



User Manual

Grid-Tied PV Inverter

SMT Series

V1.0-2022-08-30

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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.

CONTENT

1	About This Manual	1
1.1	Applicable Model	1
1.2	Target Audience	1
1.3	Symbol Definition	2
1.4	Updates	2
2	IMPORTANT SAFETY INSTRUCTIONS	3
2.1	General Safety	3
2.2	PV String Safety	3
2.3	Inverter Safety	4
2.4	Personnel Requirements	4
3	Product Introduction	5
3.1	Product Overview	5
3.2	Application Scenarios	6
3.3.3	Inverter operation mode	10
3.4	Functionality	11
3.5	Appearance	12
3.5.1	Parts	12
3.5.2	Dimensions	13
3.5.3	Indicators	13
3.5.4	Nameplate	14
4	Check and Storage	15
4.1	Check Before Receiving	15
4.2	Deliverables	15
4.3	Storage	16
5	Installation	17
5.1	Installation Requirements	17
5.2	Inverter Installation	20
5.2.1	Moving the Inverter	20
5.2.2	Installing the Inverter	20
6	Electrical Connection	23
6.1	Safety Precaution	23
6.2	Preparations Before Cable Connections	24
6.2.1	Connection Unit Introduction	24
6.2.2	Conduit Hole Dimensions	24
6.3	Removing the Enclosure Cover	25
6.4	(Optional) Connecting the PE Cable	26
6.5	Connecting the DC Input Cable(PV)	26

6.6	Connecting the AC Cable	28
6.7	Connecting the Communication Cable.....	31
6.8	Installing the WiFi Module	33
6.9	Installing the USB Cable	33
6.10	Opening the wiring cover	34
7	Equipment Commissioning.....	35
7.1	Check Before Power ON.....	35
7.2	Power On	35
8	System Commissioning.....	36
8.1	Indicators and Buttons	36
8.2	Setting Inverter Parameters via App	37
8.3	Monitoring via SEMS Portal	37
9	Maintenance	38
9.1	Power Off the Inverter.....	38
9.2	Removing the Inverter	38
9.3	Disposing of the Inverter	38
9.4	Troubleshooting.....	39
9.5	Routine Maintenance.....	46
10	Technical Parameters.....	47
11	Appendix.....	50
11.1	Inverter Parameter Accuracy	50

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.

1.1 Applicable Model

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

- GW50K-SMT-US
- GW60K-SMT-US

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:


Indicates a high-level hazard that, if not avoided, will result in death or serious injury.

Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.

Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.

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 2022-08-30

- First Issue

2 IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

You shall follow all the safety precautions mentioned in this manual when working on the device.

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 user manual is subject to change due to product updates or other reasons. This guide cannot replace the product labels or the safety precautions in the user manual 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. Visit <https://en.goodwe.com/warranty> to get more information about product warranty.

2.2 PV String Safety

DANGER

Connect the DC cables using the delivered PV 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, securely, and correctly.
- Measure the DC cable using the multimeter to avoid reverse polarity connection. Also, the voltage should be under the max DC input voltage. The manufacturer shall not be liable for the damage caused by reverse connection and extremely high voltage.
- Do not connect one PV string in one circuit to more than one inverter at the same time. Otherwise, it may cause damages to the inverter.

2.3 Inverter Safety

 WARNING	
<ul style="list-style-type: none"> • The voltage and frequency at the connecting point should meet the on-grid requirements. • Additional protective devices like circuit breakers or fuses are recommended on the AC side. Specification of the protective device should be at least 1.25 times the rated AC output rated current. • PE cable of the inverter must be connected firmly. Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters. • You are recommended to use copper cables as AC output cables. Contact the manufacturer if you want to use other cables. • The alarm can be cleared automatically if the inverter triggers a fault for less than 5 times within 24 hours. The inverter locks for protection after the 5th electric arc fault. The inverter can operate normally after the fault is solved. 	

 DANGER	
<ul style="list-style-type: none"> • Do not apply mechanical load to the terminals, otherwise the terminals can be damaged. • All labels and warning marks should be visible after the installation. Do not scrawl, damage, or cover any label on the device. • Warning labels on the inverter are as follows. 	

	HIGH VOLTAGE HAZARD Disconnect all incoming power and turn off the product before working on it.		Delayed discharge. Wait 5 minutes after power off until the components are completely discharged.
	Read through the user manual before any operations.		Potential risks exist. Wear proper PPE before any operations.
	High-temperature hazard. Do not touch the product under operation to avoid being burnt.		Grounding point.
	CSA marking for the United States of America and Canada		Do not dispose of the inverter as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.

2.4 Personnel Requirements

Notice	
<ul style="list-style-type: none"> • 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 Product Overview

The SMT 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.

Model

This manual applies to the listed inverters below:

- GW50K-SMT-US
- GW60K-SMT-US

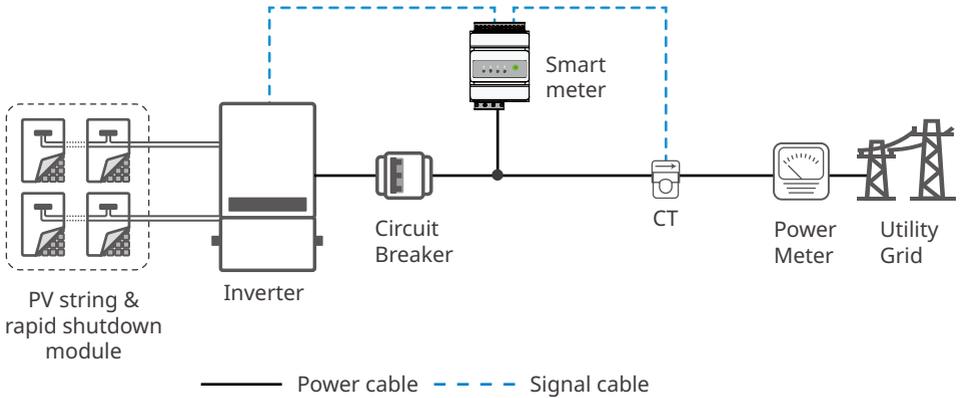
Model description

GW50K-SMT-US



No.	Referring to	Explanation
1	Brand Code	GW: GoodWe
2	Rated Power	<ul style="list-style-type: none"> • 50K: the rated power is 50kW. • 60K: the rated power is 60kW.
3	Series	SMT SMT Series
4	Area Code	US: North America

3.2 Application Scenarios



No.	Parts	Description
1	PV string & rapid shutdown module	The rapid shutdown module is optional. The external receiver must match with the integrated transmitter in the inverter.
2	Inverter	SMT series inverters.
3	AC breaker	It is recommended to use three phase AC breaker no less than 120A which conforms to local regulations. Make sure the inverter can disconnect with the grid safely under abnormal situations.
4	Smart meter	The smart meter can be purchased from the manufacturer. Recommended model: GM330.
5	CT	It is recommended to use CT with specifications: 150A: 5A; Level 0.2 in precision, and 60Hz.

Strictly follow below requirements to realize anti reverse current:

WARNING

- The anti reverse current functionality can be realized when the inverter is used together with Smart Meter, which can be purchased from the inverter manufacturer. For detailed Smart Meter operations, refer to **GMK120&GMK140&GM330 Quick Installation Guide**.
- The anti reverse current functionality is disabled in default. Set anti reverse current parameters via APP if required. For detailed APP operations, refer to **SolarGo User Manual**.
- The password shall be typed when setting the anti reverse current functionality. Contact the after-sale service for setting.
- The maximum operating currents in controlled busbars or conductors are limited by the settings of the power control system (PCS) and may be lower than the sum of the currents of the connected controlled power sources. The settings of the PCS controlled currents may be used for calculation of the design currents used in the relevant sections of NEC Article 690 and 705.
- Maximum PCS Controlled Current setting: 150 A.

**WARNING**

- Only qualified personnel shall be permitted to set or change the setting of the maximum operating current of the PCS. The maximum PCS operating current setting shall not exceed the busbar rating or conductor ampacity of any PCS controlled busbar or conductor.
- Configuration of power control settings system or changes to settings shall be made by qualified personnel only. Incorrect configuration or setting of the power control settings may result in unsafe conditions.

Stick below tags on the body part of the product(s) in the system with anti-reverse current functionality by yourselves:

PCS Controlled Current Tag

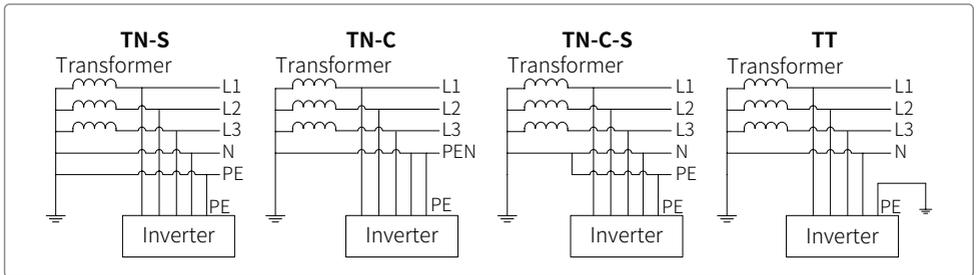
PCS Controlled Current Setting: ____ A
The maximum operating current of this system may be controlled electronically.
Refer to user manual for more information

Smart Meter or CT Description Tag

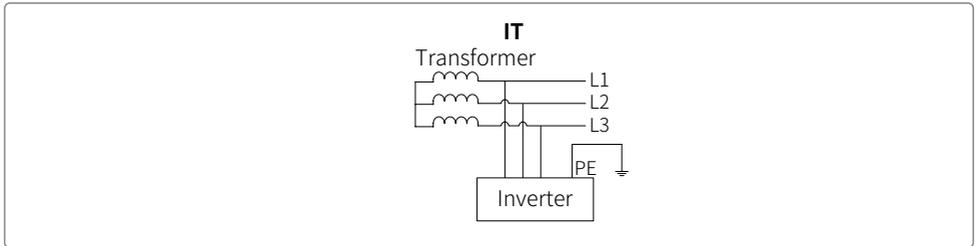
This sensor is part of a Power Control System. Do not remove. Replace only with same type and rating

Supported Grid Types

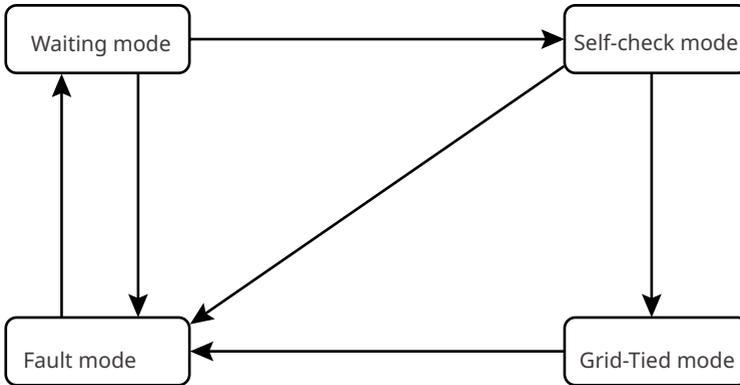
SMT series GW50K-SMT-US, and GW60K-SMT-US support four different types (TNS,TN-C,TN-C-S, TT) of grid.



When neutral wire of inverter is not connected to grid, "Delta Grid" should be selected in grid type(IT) setting page.



3.3.3 Inverter operation mode



No.	Parts	Description
1	Waiting mode	Waiting stage after the inverter is powered on. <ul style="list-style-type: none"> When the conditions are met, it enters the self-check mode. If there is a fault, the inverter enters the fault mode.
2	Self-check mode	Before the inverter starts up, it continuously performs self-check, initialization, etc. <ul style="list-style-type: none"> When the conditions are met, it enters the grid-tied mode, and the inverter starts on grid connection. If the self-check is not passed, it enters the fault mode.
3	Grid-Tied mode	The inverter is grid-tied successfully. If a fault is detected, it enters the fault mode.
4	Fault mode	If a fault is detected, the inverter enters the fault mode. When the fault is cleared, it enters the wait mode.

3.4 Functionality

Power derating

For a safe operation, the inverter will automatically reduce the output power when the operating environment is not ideal.

The following are the factors that may occur power derating. Please try to avoid them during usage.

- Unfavorable environmental conditions, e.g., direct sunlight, high temperature, etc.
- Inverter's output power percentage has been set.
- The voltage of the grid varies with the frequency.
- Higher input voltage value.

AFCI

Reason for electric arcs:

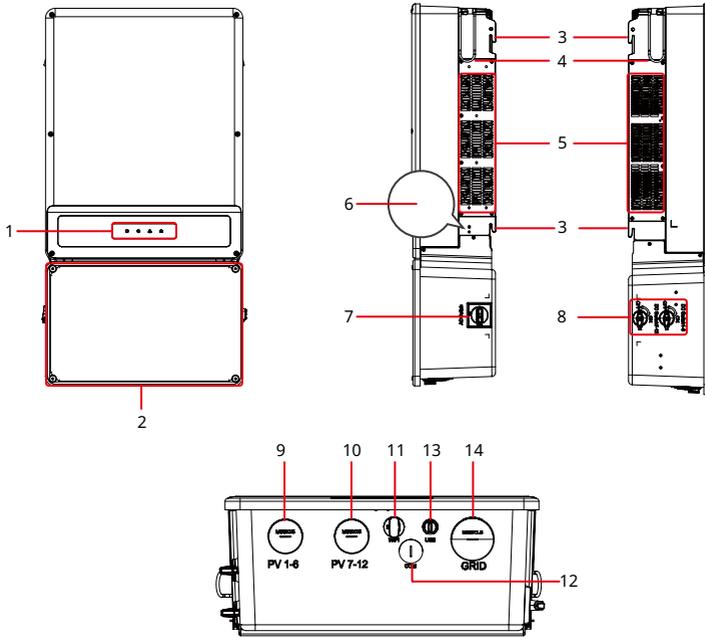
- Damaged connectors in PV system
- Wrong connected or broken cables
- Aging connectors and cables

Method to detect electric arcs

- The inverter has an integrated AFCI function and meets UL/CSA (UL1699B) standards.
- When the inverter detects an electric arc, users can find the time of the fault and the detailed phenomenon through the app.
- The alarm can be cleared automatically if the inverter triggers a fault for less than 5 times within 24 hours. The inverter will shutdown for protection after the 5th electric arc fault. The inverter can operate normally after the fault is solved. Please refer to the Storage Mate App User Manual for detailed operation.

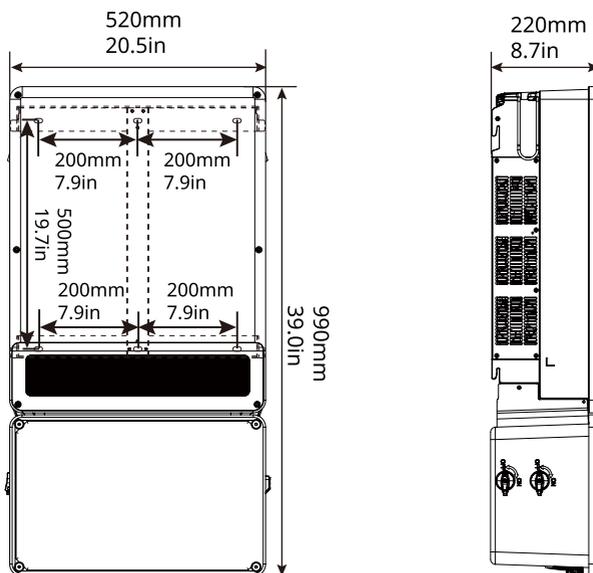
3.5 Appearance

3.5.1 Parts



No.	Parts	Description
1	LED Indicator	Indicate working status of the inverter.
2	Connection unit	The compartment collects the input and output cables of the inverter.
3	Mounting Plate	Hang the inverter on the wall.
4	Handles	Install the inverter with the handles.
5	Fans	Cool the inverter.
6	Grounding Point	(optional) Used to connect the PE cable
7	AC Switch	Start or stop AC Output
8	DC Switch	Start or stop DC input
9	DC input cable hole (PV1-PV6)	Cable hole for connecting PV1-PV6 PV strings.
10	DC input cable hole (PV7-PV12)	Cable hole for connecting PV7-PV12 PV strings.
11	Communication Module Port	Used to connect communication modules.
12	Communication cable hole	Communication cable hole
13	USB port	Connect the USB cable.
14	AC output cable hole	Cable hole for AC output cable.

3.5.2 Dimensions



3.5.3 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 at the moment.
		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 resetting.
		BLINK 2 = Wireless not connect to the router.
		BLINK 4 = Wireless server problem.
		BLINK = RS485 is connected.
		OFF = Wireless is not active.
		ON = A fault has occurred.
		OFF = No fault.

3.5.4 Nameplate

The nameplate is for reference only.

Product: Grid-Tied PV Inverter Model : GW***-SMT-US	
Vmax PV: ****Vd.c. MPPT voltage range: ***...****Vd.c. Max. PV current: ***Ad.c. Isc PV: ****Ad.c.	
Rated grid voltage: **/*/** or **/*/~ ****Va.c. Output voltage rang: ***. *~***V a.c. AC grid frequency: **Hz AC grid frequency range: **. *~ **. *Hz Max. current: **Aa.c., Max. backfeed: *Aa.c. Rated active power: **kW Rated apparent power: **kVA Max. apparent power: **kVA	
Power factor range: ~*,*.cap...*.ind Operating temperature range:*** ~**C(>** °C derating) ***~*** °F(>*** °F derating) Grid Support Utility Interactive Inverter Transformerless Type 4X, PV DC AFCI: Type 1	
S/N:	
<p style="text-align: center;">Made in China</p> GoodWe Technologies Co., Ltd. service@goodwe.com No.90 Zijin Rd., New District, Suzhou, 215011, China S/N	

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.

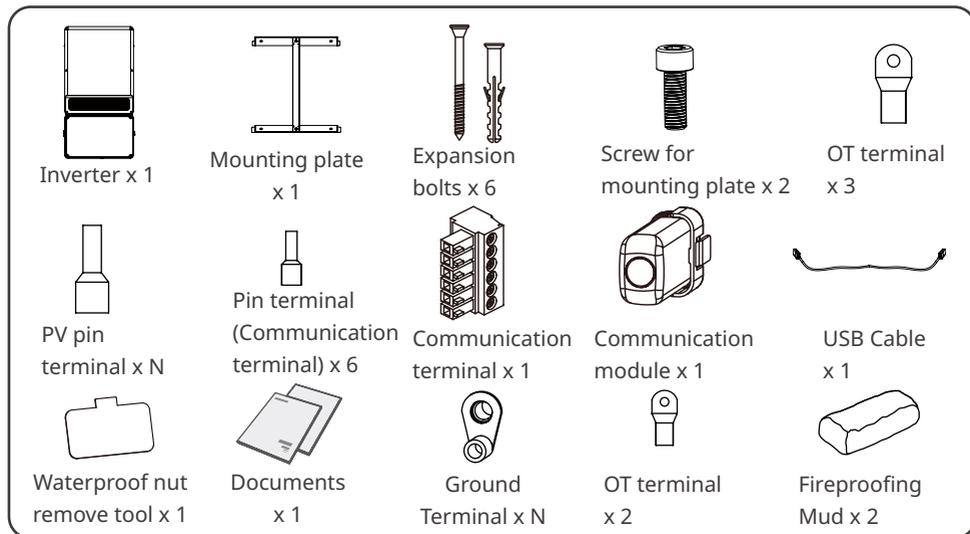
1. Check the outer packing box for damage, such as holes, cracks, deformation, and other signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the inverter model. If the inverter model is not what you requested, do not unpack 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



WARNING

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



Notice

PV pin terminal: GW50K-SMT-US x 20; GW60K-SMT-US x 24.
Ground Terminal: GW50K-SMT-US x 10; GW60K-SMT-US x 12.

4.3 Storage

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

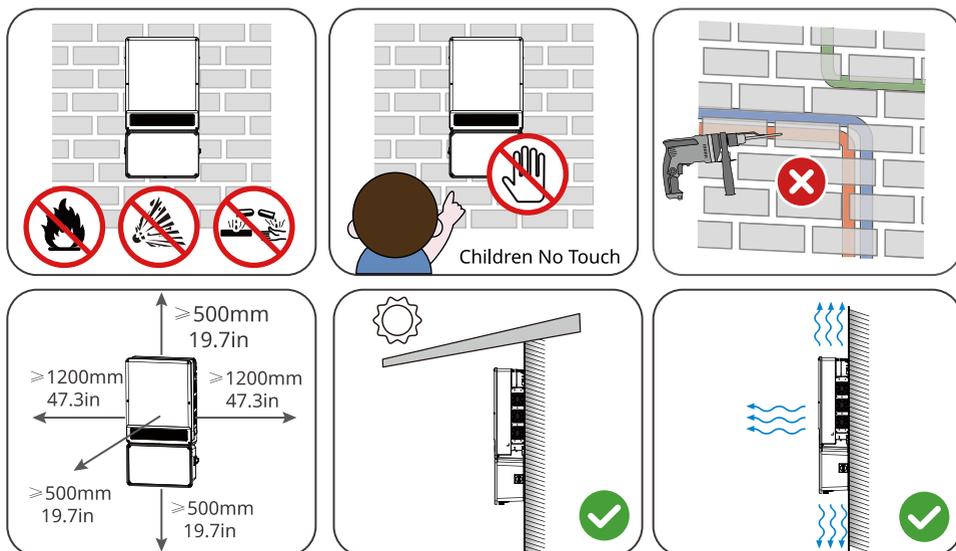
1. Do not unpack the outer package or throw the desiccant away.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.
3. The height and direction of the stacking inverters should follow the instructions on the packing box.
4. The inverters 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.

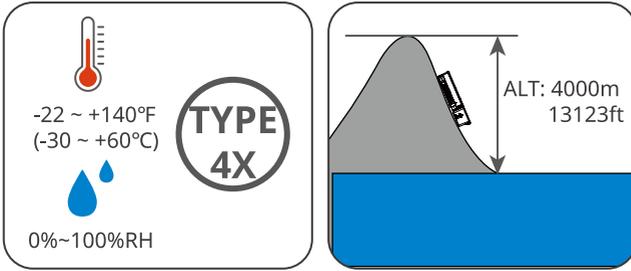
5 Installation

5.1 Installation Requirements

Installation Environment Requirements

- Do not install the equipment in a place near flammable, explosive, or corrosive materials.
- 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.
- Avoid the water pipes and cables buried in the wall when deciding the installation position.
- Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
- Install the equipment in a well-ventilated place to ensure good dissipation. The installation space should be large enough for operations.
- 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.
- Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
- The inverter shall be installed lower than the maximum operating altitude 4000m(13123ft).
- 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:
 - Add a low pass EMI filter or a multi winding ferrite core to the DC input cable or AC output cable of the inverter.
 - Install the inverter at least 30m far away from the wireless equipment.



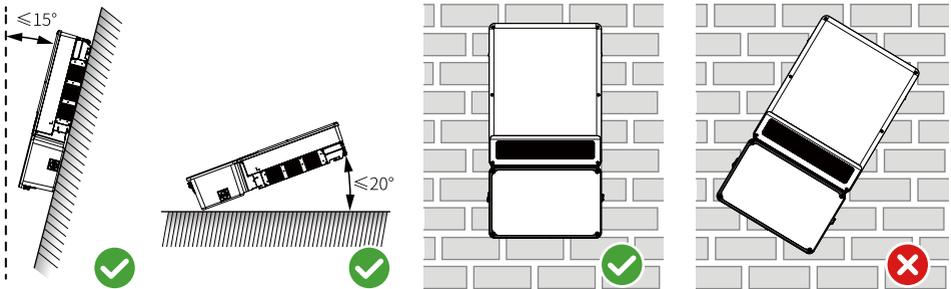


Mounting Support Requirements

- The mounting support shall be nonflammable and fireproof.
- Install the equipment on a surface that is solid enough to bear the inverter weight.
- 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.

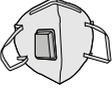
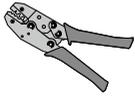
Installation Angle Requirements

- Install the inverter vertically or at a maximum back tilt of 15 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	 Crimping tool
 Diagonal pliers	 Wire stripper	 Hammer drill	 Multimeter	 DC terminal crimping tool
 Marker	 Level	 Heat shrink tube	 Rubber hammer	 Vacuum cleaner
 Cable tie	 M5 Hexagon screwdriver	 M4 Flathead screwdriver	 M2/M5/M8 Phillips screwdriver	 M5 Torque wrench

5.2 Inverter Installation

5.2.1 Moving the Inverter



CAUTION

- Transportation, moving, and installation shall meet local laws, regulations, and related requirements.
- 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 to avoid falling down 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.
- Ensure that the inverter is firmly installed to avoid falling.

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

Step 2 Drill holes to a depth of 80mm (3.15in) using the hammer drill. The diameter of the drill bit should be 10mm (0.39in).

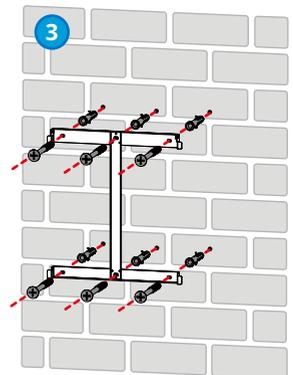
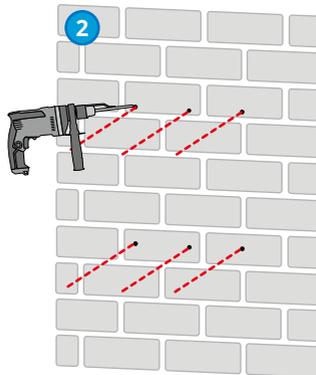
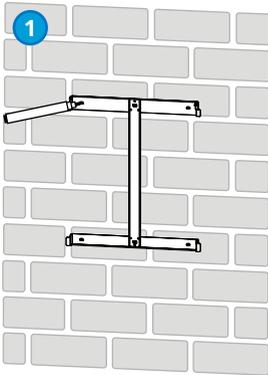
Step 3 Secure the mounting plate using the expansion bolts.

Step 4 Install the inverter on the mounting plate.

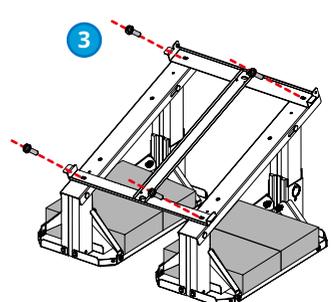
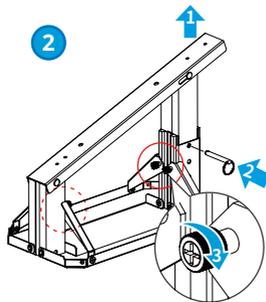
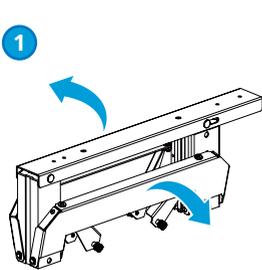
Step 5 Tighten the bolts to secure the mounting plate and the inverter.

Installing the mounting plate

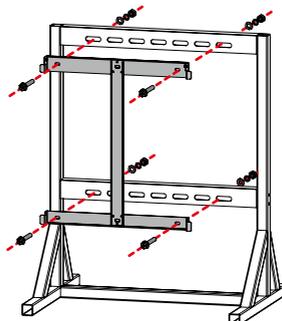
Mounting on the wall



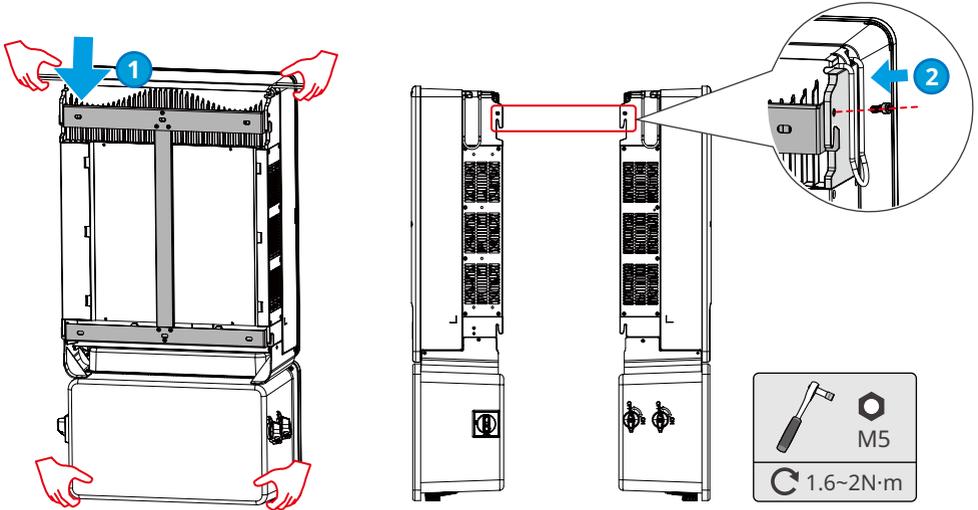
Mounting on the plate(Contact the local sales center to purchase the bracket.)



Mounting on the plate(If you want other brackets, please prepare them by yourself.)



Installing the Inverter



6 Electrical Connection

6.1 Safety Precaution



DANGER

INSTRUCTIONS PERTAINING TO A RISK OF FIRE OR ELECTRIC SHOCK

- Perform electrical connections, including operations, cables, and component specifications in compliance with local laws and regulations ANSI/NFPA 70.
- The input and output circuits are isolated from the enclosure and that system grounding, if required by the National Electric Code, ANSI/NFPA 70, is the responsibility of the installer.
- Disconnect the DC switch and the AC output switch of the inverter to power off the inverter before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- Tie the cables of the same type together, and place cables of different types apart. Do not place the cables entangled or crossed.
- If the tension is too large, the cable may be poorly connected. You have to reserve a certain length of the cable before connecting it to the inverter cable port.
- Make sure that the cable conductor is in full contact with the terminal and the cable insulation part is not crimped with the terminal when crimping the terminal. Otherwise, the inverter may not be able to work properly, or the connection may be unreliable during working, which may cause terminal block damage, etc.



WARNING

GROUNDING INSTRUCTIONS

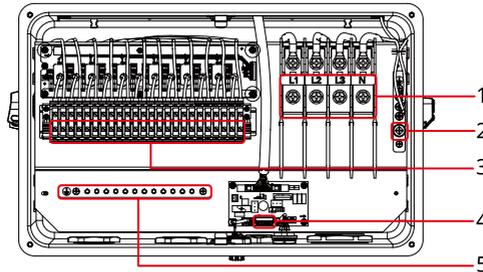
This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product.

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 shall meet local laws and regulations.

6.2 Preparations Before Cable Connections

6.2.1 Connection Unit Introduction



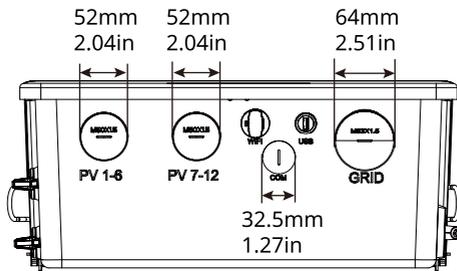
- | | | |
|---------------------------|-------------------------------------|-------------------------------------|
| 1. AC output terminal | 2. PE terminal | 3. DC input terminal ^[1] |
| 4. Communication terminal | 5. Grounding busbar for PV brackets | |

[1]: GW50K-SMT-US: 5 MPPT input. GW60K-SMT-US: 6 MPPT input.

6.2.2 Conduit Hole Dimensions

WARNING

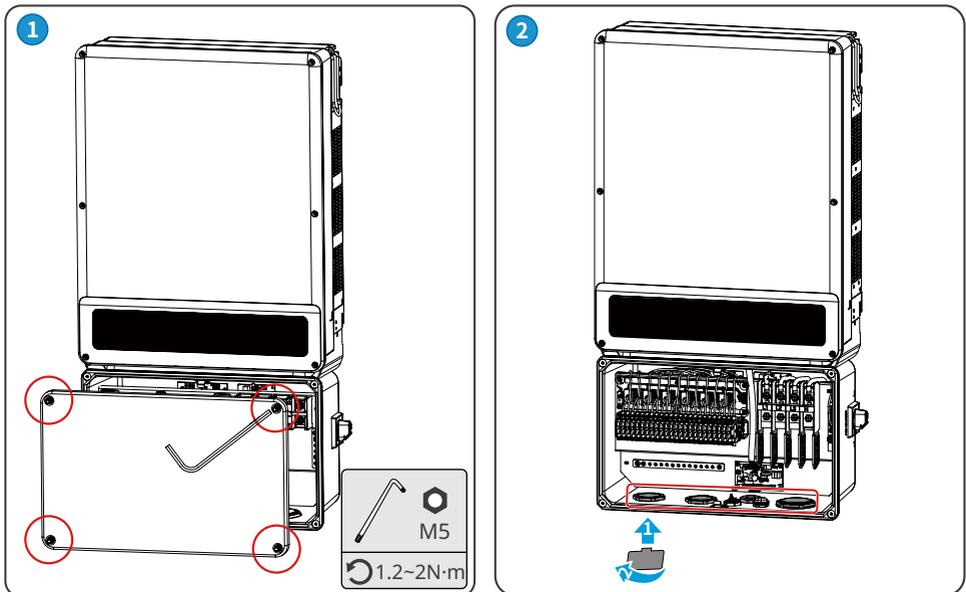
- Customers need to prepare wiring conduits that meet the specifications of the waterproof nut.
- Check the wiring conduit to make sure that the conduit is installed properly and the holes are sealed to avoid influencing the protection class and damaging the equipment.
- Below is the diameter for the routing hole on the bottom of the inverter:



6.3 Removing the Enclosure Cover

Notice

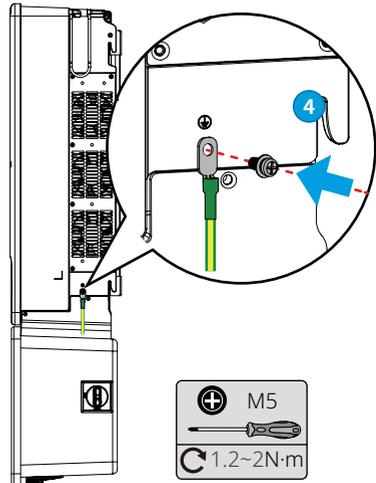
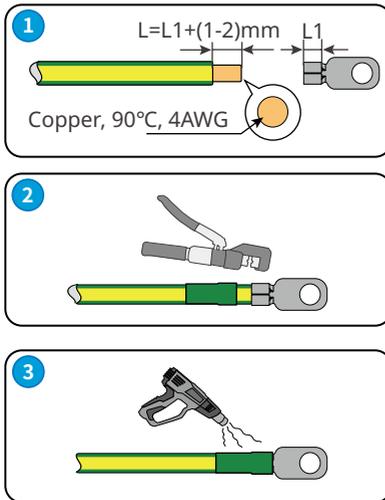
- Remove the enclosure cover of the electrical connection unit using the delivered Allen wrench. Retain the wrench and screws properly for future use.
- If it is necessary to remove the cover on rainy and snowy days, you have to take measures to protect the compartment cavity from rain and snow. If you cannot prevent the rain and snow from the compartment cavity, do not remove the cover.
- Do not remove the cover of the inverter upper part.



6.4 (Optional) Connecting the PE Cable

⚠ WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Both of the two PE cables must be securely connected.
- 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.
- Please prepare M6 terminals and M5 screws.



6.5 Connecting the DC Input Cable(PV)

⚠ DANGER

INSTRUCTIONS PERTAINING TO A RISK OF FIRE OR ELECTRIC SHOCK

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

- The PV strings cannot be grounded. Ensure the minimum isolation resistance of the PV string to the ground meets the minimum isolation resistance requirements ($R > 50k\Omega$) before connecting the PV string to the inverter. If the isolation resistance value is $\leq 50k\Omega$, the inverter will trigger an alarm.
- Choose whether to connect the grounding point of the PV string's bracket to the inverter's PV grounded bus-bar based on the system demanding.

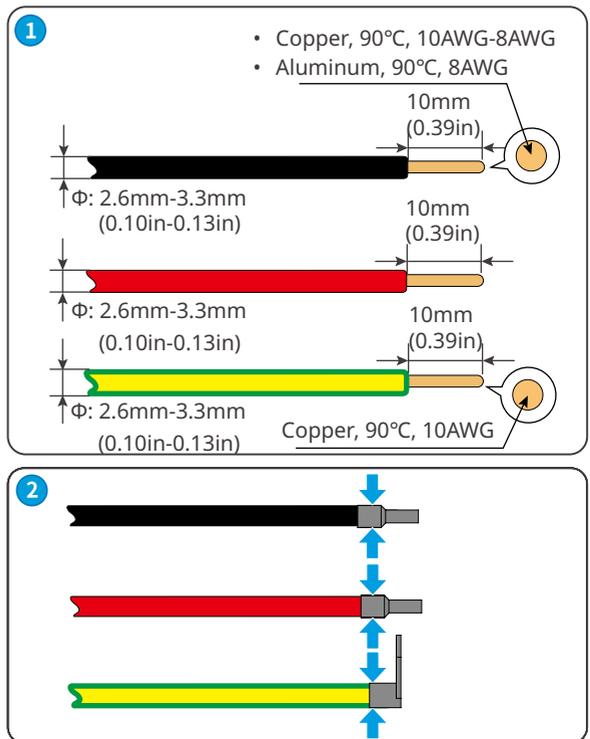
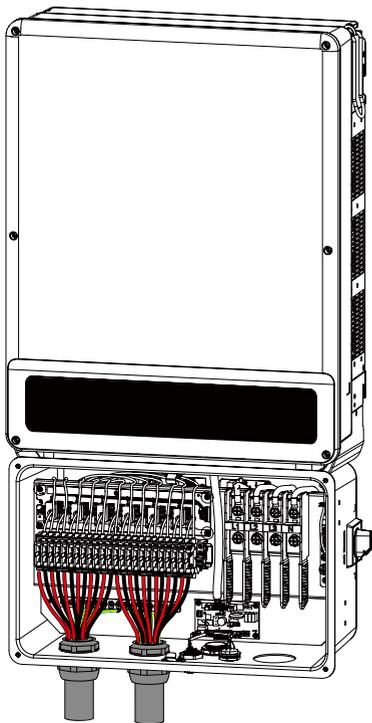
Step 1: Make the DC input cable.

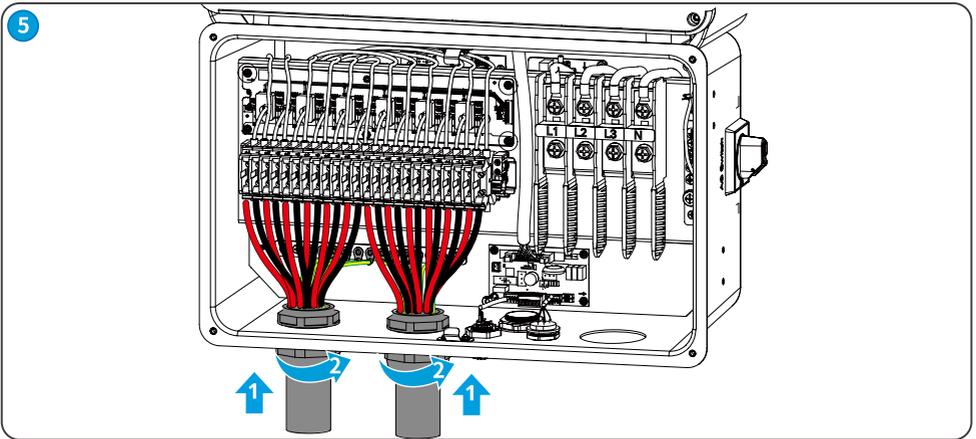
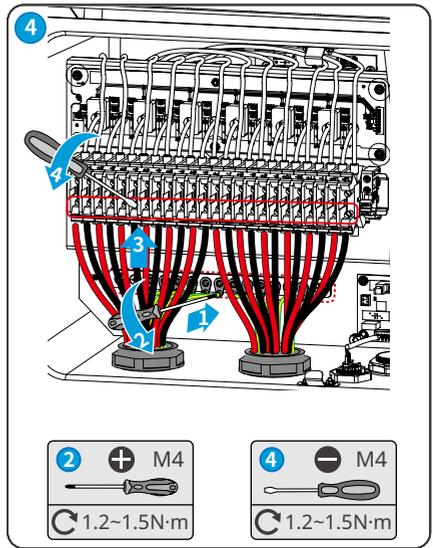
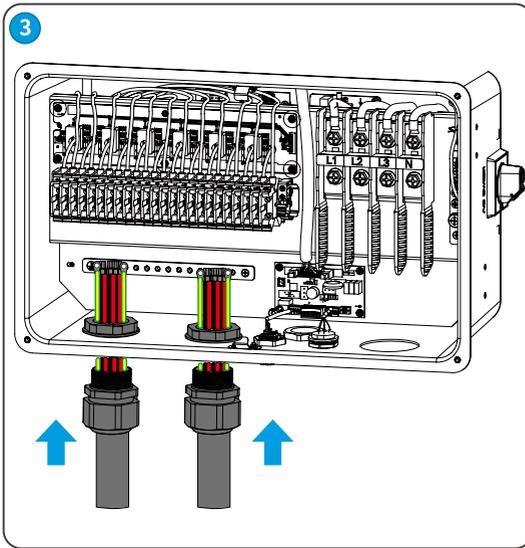
Step 2: Crimp the DC input cable.

Step 3: Run the PV input cable through the conduit to the connection compartment.

Step 4: Connect the cable to the terminal.

Step 5: Fasten the waterproof conduit.





6.6 Connecting the AC Cable

⚠ WARNING

- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- Connect the AC cables to the corresponding terminals like L1, L2, L3, N, and grounding busbar. The inverter may be damaged if the cables are connected to the wrong terminal.
- Make sure that the whole cable cores are inserted into the 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 equipment when the equipment is working.

Notice

- Install one AC circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker.
- 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.
- You are recommended to use copper cables as AC output cables. If you prefer aluminum cables, remember to use copper to aluminum adapter terminals.

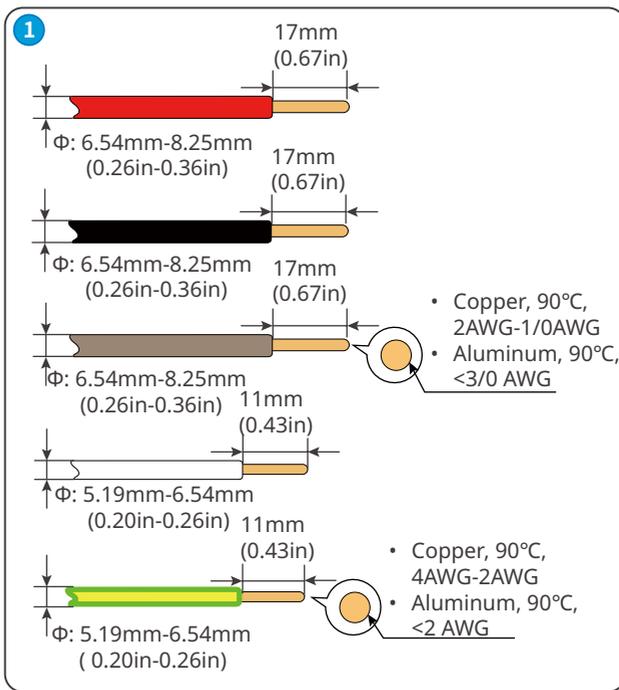
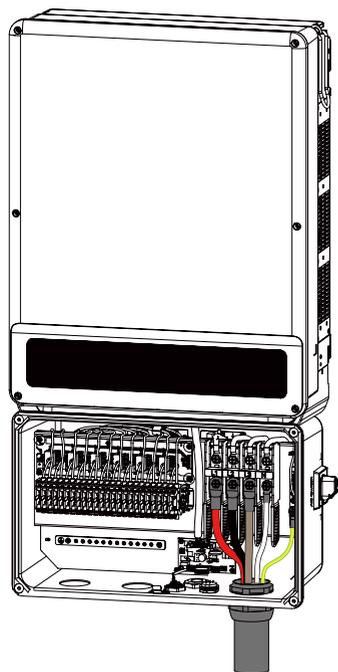
Step 1: Make the AC input cable.

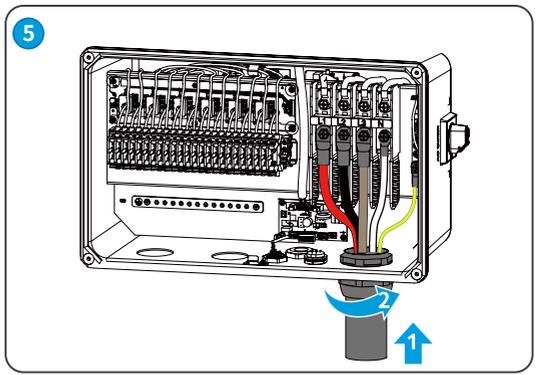
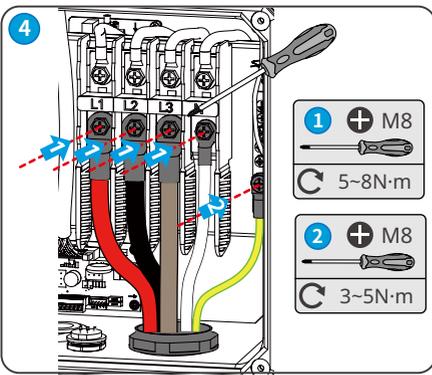
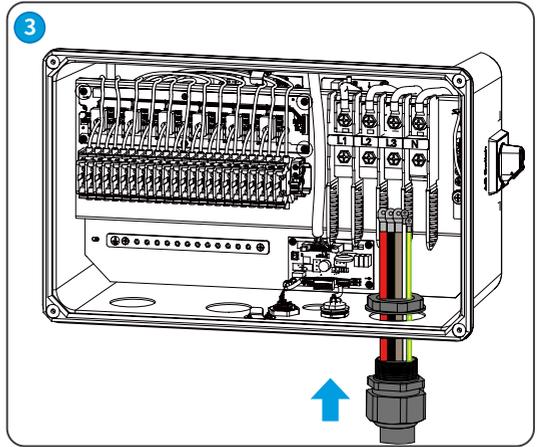
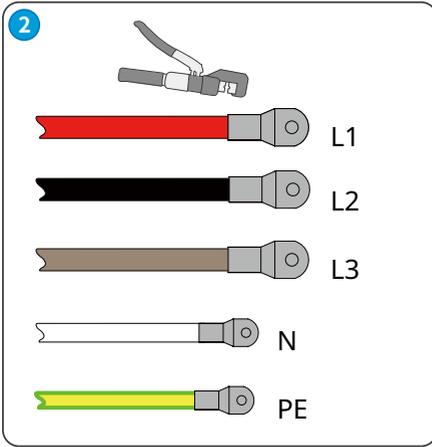
Step 2: Crimp the AC input cable.

Step 3: Run the AC output cable through the conduit to the connection compartment.

Step 4: Connect the cable to the terminal.

Step 5: Fasten the waterproof conduit.

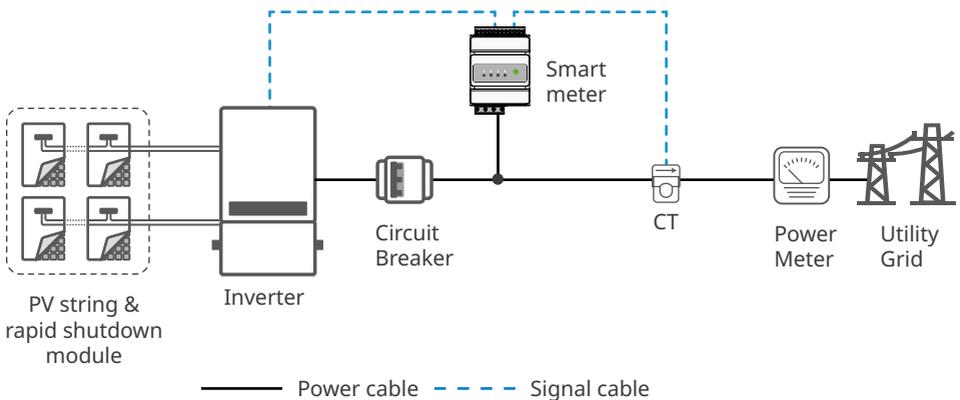




6.7 Connecting the Communication Cable

Notice

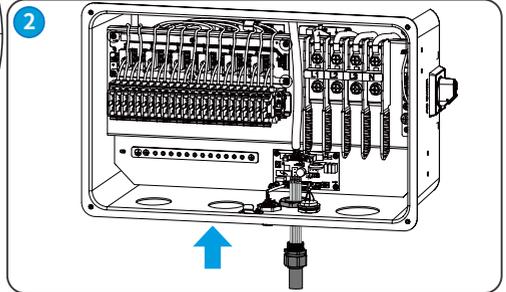
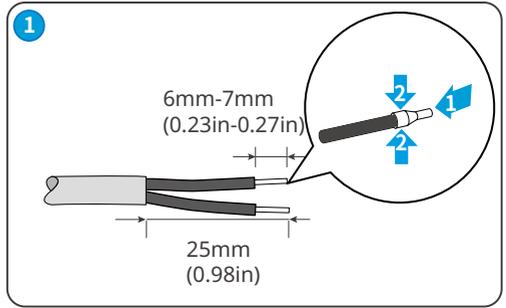
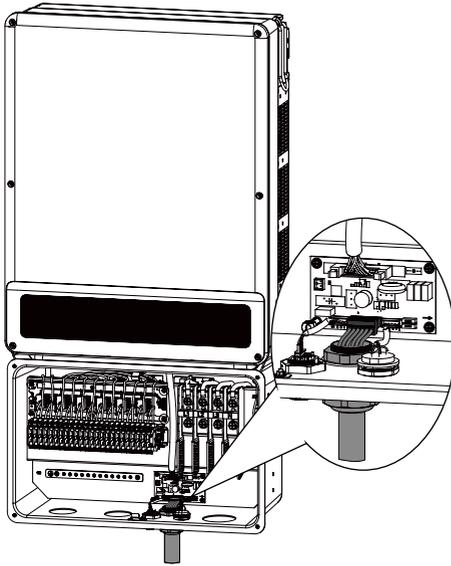
- Connect Smart Meter when the anti reverse current functionality is required. Pay attention to CT connecting direction during the meter cable connection. It will display CT reverse fault on the inverter if it is the opposite direction.
- This sensor is part of a Power Control System. Do not remove. Replace only with same type and rating.
- Ensure the direction on the body part of CT is pointed to the grid.



Notice

- Make sure that the communication device is connected to the right terminal. Route the communication cable far away from any interference source or power cable to prevent the signal from being influenced.
- Recommended cable specification: 26-16AWG, communication cables for outdoors which are satisfying UL2919, CM/CMG(NEC type) or CMH (CSA type) standards.

Communication Type	Port Definition	Function Description
RS485	1: RS485 A	Connect to data logger SEC1000.
	2: RS485 B	
	3: RS485 A	Connect to the RS485 port of other inverters.
	4: RS485 B	
	5: Meter A	Connect to the smart meter.
	6: Meter B	



3

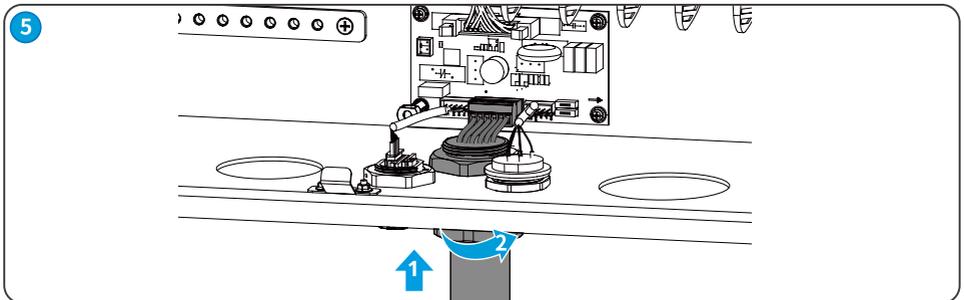
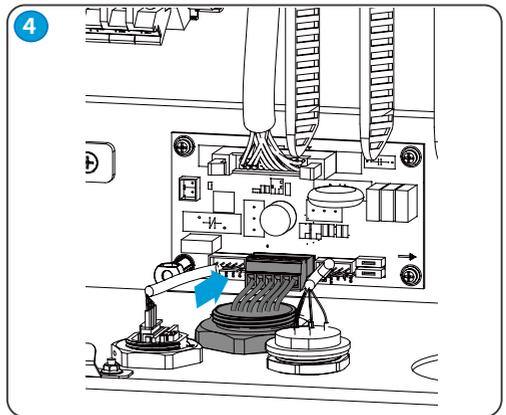
NO.	RS485
1	RS485 A
2	RS485 B
3	RS485 A
4	RS485 B
5	Meter A
6	Meter B

+

M2

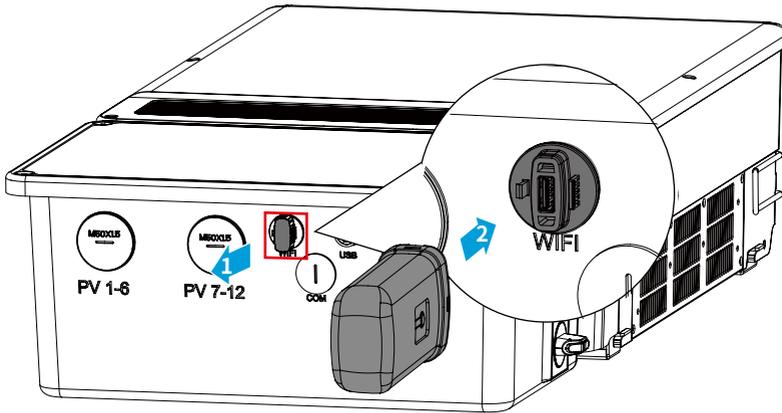
0.3~0.4N·m

A diagram showing a cable with six conductors labeled 1 through 6. A blue arrow points to the conductors. Below the diagram is a table with the pinout information. At the bottom, there is a plus sign, the text 'M2', and a torque specification '0.3~0.4N·m' with a screwdriver icon.



6.8 Installing the WiFi Module

Plug a WiFi or 4G or Wi-Fi/LAN module into the inverter to establish a connection between the inverter and the smartphone or web pages. Check running information and fault information, and observe system status in time via the smartphone or web pages.

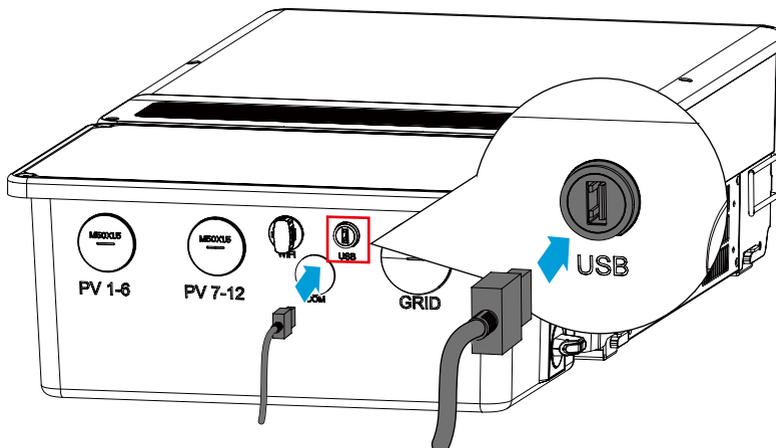


NOTICE

- Refer to the delivered communication module user manual to get more introduction to the module. For more detailed information, visit <https://en.goodwe.com/>.
- Remove the communication module using the unlock tool. The manufacturer shall not be liable for the port damage if the module is removed without the unlock tool.

6.9 Installing the USB Cable

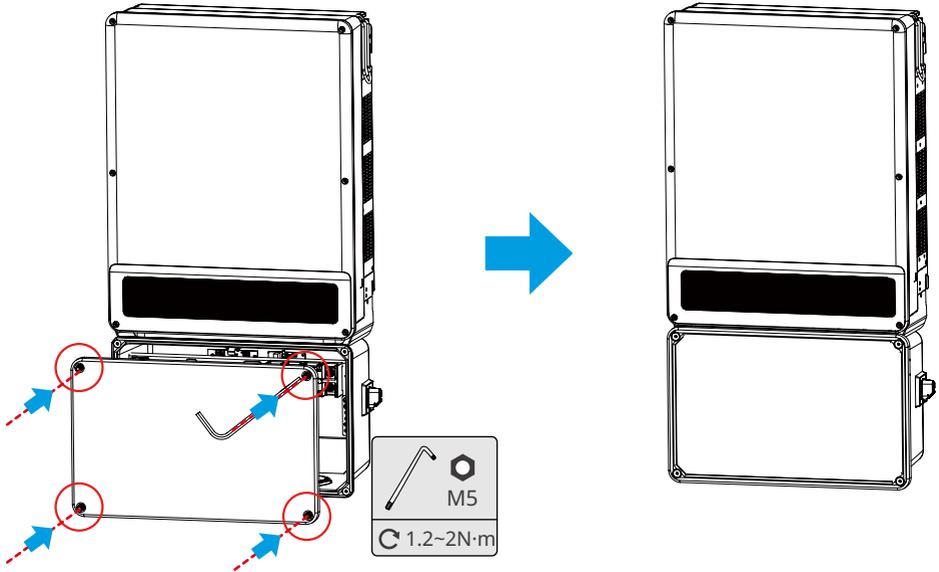
Connect to the computer using the USB cable to update the software.



6.10 Opening the Cover of Wiring Box

NOTICE

- Check whether the wiring is correct and firm after the connection. Clean the unnecessary stuff out of the box.
- Install the cover of wiring box to ensure the inverter's waterproof function after the electrical connection.



7 Equipment Commissioning

7.1 Check Before Power ON

No.	Check Item
1	The product is firmly installed at a clean place that is well-ventilated and easy-to-operate.
2	The PE, DC input, AC output, and communication cables are connected correctly and securely.
3	Cable ties are intact, routed properly and evenly.
4	Unused cable holes are fitted using the waterproof nuts.
5	The electrical conduit holes are sealed.

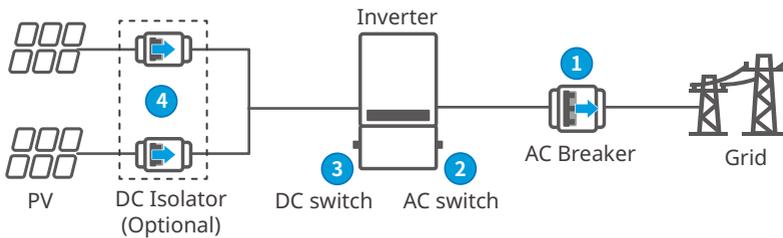
7.2 Power On

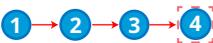
Step 1: Turn on the AC switch between the inverter and the utility grid.

Step 2: Turn on the AC switch of the inverter.

Step 3: Turn on the DC switch of the inverter.

Step 4: (optional) Turn on the DC switch between the inverter and the PV string.



Turn on 

8 System Commissioning

8.1 Indicators and Buttons

Indicator	Status	Description
		ON = Equipment power on.
		OFF = Equipment power off.
		ON = The inverter is feeding power.
		OFF = The inverter is not feeding power at the moment.
		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 resetting.
		BLINK 2 = Wireless not connect to the router.
		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 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 to get the user manual.



SolarGo App



SolarGo App
User Manual

8.3 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 to get the user manual.



SEMS Portal



SEMS Portal
User Manual

9 Maintenance

9.1 Power Off the Inverter



INSTRUCTIONS PERTAINING TO A RISK OF FIRE OR ELECTRIC SHOCK

- 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: Turn off the AC switch between the inverter and the utility grid.

Step 2: Turn off the AC switch of the inverter.

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

Step 4: (optional) Turn off the DC switch between the inverter and the PV string.

9.2 Removing the Inverter



- 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: Remove the inverter from the mounting plate.

Step 3: Remove the mounting plate.

Step 4: Store the inverter properly for future use. Ensure that the storage conditions meet the requirements.

9.3 Disposing of the Inverter

If the inverter cannot work anymore, dispose of it according to the local disposal requirements for electrical equipment waste. The inverter cannot be disposed of together with 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 that 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	Utility Loss	<ol style="list-style-type: none"> 1. Utility grid power fails. 2. The AC cable is disconnected, or the AC breaker is off. 	<ol style="list-style-type: none"> 1. The alarm is automatically cleared after the grid power supply is restored. 2. Check whether the AC cable is connected and the AC breaker is on.
2	Grid Overvoltage	The grid voltage exceeds the permissible range, or the duration of high voltage exceeds the requirement of HVRT.	<ol style="list-style-type: none"> 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. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. <ul style="list-style-type: none"> • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the overvoltage protection threshold, HVRT or disable the overvoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.

No.	Fault	Cause	Solutions
3	Grid Undervoltage	The grid voltage is lower than the permissible range, or the duration of low voltage exceeds the requirement of LVRT.	<ol style="list-style-type: none"> 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. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. <ul style="list-style-type: none"> • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the undervoltage protection threshold, LVRT or disable the undervoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.
4	Grid 10min Overvoltage	The moving average of grid voltage in 10min exceeds the range of safety requirements.	<ol style="list-style-type: none"> 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. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. <ul style="list-style-type: none"> • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the 10min overvoltage protection threshold with the consent of the local power company if the grid voltage is within the permissible range.

No.	Fault	Cause	Solutions
5	Grid Overfrequency	Utility grid exception. The actual grid frequency exceeds the requirement of the local grid standard.	<ol style="list-style-type: none"> 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. If the problem occurs frequently, check whether the grid frequency is within the permissible range. <ul style="list-style-type: none"> Contact the local power company if the grid frequency exceeds the permissible range. Modify the overfrequency protection threshold or disable the overfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range.
6	Grid Underfrequency	Utility grid exception. The actual grid frequency is lower than the requirement of the local grid standard.	<ol style="list-style-type: none"> 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. If the problem occurs frequently, check whether the grid frequency is within the permissible range. <ul style="list-style-type: none"> Contact the local power company if the grid frequency exceeds the permissible range. Modify the underfrequency protection threshold or disable the underfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range.
7	Large DC of AC current L1	The DC component of the output current exceeds the safety range or default range.	<ol style="list-style-type: none"> If the problem is caused by an external fault like a utility grid exception or frequency exception, the inverter will recover automatically after solving the problem.
8	Large DC of AC current L2		<ol style="list-style-type: none"> If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.

No.	Fault	Cause	Solutions
9	Low Insulation Res.	<ol style="list-style-type: none"> 1. The PV string is short-circuited to PE. 2. The PV system is in a moist environment and the cable is not well insulated to the ground. 	<ol style="list-style-type: none"> 1. Check whether the resistance of the PV string to PE exceeds 50kΩ. If no, check the short circuit point. 2. Check whether the PE cable is connected correctly. 3. If the resistance is lower on rainy days, please reset the ISO.
10	Abnormal Ground	<ol style="list-style-type: none"> 1. The PE cable of the inverter is not connected well. 2. The L cable and N cable are connected reversely when output of the PV string is grounded. 	<ol style="list-style-type: none"> 1. Check whether the PE cable of the inverter is connected properly. 2. Check whether the L cable and N cable are connected reversely if output of the PV string is grounded.
11	Anti Reverse power Failure	Abnormal fluctuation of load	<ol style="list-style-type: none"> 1. If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2. If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
12	Internal Comm Loss	<ol style="list-style-type: none"> 1. The chip is not powered on. 2. The program version of the chip is wrong. 	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.
13	AC HCT Check abnormal	The sampling of the AC 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.
14	AC HCT Failure	The HCT sensor 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.
15	GFCI HCT Check abnormal	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.

No.	Fault	Cause	Solutions
16	Relay Check abnormal	<ol style="list-style-type: none"> 1. The relay is abnormal or short-circuited. 2. The control circuit is abnormal. 3. The AC cable connection is abnormal, like a virtual connection or short circuit. 	<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>
17	Relay Device Failure	<ol style="list-style-type: none"> 1. The relay is abnormal or short-circuited. 2. The sampling circuit of the relay 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>
18	Flash Fault	The internal Flash storage 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>
19	DC Arc Fault	<ol style="list-style-type: none"> 1. The DC terminal is not firmly connected. 2. The DC cable is broken. 	<p>Read the Quick Installation Guide and check whether the cables are connected properly.</p>
20	AFCI Self-test Fault	AFCI detection 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>
21	Inv Module Overtemperature	<ol style="list-style-type: none"> 1. The fan power supply is abnormal. 2. Mechanical exception. 3. The fan is aging and damaged. 	<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>
22	Function Safety Fault	<ol style="list-style-type: none"> 1. Problems with the chip body. 2. Problems with the peripherals (RAM, flash and so one). 	<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
23	1.5V Ref abnormal	Reference circuit fault	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.
24	Cavity Overtemperature	<ol style="list-style-type: none"> 1. The inverter is installed in a place with poor ventilation. 2. The ambient temperature exceeds 60°C. 3. A fault occurs in the internal fan of the inverter. 	<ol style="list-style-type: none"> 1. Check the ventilation and the ambient temperature at the installation point. 2. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation. 3. Contact the dealer or after-sales service if both the ventilation and the ambient temperature are normal.
25	BUS Overvoltage	<ol style="list-style-type: none"> 1. The PV voltage is too high. 2. The sampling of the inverter BUS voltage 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.
26	PV Input Overvoltage	The PV array configuration is not correct. Too many PV panels are connected in series in the PV string.	Check the serial connection of the PV array. Make sure that the open circuit voltage of the PV string is not higher than the maximum operating voltage of the inverter.
27	PV String Reversed (Str1-Str12)	The PV string is connected reversely.	Check whether the PV strings are connected reversely.
28	PV voltage Low	Sun light is weak or changing abnormally.	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, the reason might be abnormal sun light. The inverter will recover automatically without manual intervention. 2. If the problem occurs frequently, contact the dealer or the after-sales service.
29	BUS voltage low	Sun light is weak or changing abnormally.	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, the reason might be abnormal sun light. The inverter will recover automatically without manual intervention. 2. If the problem occurs frequently, contact the dealer or the after-sales service.

No.	Fault	Cause	Solutions
30	BUS Soft Start Failure	The boost driven circuit 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.
31	BUS Voltage Imbalanc	<ol style="list-style-type: none"> 1. The sampling circuit of the relay is abnormal. 2. Abnormal hardwares 	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.
32	Gird Phase Lock failure	The frequency of the grid is unstable.	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.
33	Inverter Continuous Overcurrent	The fluctuation of the grid voltage is abnormal. There might be low voltage continuously.	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.
34	Output Current Imbalance	The voltage or the loading of the grid 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.
35	R Phase Hardware Overcurrent	Sudden changes about the grid or the loading cause overcurrent.	There is no need to deal with it if it occurs occasionally. If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
36	PWM once abnormal	<ol style="list-style-type: none"> 1. The inverter drive circuit is abnormal. 2. The IGBT on the inverter side is damaged. 	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.
37	Internal Fan abnormal	<ol style="list-style-type: none"> 1. The fan power supply is abnormal. 2. Mechanical exception. 3. The fan is aging and damaged. 	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
38	External Fan abnormal	<ol style="list-style-type: none"> 1. The fan power supply is abnormal. 2. Mechanical exception. 3. The fan is aging and damaged. 	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.

9.5 Routine Maintenance

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
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	GW50K-SMT-US	GW60K-SMT-US
Input		
Max.Input Power (kW)	75	90
Max.Input Voltage(V)	1000	
MPPT Operating Voltage Range (V)	180~980	
MPPT Voltage Range at Nominal Power (V)	550~850	
Start-up Voltage (V)	200	
Nominal Input Voltage (V)	720	
Max. Input Current per MPPT (A)	30	
Max. Short Circuit Current per MPPT (A)	50	
Max.Backfeed Current to The Array(A)	0	
Number of MPP Trackers	5	6
Number of Strings per MPPT	2	
Output		
Nominal Output Power (kW)	50	60
Nominal Output Apparent Power (kVA)	50	60
Max. AC Active Power (kW)	55	66
Max. AC Apparent Power (kVA)	55	66
Nominal Output Voltage (V)	480, 3L/N/PE or 3L/PE	
Output Voltage Range (V)	422.4~528	
Nominal AC Grid Frequency (Hz)	60	
AC Grid Frequency Range (Hz)	55~65	
Max. Output Current (A)	67.0	80.0
Max. Output Fault Current (Peak and Duration)(A)	162@7.5μs	
Inrush Current (Peak and Duration) (A)	22.4@5ms	
Nominal Output Current (A)	60.1	72.2
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	
Max. Total Harmonic Distortion	<3%	

Technical Data	GW50K-SMT-US	GW60K-SMT-US
Maximum Output Overcurrent Protection (A)	117	140
Efficiency		
Max. Efficiency	98.5%	98.5%
European Efficiency	98.2%	98.2%
Protection		
PV String Current Monitoring	Integrated	
Internal Humidity 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	Integrated	
AC Switch	Integrated	
DC Surge Arrester	Type II	
AC Surge Arrester	Type II	
AFCI	Integrated	
Rapid Shutdown	Integrated	
General Data		
Operating Temperature Range (°C)	-30 ~ +60 (°C) (>45°C derating) -22 ~ +140(°F) (>113°F derating)	
Relative Humidity	0~100%	
Max. Operating Altitude (m)	4000m(> 3000m derating) 13123ft(> 9842.5ft derating)	
Cooling Method	Smart Fan Cooling	
Display	LED, WLAN+APP	
Communication	RS485, WiFi, USB, 4G or WiFi+LAN (Optional)	
Communication protocols	Modbus-RTU (SunSpec Compliant)	

Technical Data	GW50K-SMT-US	GW60K-SMT-US
Weight (Kg)	70.0 154.3lbs	
Dimension (W×H×D)	520 x 990 x 220(mm) 20.5 x 39.0 x 8.7(in)	
Noise Emission (dB)	< 65	
Topology	Non-isolated	
Self-consumption at Night (W)	< 15	
Ingress Protection Rating	TYPE 4X	
Anti-corrosion Class	C5(Optional)	
DC Connector	#12~#8AWG Cu	
AC Connector	OT (#5-3/0AWG, Cu or Al)	
Environmental Category	4K4H	
Pollution Degree	I	
Overvoltage 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	

11 Appendix

11.1 Inverter Parameter Accuracy

For parameter, which used in grid support and protection function, adjustable requirement of CA Rule 21, HECO 14H and IEEE1547, the relevant explanations and setting methods can obtain by reading, <Parameter Adjustable Method Of Grid Support Utility Interactive Inverter>, the document can be obtained by contacting the after-sales.

Time frame	Steady-state measurements			Transient measurements		
	Minimum measurement accuracy	Measurement window	Range	Minimum measurement accuracy	Measurement window	Range
Voltage, RMS	($\pm 1\% V_{nom}$)	10 cycles	0.5 p.u. to 1.2 p.u.	($\pm 2\% V_{nom}$)	5 cycles	0.5 p.u. to 1.2 p.u.
Frequency ^b	10 mHz	60 cycles	50 Hz to 66 Hz	100 mHz	5 cycles	50 Hz to 66 Hz
Active Power	($\pm 5\% S_{rated}$)	10 cycles	0.2 p.u. < P < 1.0 p.u.	Not required	N/A	N/A
Reactive Power	($\pm 5\% S_{rated}$)	10 cycles	0.2 p.u. < Q < 1.0 p.u.	Not required	N/A	N/A
Time	1% of measured duration	N/A	5s to 600s	2 cycles	N/A	100 ms < 5 s



GoodWe Website

GoodWe Technologies Co., Ltd.

 No. 90 Zijin Rd., New District, Suzhou, 215011, China

 www.goodwe.com

 service@goodwe.com



Local Contacts