are valid only if the external protective earthing conductor is made of the same metal as the phase conductors. Otherwise, the cross-sectional area of the external protective earthing conductor is to be determined in a manner which produces a conductance equivalent to that which results from the application of this table.

Only when the dimensions of the AC OT terminals after crimping and the rubber wall are as below figures, the maximum cross sectional area of the single core cable can reach 400mm<sup>2</sup>. Contact After Sale Service for the rubber wall when the cross sectional area of the cable is more than 240mm<sup>2</sup>.

Dimensions of the AC OT terminals after crimping:



Dimensions of the rubber wall:

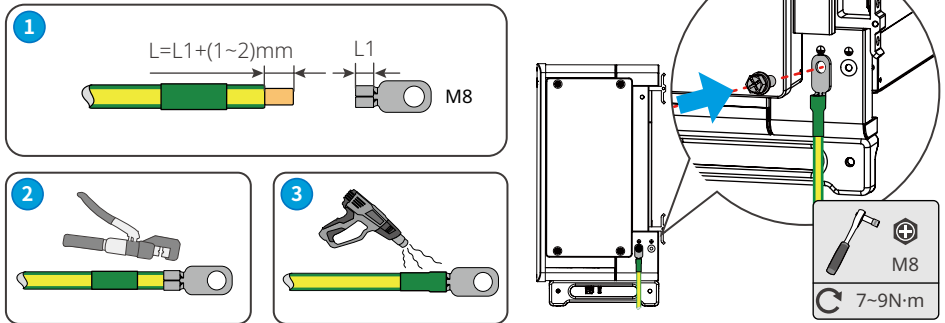


## 6.2 Connecting the PE Cable



### WARNING

- The ground point on the enclosure is preferred to connect to the PE cable for the inverter.
- Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters.
- To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- The PE cable should be prepared by customers.
- M8 ground OT terminals should be prepared by customers.





## 6.3 Connecting the PV Input Cable

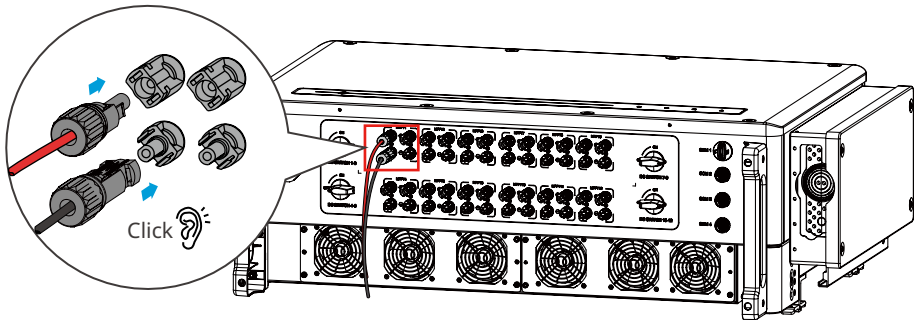
### DANGER

Confirm the following information before connecting the PV string to the inverter. Otherwise, the inverter may be damaged permanently or even cause fire and cause personal and property losses.

1. Make sure that the max short circuit current and the max input voltage per MPPT are within the permissible range.
2. Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV- of the inverter.

### WARNING

- Connect the DC cables using the delivered PV connectors. The manufacturer shall not be liable for the damage if other connectors are used.
- The PV strings cannot be grounded. Ensure the minimum isolation resistance of the PV string to the ground meets the minimum isolation resistance requirements before connecting the PV string to the inverter.
- The DC input cable should be prepared by customers.



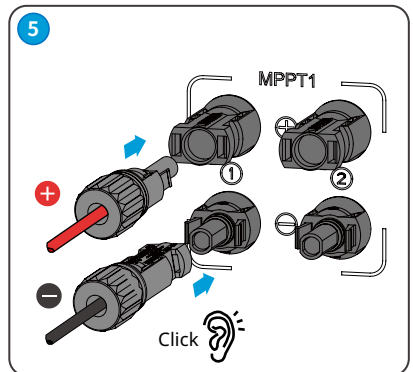
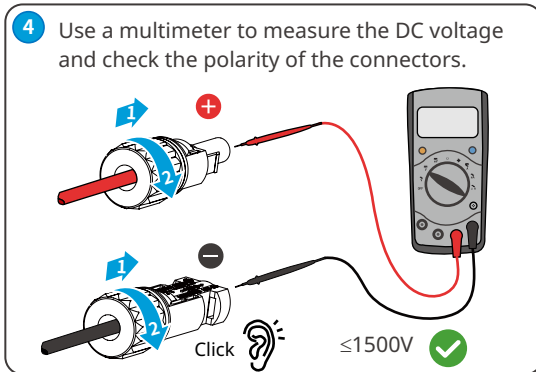
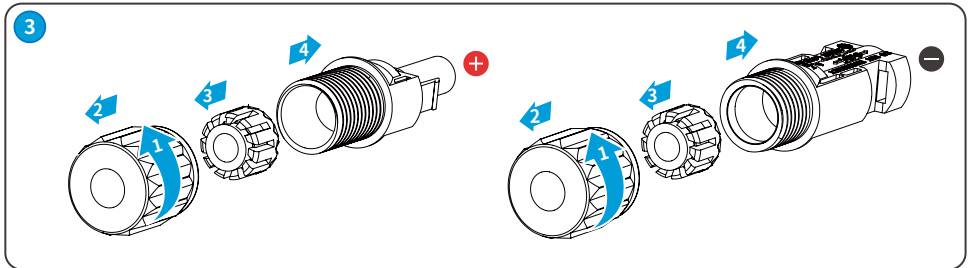
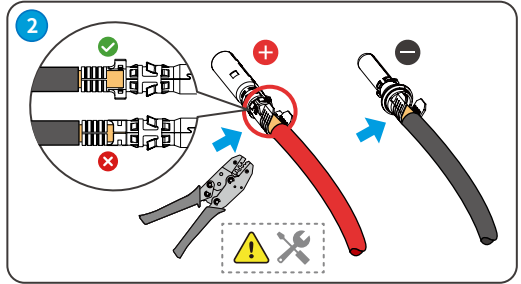
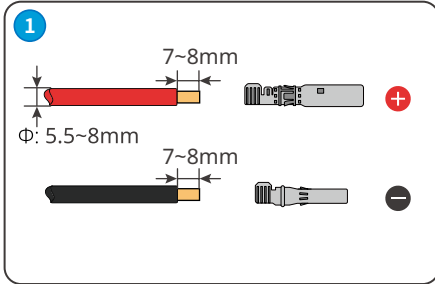
### NOTICE

Seal the PV input terminals using waterproof covers when they are not to be used. Otherwise, the ingress protection rating will be influenced.

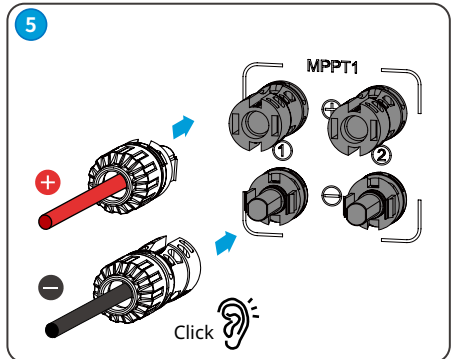
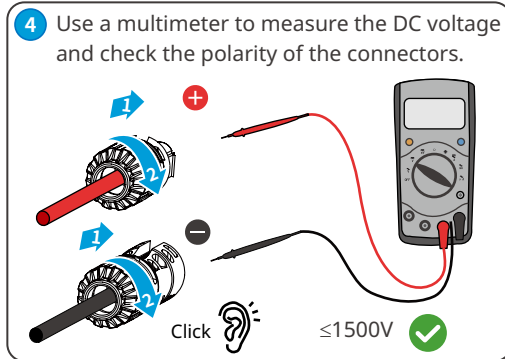
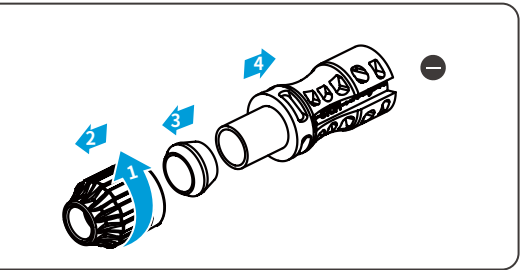
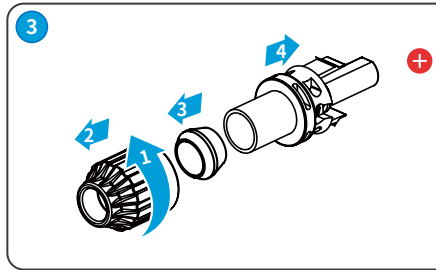
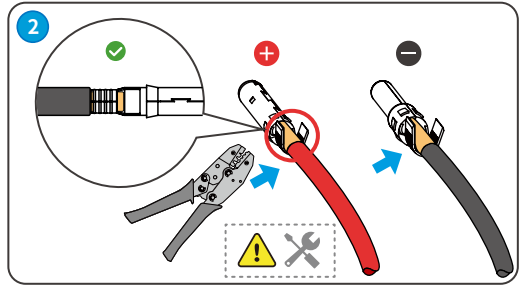
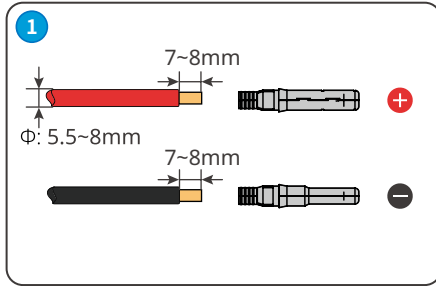
### Connecting the DC Input Cable

- Step 1** Prepare DC cables.
- Step 2** Crimp the crimp contacts.
- Step 3** Disassemble the PV connectors.
- Step 4** Make the DC cable and detect the DC input voltage.
- Step 5** Plug the PV connectors into the PV terminals.

Devalan DC Connector



### MC4 DC Connector



## 6.4 Connecting the AC Output Cable

 **WARNING**

Do not connect loads between the inverter and the AC switch directly connected to it.

Where an external RCD (Residual Current Device) is required in addition to the built-in RCMU (Residual Current Monitoring Unit), and a type A RCD must be used to avoid tripping.

Inverter model	Recommended RCD specifications
GW250K-HT, GW250KN-HT, GW225K-HT, GW225KN-HT	2500mA or higher

An AC circuit breaker should be installed on the AC side to make sure that the inverter can safety 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	AC circuit breaker
GW250K-HT, GW250KN-HT, GW225K-HT, GW225KN-HT	250A

**NOTICE**

Install one AC circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker.

 **WARNING**

- Pay attention to the silkscreens L1, L2, L3, PE on the AC terminal. Connect the AC cables to the corresponding terminals. The inverter may be damaged if the cables are connected inappropriately.
- The PE point in the maintenance compartment is used for connecting to the PE cable included in the multi-core AC power cable.
- Make sure that the whole cable cores are inserted into the AC terminal holes. No part of the cable core can be exposed.
- Make sure that the cables are connected securely. Otherwise, the terminal may be too hot to damage the inverter when the inverter is working.
- The AC terminals can be connected in three-phase four-wire or three-phase five-wire. The actual wiring method may be different. The figure below takes the three-phase five-wire as an example.
- The waterproof rubber ring for the AC outlet hole is delivered with the inverter, which is located in the AC junction box of the inverter. Please select the rubber ring types according to the actual using cables' specification.
- Reserve certain length of PE cable. Make ensure that the PE cable is the last one to bear the stress when the AC output cable is under tension.
- M8 ground OT terminals and M12 AC OT terminals should be prepared by customers.

**Step 1** Make the AC output cable.

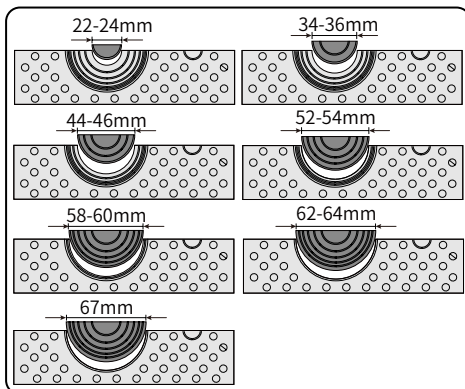
**Step 2** Dismantle the AC cover and take out the rubber ring.

**Step 3** Cut the rubber ring to right size.

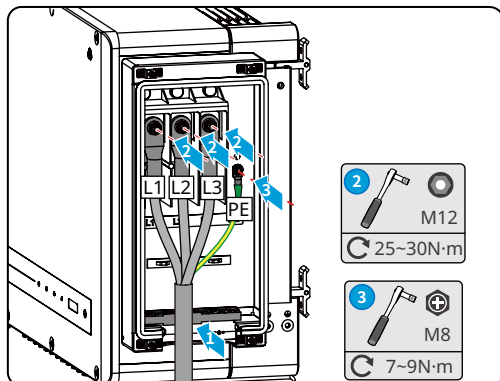
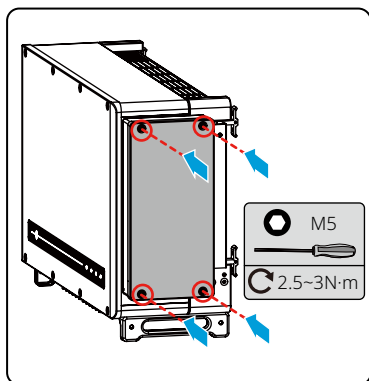
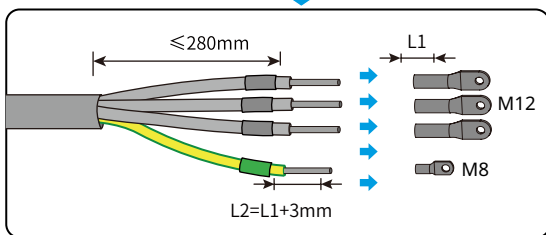
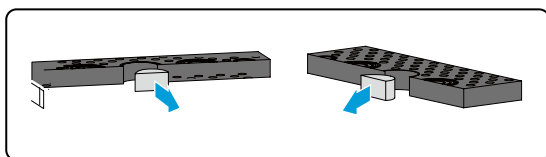
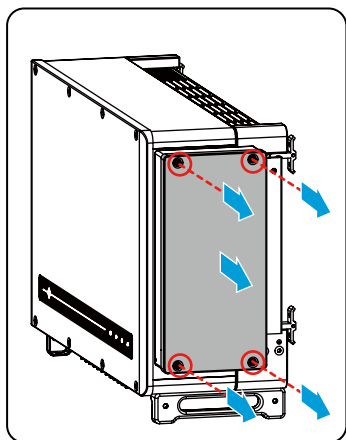
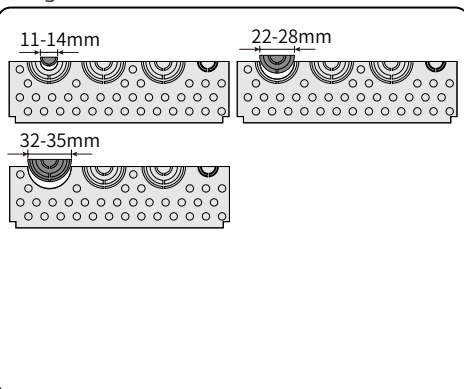
**Step 4** Crimp the AC cable OT terminal

**Step 5** Connect the AC output cables and install the cover.

Multi-core cable:



Single-core cable:



**NOTICE**

- Make sure that the cables are connected correctly and firmly after connections. Clean all the debris in the maintenance compartment.
- Seal the AC output terminal to ensure the Ingress Protection Rating.

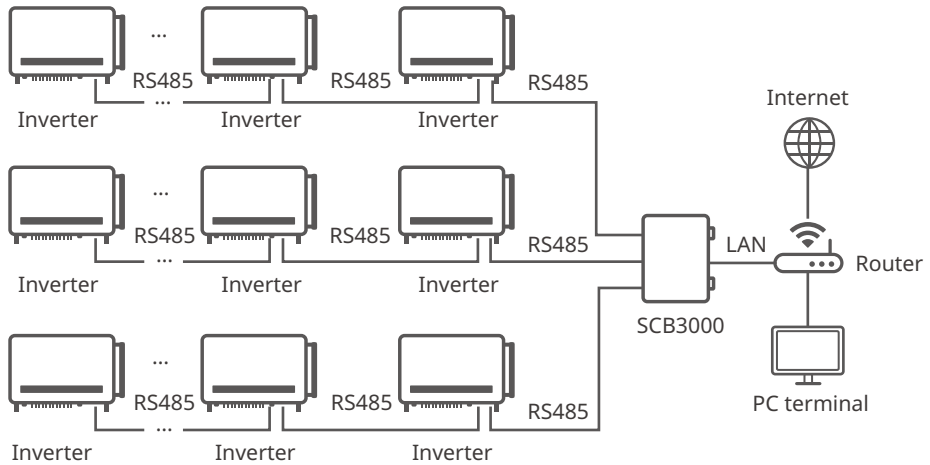
## 6.5 Communication

### 6.5.1 Connecting the Communication Cable

#### NOTICE

Make sure that the communication device is connected to the right COM port. Route the communication cable far away from any interference source or power cable to prevent the signal from being influenced.

#### RS485 networking scenario



Connect the RS485 port of the inverter to the Data Logger. The total length of the connection cable is less than 1000m.

Keep the communication cable away from power cables to prevent the communication from being interrupted.

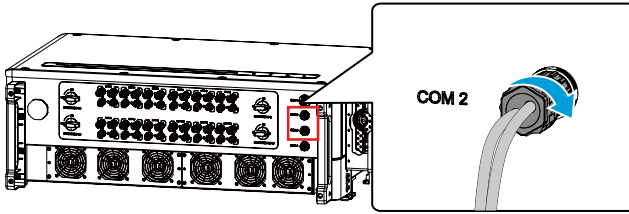
If more than 2 inverters are connected and also connected to the data logger, at most 20 inverters are allowed on the daisy chain.

#### Connecting the RS485 Communication Cable

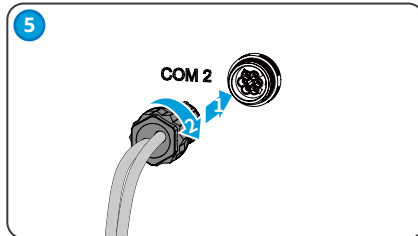
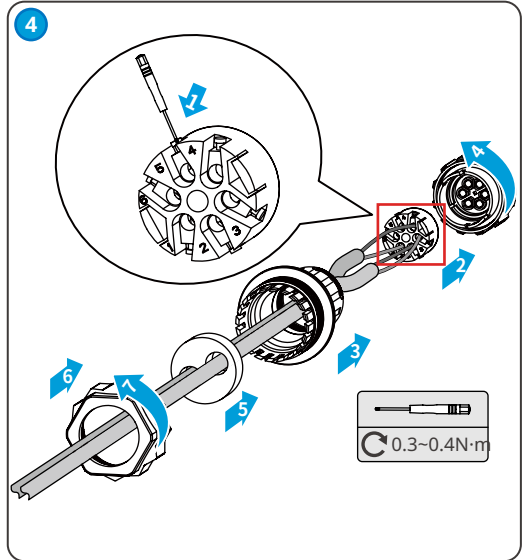
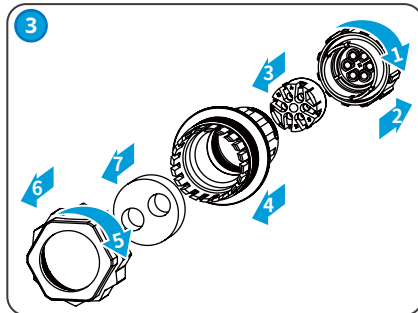
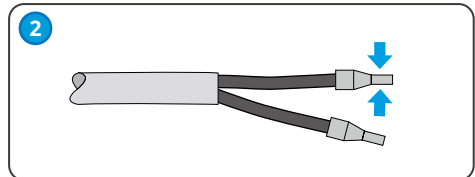
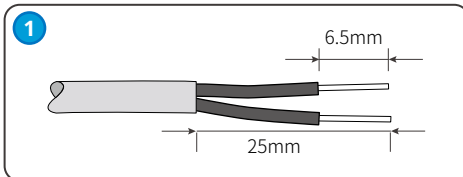
Communication Type	COM Port	Port Definition	Function Description
RS485	COM2	1: RS485 A 2: RS485 B 3: RS485 A 4: RS485 B 5: Grounding 6: Grounding	Used to connect the inverter to other inverters or the RS485 port on the data logger. You can refer to SCB3000 User Manual. Visit <a href="https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SCB3000_User%20Manual-EN.pdf">https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SCB3000_User%20Manual-EN.pdf</a> to get the user manual.
Reserved	COM3	-	-

**NOTICE**

Connect the RS485 cable and smart meter using a 6PIN communication terminal as follows.

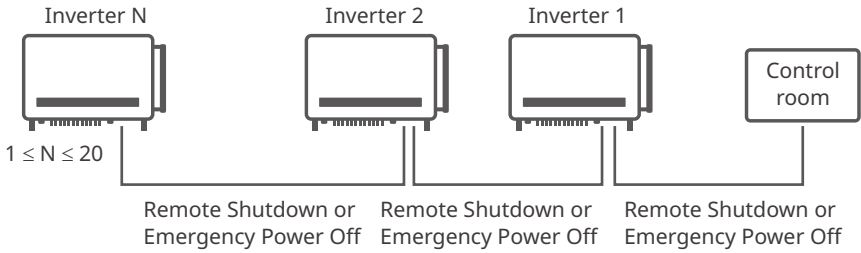


No.	COM2 (RS485)
1	RS485 A
2	RS485 B
3	RS485 A
4	RS485 B
5	Grounding
6	Grounding



### Remote Shutdown and Emergency Power Off networking scenario

Remote Shutdown: For Europe only.  
 Emergency Power Off: For India only.



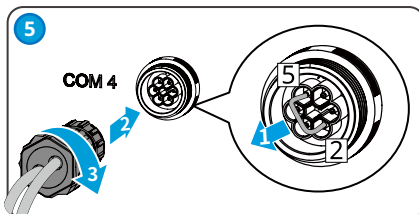
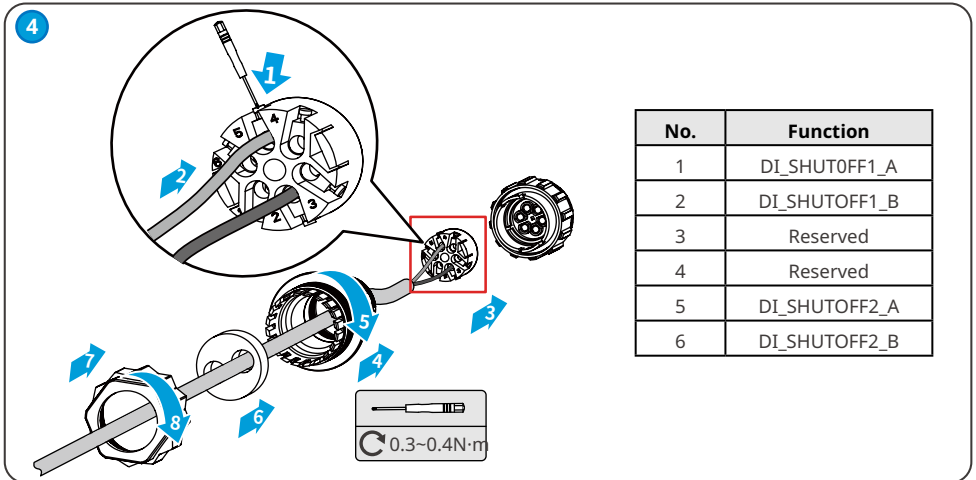
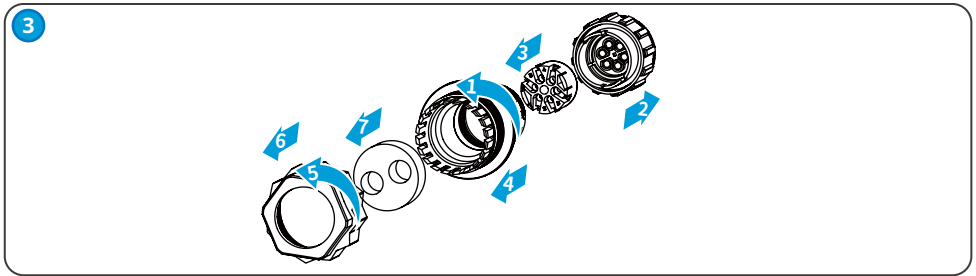
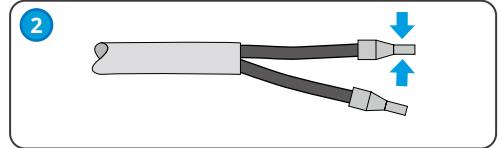
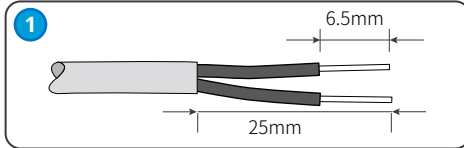
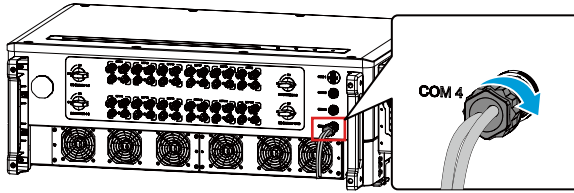
### Connecting the Remote Shutdown and Emergency Power Off Communication Cable

Communication Type	COM Port	Port Definition	Function Description
Remote Shutdown or Emergency Power Off	COM4	1: DI_SHUT0FF1_A 2: DI_SHUT0FF1_B 3: Reserved 4: Reserved 5: DI_SHUT0FF2_A 6: DI_SHUT0FF2_B	<ul style="list-style-type: none"> <li>The remote shutdown port is reserved to meet the safety regulations in Europe. Related devices have to be prepared by customers.</li> <li>The Emergency Power Off port is reserved to meet the safety regulations in India. Related devices have to be prepared by customers.</li> </ul>

#### NOTICE

Connect the Remote Shutdown or Emergency Power Off cable using a 6PIN communication terminal as follows.





**NOTICE**

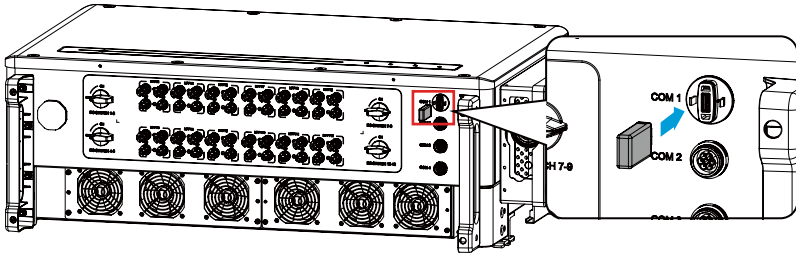
The Remote Shutdown communication port is installed with a short circuit wire. Remove the short circuit wire and keep it properly when enabling the Remote Shutdown function. Install the short circuit wire in PIN2 and PIN5 of the COM4 port when disabling the Remote Shutdown function.

## 6.5.2 Installing the Communication Module

Plug a Bluetooth module into the inverter to establish a connection between the inverter and the smartphone or web pages. Set inverter parameters, check running information and fault information, and observe system status in time via the smartphone or web pages.

### NOTICE

Refer to the delivered communication module user manual to get more introduction to the module. For more detailed information, visit [www.goodwe.com](http://www.goodwe.com).



## 7 Equipment Commissioning

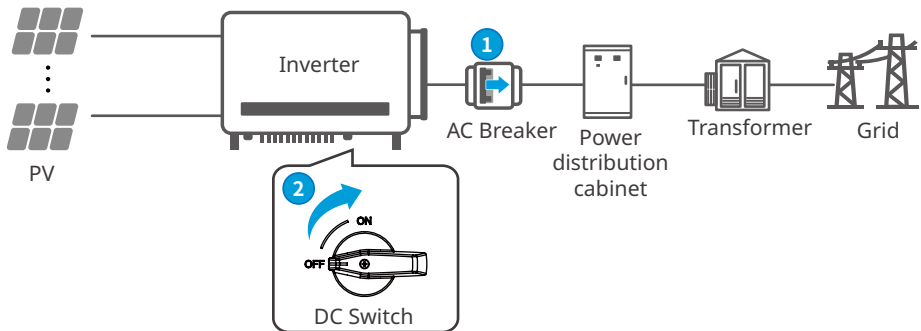
### 7.1 Check Items Before Switching Power ON

No.	Check Item
1	The inverter is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, DC input cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable ties are routed properly and evenly, and no burrs.
4	Unused ports and terminals are sealed.
5	The voltage and frequency at the connection point meet the on-grid requirements.

### 7.2 Power On

**Step 1** Turn on the AC breaker between the inverter and the utility grid.

**Step 2** Turn on the DC switch of the inverter.



## 8 System Commissioning














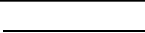




### 8.1 Indicators and Button

Model without LCD



Model with LCD



Indicator	Status	Description
		ON = EQUIPMENT POWER ON
		OFF = EQUIPMENT POWER OFF
		ON = THE INVERTER IS FEEDING POWER
		OFF = THE INVERTER IS NOT FEEDING POWER
		SINGLE SLOW FLASH = SELF CHECK BEFORE CONNECTING TO THE GRID
		SINGLE FLASH = CONNECTING TO THE GRID
		ON = WIRELESS IS CONNECTED/ACTIVE
		BLINK 1 = WIRELESS SYSTEM IS RESETING
		BLINK 2 = WIRELESS ROUTER PROBLEM
		BLINK 4 = WIRELESS SERVER PROBLEM
		BLINK = RS485 IS CONNECTED
		OFF = WIRELESS IS NOT ACTIVE
		ON = A FAULT HAS OCCURRED
		OFF = NO FAULT

## 8.2 Setting Inverter Parameters via LCD

### NOTICE

- The screen shots are for reference only. The actual display may differ.
- The name, range, and default value of the parameters is subject to change or adjust. The actual display prevails.
- the power parameters should be set by professionals to prevent the generating capacity from being influenced by wrong parameters.

### LCD Button Description

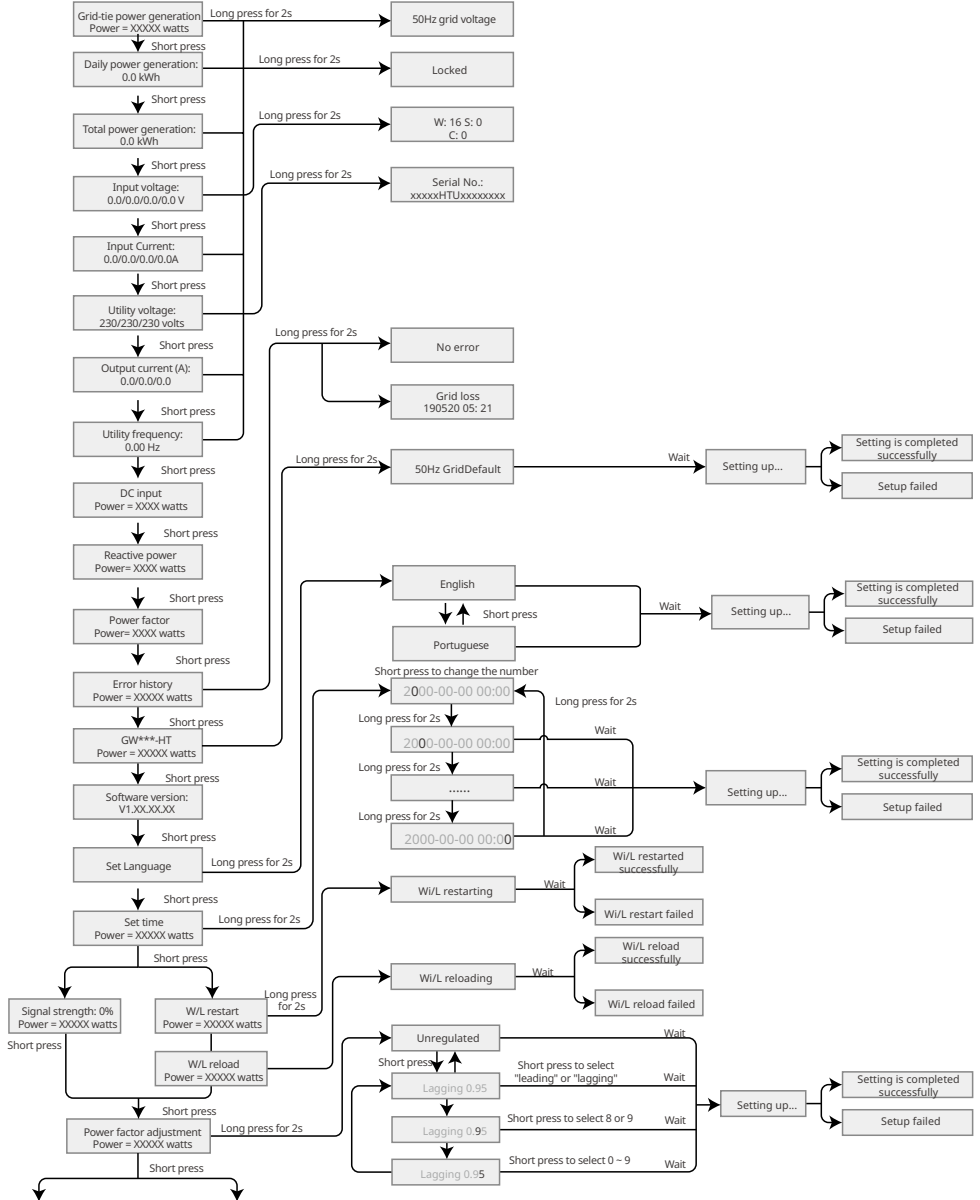
Stop pressing the button for a period in any page, the LCD will get dark and go back to the initial page, which means the parameter in that page has been saved successfully.

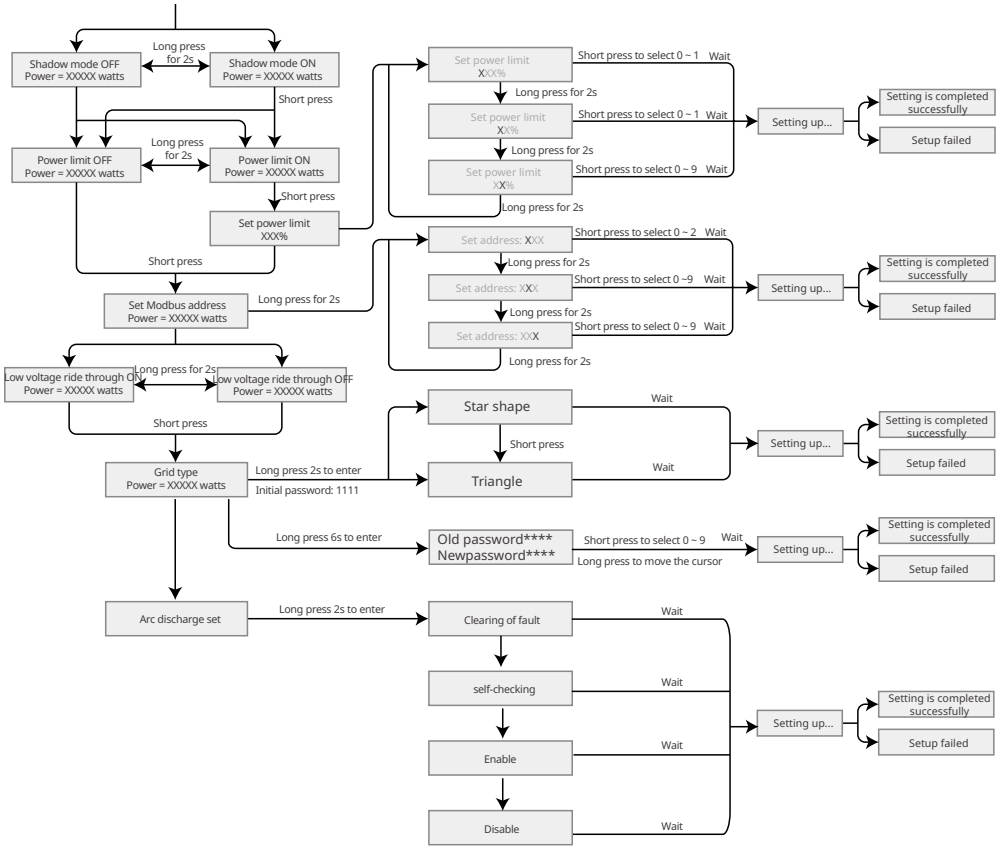
## LCD Menu Introduction

This part describes the menu structure, allowing you view inverter information and set parameters more conveniently.

### First level menu

### Second level menu





### 8.3 Setting Inverter Parameters via App

SolarGo is an application used to communicate with the inverter via Bluetooth module, WiFi module, Wi-Fi/LAN module, 4G module, or GPRS module. Commonly used functions:

1. Check the operating data, software version, alarms of the inverter, etc.
2. Set grid parameters and communication parameters of the inverter.
3. Maintain the equipment.

For more details, refer to the SolarGo APP User Manual. Scan the QR code or visit [https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW\\_SolarGo\\_User%20Manual-EN.pdf](https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SolarGo_User%20Manual-EN.pdf) to get the user manual.



SolarGo App



SolarGo App  
User Manual

### 8.4 Monitoring via SEMS Portal

SEMS Portal is an monitoring platform used to manage organizations/users, add plants, and monitor plant status.

For more details, refer to the SEMS Portal User Manual. Scan the QR code or visit [https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW\\_SEMS%20Portal-User%20Manual-EN.pdf](https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SEMS%20Portal-User%20Manual-EN.pdf) to get the user manual.



SEMS Portal



SEMS Portal  
User Manual



## 9 Maintenance

### 9.1 Power Off the Inverter

#### DANGER

- Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.
- Delayed discharge. Wait until the components are discharged after power off.

**Step 1** Issue a command to the inverter for halting the grid via SolarGo APP.

**Step 2** Turn off the AC switch between the inverter and the utility grid.

**Step 3** Turn off the DC switch of the inverter.

### 9.2 Removing the Inverter

#### WARNING

- Make sure that the inverter is powered off.
- Wear proper PPE before any operations.

**Step 1** Disconnect all the cables, including DC cables, AC cables, communication cables, the communication module, and PE cables.

**Step 2** Handle or hoist the inverter to take it down from the wall or the bracket.

**Step 3** Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

### 9.3 Disposing of the Inverter

If the inverter cannot work any more, dispose of it according to the local disposal requirements for electrical equipment waste. Do not dispose of it as household waste.

## 9.4 Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.

Collect the information below before contacting the after-sales service, so tha the problems can be solved quickly.

1. Inverter information like serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. Utility grid situation.

No.	Fault	Cause	Solutions
1	SPI Comm Fail	<ol style="list-style-type: none"> <li>1. The chip is not powered on.</li> <li>2. The chip program version is wrong.</li> </ol>	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
2	EEPROM Fail	The internal memory Flash is abnormal.	
3	Fac Fail	Utility grid exception. The actual grid frequency change rate does not meet the requirement of the local grid standard.	<ol style="list-style-type: none"> <li>1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal.</li> <li>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.                             <ul style="list-style-type: none"> <li>• Contact the local power company if the grid frequency exceeds the permissible range.</li> <li>• Contact the dealer or the after-sales service if the grid frequency is within the permissible range.</li> </ul> </li> </ol>
4	DC-SPD	The inverter is struck by lightning.	<ol style="list-style-type: none"> <li>1. Improve the lightning protection facilities around the inverter.</li> <li>2. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</li> </ol>
5	Night DCSPS Fault	<ol style="list-style-type: none"> <li>1. Temporary abnormality is caused by environmental factors.</li> <li>2. Internal components of the inverter are damaged.</li> </ol>	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.

No.	Fault	Cause	Solutions
6	Relay Fail	<ol style="list-style-type: none"> <li>1. The relay is abnormal or short-circuited.</li> <li>2. The control circuit is abnormal.</li> <li>3. The AC cable connection is abnormal, like a virtual connection or short circuit.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
7	BUS-start Fail	<ol style="list-style-type: none"> <li>1. The output power of the PV string is too low.</li> <li>2. The control circuit is abnormal.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
8	OVGRFault	<ol style="list-style-type: none"> <li>1. The output voltage value of the PV string is lower than the minimum DC input voltage value of the inverter.</li> <li>2. The control circuit is abnormal.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
9	Pv Reverse Fault	The PV string is connected reversely.	Check whether the PVstrings is connected reversely.
10	Night BUS Fault	<ol style="list-style-type: none"> <li>1. Utility grid power fails.</li> <li>2. The AC cable is disconnected, or the AC breaker is off.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
11	CPLD Error	<ol style="list-style-type: none"> <li>1. Temporary abnormality is caused by environmental factors.</li> <li>2. Internal components of the inverter are damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>

No.	Fault	Cause	Solutions
12	DCi High	The machine detects that the DC component of the internal output current exceeds the normal range.	Please contact your dealer or after-sale service.
13	ISO Fail	<ol style="list-style-type: none"> <li>1. The PV system is short-circuited to the ground.</li> <li>2. The PV system is in a moist environment and the circuit is not well insulated to the ground.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the PV input cables are broken.</li> <li>2. Check whether the module frames and the metal bracket are securely grounded.</li> <li>3. Check whether the AC side is properly grounded</li> </ol>
14	Vac Failure	The utility grid voltage is out of the allowed range.	<ol style="list-style-type: none"> <li>1. Make sure that the grid voltage is within the allowed range.</li> <li>2. Make sure that the phase sequence of the AC cables are connected correctly, and the neutral wire and PE cable are connected properly and firmly.</li> </ol>
15	ExFan Failure	<ol style="list-style-type: none"> <li>1. The fan power supply is abnormal.</li> <li>2. Mechanical exception.</li> <li>3. The fan is aging and damaged.</li> </ol>	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
16	GFCI Chk Fail	The sampling of the GFCI HCT is abnormal.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
17	AFCI Fault	<ol style="list-style-type: none"> <li>1. The DC string terminal is not firmly connected.</li> <li>2. The DC cable is broken.</li> </ol>	Please check whether the wirings of the PV modules are correct according to the requirements in the user manual.

No.	Fault	Cause	Solutions
18	Over Temperature	<ol style="list-style-type: none"> <li>1. The inverter is installed in a place with poor ventilation.</li> <li>2. The ambient temperature exceeds 60°C.</li> <li>3. A fault occurs in the internal fan of the inverter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the ventilation and the ambient temperature at the installation point.</li> <li>2. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation.</li> <li>3. Contact the dealer or after-sales service if both the ventilation and the ambient temperature are normal.</li> </ol>
19	InFan Fail	<ol style="list-style-type: none"> <li>1. The fan power supply is abnormal.</li> <li>2. Mechanical exception.</li> <li>3. The fan is aging and damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
20	DC Bus High	<ol style="list-style-type: none"> <li>1. The PV voltage is too high.</li> <li>2. The sampling of the inverter BUS voltage is abnormal.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
21	Gnd I Fail	<p>The input insulation impedance to the ground decreases when the inverter is operating.</p>	<ol style="list-style-type: none"> <li>1. Check whether the working environment of the inverter meets the requirements. For example, the fault may occur due to high humidity on rainy days</li> <li>2. Make sure that the components are properly grounded and the AC side is properly grounded.</li> </ol>
22	Utility Loss	<ol style="list-style-type: none"> <li>1. Utility grid power fails.</li> <li>2. The AC cable is disconnected, or the AC breaker is off.</li> </ol>	<ol style="list-style-type: none"> <li>1. The alarm is automatically cleared after the grid power supply is restored.</li> <li>2. Check whether the AC cable is connected and the AC breaker is on.</li> </ol>
23	AC HCT Fail	<p>The sampling of the AC HCT is abnormal.</p>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>

No.	Fault	Cause	Solutions
24	Relay Fail	<ol style="list-style-type: none"> <li>1. The relay is abnormal or short-circuited.</li> <li>2. The control circuit is abnormal.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
25	GFCI Chk Fail	The sampling of the GFCI HCT is abnormal.	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
26	SPD Failure	The inverter is struck by lightning.	<p>3. Improve the lightning protection facilities around the inverter. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
27	DC Switch Fail	The tripping times of the DC trip switch exceeds the limit.	Please contact your dealer or after-sale service.
28	Ref-V Chk Fail	The reference circuit is faulty.	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
29	HCT Chk Fail	The AC sensor is abnormal in sampling.	
30	PID Error	<ol style="list-style-type: none"> <li>1. The system grounding is abnormal.</li> <li>2. The PID module is abnormal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the DC connecting and AC connecting cables are abnormal.</li> <li>2. Check whether the PID module is abnormal.</li> <li>3. Contact your dealer or after-sales service.</li> </ol>
31	CPLD Error	<ol style="list-style-type: none"> <li>1. Temporary abnormality is caused by environmental factors.</li> <li>2. Internal components of the inverter are damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
32	PV over Curr	<ol style="list-style-type: none"> <li>1. The PV module configuration is not reasonable.</li> <li>2. The hardware is damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
34	PV soft OverCurr		

No.	Fault	Cause	Solutions
35	Model Error	<ol style="list-style-type: none"> <li>1. Temporary abnormality is caused by environmental factors.</li> <li>2. Internal components of the inverter are damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
36	Pv Short Failure	The hardware is abnormal.	Please contact your dealer or after-sale service.
37	BUS-start Fail	<ol style="list-style-type: none"> <li>1. The output power of the PV string is too low.</li> <li>2. The control circuit is abnormal.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
38	PV Over Voltage	Excess PV modules are connected in the series, and the open-circuit voltage is higher than the operating voltage.	<ol style="list-style-type: none"> <li>1. Check whether the PV string input voltage consistent with the value displayed on the LCD.</li> <li>2. Check whether the PV string voltage meets the maximum input voltage requirements.</li> </ol>
39	PV Voltage Low	Sun light is weak or changing abnormally.	<ol style="list-style-type: none"> <li>1. If the problem occurs occasionally, the reason might be abnormal sun light. The inverter will recover automatically without manual intervention.</li> <li>2. If the problem occurs frequently, contact the dealer or the after-sales service.</li> </ol>
40	PV HCT Fail	<ol style="list-style-type: none"> <li>1. Temporary abnormality is caused by environmental factors.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
41	PV over Curr	<ol style="list-style-type: none"> <li>2. Internal components of the inverter are damaged.</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>
42	Bus Unbalance	<ol style="list-style-type: none"> <li>1. The sampling circuit of the relay is abnormal.</li> <li>2. Abnormal hardwares</li> </ol>	<p>Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.</p>

## 9.5 Routine Maintenance



Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 6-12 months
Fan	Check the fan for proper working status, low noise, and intact appearance.	Once a year
DC Switch	Turn the DC switch on and off ten consecutive times to make sure that it is working properly.	Once a year
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken, or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year



## 10 Technical Parameters

Technical Data	GW250K-HT	GW225K-HT	GW250KN-HT	GW225KN-HT
<b>Input</b>				
Max.Input Power (kW)	400	400	400	400
Max.Input Voltage (V)	1500	1500	1500	1500
MPPT Operating Voltage Range (V)	500~1500	500~1500	500~1500	500~1500
MPPT Voltage Range at Nominal Power (V)	850~1300	850~1300	850~1300	850~1300
Start-up Voltage (V)	550	550	550	550
Nominal Input Voltage (V)	1160	1160	1160	1160
Max. Input Current per MPPT (A)	30	30	60	60
Max. Short Circuit Current per MPPT (A)	50	50	90	90
Max. Backfeed Current to The Array (A)	0	0	0	0
Number of MPP Trackers	12	12	6	6
Number of Strings per MPPT	2	2	3	3
<b>Output</b>				
Nominal Output Power (kW)	250	225	250	225
Nominal Output Apparent Power (kVA)	250	225	250	225
Max. AC Active Power (kW)	250	247.5	250	247.5
Max. AC Apparent Power (kVA)	250	247.5	250	247.5
Nominal Power at 40°C (kW)	250	225	250	225
Max Power at 40°C (Including AC Overload) (kW)	250	247.5	250	247.5
Nominal Output Voltage (V)	800, 3L/PE			
Output Voltage Range (V)	640~920			
Nominal AC Grid Frequency (Hz)	50 / 60			
AC Grid Frequency Range (Hz)	45~55/55~65			
Max. Output Current (A)	180.5	178.7	180.5	178.7

Technical Data	GW250K-HT	GW225K-HT	GW250KN-HT	GW225KN-HT
Nominal Output Current (A)	180.5	162.4	180.5	162.4
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Max. Total Harmonic Distortion	<3%			
Maximum Output Overcurrent Protection (A)	258			
<b>Efficiency</b>				
Max. Efficiency	99.0%	99.0%	99.0%	99.0%
European Efficiency	98.5%	98.5%	98.7%	98.7%
CEC Efficiency	98.5%	98.5%	98.8%	98.8%
<b>Protection</b>				
PV String Current Monitoring	Integrated			
Internal Humidity Detection	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	Integrated			
DC Surge Protection	Type II			
AC Surge Protection	Type II			
Emergency Power Off	Optional			
Remote Shutdown	Optional			
Anti-PID	Optional			
PID Recovery	Optional			
Reactive Power Compensation at Night	Integrated			
Power Supply at Night	Integrated			
<b>General Data</b>				
Operating Temperature Range (°C)	-30 ~ 60(60 °C for outdoor unconditioned with solar effects.)			

Technical Data	GW250K-HT	GW225K-HT	GW250KN-HT	GW225KN-HT
Relative Humidity	0~100%			
Max. Operating Altitude (m)	5000 (>4000 derating)			
Cooling Method	Smart Fan Cooling			
Display	LED (LCD optional), Bluetooth + APP			
Communication	RS485 or PLC			
Communication protocols	Modbus RTU			
Weight (Kg)	111			
Dimension (W×H×Dmm)	1091×678×341			
Noise Emission (dB)	< 70			
Topology	Non-isolated			
Self-consumption at Night (W)	< 18			
Tracker Power Interface	Integrated			
Ingress Protection Rating	IP66			
Anti-corrosion Class	C5 (Optional)			
DC Connector	MC4-Evo2 (4~6 mm <sup>2</sup> )			
AC Connector	OT / DT terminal (Max. 300 mm <sup>2</sup> )			
Environmental Category	4K4H			
Pollution Degree	III			
Overtoltage Category	DC II/AC III			
Protective Class	I			
The Decisive Voltage Class (DVC)	PV: C AC: C COM: A			
Active Anti-islanding Method	AQDPF			
Country of Manufacture	China			

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

**Overvoltage levels:**

Overvoltage I: Devices connected to the circuit which can limit instantaneous overvoltage to a relatively low level.

Overvoltage II: Energy-consuming devices powered by fixed power distribution equipment, including appliances, portable tools, and other household and similar equipment. Overvoltage III is also applicable if there are special requirements for the reliability and applicability of the equipment.

Overvoltage III: Devices apply to fixed distribution equipment, including switches in the fixed power distribution equipment and industrial equipment permanently connected to fixed power distribution equipment. The reliability and applicability of the equipment have to meet special requirements.

Overvoltage IV: Devices apply to the power distribution equipment, such as measuring instruments and prepositioned overcurrent protection devices, etc.

**Humidity Levels:**

Environmental Parameters	Level		
	3K3	4K2	4K4H
Temperature range	0°C - +40°C	-33°C - +40°C	-20°C - +55°C
Humidity range	5% to 85%	15% to 100%	4% to 100%

**Environmental levels:**

Outdoor inverter: The ambient temperature range is -25°C - +60°C, suitable for an environment with pollution of level 3;

Indoor type II inverter: The ambient temperature range is -25°C - +40°C, suitable for an environment with pollution of level 3;

Indoor type I inverter: The ambient temperature range is 0°C - +40°C, suitable for an environment with pollution of level 2;

**Pollution levels:**

Pollution level 1: No pollution or dry and non-conductive pollution only;

Pollution level 2: Usually non-conductive pollution only, but there may be temporary conductive pollution caused by condensation;

Pollution level 3: Conductive pollution or non-conductive pollution turns to conductive pollution due to condensation;


Pollution level 4: Persistent conductive pollution, such as pollution caused by conductive dust or rain and snow.




GoodWe Website

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