GOODWE

User Manual

Grid-Tied PV Inverter

SMT Series

(22-60kW) US

V1.3-2024-12-20

Trademarks

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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

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 may be subject to updates without notice. For more product details and latest documents, visit www.goodwe.com.

1.1 Applicable Model

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

- GW22KLV-SMT-US
- GW28KLV-SMT-US
- 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 Symbols Definition

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

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

2 IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

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

WARNING

The inverters are designed and tested to strictly comply 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

- 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, clothes, and wrist strips when touching electronic 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.
- The information in this user manual is subject to change due to product updates or other reasons. This guide cannot replace the product labels unless otherwise specified. All descriptions here are for guidance only.

2.2 PV String Safety

DANGER

Connect the DC cables using the supplied 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 racking system are securely grounded.
- Ensure the DC cables are connected tightly, securely, and correctly.
- Measure the DC cable using a 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 damage the inverter.

2.3 Inverter Safety

WARNING

- 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 Max. Output Current.
- All PE (aka, equipment grounding) cables to the inverter must be connected firmly. Make sure that all the grounding points on the enclosures are equipotential when connected to multiple inverters.
- Copper conductors are recommended for the AC output circuit. Contact the manufacturer if you want to use other cables.
- The alarm will clear automatically if the inverter triggers a fault 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

- 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

- Personnel who install or maintain the equipment must be strictly trained and 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

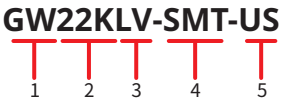
The SMT inverter is a three-phase, PV string, grid-tied inverter. The inverter converts the DC power generated by the PV modules into AC power and feeds it to site loads and into the utility grid.

Model

This manual applies to the listed inverters below:

- GW22KLV-SMT-US
- GW28KLV-SMT-US
- GW50K-SMT-US
- GW60K-SMT-US

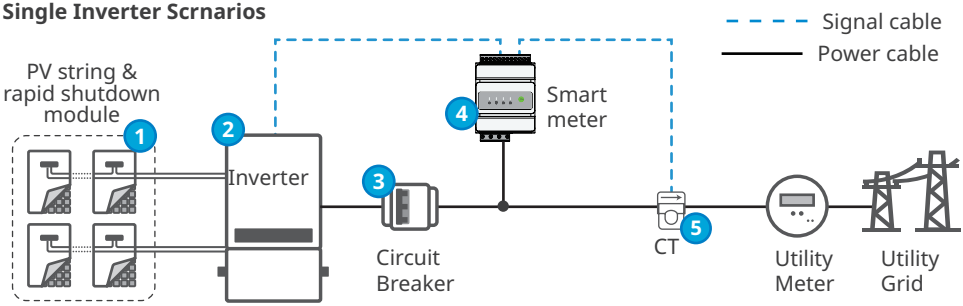
Model description



No.	Referring to	Explanation
1	Brand Code	GW: GoodWe
2	Rated Power	• 22K: the rated power is 22kW • 28K: the rated power is 28kW • 50K: the rated power is 50kW • 60K: the rated power is 60kW
3	Grid Type	LV: 208/220/240 V Grid
4	Series	SMT: SMT Series
5	Area Code	US: North America

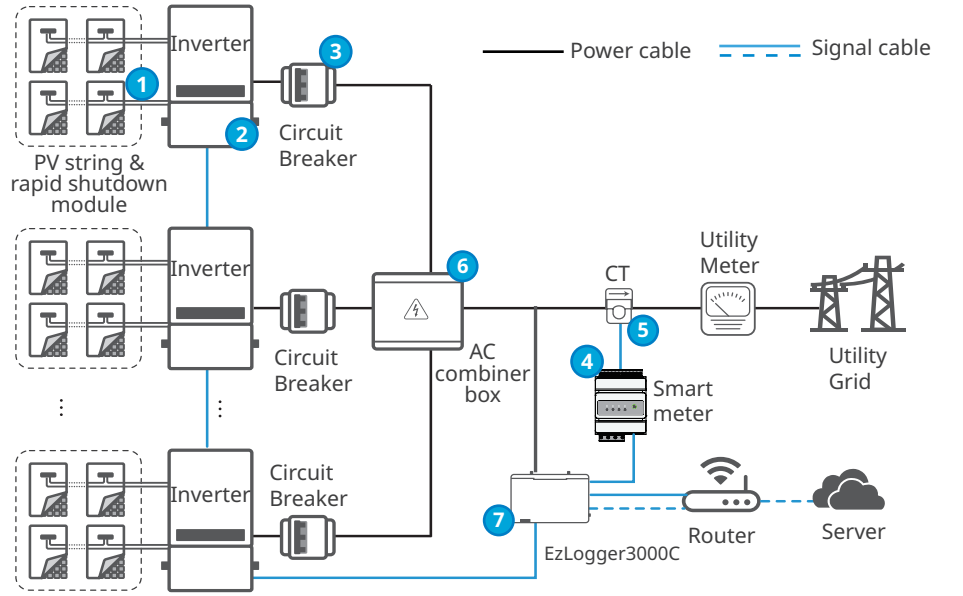
3.2 Application Scenarios

Single Inverter Scrnarios



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 which conforms to local regulations. Its specifications should be greater than 1.25 times the rated AC output current of the inverter.
4	Smart meter	The smart meter is purchased separately from vendor. Recommended model: GM330.
5	CT	Recommended CT specification: • nA/5A for the current transformation ratio of the CT. (nA: for primary current of the CT, and n ranges from 200 to 5000. 5A: The output current of the secondary current of the CT.) • precision of the CT: 0.5, 0.5s, 0.2, 0.2s. Ensure the sampling error for the CT current shall be ⩽ 1%.

Multiple Inverters Scrnarios



No.	Parts	Description
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6	AC combiner box	The AC output cable of the inverter will be converged to the combiner box.
7	EzLogger3000C	All the four models of SMT series inverters support EzLogger3000C. Pleasae update the inverter software to the latest version to use the EzLogger3000C.

Strictly follow below requirements to realize Power export limit:

⚠ WARNING

- The Power export limit functionality can be realized when the inverter is used together with a Smart Meter, which can be purchased from the inverter dealer. For detailed Smart Meter operations, refer to GM330 quick installation guide: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Smart%20Meter-US_Quick%20Installation%20Guide-EN.pdf.
- The Power export limit functionality is disabled by default. Set Power export limit parameters via App if required. For detailed App operations, refer to SolarGo User Manual: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SolarGo_User%20Manual-EN.pdf.
- 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 for the single inverter scenario: 150 A.
- 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 labels on the body part of the product(s) in the system with Power Limit current functionality:

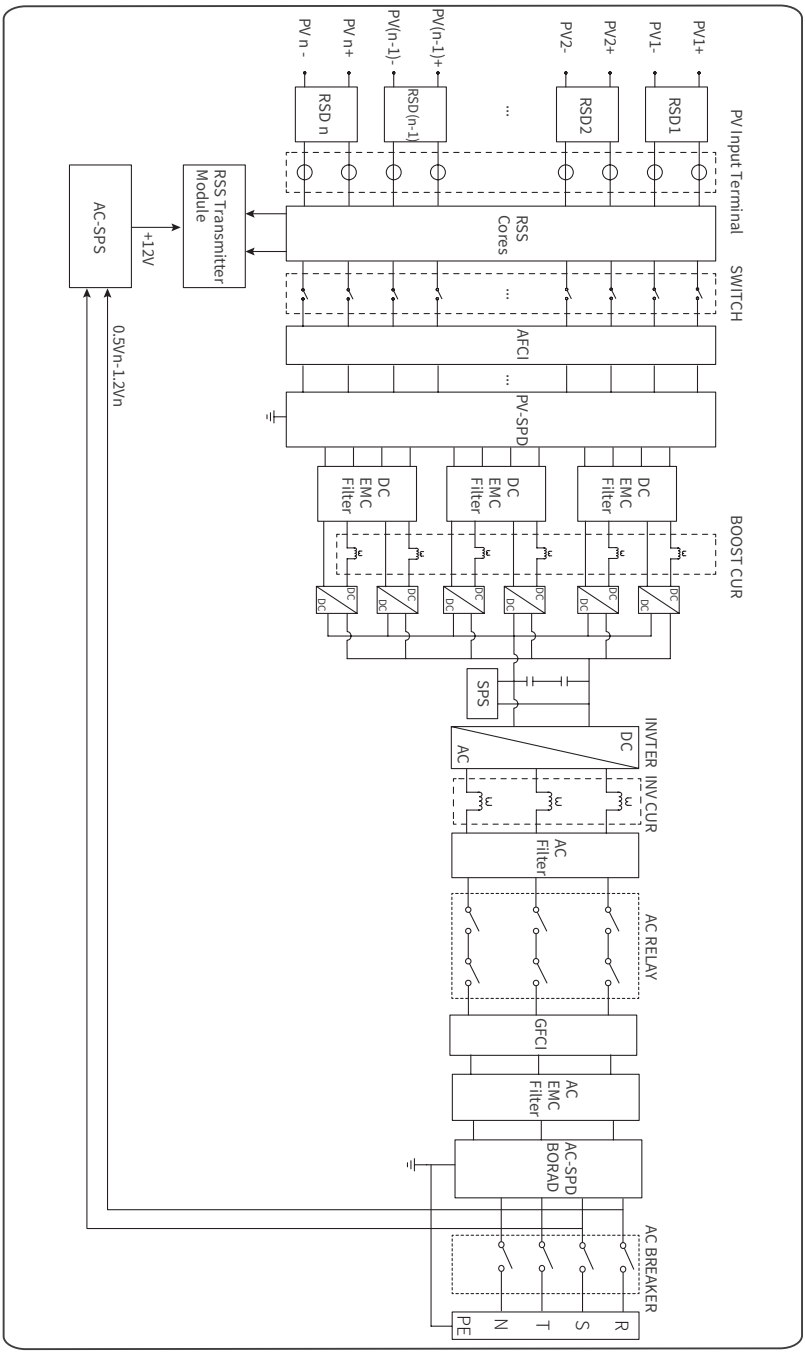
PCS Controlled Current Label

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 Label

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

Circuit Diagram

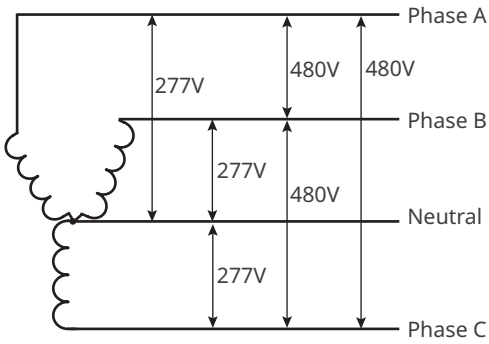


GW22KLV-SMT-US: n=6;GW28KLV-SMT-US: n=8; GW50K-SMT-US:n=10; GW60K-SMT-US:n=12.

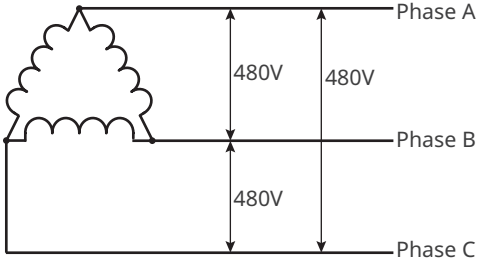
Supported Grid Types

SMT series GW50K-SMT-US, and GW60K-SMT-US support two different types of grid.

480V 3 phase 4-wire Wye (480Y/277V)

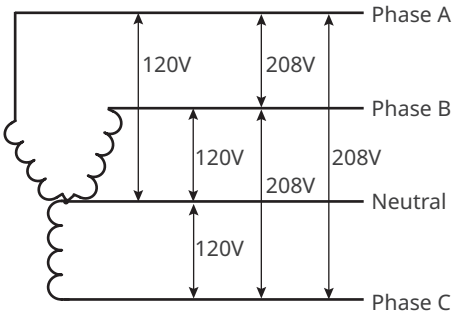


480V 3 phase 3-wire (480Δ)

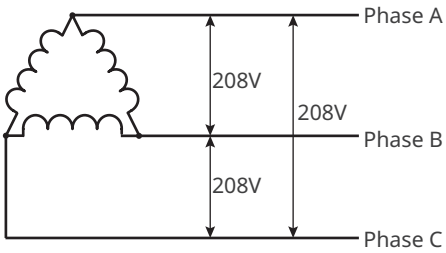


SMT series GW22KLV-SMT-US, and GW28KLV-SMT-US support the following types of grid.

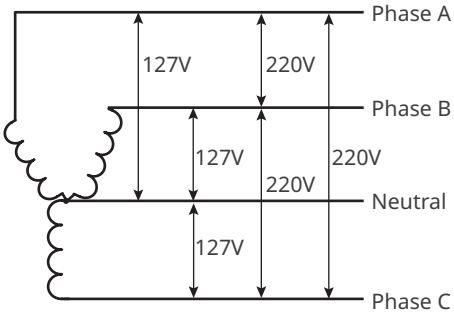
208V 3 phase 4-wire Wye (208Y/V)



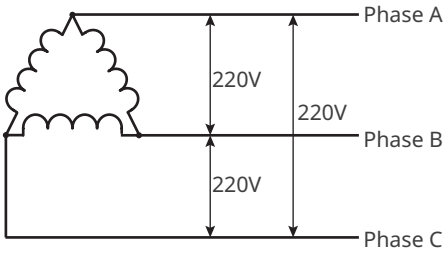
208V 3 phase 3-wire (208Δ)



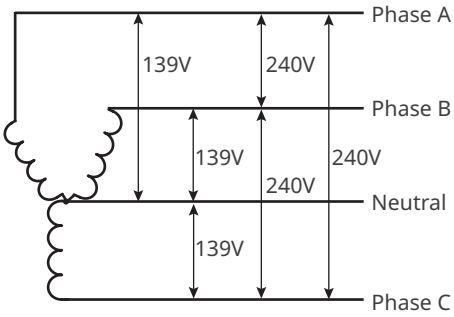
220V 3 phase 4-wire Wye (220Y/V)



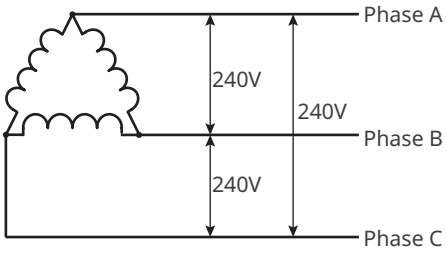
220V 3 phase 3-wire (220Δ)



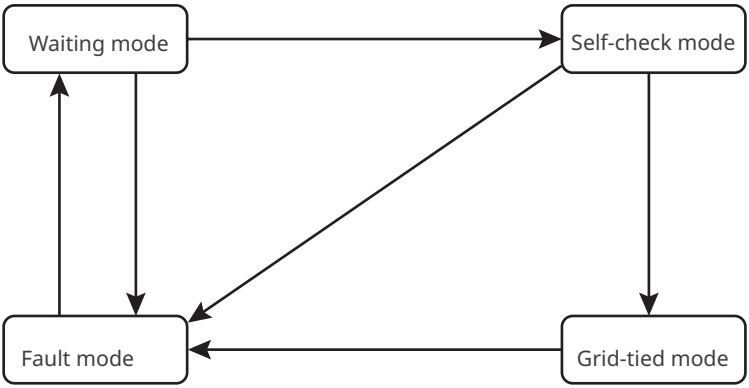
240V 3 phase 4-wire Wye (240Y/V)



240V 3 phase 3-wire (240Δ)



3.3 Inverter operation mode



No.	Parts	Description
1	Waiting mode	Waiting stage after the inverter is powered on. • 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. • 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 cause 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.
- The voltage difference between MPPTs is larger than 130 V.

AFCI

Reason for electric arcs:

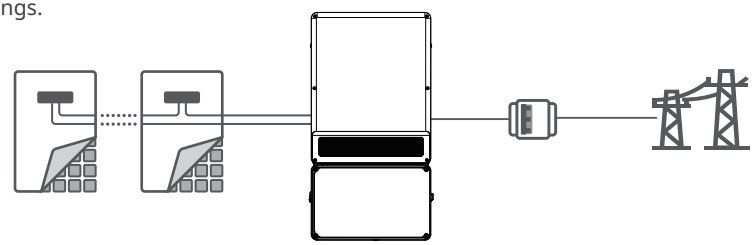
- Damaged connectors in PV system
- Wrongly connected or broken cables
- Aging connectors and cables

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 SolarGo 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 SolarGo App User Manual for detailed operation.

RSD (Optional)

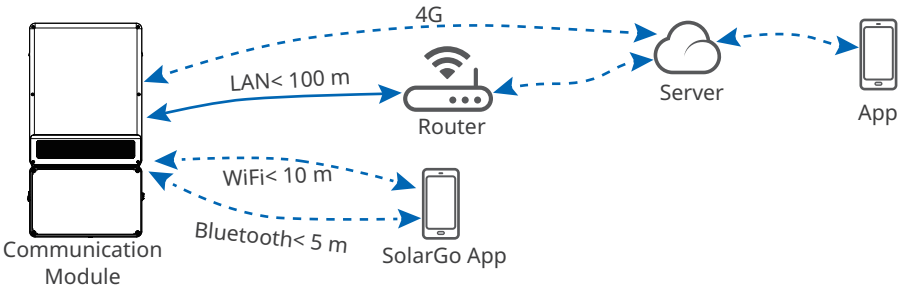
Optionally, inverters with RSD function equips with a built-in signal transmitter to communicate with module-level smart controller installed on the external of the PV strings. In case of an emergency, by turning off the AC circuit breaker at the output side of the inverter, the transmitter inside of the inverter will be cut off, consequently to interrupt the current output of the PV strings.



Communications

The inverter supports parameter setting via Bluetooth, connecting to the SEMS monitoring platform via WiFi, 4G, or WiFi+LAN, thus monitoring the operations of the inverter and the power plant, etc.

- Bluetooth (optional): meets Bluetooth 5.1 standard.
- WiFi: supports 2.4G frequency band. The router need to be set to 2.4G or 2.4G/5G coexistence mode. The router supports a maximum of 40 bytes for router wireless signal name.
- LAN (optional): supports connecting to the router via LAN communication, and then connecting to the monitoring platform.
- 4G (optional): supports connecting to the monitoring platform via 4G communication.

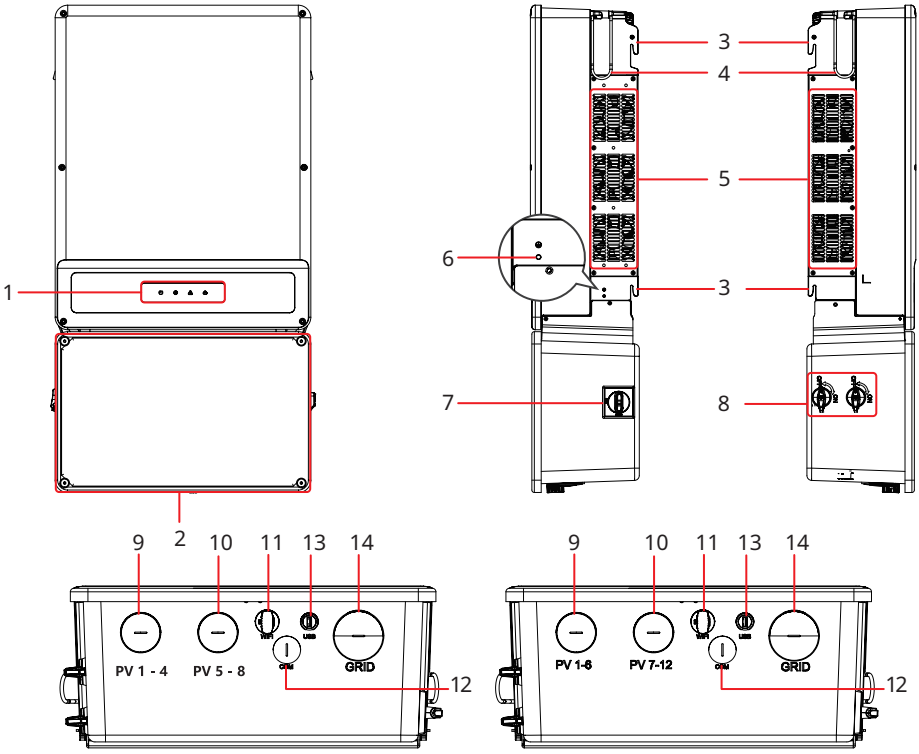


24h Load Monitoring (Optional)

The smart meter measures the data of the grid side and transmits it to the inverter. The inverter transmits the grid side date and the power generation date to the monitoring platform via a communication module, and then monitoring platform calculates the load power consumption and the 24H load monitoring is realized.

3.5 Appearance

3.5.1 Parts

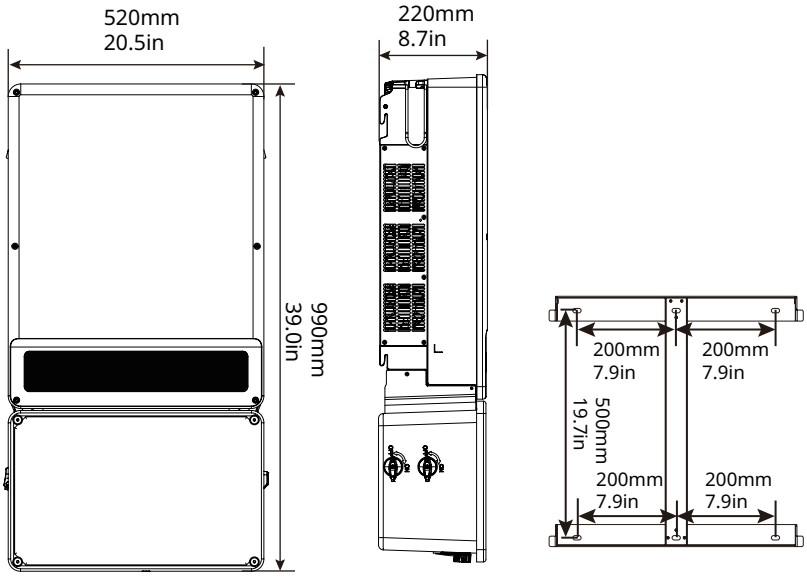


22kW & 28kW 50kW & 60kW

No.	Parts	Description
1	LED Indicators	Indicate working status of the inverter.
2	Connection unit	The compartment houses the input and output cables of the inverter.
3	Mounting Plate	Hang the inverter on the wall.
4	Handles	Install or transport the inverter with handles.
5	Fans	Cool the inverter.
6	Grounding Point	Used to connect the PE cable
7	AC Switch	Start or stop AC Output
8	DC Switch	Start or stop DC input

No.	Parts	Description
9	DC input conduit hole 1	Conduit entry for PV strings (22kW&28kW: PV1-PV4; 50KW&60kW:PV1-PV6)
10	DC input conduit hole 2	Conduit entry for PV strings (22kW&28kW: PV5-PV8; 50KW&60kW:PV7-PV12)
11	Communication Module Port	Used to connect WiFi or 4G modules.
12	Communication conduit hole	Communication conduit hole
13	USB port	Connect the USB cable.
14	AC output conduit hole	Cable hole for AC circuit wires.

3.5.2 Dimensions

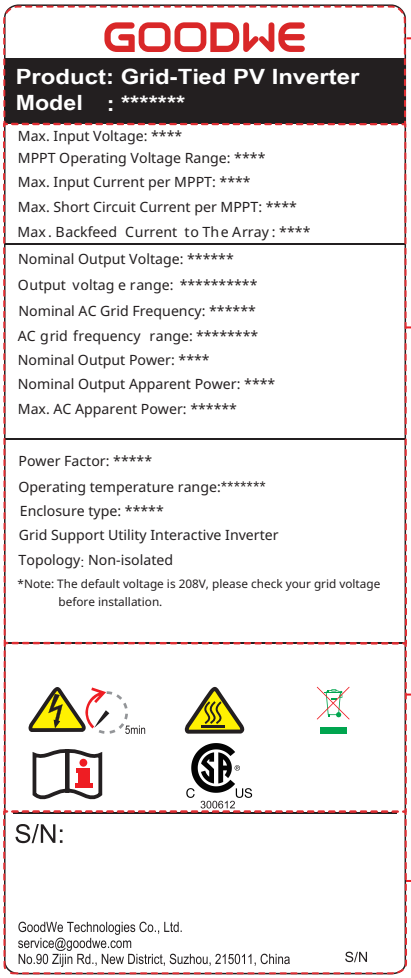


3.5.3 Indicators

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 pictured below is for reference only.



Goodwe trademark, Product type, and product model

Technical parameters

Safety symbols and certification marks

Contact information and serial number

4 Inspection and Storage

4.1 Inspection 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.

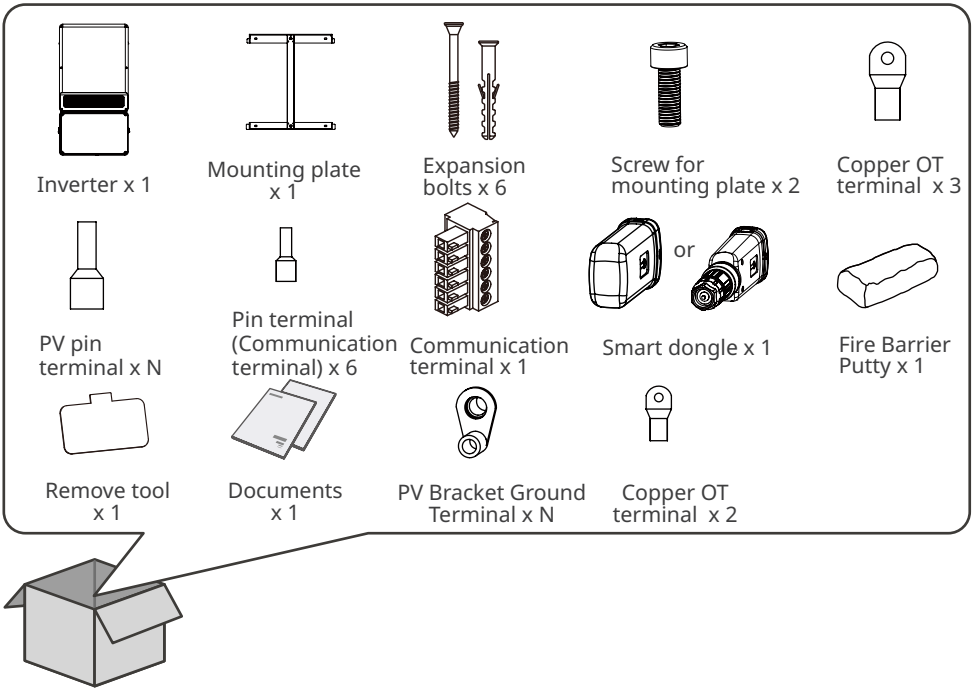
4.2 Deliverables

WARNING

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

Notice

- N means that quantity depends on the inverter model.
- PV pin terminal: GW22KLV-SMT-US: x 12; GW28KLV-SMT-US: x 16; GW50K-SMT-US x 20; GW60K-SMT-US x 24.
- PV Bracket Ground Terminal: GW22KLV-SMT-US: x 6; GW28KLV-SMT-US: x 8; 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:

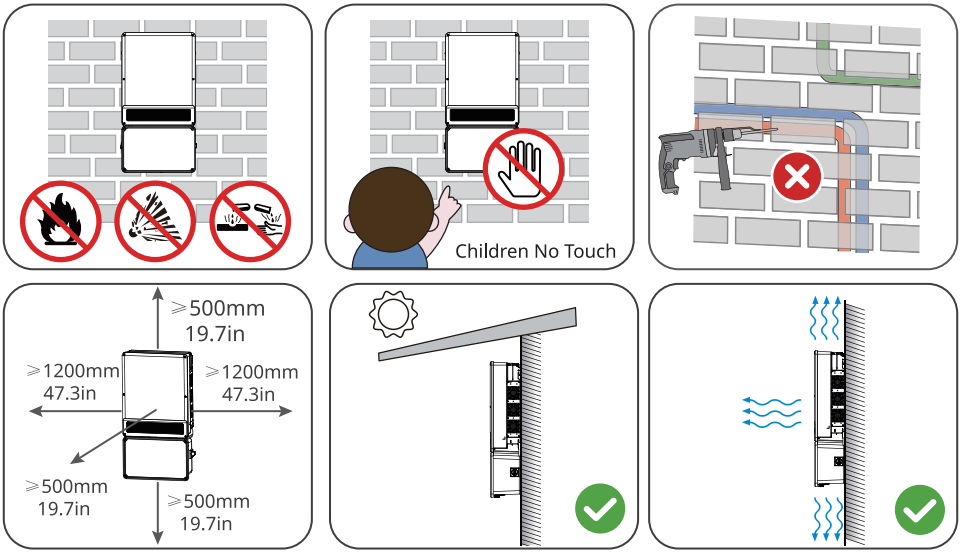
1. Do not unpack the contents from the box or throw the desiccant away.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.
3. The height and direction of the stacking inverters should follow the instructions on the packing box.
4. The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

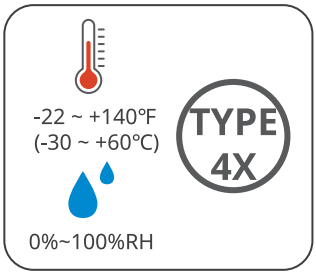
5 Installation

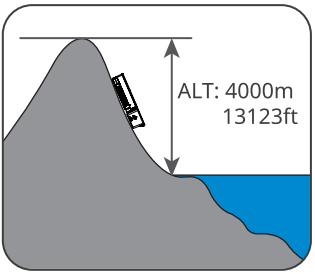
5.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. 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.
3. Avoid the water pipes and cables buried in the wall when deciding the installation position.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
5. Install the equipment in a well-ventilated place to ensure good dissipation. The installation space should be large enough for operations.
6. The equipment has a high ingress protection rating (Type 4X) and can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The inverter shall be installed below the maximum operating elevation of 4000m (13,123ft).
9. Inverters installed in salt-damaged areas may suffer from corrosion. Salt-damaged areas refer to areas within 1000 m (13123 ft) of the coast or affected by sea winds. The areas affected by sea wind vary depending on meteorological conditions (such as typhoons, seasonal winds) or terrain (with embankments, hills).
10. Install the inverter away from high magnetic fields to avoid electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz (i.e., LF or low-frequency like AM and amateur radio) near the inverter, you have to:
    - Add a low pass EMI filter or a multi-winding ferrite core to the PV-DC input cable or AC output cable of the inverter.
    - Install the inverter at least 30m away from the wireless equipment.





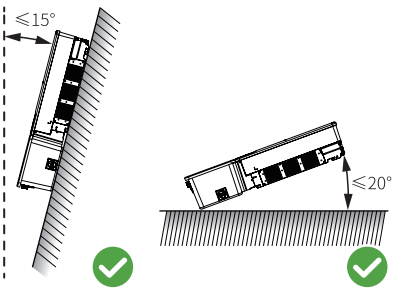


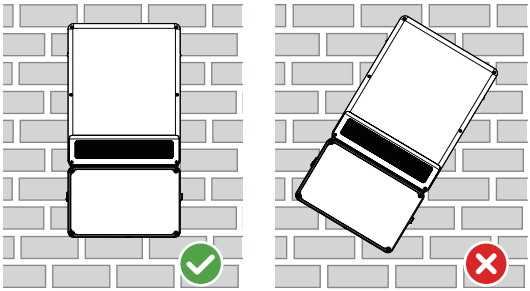
Mounting Support Requirements

- 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

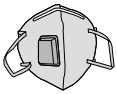
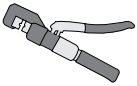
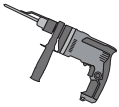
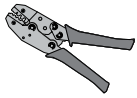
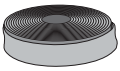
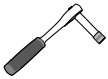
- Install the inverter vertically or at a maximum back tilt of 15 degrees.
- Install the inverter horizontally or at a maximum upward tilt of 20 degrees.
- Do not install the inverter upside down, forward tilt, or back forward tilt.





Installation Tool Requirements

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

 Safety glasses	 Safety shoes	 Safety gloves	 Dust mask	 Hydraulic crimping tool
 Diagonal pliers	 Wire stripper	 Hammer drill	 Multimeter	 Terminal crimping tool
 Marker	Level	 Heat shrink tube	 Rubber mallet	 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

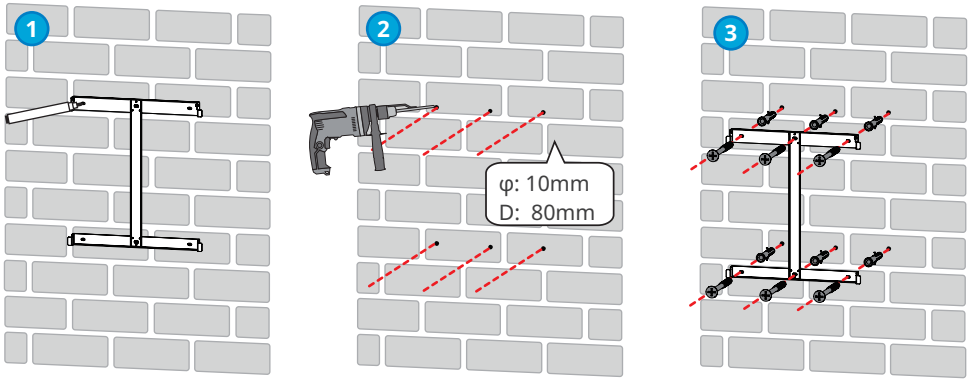
Notice

- 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.

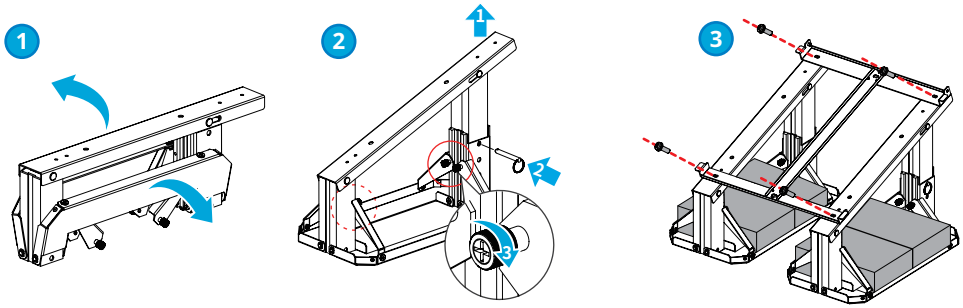
Installing the mounting plate

Mounting on the wall

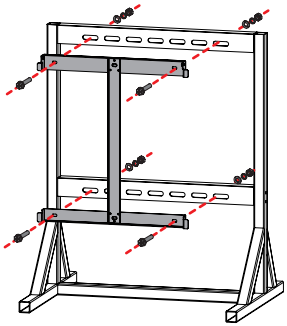
Step 1 Put the mounting plate on the wall horizontally and mark positions for drilling holes.
Step 2 Drill holes to a depth of 80mm (3.15in) using the hammer drill. The diameter of the drill bit should be 10mm (0.39in).
Step 3 Secure the mounting plate using the expansion bolts.



Mounting on an equipment stand (contact your materials supplier to purchase such a rooftop stand)



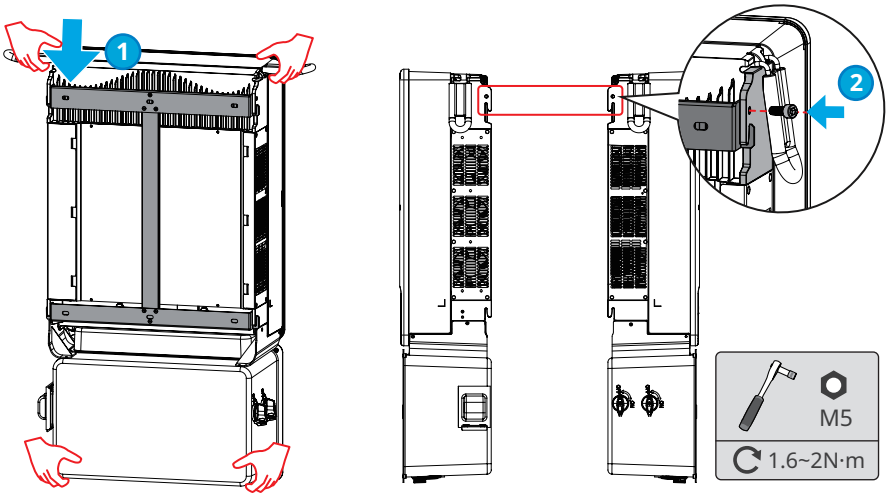
Mounting on strut or other racking (please prepare them by yourself)



Installing the Inverter

Step 1 Support the inverter at the bottom and top with two people. Use the fold-out metallic handles for lifting and guiding the upper portion of the inverter onto the mounting bracket.

Step 2 Tighten the bolts to secure the mounting plate and the inverter.



6 Electrical Connection

6.1 Safety Precautions

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 there is too much tension on a connected wire, the conductor may be poorly connected. Reserve the appropriate length of wire (aka, 'service loop') before connection.
- 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

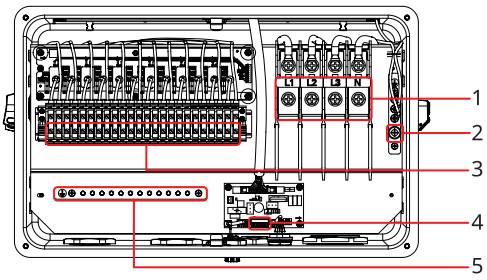
This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product.

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 Wire & Cable Connections

6.2.1 Connection Unit Introduction



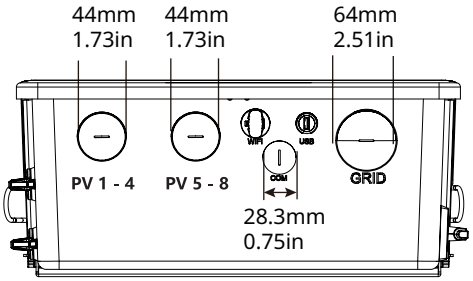
1. AC output terminal
2. PE (Gnd) Terminal
3. DC input terminal[1]
4. Communication terminal
5. Grounding busbar for equipment grounding conductor(s) (EGC) from PV array bracket(s)

[1]: GW22KLV-SMT-US: 3 MPPT inputs. GW28KLV-SMT-US: 4 MPPT inputs. GW50K-SMT-US: 5 MPPT inputs. GW60K-SMT-US: 6 MPPT inputs.

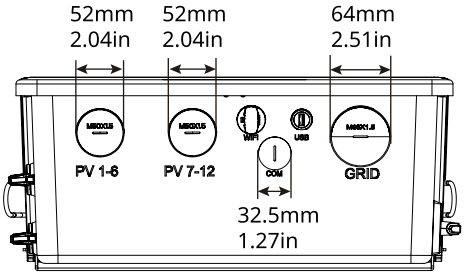
6.2.2 Conduit Hole Dimensions

WARNING

- The conduit hole covers provide a NEMA 4X ingress protection, and thus the customer should provide an equal protection when selecting and installing conduit or tubing and associated connectors.
- 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.



GW22KLV-SMT-US & GW28KLV-SMT-US

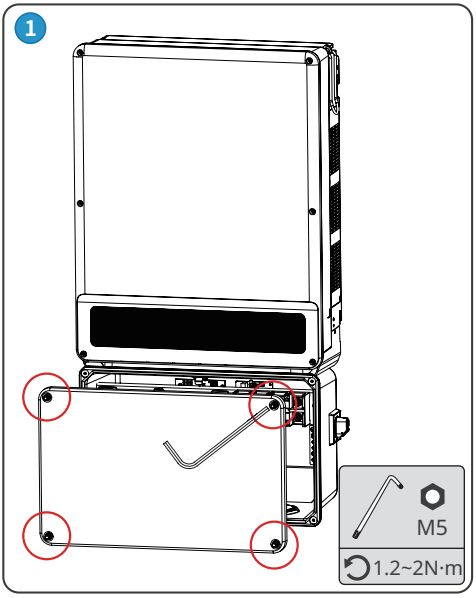


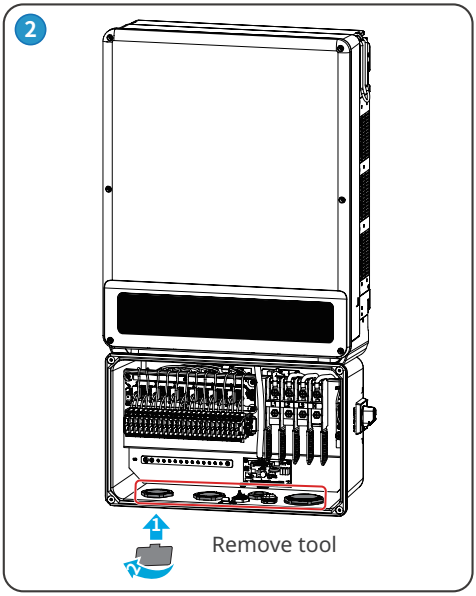
GW50K-SMT-US & GW60K-SMT-US

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 unit.

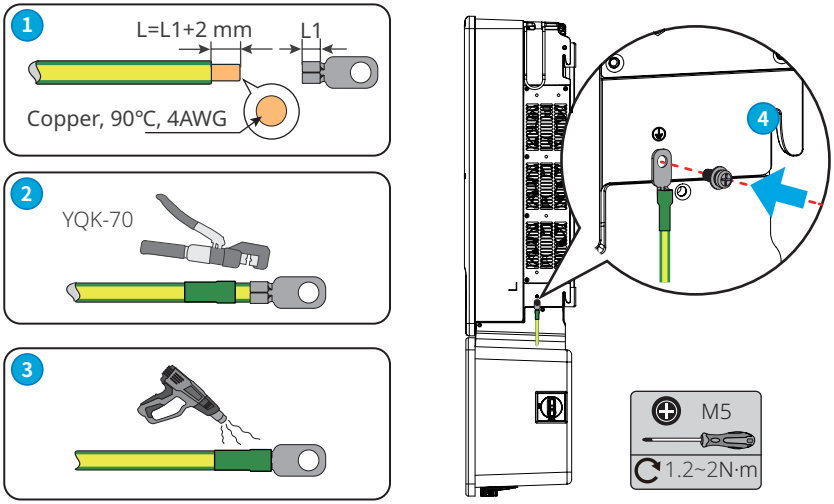




6.4 Connecting the PE Cable

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 AC Circuit and Equipment Grounding Conductors

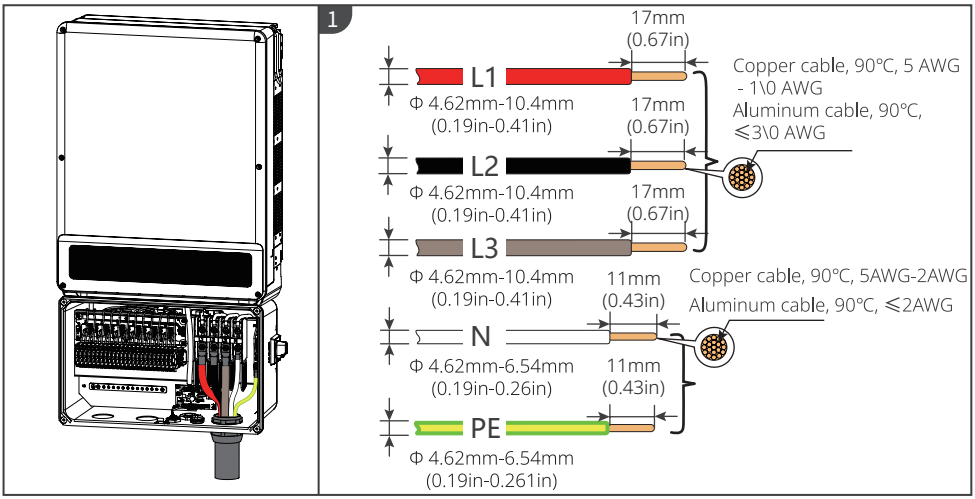
WARNING

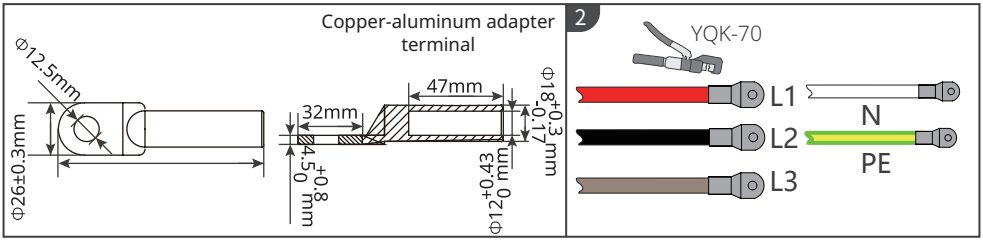
- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- Connect the AC wires to the corresponding terminals like L1, L2, L3, N, and grounding busbar. The inverter may be damaged if the cables are connected to the wrong terminal.
- Make sure that the whole wire conductors are inserted into the terminal holes. No part of the cable core can be exposed.
- Make sure that the wires are connected securely. Otherwise, the terminal may become too hot and damage the equipment when the equipment is operating.

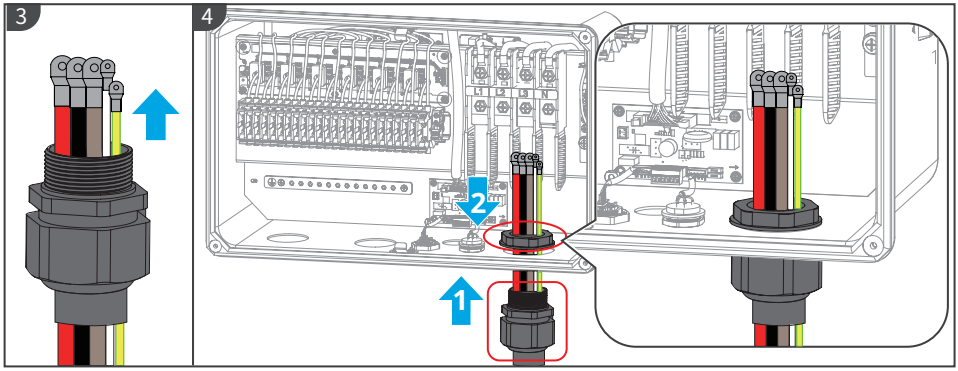
Notice

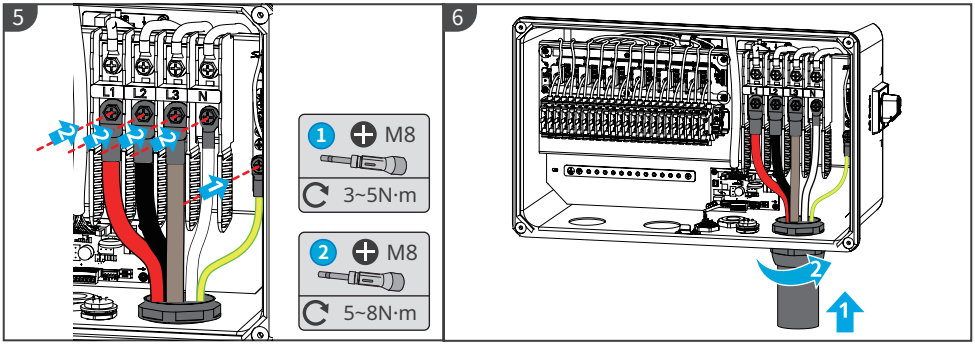
- Install one AC circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker.
- An AC circuit breaker shall be installed on the AC side to make sure that the inverter can safely disconnect the grid when an exception happens. Select the appropriate AC circuit breaker in compliance with local laws and regulations.
- You are recommended to use copper wiring for the AC circuit. If you prefer aluminum wiring, remember to use copper to aluminum adapter terminals.

Step 1: Prepare the AC cable.
Step 2: Crimp the OT terminals to each cable conductors.
Step 3: Lead the AC cable through the waterproof connector.
Step 4: Lead the cable through the cable connection compartment.
Step 5: Connect the cables to their respective terminals.
Step 6: Fasten the waterproof conncetor.






3
4
2
1


5
L1
L2
L3
N
1
M8
3~5N·m
2
M8
5~8N·m
6
2
1

6.6 Connecting the PV (DC-only) Input Conductors

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.

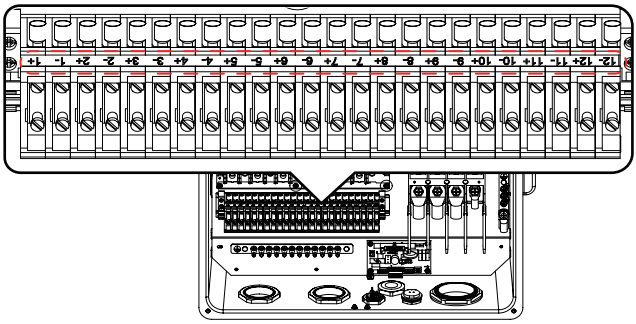
WARNING

- 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 > 50kΩ) before connecting the PV string to the inverter. If the isolation resistance value is ≤ 50kΩ, the inverter will trigger an alarm.
- Connect any equipment grounding conductor(s) from the PV Array to the inverter's grounding busbar for PV circuits, per AHJ requirements.

PV String Connection Manner

When connecting PV strings, the following four conditions should be met at the same time:

- The maximum open-circuit voltage of each PV string shall not exceed 1000 V;
- the MPPT voltage of the PV modules connected in series is within the MPPT Voltage Range at Nominal Power of the inverter as shown in the Technical Parameter;
- The voltage difference between MPPTs should be less than 130 V;
- When there are multiple PV strings, it is recommended to maximize the connections of MPPTs.



GW22KLV-SMT-US

Quantity of PV Strings	MPPT1		MPPT2		MPPT3	
3	1+ & 1-		3+ & 3-		5+ & 5-	
4	1+ & 1-	2+ & 2-	3+ & 3-		5+ & 5-	
5	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-	

GW28KLV-SMT-US

Quantity of PV String	MPPT1		MPPT2		MPPT3		MPPT4	
4	1+ & 1-		3+ & 3-		5+ & 5-		7+ & 7-	
5	1+ & 1-	2+ & 2-	3+ & 3-		5+ & 5-		7+ & 7-	
6	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-		7+ & 7-	

GW50K-SMT-US

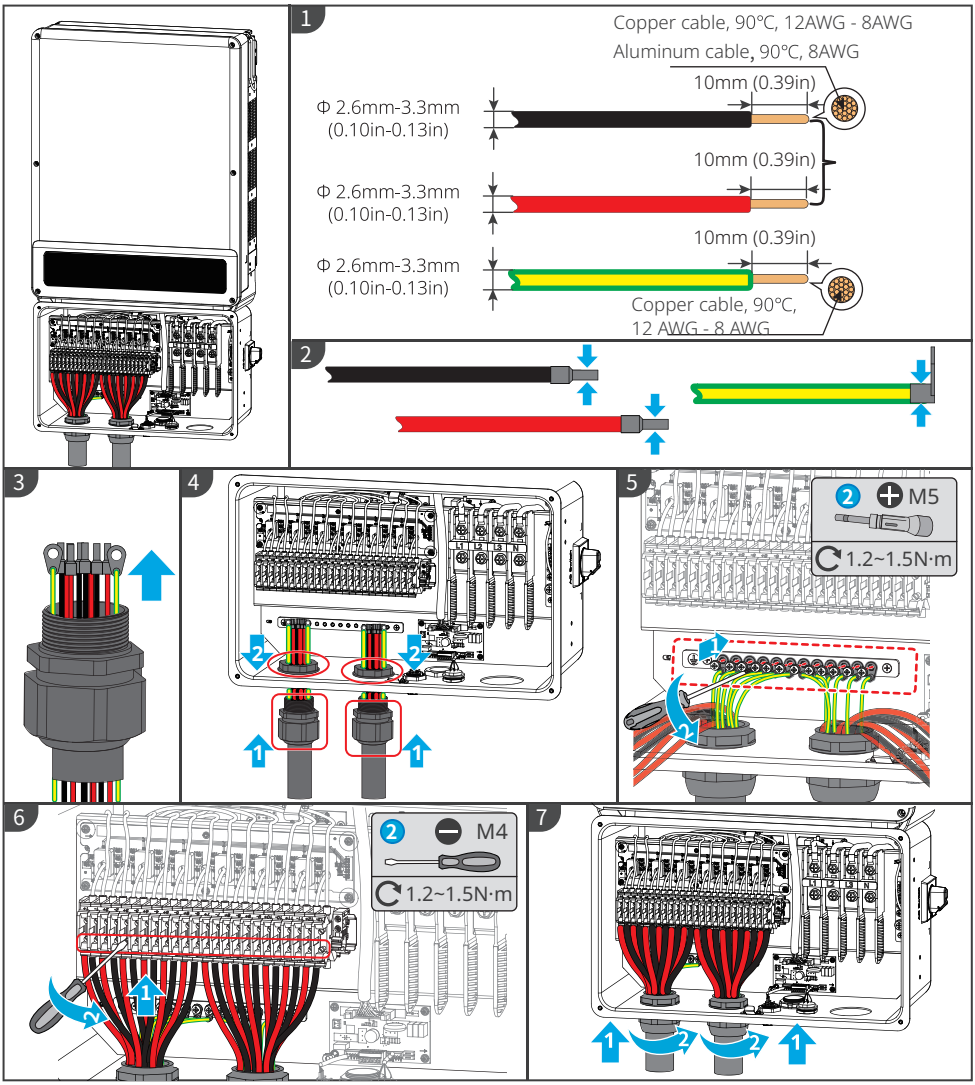
Quantity of PV String	MPPT1		MPPT2		MPPT3		MPPT4		MPPT5	
5	1+ & 1-		3+ & 3-		5+ & 5-		7+ & 7-		9+ & 9-	
6	1+ & 1-	2+ & 2-	3+ & 3-		5+ & 5-		7+ & 7-		9+ & 9-	
7	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-		7+ & 7-		9+ & 9-	
8	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-	6+ & 6-	7+ & 7-		9+ & 9-	

GW60K-SMT-US

Quantity of PV String	MPPT1		MPPT2		MPPT3		MPPT4		MPPT5		MPPT6	
6	1+ & 1-		3+ & 3-		5+ & 5-		7+ & 7-		9+ & 9-		11+ & 11-	
7	1+ & 1-	2+ & 2-	3+ & 3-		5+ & 5-		7+ & 7-		9+ & 9-		11+ & 11-	
8	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-		7+ & 7-		9+ & 9-		11+ & 11-	
9	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-	6+ & 6-	7+ & 7-		9+ & 9-		11+ & 11-	
10	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-	6+ & 6-	7+ & 7-	8+ & 8-	9+ & 9-		11+ & 11-	
11	1+ & 1-	2+ & 2-	3+ & 3-	4+ & 4-	5+ & 5-	6+ & 6-	7+ & 7-	8+ & 8-	9+ & 9-	10+ & 10-	11+ & 11-	

Connecting PV Cable

Step 1: Prepare the DC input cable.
Step 2: Crimp the DC input cable.
Step 3: Lead the DC cable through the waterproof connector.
Step 4: Lead the cable and waterproof connectort through the cable connection compartment.
Step 5: Connect the PE cables of PV array bracket to the grounding busbar.
Step 6: Connect the cables to the terminal.
Step 7: Fasten the waterproof connector.

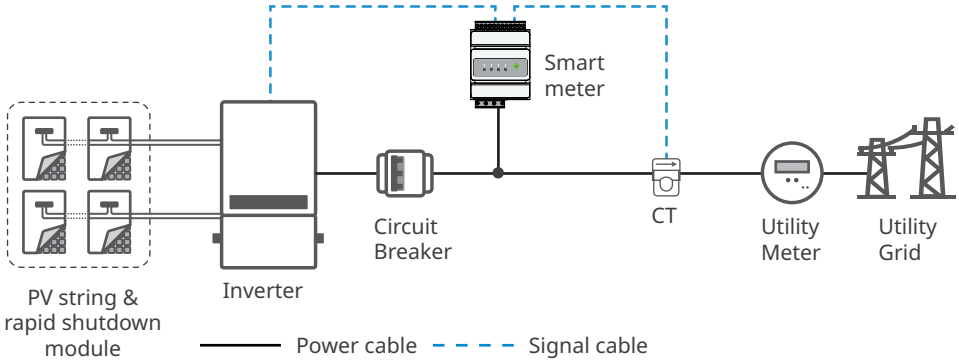


6.7 Connecting the Smart Meter Communication Cable

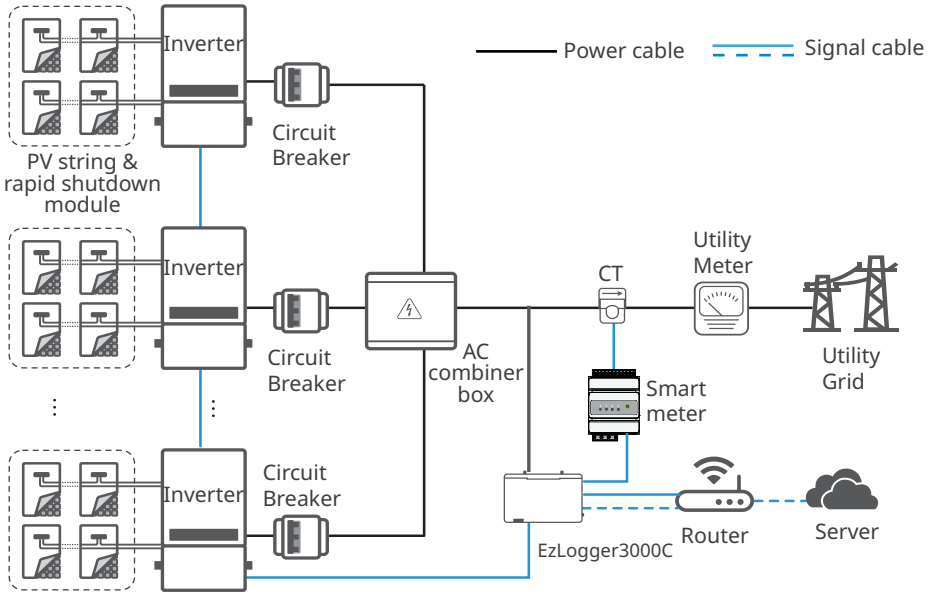
Notice

- Connect a Smart Meter and CT's when the Power export limit functionality or self-consumption monitoring is required. Pay attention to the CT direction when connecting the smart meter. An alarm will be prompted in the SolarGo app if the CT is connected reversely.
- Make sure that the arrow label on the CT points to the utility grid.
- This sensor is part of a Power Control System. Do not remove. Replace only with same type and rating.
- Ensure the direction arrow on the body part of CT is pointed to the grid.

Single Inverter Scrnarios



Multiple Inverters Scrnarios



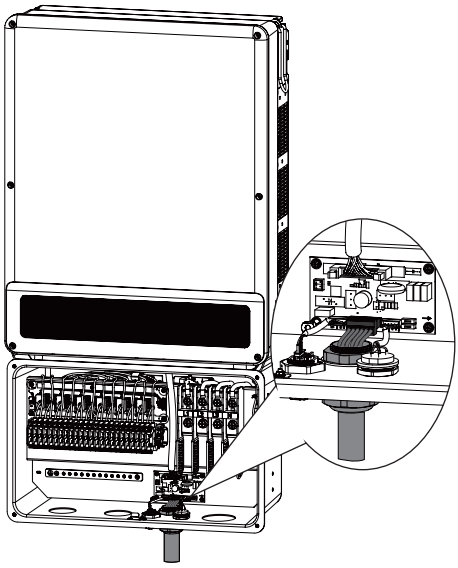
You can refer to GM330 quick installation guide. Scan the QR code or visit https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Smart%20Meter-US_Quick%20Installation%20Guide-EN.pdf to get the user manual.

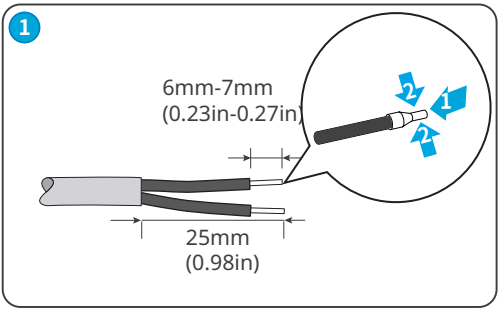
GM330 (US) quick installation guide

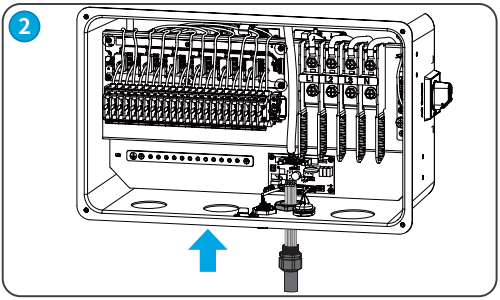
Notice

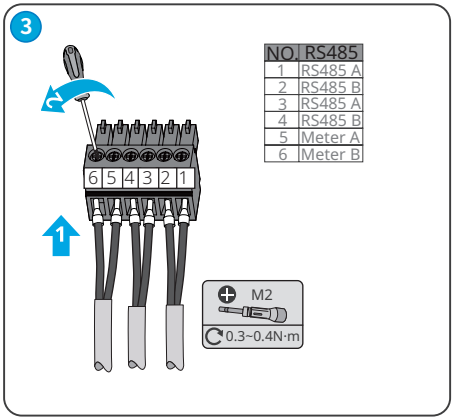
- Make sure that the communication device is connected to the correct terminal. Route the communication cable far away from any interference source or power cable to prevent the signal from being influenced.
- Recommended cable specification: 26-16AWG, communication cables for outdoors which satisfy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

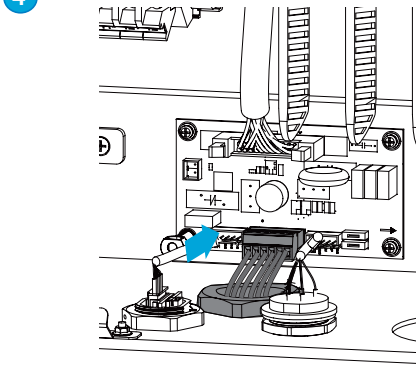
Communication Type	Port Definition	Function Description
RS485	1: RS485 A	Connect to the RS485 port of other inverters and EzLogger3000C.
	2: RS485 B	
	3: RS485 A	
	4: RS485 B	
	5: Meter A	Connect to the smart meter.
	6: Meter B	

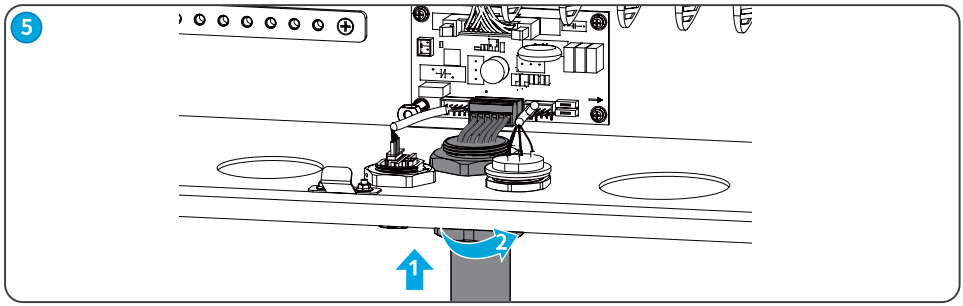



1
6mm-7mm
(0.23in-0.27in)
2
1
2
25mm
(0.98in)


2

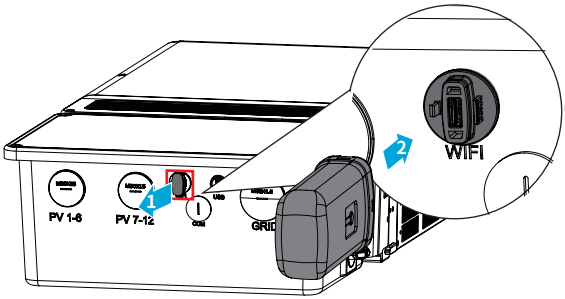

3
NO. RS485
1 RS485 A
2 RS485 B
3 RS485 A
4 RS485 B
5 Meter A
6 Meter B
6 5 4 3 2 1
1
M2
0.3~0.4N·m


4


5
1
2

6.8 Installing a Smart Dongle

Plug a WiFi or 4G or Wi-Fi/LAN dongle 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.

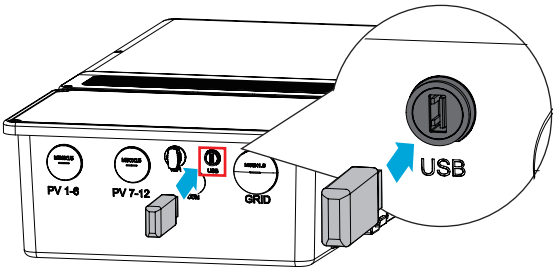


NOTICE

For more information, see the included user manual with you smart dongle or visit the GoodWe Products for North America webpage: https://en.goodwe.com/products?tp=5.

6.9 Installing the USB Flash Drive

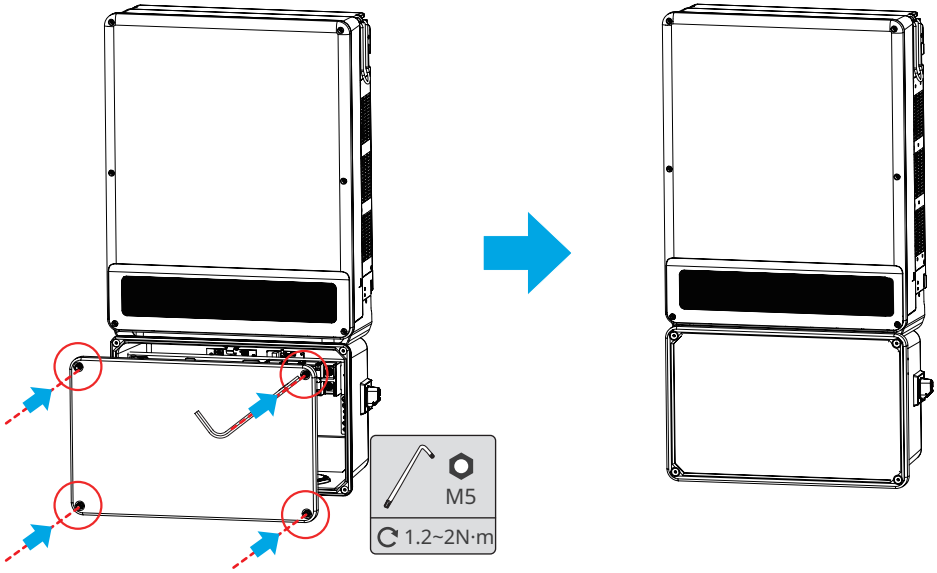
If instructed by After Sales Support, a firmware update can be performed via a USB flash drive. Connect the USB cable and follow the support instructions.



6.10 Closing 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.
- The wiring box cover was already removed; these are the instructions to close it.



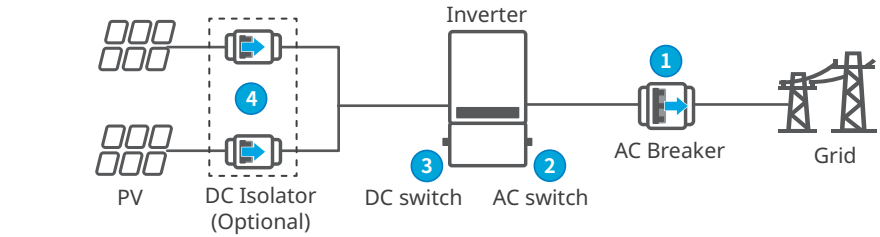
7 Equipment Commissioning

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 conduit holes are fitted with the included waterproof nuts.
5	If required, the electrical conduit openings are sealed with the included Fire Barrier Putty.

7.2 Power On

Step 1: Turn on the AC switch or breaker between the inverter and the point of common coupling (PCC).
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 1 → 2 → 3 → 4

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 WiFi module, Wi-Fi/LAN module, or 4G 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

DANGER

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

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: 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	1. Utility grid power failure. 2. The AC circuit or the AC breaker is disconnected.	1. The alarm will be automatically cleared after the grid power supply restores. 2. Check whether the AC cable is connected and the AC breaker is on.
2	Grid Overvoltage	The grid voltage exceeds the allowed range, or the duration exceeds the setted value of HVRT duration.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the inverter grid overvoltage protection value with the consent of the local power operator. 3. If it does not restore for a long time, please check whether the AC side circuit breaker or output cables are connected properly.

No.	Fault	Cause	Solutions
3	Grid Rapid Overvoltage	The grid voltage is abnormal or the ultra-high voltage triggers the fault.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the inverter grid overvoltage protection value with the consent of the local power operator. 3. If it does not restore for a long time, please check whether the AC side circuit breaker or output cables are connected properly.
4	Grid Undervoltage	The grid voltage the allowed range, or the duration exceeds the setted value of LVRT duration.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the inverter grid undervoltage protection value with the consent of the local power operator. 3. If it does not restore for a long time, please check whether the AC side circuit breaker or output cables are connected properly.

No.	Fault	Cause	Solutions
5	Grid 10min Overvoltage	The average value of the grid voltage within 10 minutes exceeds the range specified by safety regulations.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the Grid 10min Overvoltage protection value with the consent of the local power operator.
6	Grid Overfrequency	The frequency of the grid exceeds the local grid standard range.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the Grid Overfrequency protection value with the consent of the local power operator.

No.	Fault	Cause	Solutions
7	Grid Underfrequency	The frequency of the grid is below the local grid standard range.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If the grid voltage exceeds the allowed range, please contact local power operator. • If the grid voltage is within the allowable range, please modify the Grid Underfrequency protection value with the consent of the local power operator.
8	Anti-islanding	The grid has been disconnected. The grid voltage is maintained due to the presence of loads. Grid connection has been stopped based on safety regulations and protection requirements.	The inverter will resume grid reconnection after the grid to return to normal.

No.	Fault	Cause	Solutions
9	LVRT Undervoltage	Abnormal grid, and the abnormal duratin exceeds the specified value of local high voltage safety regulation.	1. If occurs occasionaly, it may be caused a short term grid abnormity. The inverter will recover automatically after the grid is normal. 2. If it occurs frequently, please check whether the grid voltage is within the allowed range. • If no, please contact local power operator. • If yes, please contact the local service center.
10	HVRT Overvoltage	Abnormal grid, and the abnormal duratin exceeds the specified value of local high voltage safety regulation.	
11	Abnormal GFCI 30mA	The insulation impedance pf PV string to ground decreases during the operation of the inverter.	1. If occurs occasionaly, it may be caused a occasional abnormal ouside wiring. The inverter will recover automatically after clear the abnormity. 2. If it occurs frequently or cannot restore for a long time, please check if the insulation impedance of the PV string to the ground is too low.
12	Abnormal GFCI 60mA		
13	Abnormal GFCI 150mA		
14	Abnormal GFCI		
15	Large DC of AC current L1	The DC component of the inverter output current exceeds the local safety regulation's or the inverter's default allowable range.	1. If caused by an external fault (such as the grid abnormality, frequency abnormality, etc.), the inverter will resume normal operation automatically after the fault is cleared. 2. If the alarm occurs frequently or affects the normal power generation, please contact your dealer or after-sales service center.
16	Large DC of AC current L2		
17	Low Insulation Res.	1. The short circuit protection of PV to the ground. 2. The installation environment of PV strings is relatively humid for a long time and the insulation of PE cable is poor.	1. Check the impedance of the PV string to the ground. If there is a short circuit phenomenom, please check the short circuit point and rectify it. 2. Check if the PE cable of the inverter is connected correctly. 3. If it is confirmed that the impedance is indeed lower than the default value in cloudy and rainy days, please reset the "insulation impedance protection value".

No.	Fault	Cause	Solutions
18	Abnormal Ground.	1. The PE cable is not connected. 2. When ground the PV string, the AC output cables L and N of the inverter are reversed.	1. Please confirm if the PE cable of the inverter is not connected properly. 2. Under the scenerio of PV string grounding, please confirm whether the inverter's AC output cables L and Nare reversed.
19	L-PE Short Circuit	The live wire connection of the inverter output terminal is abnormal	1. Check the wiring of the grid side. If the wiring is wrong, please correct it. 2. If the inverter continues to fail to return to normal, please contact after-sales service
20	Anit Reverse power Failure	Abnormal load connection	1. If caused by an external fault, the inverter will resume normal operation automatically after the fault is cleared. 2. If the alarm occurs frequently or affects the normal power generation, please contact your dealer or after-sales service center.
21	Internal Comm Loss	1. Chip has not be powered on 2. Chip program version error	Disconnect the AC side switch and DC side switch, and after 5 minutes, close the AC side switch and DC side switch. If the fault persists, please contact your dealer or after-sales service center.

No.	Fault	Cause	Solutions
22	AC HCT Check abnormal	Abnormal sampling of AC HCT	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.
23	GFCI HCT Check abnormal	Abnormal sampling of GFCI HCT	
24	Relay Check abnormal	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.	
25	Internal Fan abnormal	1. The fan power supply is abnormal. 2. Mechanical exception. 3. The fan is aging and damaged.	
26	External Fan abnormal		
27	Flash Fault	Internal storage Flash exception	
28	DC Arc Fault	1. The PV string connection terminal is not securely connected. 2. The DC cable is damaged.	Please check if the DC side is correctly wored according to the guidances of the user manual.
29	AFCI Self-test Fault	Arc detection device 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.
30	Inv Module Overtemperature	1. The inverter is installed in a place with poor ventilation. 2. The ambient temperature exceeds 60℃. 3. A fault occurs in the internal fan of the inverter.	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 proper.

No.	Fault	Cause	Solutions
31	1.5V Ref abnormal	The reference 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.
32	0.3V Ref abnormal	The reference circuit is abnormal.	
33	BUS Overvoltage	1. The PV voltage is too high. 2. The sampling of the inverter BUS voltage is abnormal. 3. The isolation of the transformer of the inverter is poor, so two inverters influence each other when connected to the grid. One of the inverters reports DC Overvoltage.	
34	P-BUS Overvoltage		
35	N-BUS Overvoltage		
36	BUS Overvoltage(Slave CPU 1)		
37	P-BUS Overvoltage(Slave CPU 1)		
38	N-BUS Overvoltage(Slave CPU 1)		
39	PV Input Overvoltage	Excess PV modules are connected in the series, and the open-circuit voltage is higher than the operating voltage.	Check whether the PV string open-circuit voltage meets the maximum input voltage requirements.
40	PV Continuous Hardware Overcurrent	1. Improper PV panels configuration. 2. Internal components of the inverter are 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.
41	PV Continuous Software Overcurrent		
42	PV String Reversed (Str1~Str16)	The PV string is connected reversely.	Check if The PV string is connected reversely.

No.	Fault	Cause	Solutions
43	PV voltage Low	Sun light is weak or changing abnormally.	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.
44	BUS voltage Low		
45	BUS Soft Start Failure	boost driving ciucuit 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.
46	BUS Voltage Imbalance	1. Abnormal inverter sampling circuit 2. Abnormal hardware.	
47	Gird Phase Lock failure	the grid frequency is unstable.	
48	Inverter Continuous Overcurrent	Short time sudden changes in the grid or load cause the control overcurrent.	If the problem occurs occasionally, ignore it. If the problem occurs frequently, contact the dealer or the after-sales service.
49	Inv Software Overcurrent		
50	R Phase Hardware Overcurrent		
51	S Phase Hardware Overcurrent		
52	T Phase Hardware Overcurrent		
53	PV Hardware Overcurrent	Sun light is weak or changing abnormally.	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.
54	PV Software Overcurrent		
55	PV HCT Failure	Abnormal boost current sensor	
56	Cavity Overtemperature	1. The inverter is installed in a place with poor ventilation. 2. The ambient temperature exceeds 60℃. 3. A fault occurs in the internal fan of the inverter.	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 proper.

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	GW22KLV-SMT-US	GW28KLV-SMT-US	GW50K-SMT-US	GW60K-SMT-US
Input				
Max.Input Power (kW)	39.6	50.4	75	90
Max.Input Voltage(V)	1000	1000	1000	
MPPT Operating Voltage Range (V)	180~950	180~950	180~980	
MPPT Voltage Range at Nominal Power (V)	350~750	350~750	550~850	
Start-up Voltage (V)	200	200	200	
Nominal Input Voltage (V)	450	450	720	
Max. Input Current per MPPT (A)	32	32	30	
Max. Short Circuit Current per MPPT (A)	45	45	50	
Max.Backfeed Current to The Array(A)	0	0	0	
Number of MPP Trackers	3	4	5	6
Number of Strings per MPPT	2	2	2	
Output				
Nominal Output Power (kW)	22	28	50	60
Nominal Output Apparent Power (kVA)	22	28	50	60
Max. AC Active Power (kW)	22@208V 23@220V 25@240V	28@208V 30@220V 32@240V	55	66
Max. AC Apparent Power (kVA)	22@208V 23@220V 25@240V	28@208V 30@220V 32@240V	55	66
Nominal Power at 40℃ (kW)	22	28	-	-
Max. Power at 40℃ (Including AC Overload) (kW)	22@208V 23@220V 25@240V	28@208V 30@220V 32@240V	-	-
Nominal Output Voltage (V)	208/220/240, 3L/N/PE or 3L/PE		480, 3L/N/PE or 3L/PE	

Technical Data	GW22KLV-SMT-US	GW28KLV-SMT-US	GW50K-SMT-US	GW60K-SMT-US
Output Voltage Range (V)	183.0~228.8 @ 208V 193.6~242.0 @ 220V 211.2~264.0 @ 240V		422.4~528	
Nominal AC Grid Frequency (Hz)	60			
AC Grid Frequency Range (Hz)	58.5~61.2		55~65	
Max. Output Current (A)	61	77.7	67.0	80.0
Max. Output Fault Current (Peak and Duration)(A)	162@7.5μs		162@7.5μs	
Inrush Current (Peak and Duration) (A)	22.4@5ms		22.4@5ms	
Nominal Output Current (A)	61.0 @ 208V 57.3 @ 220V 52.9 @ 240V	77.7 @ 208V 73.5 @ 220V 67.4 @ 240V	60.1	72.2
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Max. Total Harmonic Distortion	< 3%		< 3%	
Maximum Output Overcurrent Protection (A)	162		117	140
Efficiency				
Max. Efficiency	97.5%		98.5%	98.5%
European Efficiency	-		98.2%	98.2%
CEC Efficiency	96.5%		-	
Protection				
PV String Current Monitoring	Integrated		Integrated	
PV Insulation Resistance Detection	Integrated		Integrated	
Residual Current Monitoring	Integrated		Integrated	
PV Reverse Polarity Protection	Integrated		Integrated	

Technical Data	GW22KLV-SMT-US	GW28KLV-SMT-US	GW50K-SMT-US	GW60K-SMT-US
Anti-islanding Protection	Integrated		Integrated	
AC Overcurrent Protection	Integrated		Integrated	
AC Short Circuit Protection	Integrated		Integrated	
AC Overvoltage Protection	Integrated		Integrated	
DC Switch	Integrated		Integrated	
AC Switch	-		Integrated	
DC Surge Protection	Type II (Type I + Type II optional)		Type II	
AC Surge Protection	Type II		Type II	
AFCI	Integrated		Integrated	
Rapid Shutdown	Integrated		Integrated	
PID Recovery	Optional		-	
Power Supply at Night	Integrated		-	
General Data				
Operating Temperature Range (℃)	-30 ~ 60℃ (>45℃ derating) -22~140℉ (>113℉ derating)		-30 ~ +60 (℃) (>45℃ derating) -22 ~ +140 (℉) (>113℉ derating)	
Storage Temperature	-40~+70℃(40~158℉)		-	
Relative Humidity	0 ~ 100%		0~100%	
Max. Operating Altitude	4000m (>3000 Derating) 13123ft (>9842.5ft Derating)		4000m (> 3000m derating) 13123ft (> 9842.5ft derating)	
Cooling Method	Smart Fan Cooling		Smart Fan Cooling	
User Interface	LED, LCD (Optional) ,WLAN+APP		LED, WLAN+APP	
Communication	RS485, WiFi+LAN ,4G (Optional)		RS485, WiFi, USB, 4G or WiFi+LAN (Optional)	
Communication protocols	Modbus-RTU (SunSpec Compliant)		Modbus-RTU (SunSpec Compliant)	
Weight (Kg)	62 136.4 lbs	62 136.4 lbs	70.0 154.3lbs	

Technical Data	GW22KLV-SMT-US	GW28KLV-SMT-US	GW50K-SMT-US	GW60K-SMT-US
Dimension (W×H×D)	520*990*220mm 20.5*39.0*8.7(in)		520 x 990 x 220 (mm) 20.5 x 39.0 x 8.7 (in)	
Noise Emission (dB)	<65		< 65	
Topology	Non-isolated		Non-isolated	
Self-consumption at Night (W)	<12*1		<12*1	
Enclosure Type	TYPE 4X		TYPE 4X	
Anti-corrosion Class	C5(Optional)		C5 (Optional)	
DC Connector	#12~#8AWG Cu		#12~#8AWG Cu	
AC Connector	OT (#5-3/0AWG, Cu or Al)		OT (#5-3/0AWG, Cu or Al)	
Environmental Category	4K4H		4K4H	
Pollution Degree	III		I	
Overvoltage Category	DCII / AC IV		DC II/AC IV	
Protective class	I		I	
The Decisive Voltage Class (DVC)	PV:C		PV: C	
	AC:C		AC: C	
	com:A		COM: A	
Active Anti-islanding Method	AFDPF + AQDPF		AQDPF	
Country of Manufacture	China		China	

*1: Self-consumption at night will be less than 1 W without the optional RSD and 24-hour load monitoring.

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		
Parameter	Minimum measurement accuracy	Measurement window	Range	Minimum measurement accuracy	Measurement window	Range
Voltage, RMS	(± 1% V_{nom})	10 cycles	0.5 p.u. to 1.2 p.u.	(± 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	(± 5% S_{rated})	10 cycles	0.2 p.u. < P < 1.0 p.u.	Not required	N/A	N/A
Reactive Power	(± 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

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