

GOODWE



User Manual

Hybrid Inverter
ET Series
(6.0-15.0kW) G2

V1.0 -2023 -12-31

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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 in the manual are for guidance only.

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1 About This Manual

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

1.1 Applicable Model

This manual applies to the listed inverters below:

- GW6000-ET-20
- GW8000-ET-20
- GW9900-ET-20
- GW10K-ET-20
- GW12K-ET-20
- GW15K-ET-20

Note: GW9900-ET-20 is only available in the Australia.

1.2 Target Audience

This manual applies to trained and knowledgeable technical professionals only. 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:

 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
Highlights key information and supplements the texts. Or some skills and methods to solve product-related problems to save time.

2 Safety Precaution

Please strictly follow these safety instructions in the user manual during the operation.



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

- 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 in the manual are for guidance only.
- Before installations, read through the user manual to learn about the product and the precautions.
- All operations 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 guide and user manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, please visit <https://en.goodwe.com/warranty>

2.2 DC Side Safety



DANGER

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



WARNING

- Ensure the component frames and the bracket system are securely grounded.
- Ensure the DC cables are connected tightly, securely and correctly.
- Measure the DC cables using a multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.

2.3 AC Side 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 rated AC output rated current.
- Make sure that all the groundings are tightly connected. When there are multiple inverters, make sure that all the grounding points on the enclosures are equipotential bonding.
- You are recommended to use copper cables as AC output cables.
- When single overload protection occurs, the inverter can restart automatically; however, the restarting time will be extended if it happens several times. For a faster restarting, try it via SolarGo App.
- BACK-UP function is not recommended if the PV system is not configured with batteries.

2.4 Inverter Safety



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 cover, scrawl, or damage any label on the equipment.
- Warning labels on the inverter are as follows:

	HIGH VOLTAGE HAZARD High voltage exists during the inverter's running. 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 Personnel Protective Equipment before any operations.
	High-temperature hazard. Do not touch the product under operation to avoid being burnt.		Grounding point.
	CE Mark.		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.
	RCM Mark.	-	-

2.5 Battery Safety



WARNING

- The battery used with the inverter shall be approved by the inverter manufacturer. The approved battery list can be obtained through the official website.
- Before installations, read through the corresponding battery's user manual to learn about the product and the precautions. Strictly follow its requirements.
- If the battery discharged completely, please charge it in strict accordance with the corresponding model's user manual.
- Factors such as: temperature, humidity, weather conditions, etc. may limit the battery's current and affect its load.
- Contact after-sale service immediately if the battery is not able to be started. Otherwise, the battery might be damaged permanently.
- Measure the DC cable using the multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- Do not connect one battery group to several inverters at the same time. Otherwise, it may cause damage to the inverter.

2.6 Personnel Requirements

NOTICE

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

2.7 EU Declaration of Conformity

GoodWe Technologies Co., Ltd. hereby declares that the inverter with wireless communication modules sold in the European market meets the requirements of the following directives:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

You can download the EU Declaration of Conformity on <https://en.goodwe.com>.

GoodWe Technologies Co., Ltd. hereby declares that the inverter without wireless communication modules sold in the European market meets the requirements of the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

You can download the EU Declaration of Conformity on <https://en.goodwe.com>.

3 Product Introduction

3.1 Product Overview

Intended usage

Inverters control and optimize the power in PV systems through an integrated energy management system. In self consumption mode, the electricity generated in the PV system can be prioritized for load use, excess electricity can be stored in the battery, and when the battery is fully charged, it can be output to the power grid.

Model

This manual applies to the listed inverters below:

- GW6000-ET-20
- GW8000-ET-20
- GW9900-ET-20
- GW10K-ET-20
- GW12K-ET-20
- GW15K-ET-20

Note: GW9900-ET-20 is only available in the Australia.

Model

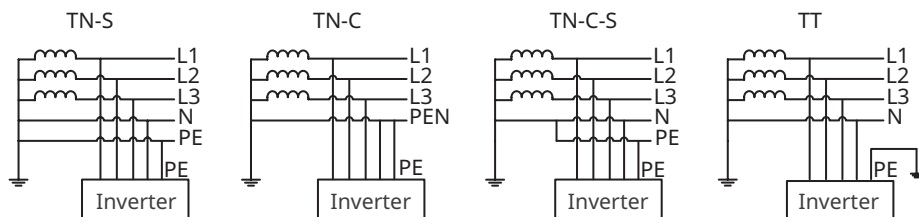
GW6000-ET-20



No.	Referring to	
1	Brand Code	GW: GoodWe
2	Rated Power	• 6000: the nominal power is 6000W. • 8000: the nominal power is 8000W. • 9900: the nominal power is 9900W. • 10K: the nominal power is 10kW. • 12K: the nominal power is 12kW. • 15K: the nominal power is 15kW.
3	Series Code	ET: ET Series (Hybrid Inverter)
4	Version code	20: the second generation inverter.

Supported Grid Types

For the grid type with neutral wire, the voltage between the neutral wire and the ground must be less than 10V.

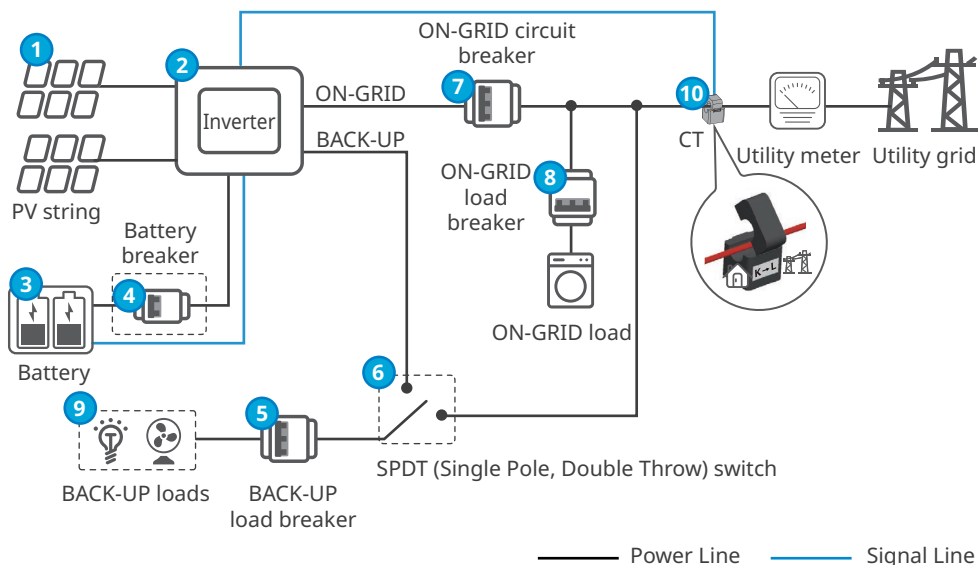


3.2 Application Scenarios

WARNING

- The PV system is not suitable to connect equipment that relies on a stable power supply, such as medical equipment to sustain life. Ensure that no personal injury is occurred when the system is disconnected.
- Avoid loads with high starting current like high-power water pumps in the PV system. Otherwise, the off-grid output may fail due to excessive instantaneous power.
- BACK UP function is not recommended if the PV system is not configured with batteries.
- The Back-UP port does not support connecting autotransformer or isolation transformer.
- When connecting three-phase loads to the BACK-UP port, only three-phase loads with N-wire are supported. It is not supported to connect loads without N-wire.
- Factors such as: temperature, humidity, weather conditions, etc. may limit the battery's current and affect its load.
- The inverter supports UPS, and the switching time is less than 10ms. Please make sure that the BACK-UP load capacity is less than the nominal power of the inverter. Otherwise, it may cause the UPS function to fail when the power grid is cut off.
- When single overload protection occurs, the inverter can restart automatically; however, the restarting time will be extended if it happens several times. For a faster restarting, try it via SolarGo App.
- Normal household loads can be supported when the inverter is in back-up mode. Accepted loads as below:
 - Inductive load: Air conditioning with specifications of 1.5 horsepower or less.
 - Capacitive loads: total power ≤ 0.6 times of the inverter's rated output power.

Single Inverter Scheme



No.	Parts	Description
1	PV string	PV string is composed of series connected PV panels.
2	Inverter	Supports the second generation ET series (6-15kW) inverter.
3	Battery	Select the battery model according to the inverter model and the approved battery list.
4	(Optional) Battery switch	- It must meet the local regulatory requirements. Recommend customers to prepare 2 horsepower DC switch. - Recommended specifications: - For GW6000-ET-20 and GW8000-ET-20: the nominal current is $\geq 40A$ and the nominal voltage is $\geq 720V$ DC. - Other models: the nominal current is $\geq 50A$ and the nominal voltage is $\geq 720V$ DC
5	BACK-UP load breaker	- AC circuit breakers shall be prepared by the customers. - Recommended specifications of AC circuit breaker: - For GW6000-ET-20: the nominal current is $\geq 20A$ and the nominal voltage is $\geq 230V$ AC. - For GW8000-ET-20: the nominal current is $\geq 25A$ and the nominal voltage is $\geq 230V$ AC. - Other models: the nominal current is $\geq 32A$ and the nominal voltage is $\geq 230V$ AC.

No.	Parts	Description
6	(optional) SPDT (Single Pole, Double Throw) switch	- SPDT (Single Pole, Double Throw) switch shall be prepared by the customers. - An SPDT switch is recommended to ensure that the BACK-UP loads do not stop working when the inverter is off or in maintenance. - Recommended specifications of AC Circuit Breaker and SPDT Switch: - For GW6000-ET-20: the nominal current is $\geq 20A$ and the nominal voltage is $\geq 230V$ AC. - For GW8000-ET-20: the nominal current is $\geq 25A$ and the nominal voltage is $\geq 230V$ AC. - Other models: the nominal current is $\geq 32A$ and the nominal voltage is $\geq 230V$ AC.
7	ON-GRID circuit breaker	- AC circuit breakers shall be prepared by the customers. - Recommended specifications of AC circuit breaker: - For GW6000-ET-20: the nominal current is $\geq 20A$ and the nominal voltage is $\geq 230V$ AC. - Other models: the nominal current is $\geq 32A$ and the nominal voltage is $\geq 230V$ AC.
8	ON-GRID load breaker	Depend on the actual using load.
9	BACK-UP load	- Connecting BACK-UP loads, such as loads requiring 24-hour power supply or other important loads. - Connecting unbalanced loads. L1, L2, L3 of the inverter respectively connected to loads with different power. - When connecting three-phase loads to the BACK-UP port, only three-phase loads with N-wire are supported. It is not supported to connect loads without N-wire. - The Back-UP port does not support connecting autotransformer or isolation transformer.
10	CT	- The inverter is equipped with a built-in smart meter, please use the CT shipped with the box. - External electricity meter can be selected according to needs.

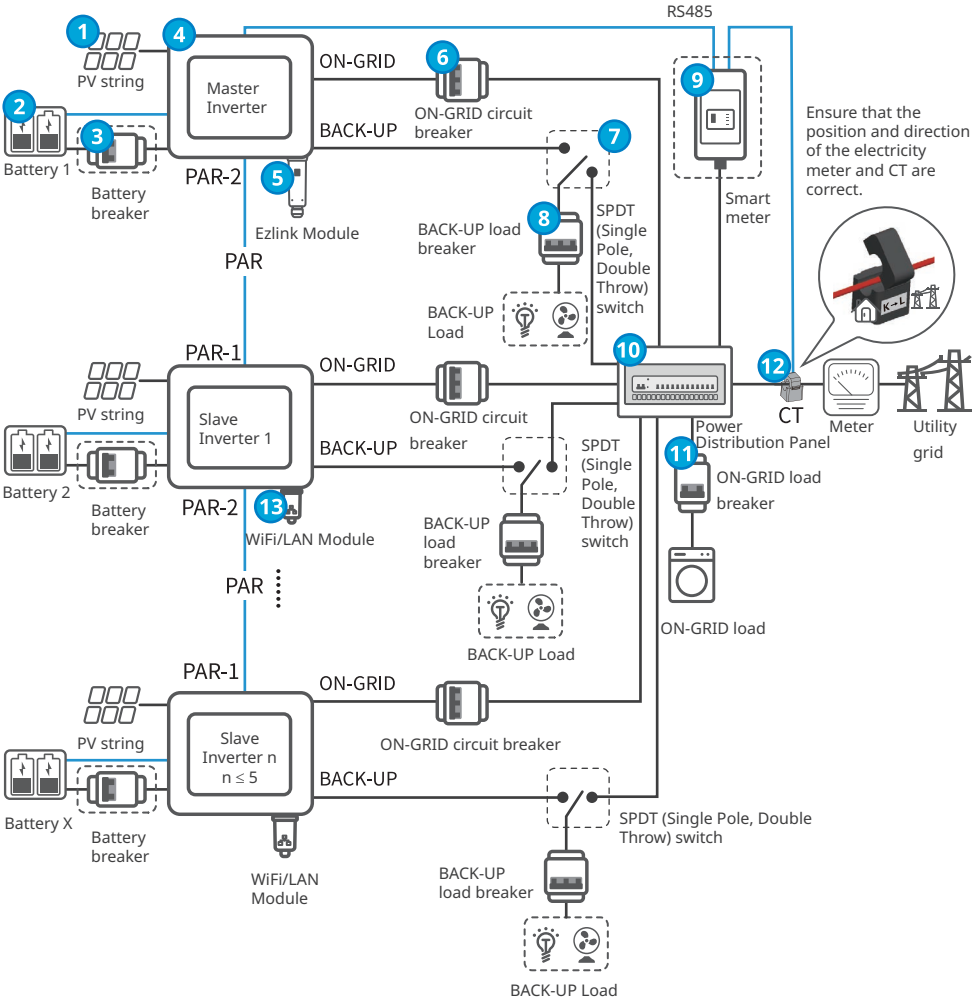
Multiple Inverters Parallel Scheme

**WARNING**

- Off grid multiple inverters parallel system is not supported. Do not parallel the BACK-UP ports of each inverter in the system.
- When installing a parallel system, please consider factors such as a communication cable length of 2m, and plan the installation distance of the equipment reasonably. If the length of the parallel communication cable shipped with the box cannot meet the usage requirements, it is recommended that the length of the self provided communication cable should not exceed 5m.
- After the wiring of the parallel system is completed, the DIP switch of the first and last inverters needs to be turned to the ON position, and other inverters need to be turned to the 1 position.
- In parallel system, only Ezlink module is supported for networking, and only one Ezlink module needs to be installed in the same system. The inverter connected to the Ezlink module defaults to the master inverter, and other inverters are slave inverters. The slave inverters are required to install a WiFi/LAN module that shipped with the box.
- When using an inverter with built-in electricity meter for networking in a parallel system, only the master inverter CT needs to be connected; When using an external smart meter for networking, please connect the meter to the master inverter.

NOTICE

- The parallel system supports up to 6 inverters.
- In the parallel system, the inverter EMS communication port does not support access to third-party EMS monitoring devices.
- In the parallel system, the battery model is selected based on the inverter and battery matching list. It is recommended that the battery model and capacity connected to each inverter in the same system be consistent.



Power Line Signal Line

No.	Parts	Description
1	PV string	PV string is composed of series connected PV panels.
2	Battery	- Select the battery model according to the inverter model and the approved battery list. - In parallel system, it is recommended to use batteries of the same brand, model, and capacity. - Do not connect one battery to more than one inverter at the same time. Otherwise, it may cause damage to the inverter. - When the parallel system is connected to the power grid, the SOC of each battery may be unbalanced.
3	Battery breaker	- It must meet the local regulatory requirements. Recommend customers to prepare 2 horsepower DC switch. - Recommended specifications: - For GW6000-ET-20 and GW8000-ET-20: the nominal current is $\geq 40\text{A}$ and the nominal voltage is $\geq 720\text{V DC}$. - Other models: the nominal current is $\geq 50\text{A}$ and the nominal voltage is $\geq 720\text{V DC}$
4	Inverter	- Supports the second generation ET series (6-15kW) inverter. It is recommended to use the same model of inverter in the same system. If there is a need, different models of inverters can also be used. - The system supports up to 6 inverters. The power limit of the parallel system must meet local regulatory requirements. - When using a parallel system, if you need to achieve functions such as load control, remote shutdown, DRED/RCR, etc., please connect the communication cable to the master inverter. - When the master inverter in the parallel system malfunctions, the parallel system cannot function properly; When any slave inverter in the parallel system experiences an abnormality, except for the malfunctioned one, all other inverters can operate normally.
5	Ezlink Module	- In parallel system, only Ezlink module is supported for networking. - Only one Ezlink module needs to be installed in the same system. The inverter connected to the Ezlink module defaults to the master inverter, while other inverters are slave inverters. The master inverter can issue commands to the slave inverter. If other inverters are installed with Ezlink modules, it will cause abnormal communication.

No.	Parts	Description
6	ON-GRID circuit breaker	An AC circuit breaker needs to be installed externally on the AC side of the inverter in the parallel system. AC circuit breakers shall be prepared by the customers, and the recommended specifications: - For GW6000-ET-20: the nominal current is $\geq 20\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$. - Other models: the nominal current is $\geq 32\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$.
7	SPDT (Single Pole, Double Throw) switch	- SPDT (Single Pole, Double Throw) switch shall be prepared by the customers. - An SPDT switch is recommended to ensure that the BACK-UP loads do not stop working when the inverter is off or in maintenance. - Recommended specifications of AC Circuit Breaker and SPDT Switch: - For GW6000-ET-20: the nominal current is $\geq 20\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$. - For GW8000-ET-20: the nominal current is $\geq 25\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$. - Other models: the nominal current is $\geq 32\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$.
8	BACK-UP load breaker	- AC circuit breakers shall be prepared by the customers. - Recommended specifications of AC circuit breaker: - For GW6000-ET-20: the nominal current is $\geq 20\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$. - For GW8000-ET-20: the nominal current is $\geq 25\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$. - Other models: the nominal current is $\geq 32\text{A}$ and the nominal voltage is $\geq 230\text{V AC}$.
9	(Optional) Smart meter	- The built-in smart meter in the inverter can be used for parallel system use. If you need to use other smart meter, you can purchase them separately. The recommended meter model is GM330 or GM3000. - When using the built-in meter of the inverter, it is necessary to connect the CT on the master inverter; When using other smart meter, it is necessary to connect the meter to the master inverter. - Refer to the following information to choose smart meter: - Built in electricity meter: The current at the grid connection point is $< 90\text{A}$, and the distance between the inverter and the switchboard is $\leq 25\text{m}$. - GM3000: $90\text{A} \leq$ the current at the grid connection point $< 120\text{A}$, distance between inverter and switchboard $> 25\text{m}$. - GM330: the current at the grid connection point $\geq 120\text{A}$, distance between inverter and distribution panel $> 25\text{m}$.

No.	Parts	Description
10	Switchboard	- Switchboard shall be prepared by the customers. - The rated current of the switchboard is $\geq 2 \times N \times I_{Max}$ (N: number of inverters in the parallel system; I_{Max}: maximum output current of the inverter).
11	ON-GRID load breaker	Depend on the actual using load.
12	CT	- When using the built-in meter in the inverter, only need to connect the CT shipped with the box to the master inverter. - When using the GM330 meter, please refer to the meter manual and prepare CT. - When using the GM3000 meter, please use the CT shipped with the meter.
13	WiFi/LAN Module	In parallel system, the slave inverters are required to install a WiFi/LAN module that shipped with the box.

3.3 Working Mode

3.3.1 System working mode

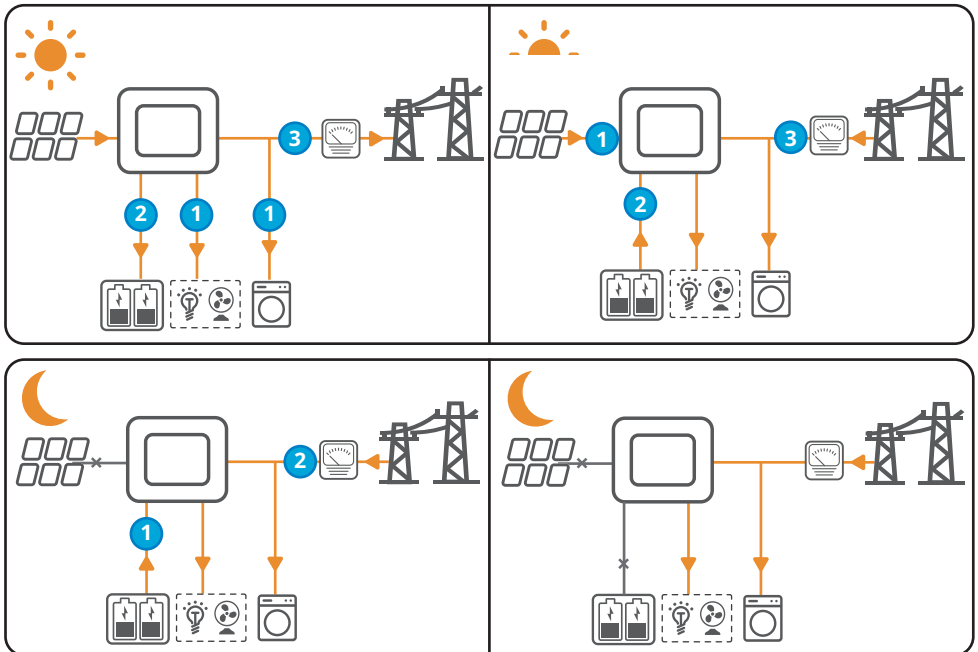
Self consumption mode

NOTICE

- For solar power, consider self consumption mode in priority: the excess power charges the battery in day time; the battery supplies power to the load when there is no solar power generated at night. This will improve the self consumption rate and saves electricity costs.
- It is suitable for areas with high electricity prices and little or no solar power generation subsidies.

- Day time:
 - When the power generated in the PV system is sufficient, it will supply the loads in priority. And the excess power will charge the batteries first. The remaining power will be sold to the grid.
 - When the power generated in the PV system is insufficient or no power is generated, the battery will supply the loads in priority. If the battery power is insufficient, then the load will be powered by the grid.
- Night:

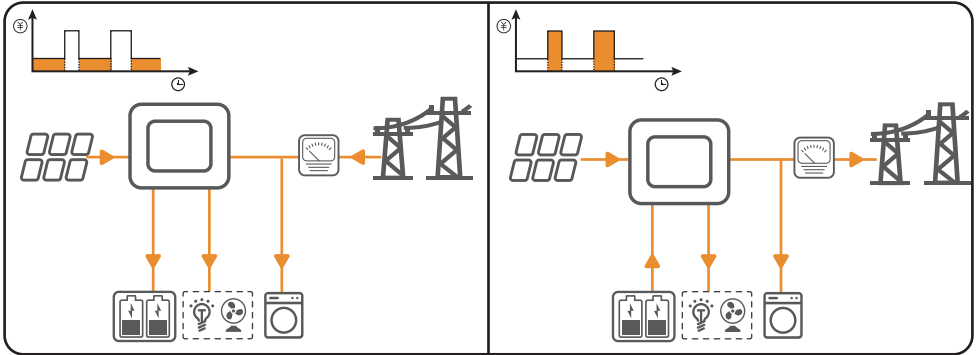
If the battery power is sufficient, the load will be powered by the battery. If the battery power is not enough, the load will be powered by the grid.



Economic mode

NOTICE

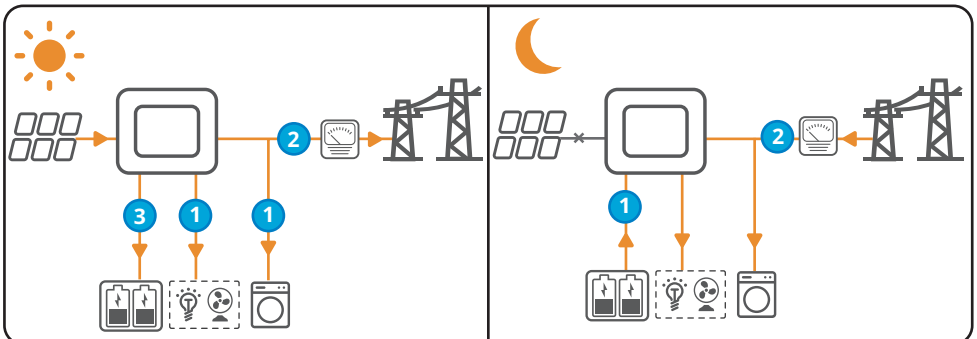
- Economic models can only be used when local laws and regulations are met, such as whether the power grid is allowed to charge the battery or whether the battery is allowed to discharge and sell to the power grid. If not, do not use this mode.
- It is recommended to use economic mode in scenarios when the peak-valley electricity price varies a lot.
- When the electricity price is at its valley, set the time for the grid to charge the battery.
- When the electricity price is at its peak, the battery will power the load first, and the remaining power can be sold to the grid.



Delayed Charging Mode

NOTICE

- Delayed charging mode can prevent the battery from quickly being filled up and wasting energy when the PV energy exceeds the limit power value.
- It applies to regions with grid connected power output limitations.
- Daytime: The load usage will be first met by PV power generation. When the excess PV power is less than the limit power value, priority will be given to selling the electricity to the power grid; When the excess PV energy exceeds the limit power value, use the power exceeding the limit output power to charge the battery to prevent power waste.
- Night: If the battery power is sufficient, the load will be powered by the battery. If the battery power is not enough, the load will be powered by the grid.

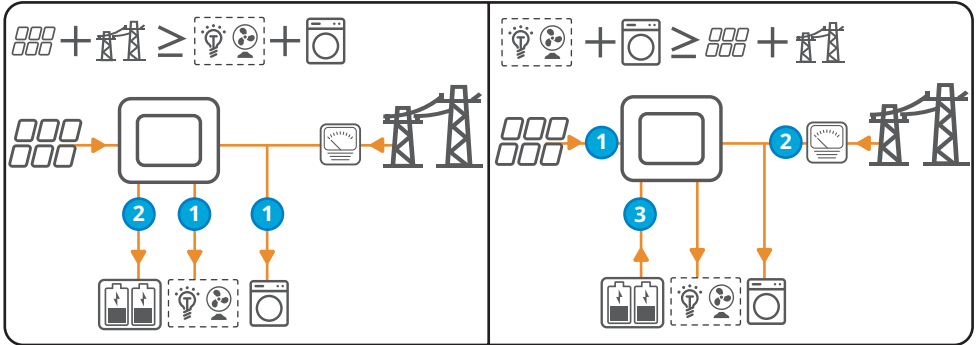


Peak Shaving Mode

NOTICE

Peak shaving mode is mainly applicable to industrial and commercial scenarios. When the total power consumption of the load exceeds the power consumption quota in a short period of time, battery discharges to reduce the power exceeding the quota.

- When the sum of PV power generation and the power purchased from the grid exceeds the power used by the load, the excess power can charge the battery.
- When the power used by the load exceeds the sum of PV power generation and the power purchased from the grid, the battery discharges to supplement the excess power.

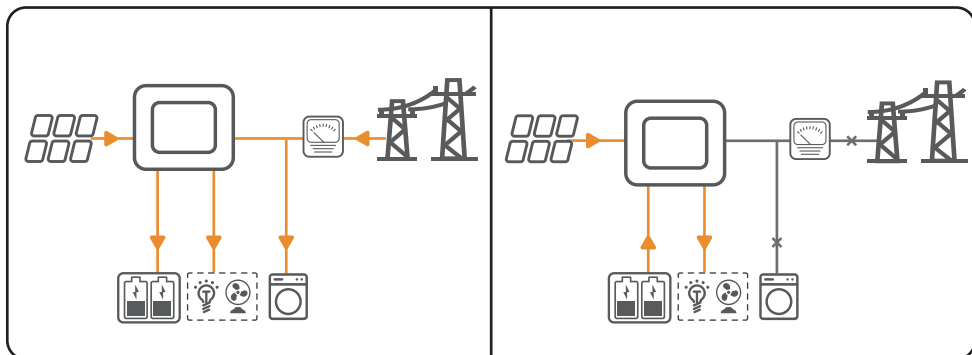


BACK-UP Mode

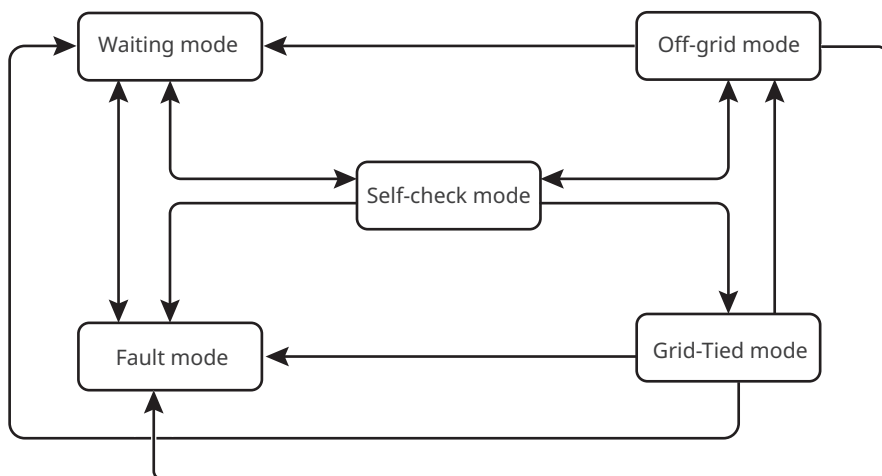
NOTICE

- In BACK-UP mode, you can set different battery SOC values for grid-tied and off-grid status. When the power grid is cut off, the inverter switches to off-grid mode, and the battery can discharge to supply power to the load to ensure that the BACK-UP load does not lose power; When the power grid is restored, the inverter switches to grid-tied mode. If the battery's SOC is lower than the set SOC, the battery can be charged by power grid.
- The purchase of electricity from the power grid to charge the battery must comply with local laws and regulations.
- Recommended for use in areas with unstable power grid.

- When the SOC of the battery is lower than the set value, use PV power generation and electricity from the power grid to supply load and charge the battery.
- When the power grid is cut off, if the PV power generation cannot meet the load usage, the battery discharges to supplement this part of power to ensure that the load connected to BACK-UP port does not lose power.



3.3.2 Inverter operation mode



No.	Parts	Description
1	Waiting mode	The stage when the equipment is waiting after being powered on; or the stage waiting for the warning to be cleared after a warning appears. - 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 operation, 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 power grid is not detected or there is a power outage during the self-check process, and the off-grid output function is enabled, the inverter will enter off-grid mode; If the off-grid output function is not enabled, it will enter fault mode. - If the self-check is not passed, and a fault is detected, it enters fault mode. - If the self-check is not passed, and a warning is detected, it enters waiting mode.
3	Grid-Tied mode	The inverter is grid-tied successfully. - If a fault is detected, and the off-grid output function is not enabled, it enters fault mode. - If a warning is detected, and the off-grid output function is not enabled, it enters waiting mode. - If the off-grid output function is enabled and a fault or warning that does not affect the operation of off-grid mode is detected, it enters off-grid mode. - If the off-grid output function is enabled and a fault or warning that affects the operation of off-grid mode is detected, it enters fault mode. - If the off-grid output function is enabled and a warning that affects the operation of off-grid mode is detected, it enters waiting mode.
4	Off-grid mode	When the grid is powered off, the inverter switches to the off-grid mode and continues to supply power to the load via BACK-UP port. - If a fault is detected, it enters the fault mode. - If a warning is detected, or the off-grid output function is not enabled, it enters waiting mode. - If the conditions meet grid-tied requirements and the off-grid output function is turned on, it enters the self-check mode.
5	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 Features

Power derating

In order to ensure the safe operation of the inverter and meet local safety regulations, 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 when the inverter is working.

- Unfavorable environmental conditions, e.g., direct sunlight, high temperature, etc.
- Inverter's output power percentage has been set.
- Changes in grid voltage and frequency.
- Higher input voltage value.
- Higher input current value.

AFCI (Optional)

Reason to occur electric arcs:

- Poor contact of connectors in PV system.
- Wrong connected or broken cables.
- Aging connectors and cables.

Method to detect electric arcs:

- The inverter has integrated AFCI function and met the IEC 63027 standard.
- When the inverter detects an electric arc, users can check the time the alarm appears and the detailed phenomenon through SolarGo App.
- The inverter will shutdown for protection after triggering an AFCI alarm. After the alarm is cleared, the inverter will automatically reconnect to the grid for operation.
 - Automatic reconnection: If the inverter triggers AFCI alarm less than 5 times within 24 hours, each alarm will be automatically cleared after 5 minutes, and the inverter will reconnect to the grid for operation;
 - Manual reconnection: If the inverter triggers the 5th AFCI alarm within 24 hours, the alarm needs to be manually cleared before the inverter reconnect to the grid for operation.

Please refer to the SolarGo App User Manual for detailed operation.

The AFCI function is disabled by default at the factory. If you need to use it, please enable the "AFCI Detection" function through the "Advanced Settings" interface on the SolarGo App.

Model	Tag	Description
GW6000-ET-20	F-I-AFPE-1-2-1	F: Full coverage I: Integrated AFPE: Detection and interruption capability provided 1: 1 monitored string per input port 2: 2 input ports per channel 1: 1 monitored channel
GW8000-ET-20		
GW9900-ET-20	F-I-AFPE-1-2/ 1- 2	F: Full coverage I: Integrated AFPE: Detection and interruption capability provided 1: 1 monitored string per input port 2/1: 2/1 input ports per channel(AFD1: 2 , AFD2: 1) 2: 2 monitored channels
GW10K-ET-20		
GW12K-ET-20		
GW15K-ET-20		

Communication

The inverter supports communication modules such as 4G, Wi Fi/LAN modules.

The inverter supports setting via Bluetooth in a short distance; connecting to cloud platform via 4G, WiFi/LAN modules to monitor the working status of the inverter and the running situations of the power plant, etc.

- 4G module (optional): Supports mainstream network operators such as CMCC, Simpoint, T-moblie, 1NCE, Optus, and Telstra.
- WiFi/LAN Module:
 - WiFi communication supports 2.4G frequency band. Users need to set the router to 2.4G or 2.4G/5G coexistence mode. (Users can set 40 bytes for router wireless signal name maximumly.)
 - LAN communication supports connecting inverters to routers through Ethernet cables.
 - Bluetooth communication supports V4.2 BR/EDR and Bluetooth LE standard Class-1, Class-2, and Class-3 transmitters.

Single Phase Unbalanced Output

Both the grid-tied and the BACK-UP mode of the inverter support single-phase unbalanced output power. The maximum output power per phase for different models is shown in the table below:

Model	Maximum output power per phase
GW6000-ET-20	3kW
GW8000-ET-20	4kW
GW9900-ET-20	5kW
GW10K-ET-20	5kW
GW12K-ET-20	5kW
GW15K-ET-20	5kW

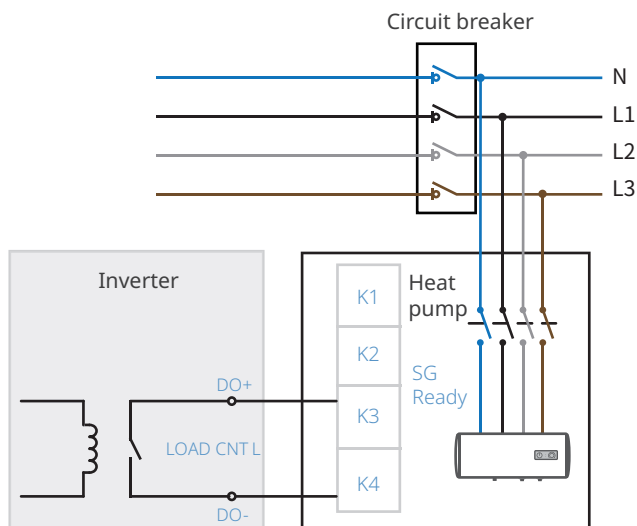
Load Control

The inverter reserves a dry contact controlling port, which supports connecting SG Ready certified heat pumps and controllable loads for controlling load on or off.

The load control methods are as follows:

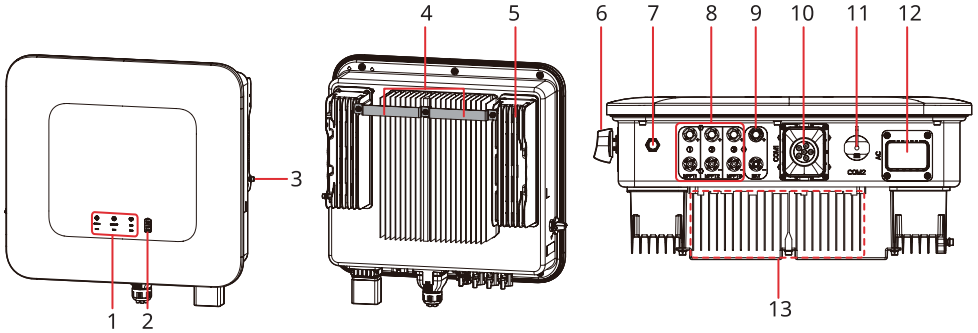
- Time control: In standard time mode, the time for controlling the load to turn on or off can be set, and the load will automatically turn on or off within the set time period; In intelligent time mode, when the remaining PV energy exceeds the rated power of the load within the set time period, the load will be turned on.
- Switch control: when the control mode is selected as ON, the load will be enabled; when it is set as OFF, the load will be disabled.
- BACK-UP control: the inverter has integrated DO dry contact controlling port, which can control the loads on or off. In off-grid mode, the loads connected to the DO port can be turned off if the overload at the BACK-UP is detected or the battery SOC value is lower than the battery off-grid protection setting.

The load control function is disabled by default. If you need to use it, please enable and set the "Load Control" function through the "More" interface on the SolarGo App.



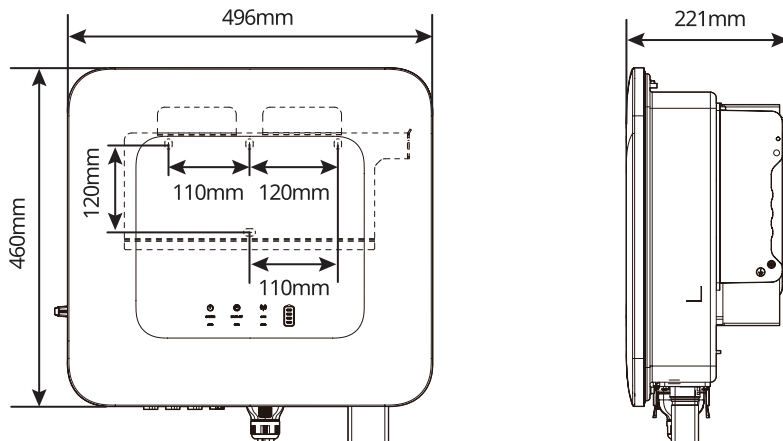
3.5 Appearance

3.5.1 Parts



No.	Parts	Description
1	Indicator	Indicates working status of the inverter.
2	Battery SOC indicator	Indicates the working status of the inverter.
3	PE terminal	Connect the PE cable of the box.
4	Mounting plate	Used to install the inverter.
5	Cooling fin	Cooling fin of the inverter.
6	DC switch	Control DC input connection or disconnection.
7	Breather valve	-
8	PV input terminal	Connect the PV module DC input cables. - GW6000-ET-20and GW8000-ET-20: MPPT x 2 - GW9900-ET-20, GW10K-ET-20, GW12K-ET-20, GW15K-ET-20: MPPT x 3
9	Battery DC input/output port	Connect the battery input cables.
10	Communication port COM1	Connects communication cables and supports communication with CT, electricity meter, DRED, remote shutdown, RCR, EMS, and BMS.
11	Communication module port COM2	- Supports communication modules such as 4G, Wi Fi/LAN - Upgrading system software using a USB flash drive.
12	AC output port	Connecting AC Cables.
13	Cooling fin	- Cooling the inverter. - GW12K-ET-20 and GW15K-ET-20 can be optionally equipped with fans.

3.5.2 Dimension



3.5.3 Indicator Description

Inverter Indicator

Indicator	Status	Description
 SYSTEM		The inverter is powered on and in standby mode.
		The inverter is starting and in self-check mode.
		The inverter is in normal operation under grid-tied or off-grid modes.
		BACK- UP output overload
		A fault has occurred.
		The inverter is powered off.
 BACK-UP		The grid is abnormal, and the power supply to the BACK-UP port of the inverter is normal.
		The grid is normal, and the power supply to the BACK-UP port of the inverter is normal.
		The BACK-UP port has no power supply.
 COM		The monitoring module of the inverter is resetting.
		The inverter fails to connect with the communication Termination.
		Communication fault between the communication Termination and Server.
		The monitoring of the inverter operates well.
		The monitoring module of the inverter has not been started yet.

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 contents from the box 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.

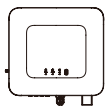
4.2 Deliverables



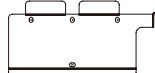
WARNING

- Connect the DC cables with the delivered terminals. The manufacturer shall not be liable for the damage if other terminals are used.
- [1] The number of PV DC input terminals matches the number of inverter DC input terminals.

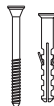
Inverter Deliverables



Inverter x 1



Mounting plate x 1



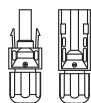
Expansion bolt x 4



M5 screws x 1



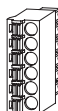
PE terminal x 1



Battery connector x 2



PV DC input terminal x N^[1]



6Pin communication terminal x 2



4Pin communication terminal x 1



2Pin communication terminal x 1



AC crimping terminal x 12



Tubular terminal x 12



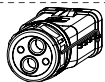
CT x 3



CT connection cable x 1



Communication module x 1



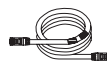
or



AC cable protective cover and hexagonal screwdriver x 1



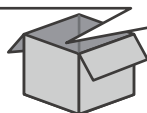
Slotted screwdriver x 1



BMS communication cable x 1



Documents x 1



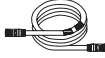
Deliverables for parallel system(Ezlink module)

NOTICE

By default, 5 communication cables will be distributed, each with a length of 2m.



Ezlink module
x 1



Communication
cable x 5

4.3 Storage

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

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

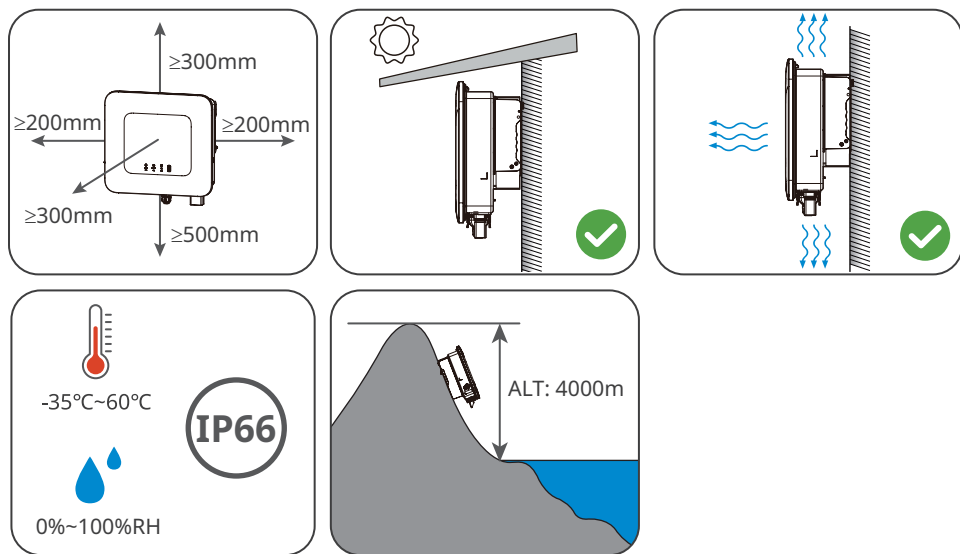
5 Installation

5.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. 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 drilling holes.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
5. The place to install the equipment shall be well-ventilated for heat dissipation and large enough for operations.
6. 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.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The altitude to install the equipment shall be lower than the maximum working altitude 4000m.
9. Install the equipment away from electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz near the equipment, please install the equipment as follows:
 - Add a multi-turn winding ferrite core at the DC input line or AC output line of the inverter, or add a low-pass EMI filter.
 - Install the inverter at least 30m far away from the wireless equipment.
10. The DC and communication cables between the battery and inverter should be less than 3 meters. Please ensure that the installation distance between the inverter and the battery meets the cable length requirements.



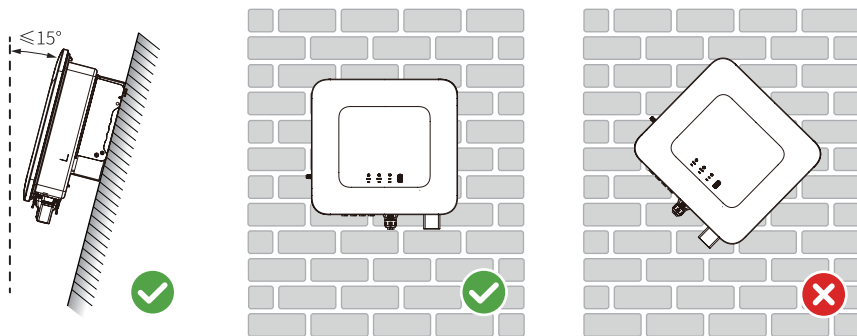


Mounting Support Requirements

- 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 bothering people nearby.

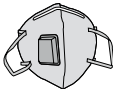
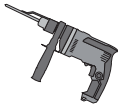
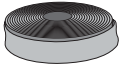
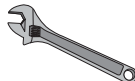
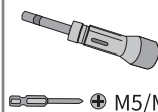
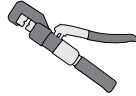
Installation Angle Requirements

- 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	RJ45 crimping tool
				
Diagonal pliers	Wire stripper	Hammer drill	Heat gun	Vacuum cleaner
				
Marker	Level	Heat shrink tube	Rubber hammer	Monkey wrench
				
Multimeter	Cable tie	Torque wrench M5/M6	YQK-70 hydraulic pliers	

5.2 Inverter Installation

5.2.1 Moving the Inverter



CAUTION

- Operations such as transportation, shipment, installation and so on shall in compliance with the laws and regulations of the country or region where the inverter is located.
- 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.
- The DC switch lock of appropriate size should be prepared by customers. Diameter of the lock hole is 8mm. Choose the appropriate size, otherwise, it might not be able to install.
- The anti-theft lock of appropriate size should be prepared by customers. Diameter of the lock hole is 8mm. Choose the appropriate size, otherwise, it might not be able to install.
- Make sure the inverter is firmly installed in case of falling down.

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

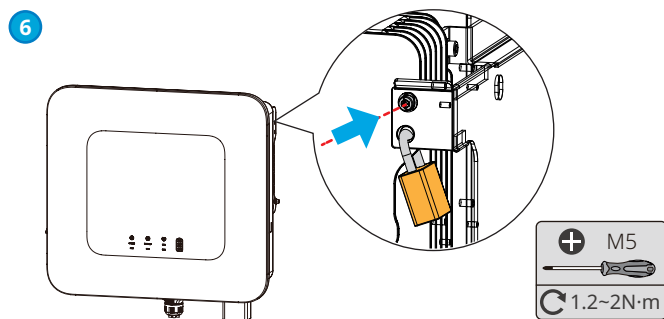
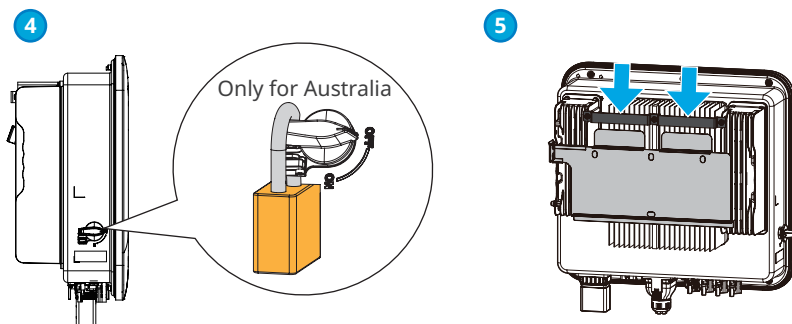
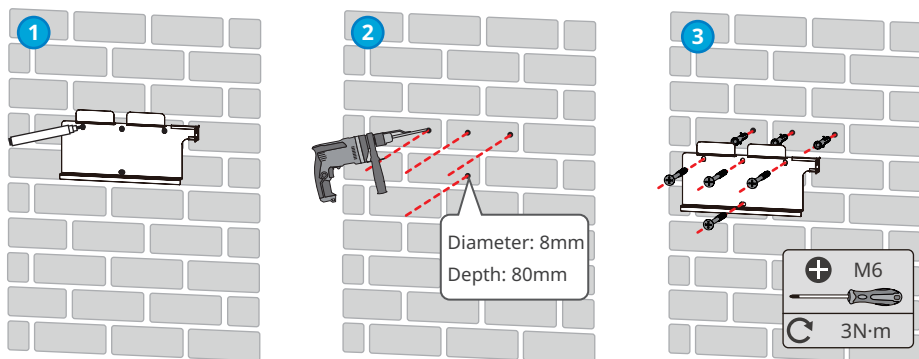
Step 2: Drill holes to a depth of 80mm using the hammer drill. The diameter of the drill bit should be 8mm.

Step 3: Use the expansion bolts to fix the inverter on the wall.

Step 4: (Optional) Secure the DC switch with the DC switch lock, ensuring that the DC switch is "OFF" during installation.

Step 5: Install the inverter on the mounting plate.

Step 6: Tighten the nuts to secure the mounting plate and the inverter, and then install the anti-theft lock.



6 Electrical Connection

6.1 Safety Precaution



DANGER

- Perform electrical connections in compliance with local laws and regulations. Including operations, cables, and component specifications.
- 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. 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.

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 Cable Requirements

No.	Cable	Requirements	Specifications
1	Protective earthing cable	Outdoor copper core cable	Conductor cross-sectional area: 6mm ²
2	PV string DC cable		• Cable outer diameter: 4-5mm • Conductor cross-sectional area: 4mm²-6mm²
3	Battery DC cable		• Cable outer diameter: 5-8.5mm • Conductor cross-sectional area: 8mm²-13.5mm² • The inverter supports connecting multiple types of batteries, and when selecting the battery connection cable, it is necessary to be compatible with the battery cable requirements.
4	AC cable (BACK-UP)		• Cable outer diameter: 18mm • Conductor cross-sectional area: 6mm²
5	AC cable (ON-GRID)		

No.	Cable	Requirements	Specifications
6	Battery CAN communication cable	Please use the BMS communication cable shipped in the attachment.	Cable length: 3m
7	(Optional) Communication cable for parallel system x 5	- Please use the BMS communication cable shipped in the attachment.. - If the length of the communication cable shipped with the box cannot meet the usage requirements, please prepare the following communication cables: - Registered jack-45 connector - CAT 5E or direct network cable with higher specification - Recommended length not exceeding 5m	- Cable outer diameter: 5-8mm - Conductor cross-sectional area: 0.2mm²
8	(Optional) Electricity meter RS485 communication cable	- Only required when selecting external electricity meter - Shielded twisted pair cable that meets local standards	- Cable outer diameter: 5-8mm - Conductor cross-sectional area: 0.2mm²-0.4mm²
9	DRED/RCR communication cable	Shielded cable that meets local standards	- Cable outer diameter: 5-8mm - Conductor cross-sectional area: 0.2mm²-0.4mm²
10	DO/DI signal cable		
11	Battery enable signal cable		
12	Battery RS485 communication cable		
13	CT connection cable	Please use the CT connection cable shipped in the attachment.	- Cable length: 15m - When the connection length between CT and inverter exceeds 15m, if you need to use a CT extension cable, please contact the after-sales service center to obtain it. Extension cable length: 10m.

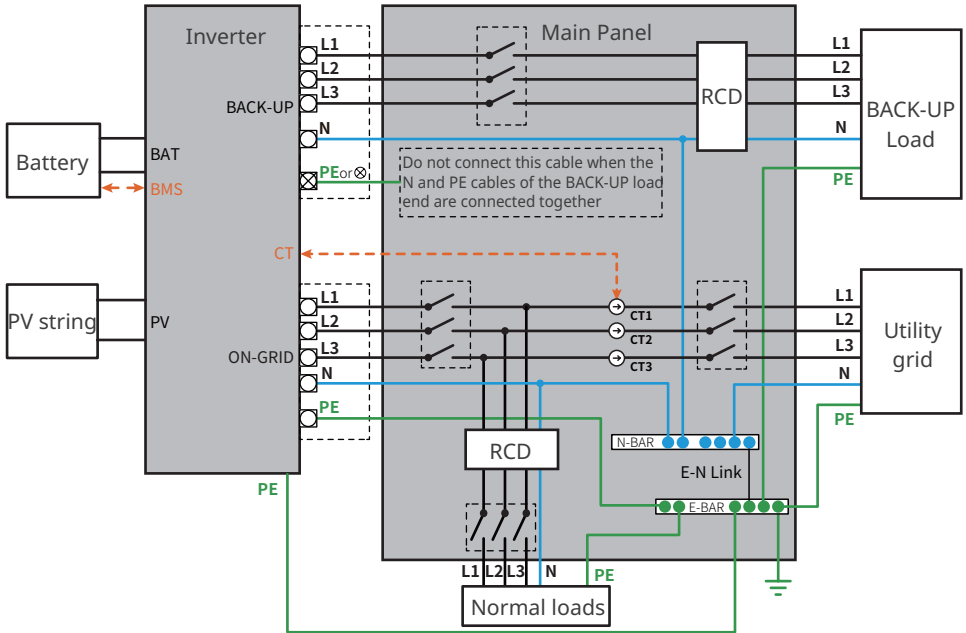
6.3 Wiring Diagram

NOTICE

- N and PE wiring via ON-GRID and BACK-UP ports of the inverter are different based on the regulation requirements of different regions. Refer to the specific requirements of local regulations.
- The inverter has a built-in meter that can directly connect to the CT for use.
- When the connection length between CT and inverter exceeds 25m, the accuracy will decrease. If there are high accuracy requirements, you can connect an external smart meter

The N and PE cables of the BACK-UP load end are connected together for wiring in the distribution box.

This wiring method is suitable for regions such as Australia and New Zealand.

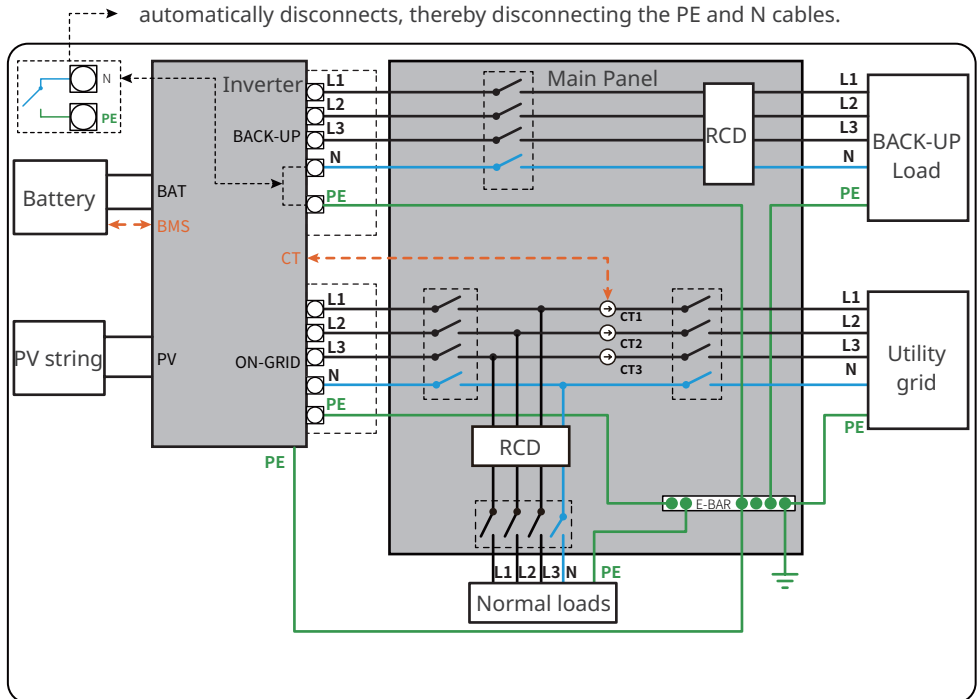


N and PE cables of BACK-UP load end shall be wired separately in the distribution box. Other countries except Australia, New Zealand, etc., are applicable to the following wirings.

NOTICE

If the inverter switches to off grid mode without connecting N and PE cables, the "Back-up N and PE relay switch" function can be turned off through the "Advanced Settings" interface of the SolarGo App.

- When the inverter switches to off grid mode, the internal relay automatically connects, connecting the PE and N cables.
- When the inverter switches to grid connection mode, the internal relay automatically disconnects, thereby disconnecting the PE and N cables.

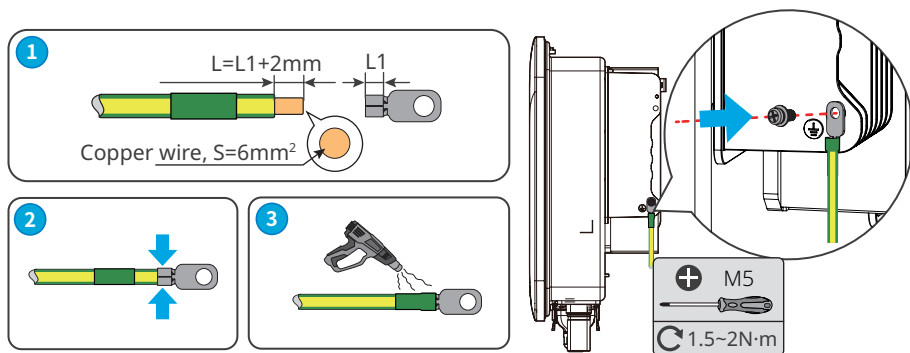


6.4 Connecting the PE cable



WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Make sure that both of the two PE cables are securely connected.
- When there are multiple inverters, make sure that all the grounding points on the enclosures are equipotential bonding.
- Connect the PE cable first before installing the equipment. Disconnect the PE cable before dismantling the equipment.
- To improve the corrosion resistance of the terminal, you are recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- The PE cable should be prepared by customers.



6.5 Connecting the DC Input Cable(PV)

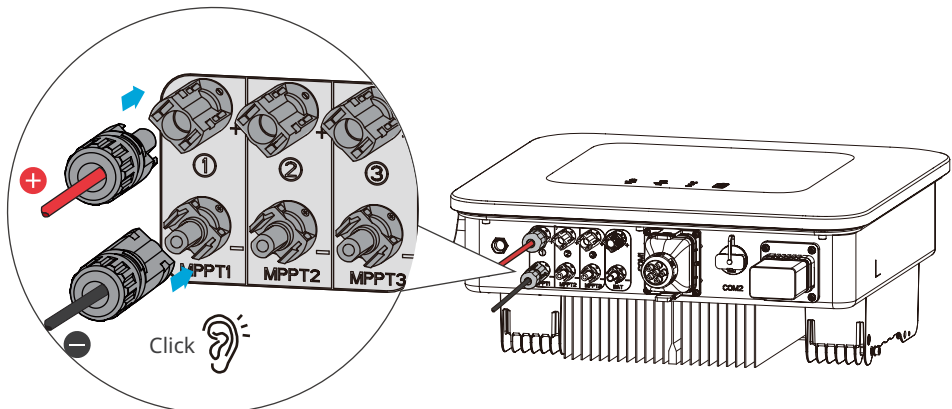
! DANGER

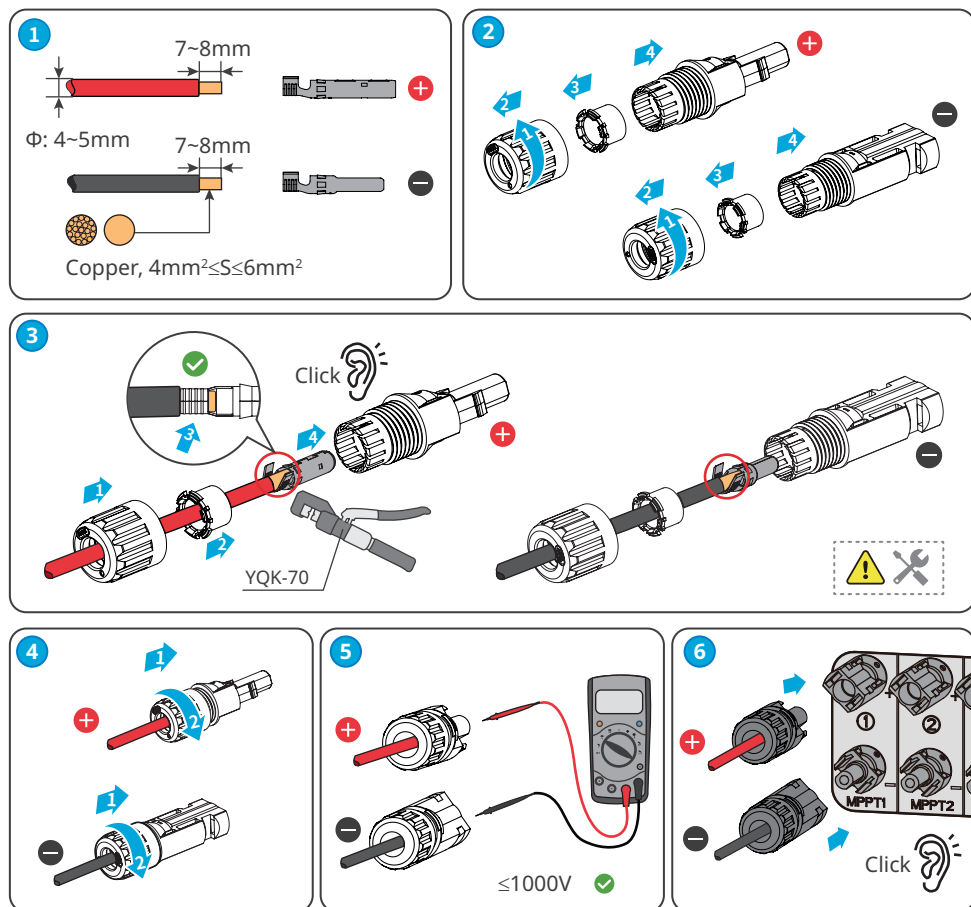
- Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- The PV strings cannot be grounded. Ensure the minimum insulation resistance of the PV string to the ground meets the minimum insulation resistance requirements before connecting the PV string to the inverter ($R = \text{maximum input voltage} / 30\text{mA}$).
- 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.
 - Make sure that the short circuit current and the input voltage of per MPPT are within the permissible range.
 - Please ensure that the positive and negative poles of the PV string are connected correctly.

! WARNING

- Ensure the DC cables are connected tightly, securely and correctly.
- Measure the DC cables with a multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- The inverter supports independent MPPT string connection, and it is not recommended to use MPPT string parallel connection, otherwise it will affect the MPPT tracking efficiency. If MPPT string parallel connection is required, only MPPT1+MPPT2 parallel connection or MPPT 1+MPPT 2+MPPT 3 parallel connection is supported.
- The MPPT string parallel connection must meet the requirements of local laws and regulations.

Stäubli MC4 PV connector





6.6 Connecting the battery cable



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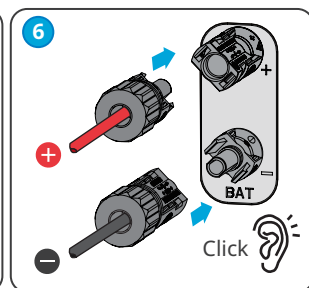
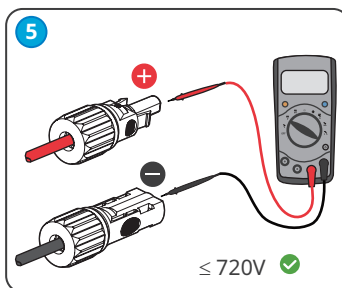
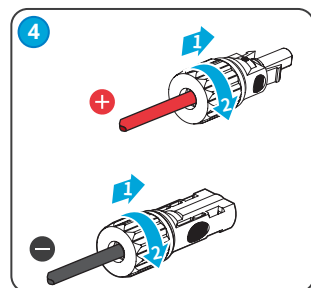
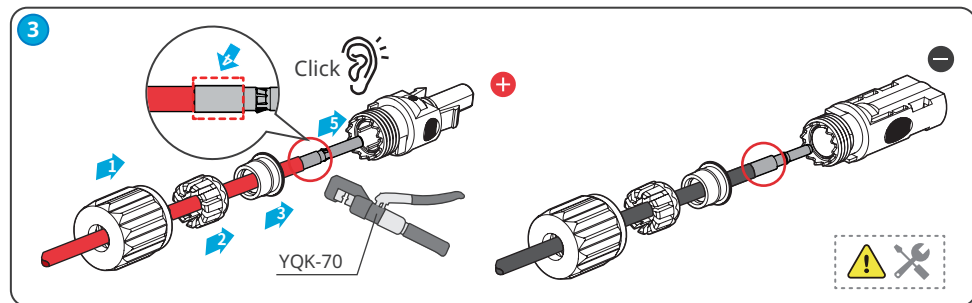
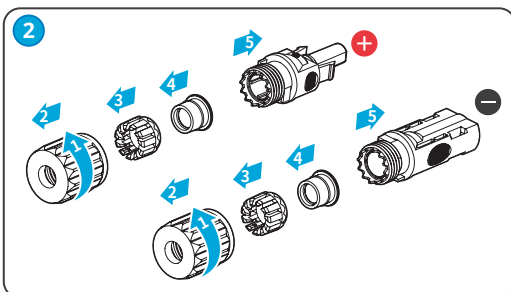
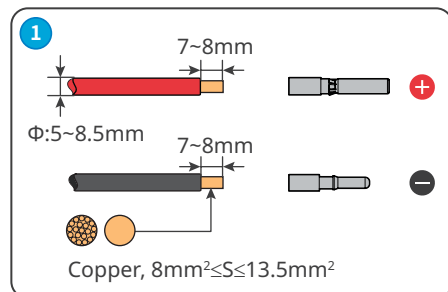
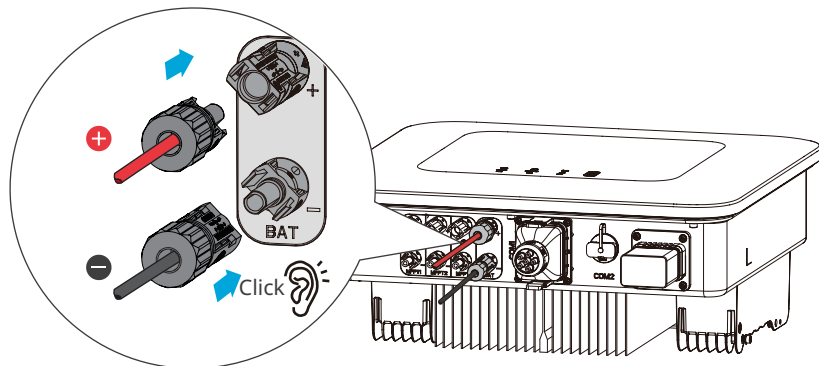
- The battery used with the inverter shall be approved by the inverter manufacturer. The approved battery list can be obtained through the official website.
- The positive and negative poles of the battery cannot be grounded. Before connecting the battery to the inverter, please ensure that the minimum insulation resistance to ground of the battery meets the minimum insulation impedance requirement ($R = \text{maximum input voltage} / 30\text{mA}$).
- A short circuit in the battery may cause personal injury. The instantaneous high current caused by a short circuit can release a large amount of energy and may cause a fire.
- Before connecting the battery cable, ensure the inverter and the battery, and downstream&upstream switches, are all disconnected.
- It is forbidden to connect and disconnect the battery cables when the inverter is running. Otherwise it may cause electric shock.
- Do not connect one battery pack to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- It is forbidden to connect loads between the inverter and batteries.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or short circuit to the batteries.
- Ensure that the open circuit voltage of the battery is within the permissible range of the inverter.
- A DC switch is required between the inverter and the battery. If there is a switch on the battery, you can choose whether to install an additional DC switch according to local laws and regulations.



WARNING

- Connect the battery cables to the corresponding terminals such as BAT+, BAT- and grounding ports correctly. Otherwise it will cause damage to the inverter.
- Ensure the DC cables are connected tightly, securely and correctly.
- It is recommended to use YQK-70 hydraulic pliers for crimping the DC terminals of batteries. When the cross-sectional area of the conductor is $8\text{mm}^2 \leq S < 10\text{mm}^2$, considering the overall thickness of the terminal wall, a crimping die that is suitable for wire with diameter of 8mm^2 can be used; When the cross-sectional area of the conductor is $10\text{mm}^2 \leq S < 13.5\text{mm}^2$, considering the overall thickness of the terminal wall, a crimping die that is suitable for wire with diameter of 10mm^2 can be used;
- If the recommended hydraulic plier cannot be purchased, please choose the crimping tool according to the terminal size to ensure that the crimped terminals meet the usage requirements.
- Measure the DC cables using a multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- The inverter supports connecting multiple types of batteries, and when selecting the battery connection cable, it is necessary to be compatible with the battery cable requirements.

Vaconn Connector



6.7 Connecting the AC Cable



WARNING

- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- An AC circuit breaker should be installed on the AC side to make sure that the inverter can safely disconnect the grid when an exception happens. Install one AC circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker. Select an appropriate AC circuit breaker in compliance with local laws and regulations.
- The residual current monitoring unit (RCMU) is integrated into the inverter. When the leakage current exceeds the allowable limit, the inverter will disconnect from the grid quickly.
- When the inverter is powered on, the BACK-UP AC port is live. Power off the inverter first if maintenance is required for the loads connected with BACK-UP ports. Otherwise, it may cause electric shock.

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

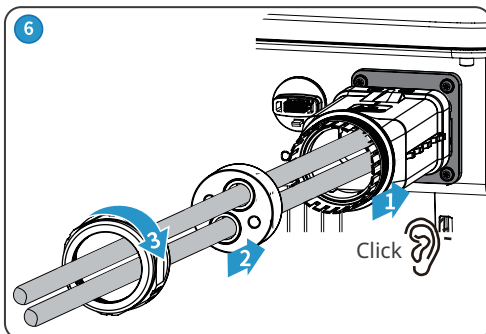
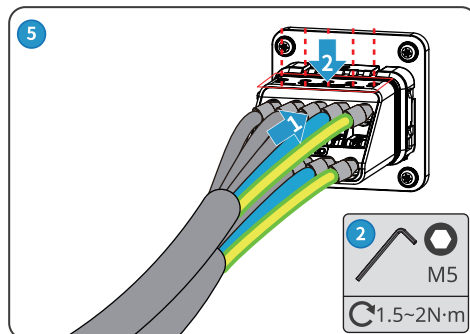
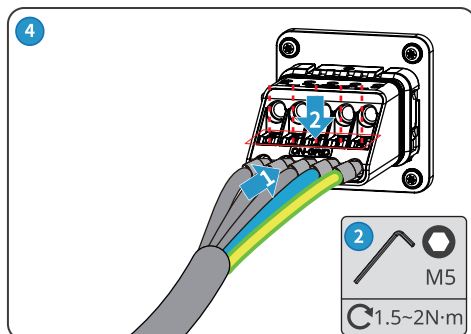
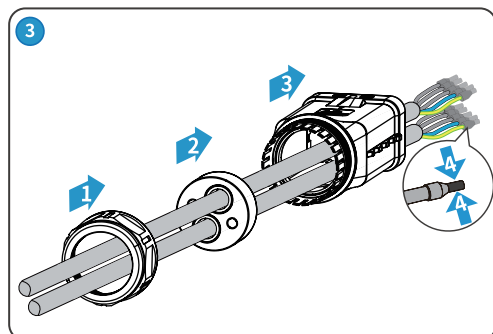
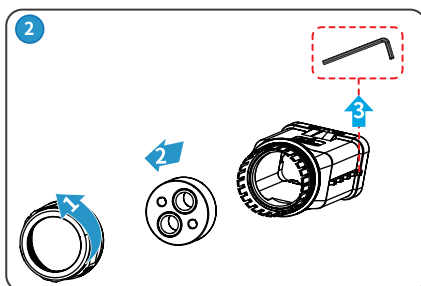
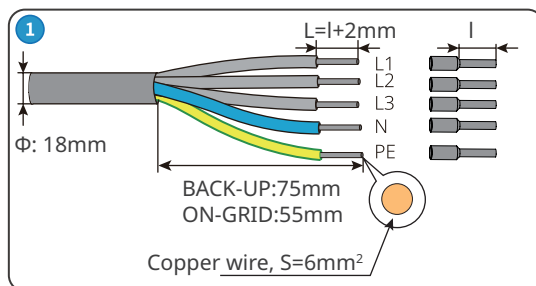
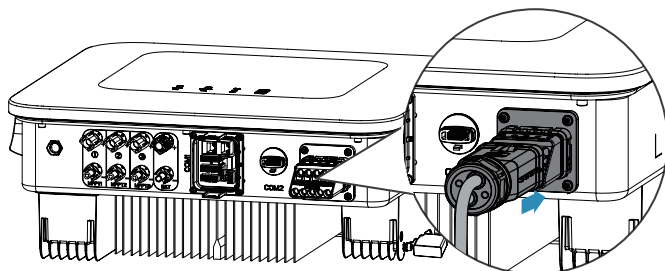
No.	Inverter Model	RCD Type (ON-GRID)	RCD Type (BACK-UP)
1	GW6000-ET-20	300mA	30mA
2	GW8000-ET-20		
3	GW9900-ET-20		
4	GW10K-ET-20		
5	GW12K-ET-20		
6	GW15K-ET-20		



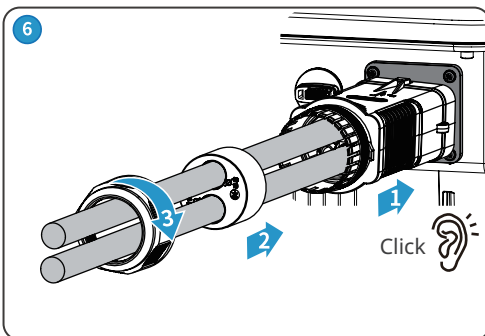
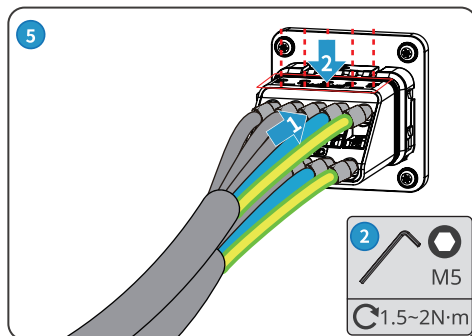
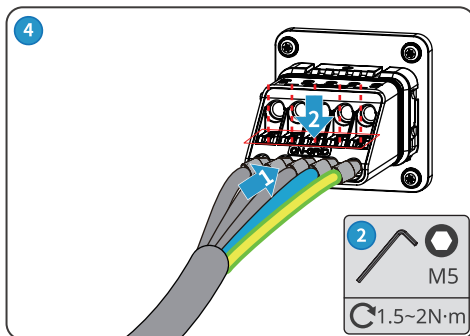
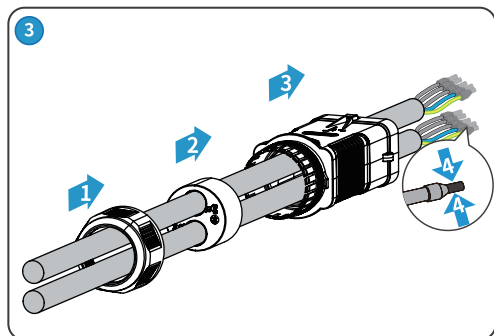
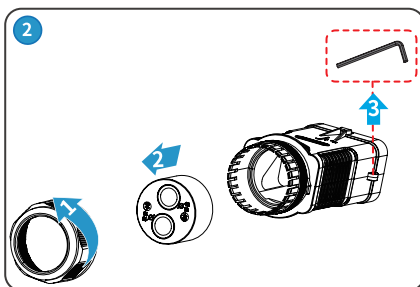
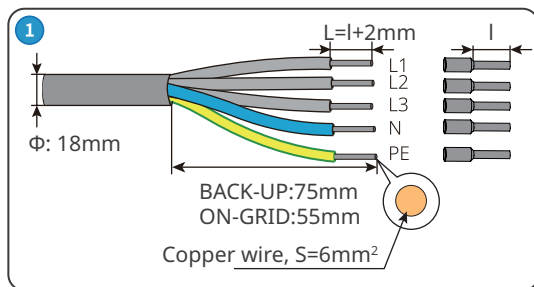
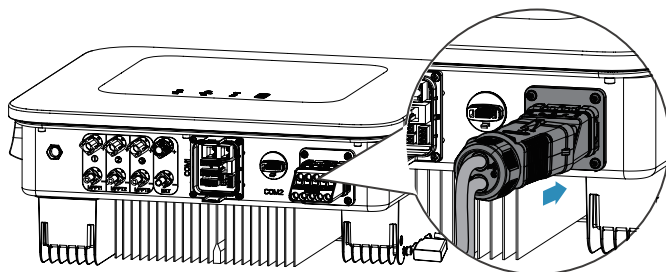
WARNING

- When wiring, AC cables must completely match the corresponding "L1", "L2", "L3", "N", and grounding ports. The inverter may be damaged if the cables are connected to the wrong terminal.
- Ensure that the whole cable cores are inserted into the terminal holes. No part of the cable core can be exposed.
- Ensure that the cables are connected securely. Otherwise it will cause damage to the inverter due to overheat during its operation.
- When connecting the AC cable, it is necessary to first connect the ON-GRID cable and then connect the Back-UP cable.

Type I



Type II



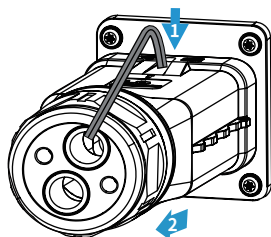
If you need to remove the protection cover, please refer to the following steps.

Step1: Use an external hexagonal screwdriver to press the unlock hole to unlock the protection cover.

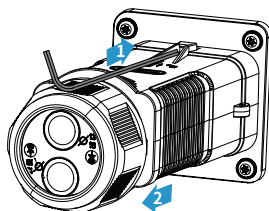
Step2: Remove screwdriver.

Step3: Remove the protection cover.

Type I



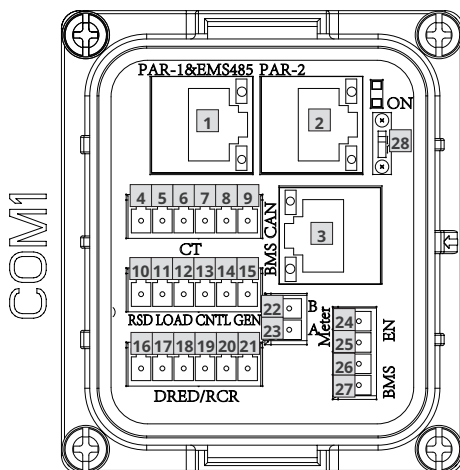
Type II



6.8 Communication

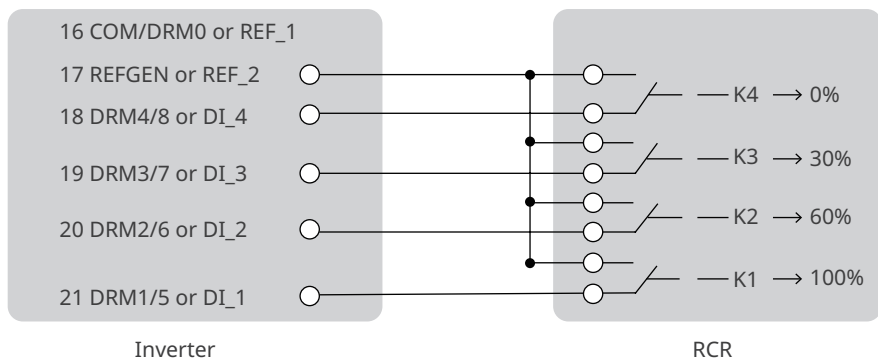
NOTICE

- Make sure that the communication device is connected to the right COM port. Route the communication cable far away from any interference source or power cable to prevent the signal from being influenced.
- Enable the DRED, RCR or remote shutdown function via SolarGo App after cable connections.
- If the inverter is not connected to the DRED device or remote shutdown device, do not enable these functions in the SolarGo App, otherwise the inverter cannot be connected to the grid for operation.



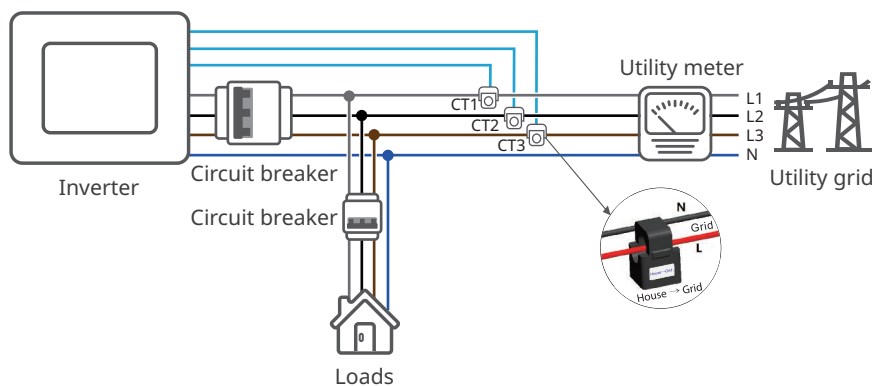
No.	Function	Port Definition	Function Description
1	(Optional) Parallel communication port, EMS communication port (PAR-1&EMS485)	1.Orange&White: RS485A 2.Orange: RS485B 3.Green and White: - 4.Blue: CANH 5.Blue and White: CANL 6.Green: GND 7.Brown and White: BUS1 8.Brown: BUS2	- CAN and BUS ports: parallel communication ports, and use CAN communication to connect other inverters in the parallel system; Use BUS to control the on-grid and off-grid of inverters in the parallel system. - RS485 port: used to connect third-party device. Third-party EMS device is not supported in parallel system.
2	(Optional) Parallel communication port (PAR-2)	4.Blue: CANH 5.Blue and White:CANL 6.Green: GND 7.Brown and White: BUS1 8.Brown: BUS2 Other: -	Use CAN communication to connect other inverters in the parallel system; Use BUS to control the on-grid and off-grid of inverters in the parallel system.
3	(Optional) Battery CAN communication port (BMS CAN)	4.Blue: CANH 5.Blue and White:CANL Other: -	Battery system CAN signal communication port
4	(Optional) CT1 connection port	CT1+	When using only the built-in meter of the inverter, a CT communication cable needs to be connected.
5		CT1-	
6	(Optional) CT2 connection port	CT2+	
7		CT2-	
8	(Optional) CT3 connection port	CT3+	
9		CT3-	
10	(Optional) Remote shutdown function port (RSD)	RSD+	- When an accident occurs, stop the device. - When using the RCR function on the inverter, please ensure that the remote shutdown device is connected or that the remote shutdown ports RSD+ and RSD- are short circuited; When using both RCR and RSD functions simultaneously, the RSD device needs to be connected to a normally closed switch.
11		RSD-	
12	(Optional) Load control port (LOAD CNTL)	DO+	The inverter has a dry contact control port that supports the connection of additional contactors for controlling the off and on of loads.
13		DO-	

No.	Function	Port Definition	Function Description
14	(Optional) Generator control port (GEN)	DO+	- Support access to generator control signals. - Do not connect the generator power cable to the inverter AC port.
15		DO-	
16	(Optional) DRED or RCR function connection port (DRED/RCR)	DRM0 or REF_1	- DRED (Demand Response Enabling Device): The inverter meets the Australian DERD certification requirements and provides a DRED signal control port. - RCR Ripple Control Receiver: In Germany and some European areas, power grid companies use Ripple Control Receiver to convert power grid dispatch signals into dry contact mode for transmission, and power stations receive power grid dispatch signals through dry contact communication.
17		REFGEN or REF_2	
18		DRM4/8 or DI_4	
19		DRM3/7 or DI_3	
20		DRM2/6 or DI_2	
21		DRM1/5 or DI_1	
22	(Optional) Meter connection port	RS485B	Use RS485 communication to connect to an external smart meter.
23		RS485A	
24	(Optional) Battery enable communication port (EN)	EN-	Output battery enable signal.
25		EN+	
26	(Optional) Battery RS485 communication port (BMS)	RS485B	Battery system RS485 signal communication port.
27		RS485A	
28	(Optional) Parallel system DIP switch	-	In parallel system with multiple inverters, the DIP switch of the first and last inverters need to be turned to the ON position, and other inverters need to be turned to the 1 position.



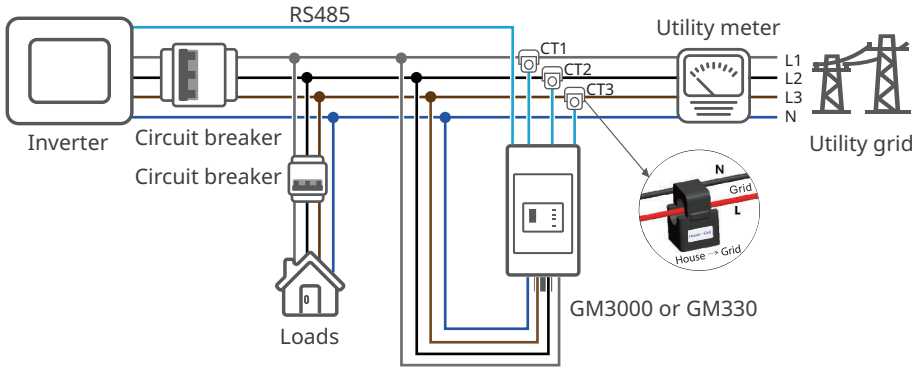
Load monitoring and output power limit networking

The inverter can monitor the real-time electricity consumption of loads and control the inverter's real-time output power by connecting CT.



Load monitoring and output power limit networking (GM3000 or GM330)

When the connection distance between the inverter and CT exceeds 20m, the data acquisition accuracy may decrease. An external GM3000 or GM330 meter can be connected for higher precision monitoring of load electricity consumption and real-time output power control of the inverter.



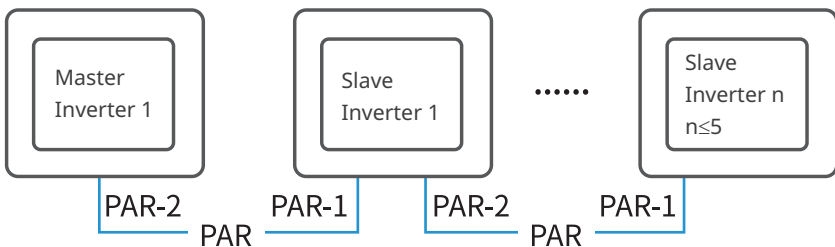
After the wiring is completed, the "Advanced Settings" interface on the SolarGo App can be used to set the relevant parameters of "Power Limit" to complete the power limit functions.

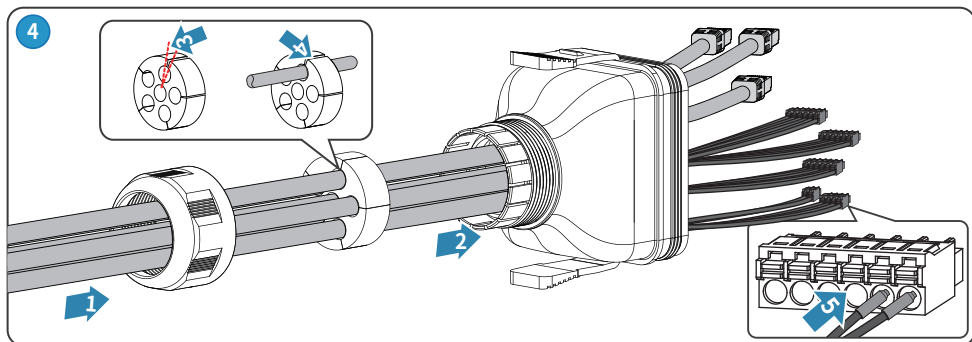
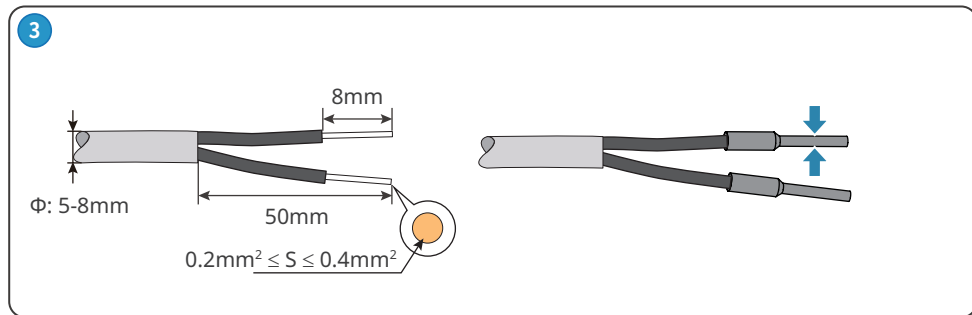
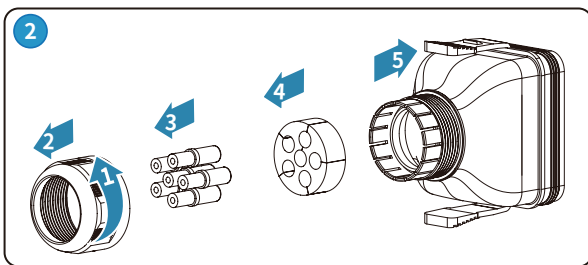
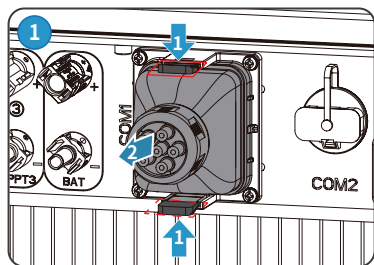
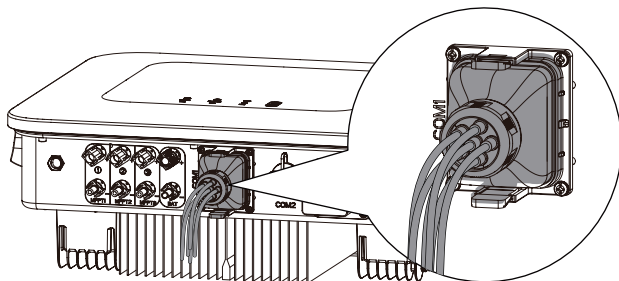
6.8.1 Connecting the Communication Cable

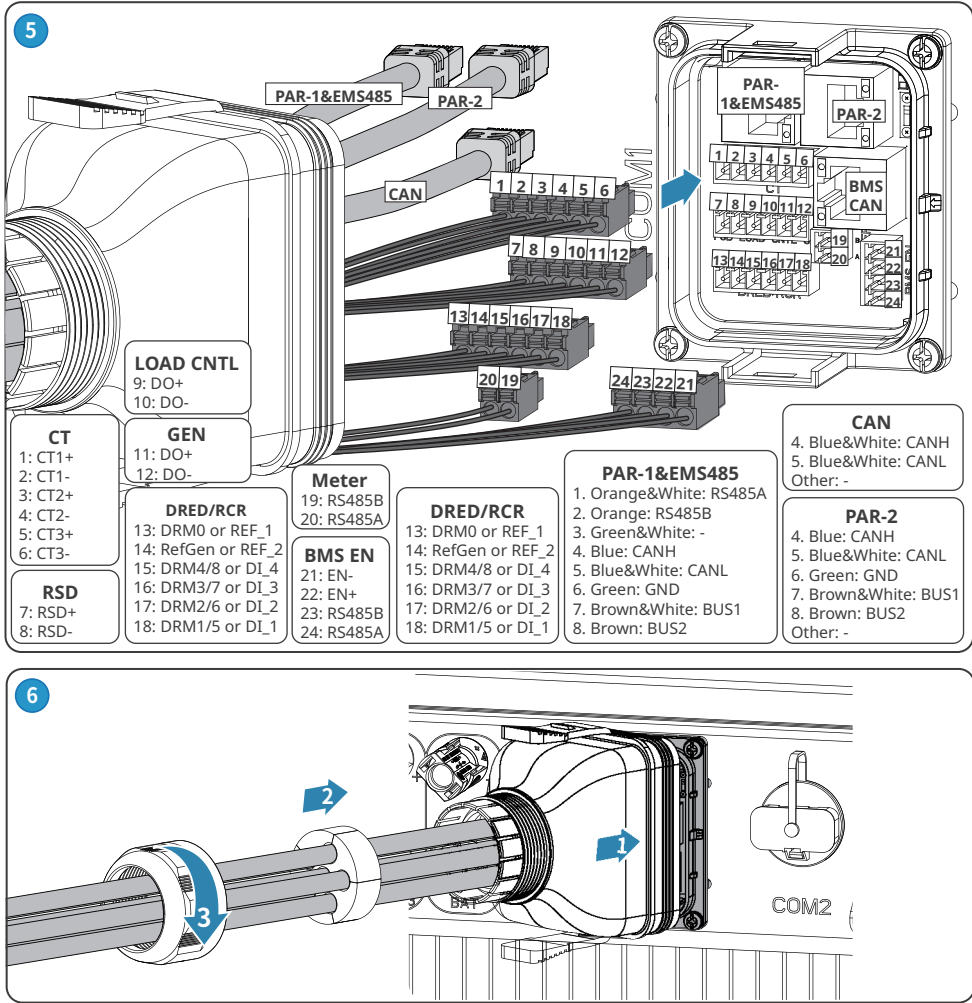
NOTICE

- When using built-in meters for networking in a parallel system, only the master inverter needs to connect CT cable.
- Please use the CT connection cable shipped in the attachment.
- Inverter DO signal communication port, can be connected to dry contact signal with specification parameters: Max $\leq 24\text{Vdc}$, 1A.
- EMS communication port: used to connect with the third party device. Third-party EMS device is not supported in parallel system.
- In the parallel system, if you want to realize the DRED and RCR functions, you need only to connect the DRED and RCR communication cables to the master inverter; To achieve remote shutdown function, the remote shutdown communication cables needs to be connected to all inverters.
- To ensure communication quality, please connect the parallel communication port PAR1 of one inverter to the parallel communication port PAR2 of another inverter.
- Other cables shall be prepared by the customer.
- To ensure the waterproof level of the inverter, do not remove the unused waterproof plugs of communication port on the inverter.

Inverter parallel system networking



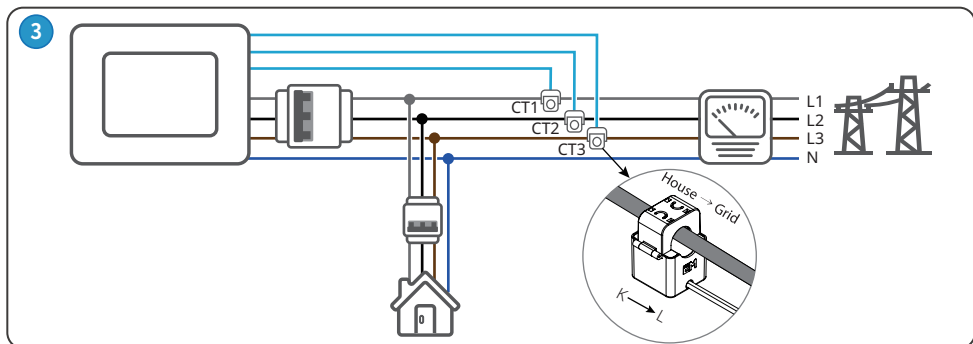
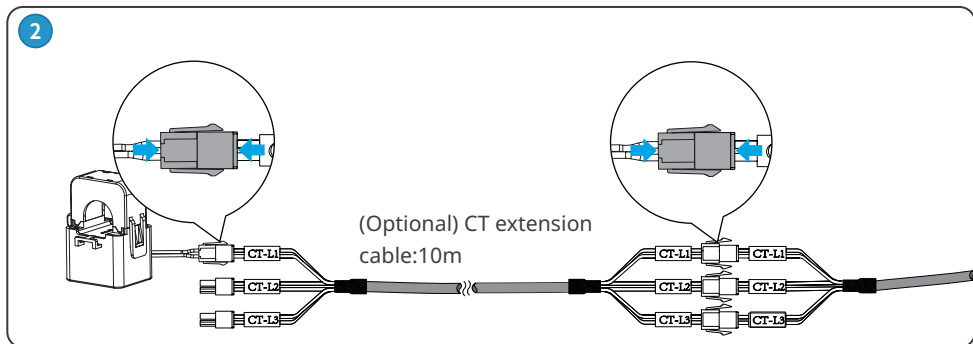
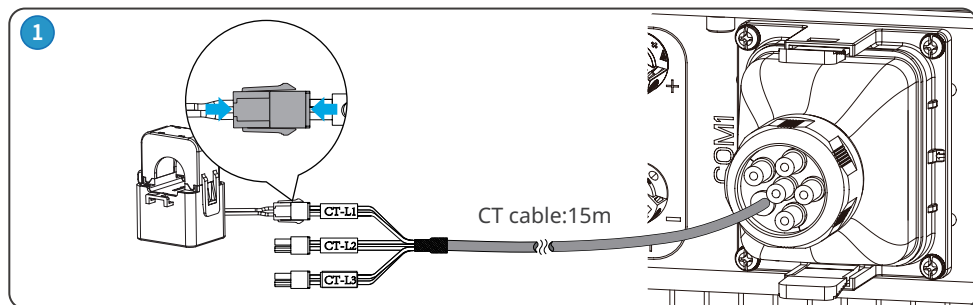




6.8.2 Connecting the CT

NOTICE

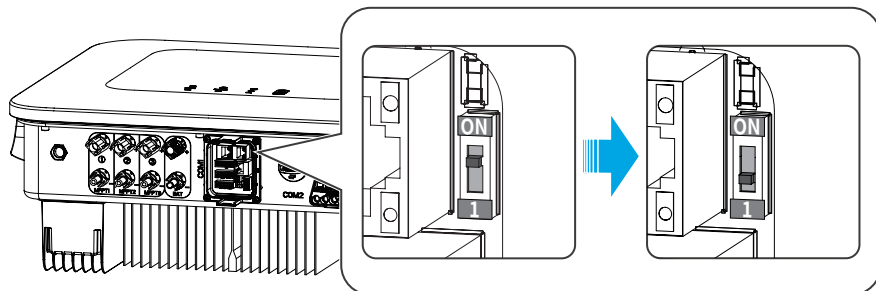
- Please use the CT connection cable shipped in the attachment.
- When using only the built-in meter of the inverter, a CT communication cable needs to be connected.
- In parallel system, only the CT port of master inverter needs to be connected.
- Please ensure that the position and direction of CT are correct, otherwise the system will not function properly.
- Before connecting the CT, please ensure that the AC cable is not powered on, otherwise there is a risk of electric shock.
- The CT accuracy of the inverter shipped in the attachment is 0.5% @ 90A.



6.8.3 Parallel system DIP switch

NOTICE

- After the wiring of the parallel system is completed, the DIP switch of the first and last inverters needs to be turned to the ON position, and other inverters need to be turned to the 1 position.
- The DIP switch for parallel system is set to the ON position by default when leaving the factory.

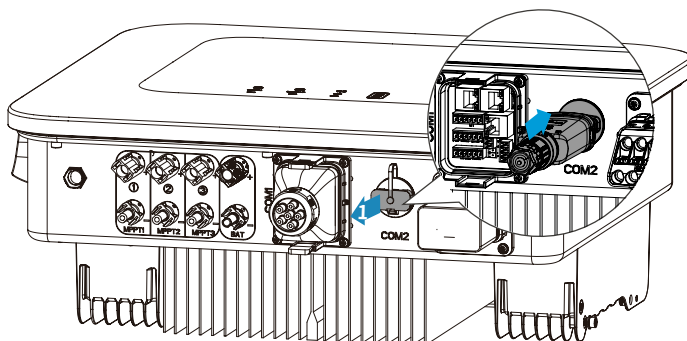


6.9 Installing the Communication Module (Optional)

Plug a communication module into the inverter to establish a connection between the inverter and the smartphone or web pages. The communication module can be a WiFi kit, WiFi/LAN kit, or 4G module. Set inverter parameters, check running information and fault information, and observe system status in time via the smartphone or web pages.

NOTICE

- Refer to the delivered communication module user manual to get more introduction to the corresponding module. For more detailed information, please visit our official website.
- When multiple inverters are connected in the parallel system, the master inverter needs to be equipped with Ezlink module for networking.
- When replacing the communication module, if the inverter is in operation, the interval between reinstalling the module should be at least 5 seconds.



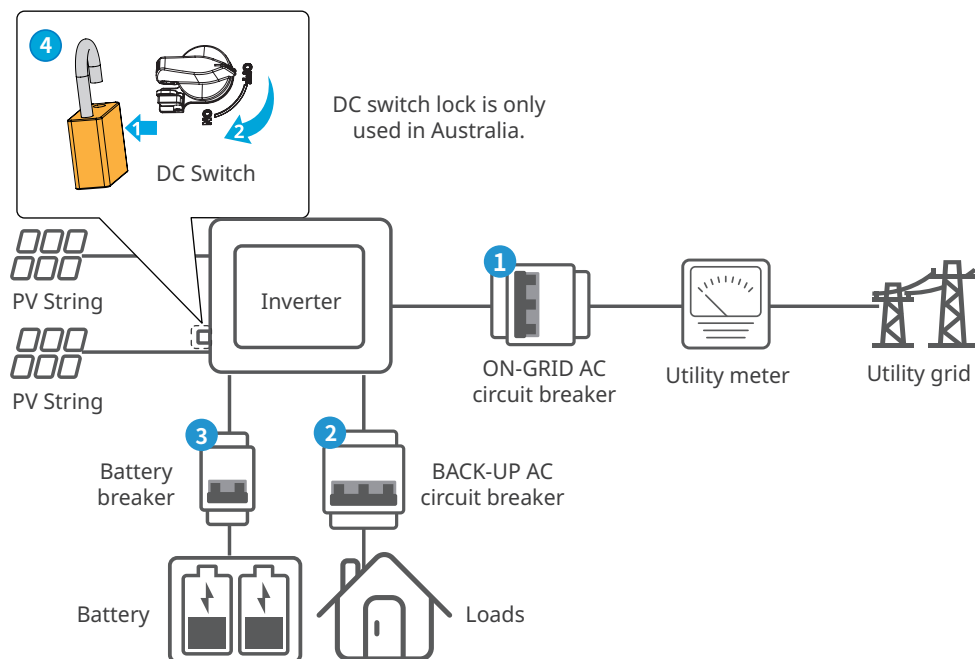
7 Equipment Commissioning

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.
6	The voltage and frequency at the connection point meet the inverter grid connection requirements.

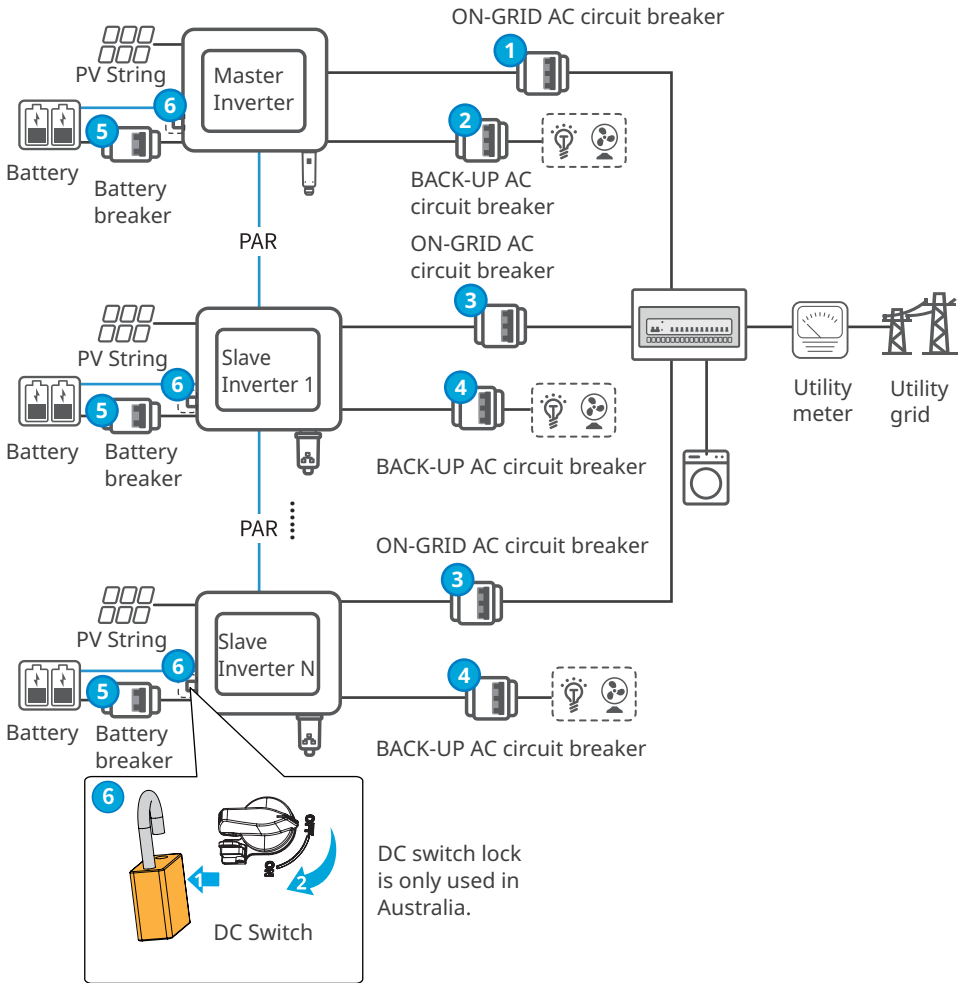
7.2 Power On

Single inverter system



Turn on: ① → ② → ③ → ④

Multiple inverters parallel system



8 System Commissioning

8.1 Indicators and Buttons

Inverter Indicator

Indicator	Status	Description
 SYSTEM		The inverter is power on and in the standby mode.
		The inverter is starting and in self-check mode.
		The inverter is in normal operation under grid-tied or off-grid modes.
		BACK- UP output overload
		A fault has occurred.
		The inverter is powered off.
 BACK-UP		The grid is abnormal, and the power supply to the BACK-UP port of the inverter is normal.
		The grid is normal, and the power supply to the BACK-UP port of the inverter is normal.
		The BACK-UP port has no power supply.
 COM		The monitoring module of the inverter is resetting.
		The inverter fails to connect with the communication Termination.
		Communication fault between the communication Termination and Server.
		The monitoring of the inverter operates well.
		The monitoring module of the inverter has not been started yet.

Battery SOC indicator

Indicator	Description
	$75\% < \text{SOC} \leq 100\%$
	$50\% < \text{SOC} \leq 75\%$
	$25\% < \text{SOC} \leq 50\%$
	$0\% < \text{SOC} \leq 25\%$
	No battery connected

The indicator light flashes when the battery is discharging: for example, when the battery SOC is between 25% and 50%, the light at the 50% position blinks.

8.2 Setting Inverter Parameters via SolarGo App

NOTICE

Please set the inverter parameters first via SolarGo App to ensure its operation.

SolarGo App is a smart phone application used to communicate with the inverter via bluetooth, WiFi or 4G modules. Commonly used functions are as follows:

1. Check the operating data, software version, alarms, etc.
2. Set grid parameters, communication parameters, etc.
3. Equipment maintenance.
4. Upgrade software version.

Please refer to the "SolarGo App User Manual" for details, which can be obtained from official website: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_SolarGo_User%20Manual-EN.pdf to get the user manual. Or obtained by scanning the following QR code.



SolarGo App



SolarGo App User Manual

8.2.1 Setting the inverter parameters for a single inverter system

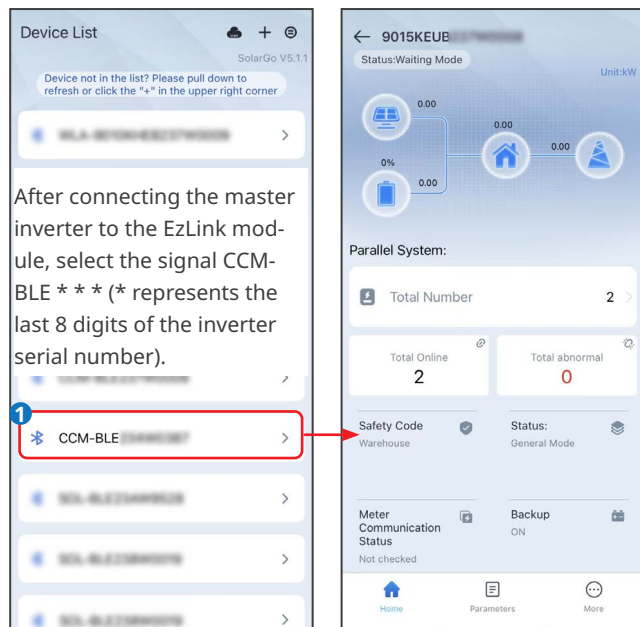
When setting parameters for a single inverter, please refer to the SolarGo App User Manual.

8.2.2 Setting the inverter parameters for multiple inverters parallel system

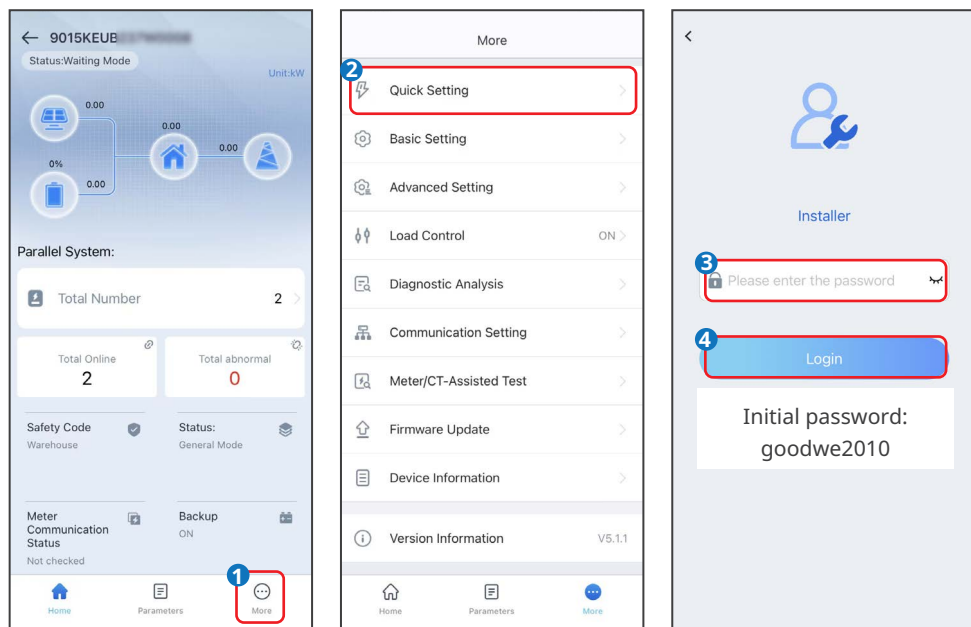
NOTICE

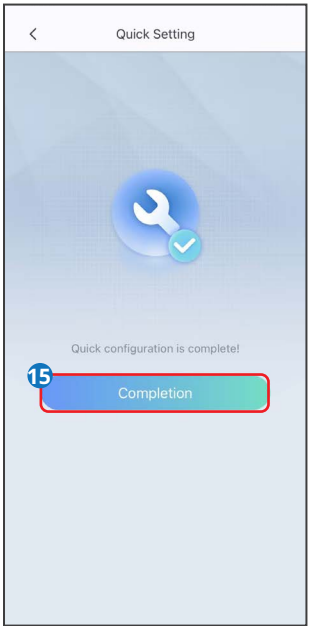
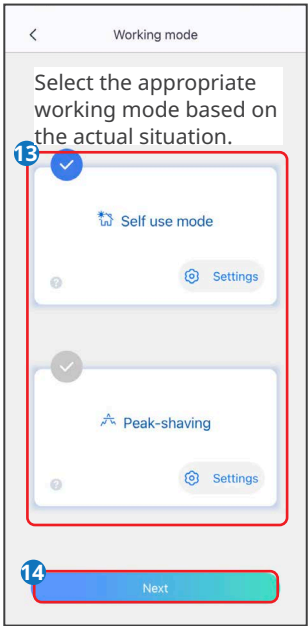
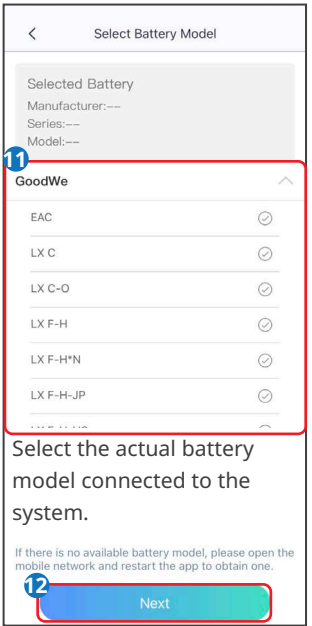
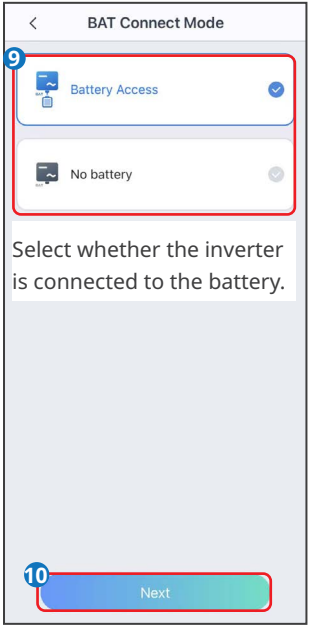
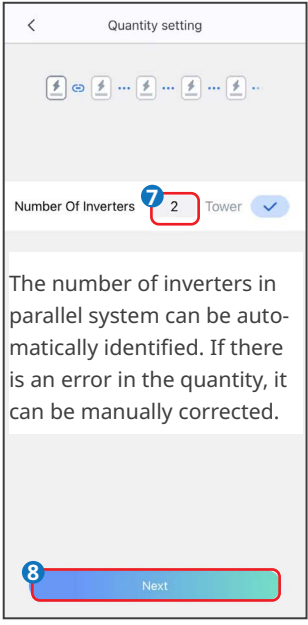
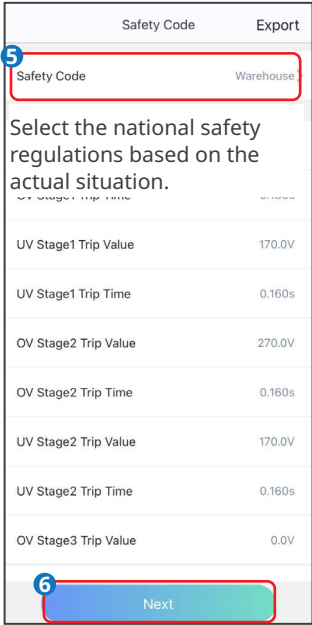
- If you need to use a parallel system, please first check the inverter firmware version via the SolarGo App to ensure that all inverter firmware versions are consistent. When the firmware version does not meet the requirements, please upgrade the software version.
- When setting the parameters of the parallel system, simply connect the master inverter to the SolarGo App to complete all inverter configurations.
- When setting the parameters of the parallel system, please ensure that the working mode of each inverter remains consistent.

When setting parameters for a single inverter, please refer to the SolarGo App User Manual. The following only introduces the relevant guidance steps for quick setup in parallel system.

Step1: Login parallel system

Step2: Set and adjust the parameters of parallel system according to the interface prompts and actual application scenarios.





Step3: In parallel system, if the battery models connected to a single inverter are different, they can be set separately.

Parallel System:

Total Number: 2

Total Online: 2

Total abnormal: 0

Safety Code: Warehouse

Status: General Mode

Meter Communication Status: Not checked

Backup: ON

Master-9015KEUB

Slave-9015KEUB

More

- Quick Setting
- Basic Setting
- Advanced Setting
- Diagnostic Analysis
- Device Information
- Version Information: V5.1.1

Installer

Please enter the password

Login

Initial password: goodwe2010

Safety Code	Export
Safety Code	Warehouse
Voltage Protection Parameters:	
OV Stage1 Trip Value	271.0V
OV Stage1 Trip Time	0.160s
UV Stage1 Trip Value	170.0V
UV Stage1 Trip Time	0.160s
OV Stage2 Trip Value	270.0V
OV Stage2 Trip Time	0.160s
UV Stage2 Trip Value	170.0V
UV Stage2 Trip Time	0.160s
OV Stage3 Trip Value	0.0V

Next

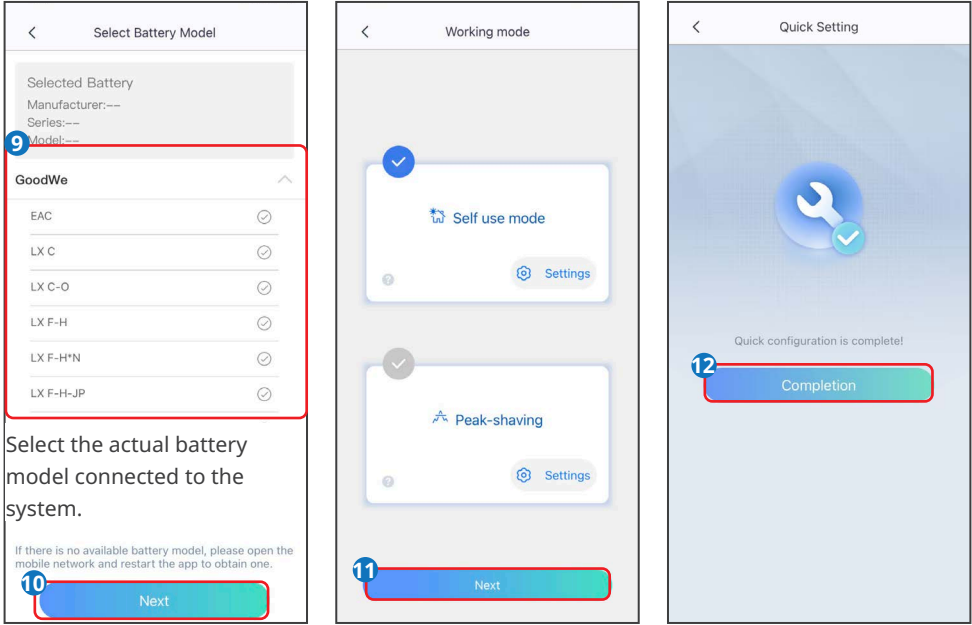
BAT Connect Mode

Battery Access

No battery

Select whether the inverter is connected to the battery.

Next



8.3 Monitoring via SEMS Portal

NOTICE

In parallel system, only the master inverter needs to be added to the SEMS Portal monitoring platform, which can obtain all inverter information from the parallel system. If the slave inverter is added to the SEMS Portal monitoring platform, it will result in duplicate or distorted data in the parallel system.

SEMS Portal is an monitoring platform used to communicate with the equipment via WiFi, LAN or 4G. Commonly used functions:

- 1. Manage the organization or User information;
- 2. Add and monitor the power plant information;
- 3. Equipment maintenance.



SEMS Portal

9 Maintenance

9.1 Power OFF the Inverter

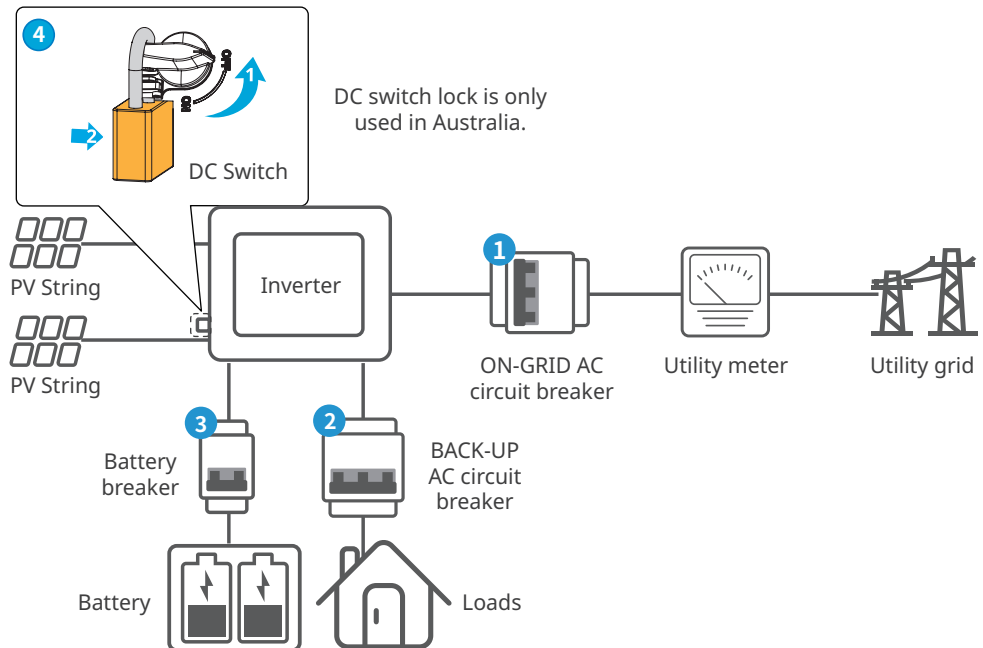


DANGER

INSTRUCTIONS PERTAINING TO A RISK OF FIRE OR ELECTRIC SHOCK.

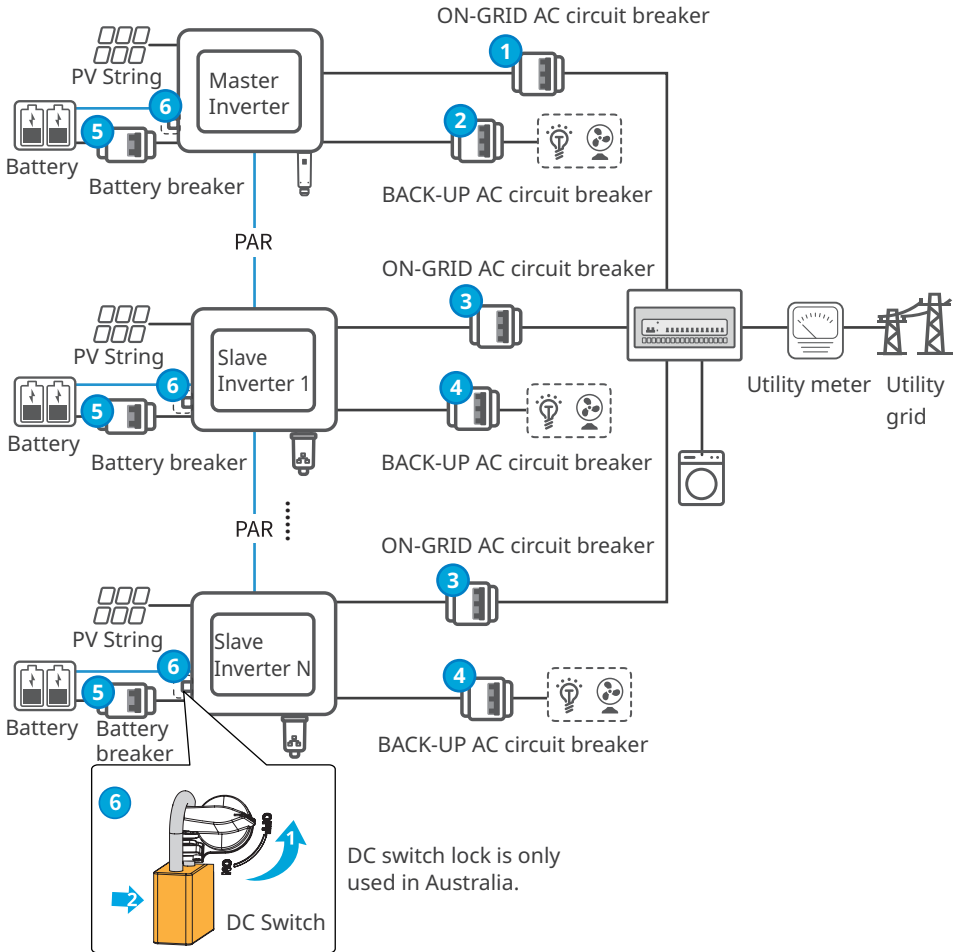
- Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.
- Delayed discharge. Wait until the components are discharged after power off.

Single inverter system



Turn off: 1 → 2 → 3 → 4

Multiple inverters parallel system



Turn off: 3 → 4 → 1 → 2 → 5 → 6

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. Ensure that the storage conditions meet the requirements for future use.

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.

Single inverter system

No.	Fault	Cause	Solutions
1	PV power low	Weak or abnormal changes in lighting	1. If it occurs accidentally, it may be due to abnormal lighting, and the inverter will automatically resume normal operation without manual intervention. 2. Check if the battery is connected or working abnormally. 3. If it occurs frequently, please contact your dealer or after-sales service center.
2	PV voltage Low		
3	BUS voltage Low		
4	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.
5	BUS Soft Start Failure	Weak or abnormal changes in lighting	1. If it occurs accidentally, it may be due to abnormal lighting, and the inverter will automatically resume normal operation without manual intervention. 2. If it occurs frequently, please contact your dealer or after-sales service center.

No.	Fault	Cause	Solutions
6	BAT Abnormal Connect	BAT Abnormal Connect	For battery ready models, please purchase the battery function before connecting the battery. For more information, please contact your dealer or after-sales service center.
7	BAT1 Overvoltage	The battery connection voltage exceeds the rated range of the equipment.	Confirm if the battery voltage is within the rated range of the equipment.
8	Back-up Output Overload	Excessive power of connected load	1. Confirm whether the connected load power is within the rated range of the equipment. 2. Confirm if there is insufficient light or battery power. 3. If it occurs frequently, please contact your dealer or after-sales service center.
9	Back-up Output AC Undervoltage	1. Excessive power of connected load 2. Insufficient energy on the DC side or Bus leads to low inverter voltage	1. Confirm whether the connected load power is within the rated range of the equipment. 2. Confirm if there is insufficient light or battery power. 3. If it occurs frequently, please contact your dealer or after-sales service center.
10	Cavity Overtemperature	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.	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.

No.	Fault	Cause	Solutions
11	Low Insulation Res.	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.	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 than default on rainy days, please reset the ISO via SolarGo app. Inverters for the Australian and New Zealand markets can also be alerted in the following ways in the event of insulation impedance failure: 1. The inverter is equipped with the buzzer: the buzzer sounds continuously for 1 minute in case of failure; If the fault is not resolved, the buzzer sounds every 30 minutes. 2. Add the inverter to the monitoring platform, and set the alarm reminder, the alarm information can be sent to the customer by emails.
12	DC Arc Fault	1. The DC terminal is not firmly connected. 2. The DC cable is broken.	Read the Quick Installation Guide and check whether the cables are connected properly.
13	CPLD Protection	CPLD protection triggering fault	1. If it happens by chance, no manual intervention is required. 2. If it occurs frequently, please contact your dealer or after-sales service center.
14	DC SPD Failure	DC side lightning protection device failure	1. Improve the lightning protection facilities around the inverter; 2. You can determine whether it is necessary to contact the dealer/after-sales service center to handle DC side lightning protection device faults based on needs; 3. If it is confirmed that there is no need to handle it, the lightning protection alarm can be turned off in the basic settings of the SolarGo App; 4. 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
15	Utility Loss	1. Utility grid power fails. 2. The AC cable is disconnected, or the AC breaker is off.	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.
16	Grid Overvoltage	The grid voltage exceeds the permissible range, or the duration of high voltage exceeds the requirement of HVRT.	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. • 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.
17	Grid Rapid Overvoltage	The grid voltage is abnormal or ultra-high.	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 allowed range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.

No.	Fault	Cause	Solutions
18	Grid Undervoltage	The grid voltage is lower than the permissible range, or the duration of low voltage exceeds the requirement of LVRT.	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. • 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.
19	Grid 10min Overvoltage	The moving average of grid voltage in 10min exceeds the range of safety requirements.	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 allowed range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.

No.	Fault	Cause	Solutions
20	Grid Overfrequency	Utility grid exception. The actual grid frequency exceeds the requirement of the local grid standard.	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 frequency is within the permissible range. • 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.
21	Grid Underfrequency	Utility grid exception. The actual grid frequency is lower than the requirement of the local grid standard.	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 frequency is within the permissible range. • 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. Or close "Grid Underfrequency" function.

No.	Fault	Cause	Solutions
22	Grid Frequency Instability	Utility grid exception. The actual grid frequency change rate does not meet the requirement of the local grid standard.	- 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. - Contact the local power company if the grid frequency exceeds the permissible range. - Contact the dealer or the after-sales service if the grid frequency is within the permissible range.
23	Anti-islanding	The utility grid is disconnected. The utility grid is disconnected according to the safety regulations, but the grid voltage is maintained due to the loads.	- Check whether the utility grid is disconnected. - Contact the dealer or the after-sales service.
24	LVRT Undervoltage	Utility grid exception. The duration of the utility grid exception exceeds the set time of LVRT.	- 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. If not, contact the local power company. If yes, contact the dealer or the after-sales service.
25	HVRT Overvoltage	Utility grid exception. The duration of utility grid exception exceeds the set time of HVRT.	

No.	Fault	Cause	Solutions
26	Abnormal GFCI 30mA	The input insulation impedance becomes low when the inverter is working.	1. If the problem occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved. 2. Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
27	Abnormal GFCI 60mA		
28	Abnormal GFCI 150mA		
29	Abnormal GFCI		
30	Large DC of AC current L1	The DC component of the output current exceeds the safety range or default range.	1. 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. 2. If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
31	Large DC of AC current L2		
32	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.	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	BUS Overvoltage	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.

No.	Fault	Cause	Solutions
34	Internal Comm Loss	1. Frame format error 2. Parity checking error 3. Can bus offline 4. Hardware CRC error 5. Send (receive) control bit is receive (send). 6. Transmit to the unit that is not allowed.	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	PV Software Overcurrent	Abnormal changes in lighting or the PV panel is far from the inverter.	1. If it occurs accidentally, it may be due to abnormal lighting, and the inverter will automatically resume normal operation without manual intervention. 2. If it occurs frequently, please contact your dealer or after-sales service center.
36	The PV string is connected reversely.	The PV string is connected reversely.	Check whether the PV1 and PV2 strings are connected reversely.
37	PV Continuous Hardware Overcurrent	1. The PV configuration is not proper. 2. The hardware 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.
38	PV Continuous Software Overcurrent		
39	Battery Reverse Connection Fault	Reverse connection of positive and negative electrodes of the battery	Check if the positive and negative terminal connections between the battery and the inverter side battery are correct.
40	BUS Voltage Imbalance	1. Abnormal load access 2. Hardware problem	1. If it occurs accidentally, it may be due to abnormal lighting, and the inverter will automatically resume normal operation without manual intervention. 2. If it occurs frequently, please contact your dealer or after-sales service center.

No.	Fault	Cause	Solutions
41	Inv Software Overcurrent	Short time sudden changes in the power grid or load leading to control overcurrent.	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 it occurs frequently, please contact your dealer or after-sales service center.
42	Back-up Output Loss	1. Abnormal inverter sampling circuit 2. Hardware problem	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.
43	Back-up Output AC Overvoltage		
44	AC HCT Failure	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.
45	GFCI HCT Failure	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.
46	AFCI Self-test Fault	AFCI detection 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.
47	Flash Fault	The internal Flash storage 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.
48	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.
49	0.3V Ref abnormal	Reference circuit fault	

No.	Fault	Cause	Solutions
50	External fan abnormal	Possible cause of external fan abnormal: 1.The power supply to the fan is abnormal; 2.Mechanical failure (blocked rotation); 3.Fan aging damage.	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.

Multiple inverters parallel system

No.	Fault	Cause	Solutions
1	Parallel system CAN communication abnormal	The parallel communication cables' connection is abnormal, or any inverter in the parallel system is not powered on.	Check if all inverters are powered on and if the parallel communication cables are securely connected.

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
THDi Test	For Australia requirements, in the THDi test, there should add Zref between inverter and mains. L:0.24 Ω + j0.15 Ω ; N:0.16 Ω +j0.10 Ω L:0.15 Ω + j0.15 Ω ; N:0.1 Ω + j0.1 Ω	As needed.

10 Technical Data

Technical data	GW6000-ET-20	GW8000-ET-20	GW9900-ET-20
Battery Input Data			
Battery Type	Li-Ion	Li-Ion	Li-Ion
Nominal Battery Voltage (V)	500	500	500
Battery Voltage Range (V)	150~720	150~720	150~720
Start-up Voltage (V)	150	150	150
Number of Battery Interfaces	1	1	1
Max. Continuous Charging Current (A)	30	30	40
Max. Continuous Discharging Current (A)	30	30	40
Max. Charge Power (W)	9,000	12,000	15,000
Max. Discharge Power (W)	6,600	8,800	11,000
PV String Input Data			
Max. Input Power (W)* ¹	9,600	12,800	16,000
Max. Input Voltage (V)* ²	1000	1000	1000
MPPT Operating Voltage Range (V)	120~850	120~850	120~850
MPPT Voltage Range at Nominal Power (V)	220 ~ 850	285~850	260~850
Start-up Voltage (V)	150	150	150
Nominal Input Voltage (V)	620	620	620
Max. Input Current per MPPT (A)	16	16	16
Max. Short Circuit Current per MPPT (A)	24	24	24
Max. Backfeed Current to The Array (A)	0	0	0
Number of MPP Trackers	2	2	3
Number of Strings per MPPT	1	1	1
AC Output Data (On-grid)			
Nominal Output Power (W)	6,000	8,000	9,900
Max. Output Power (W)	6,000	8,000	9,900
Nominal Apparent Power Output to Utility Grid (VA)	6,000	8,000	9,900
Max. Apparent Power Output to Utility Grid (VA)* ³	6,000	8,000	9,900

Technical data	GW6000-ET-20	GW8000-ET-20	GW9900-ET-20
Nominal Apparent Power from Utility Grid (VA)	6,000	8,000	10,000
Max. Apparent Power from Utility Grid (VA)	12,000	16,000	20,000
Nominal Output Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE
Output Voltage Range (V)	170~290	170~290	170~290
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~65	45~65	45~65
Max. AC Current Output to Utility Grid (A)*4	8.7	11.6	14.3
Max. AC Current From Utility Grid (A)	15.7	21.0	26.1
Nominal Output Current (A)	8.7	11.6	14.3
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)
Max. Total Harmonic Distortion	<3%	<3%	<3%
AC Output Data (Back-up)			
Back-up Nominal Apparent Power (VA)	6,000	8,000	10,000
Max. Output Apparent Power (On-grid) (VA)	6,000	8,000	10,000
Max. Output Apparent Power (Back-up) (VA)	6,000 (12,000 at60sec)	8,000 (16,000 at60sec)	10,000 (18000 at60sec)
Max. Output Current (A)	13.0 (17.4at60sec)	17.4 (23.3at60sec)	21.7 (26.1at60sec)
Nominal Output Voltage (V)	400/380	400/380	400/380
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Output THDv (@Linear Load)	<3%	<3%	<3%
Efficiency			
Max. Efficiency	98.0%	98.0%	98.2%
Max. Battery to AC Efficiency	97.2%	97.5%	97.5%
Protection			

Technical data	GW6000-ET-20	GW8000-ET-20	GW9900-ET-20
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
AFCI Protection	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II
General Data			
Operating Temperature Range (°C)	-35~+60	-35~+60	-35~+60
Storage Temperature (°C)	-40~+85	-40~+85	-40~+85
Relative Humidity	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000
Cooling Method	Natural Convection	Natural Convection	Natural Convection
User Interface	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP
BMS Communication	RS485 / CAN	RS485 / CAN	RS485 / CAN
Communication with Meter	RS485	RS485	RS485
Weight (kg)	23	23	25
Dimension (W×H×D mm)	496*460*221	496*460*221	496*460*221
Noise Emission (dB)	<30	<30	<30
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W) ^{*6}	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66
DC Connector	MC4 (4~6mm ²)	MC4 (4~6mm ²)	MC4 (4~6mm ²)

Technical data	GW6000-ET-20	GW8000-ET-20	GW9900-ET-20
AC Connector	Feed-Through Terminal Blocks UW10	Feed-Through Terminal Blocks UW10	Feed-Through Terminal Blocks UW10
Environmental Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II/AC III	DC II/AC III	DC II/AC III
Ingress Protection Rating	I	I	I
The Decisive Voltage Class (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid
Certification*7			
Grid Standards			
Safety Regulation	IEC62109-1&2		
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4		
*1: Max input power: 1.6 times nominal power and non continuous. *2: For a 1000V system, the maximum operating voltage is 950V. *3: According to local power grid standards. *4: The Max AC current output to the grid connected load is 13A, 17.4A, 21.7A, 21.7A, and 21.7A, respectively. *5: This power can only be output when the PV and battery power are sufficient. *6: Does not include Back-up output. *7 Not all certificates and standards are listed here, please refer to the official website for more accuracy.			

Technical data	GW10K-ET-20	GW12K-ET-20	GW15K-ET-20
Battery Input Data			
Battery Type	Li-Ion	Li-Ion	Li-Ion
Nominal Battery Voltage (V)	500	500	500
Battery Voltage Range (V)	150~720	150~720	150~720
Start-up Voltage (V)	150	150	150
Number of Battery Interfaces	1	1	1
Max. Continuous Charging Current (A)	40	40	40
Max. Continuous Discharging Current (A)	40	40	40
Max. Charge Power (W)	15,000	18,000	24,000
Max. Discharge Power (W)	11,000	13,200	16,500
PV String Input Data			
Max. Input Power (W)* ¹	16,000	19,200	24,000
Max. Input Voltage (V)* ²	1000	1000	1000
MPPT Operating Voltage Range (V)	120~850	120~850	120~850
MPPT Voltage Range at Nominal Power (V)	260 ~ 850	285~850	380~850
Start-up Voltage (V)	150	150	150
Nominal Input Voltage (V)	620	620	620
Max. Input Current per MPPT (A)	16	16	16
Max. Short Circuit Current per MPPT (A)	24	24	24
Max. Backfeed Current to The Array (A)	0	0	0
Number of MPP Trackers	3	3	3
Number of Strings per MPPT	1	1	1
AC Output Data (On-grid)			
Nominal Output Power (W)	10,000	12,000	15,000
Max. Output Power (W)	10,000	12,000	15,000
Nominal Apparent Power Output to Utility Grid (VA)	10,000	12,000	15,000
Max. Apparent Power Output to Utility Grid (VA)* ³	10,000	12,000	15,000
Nominal Apparent Power from Utility Grid (VA)	10,000	12,000	15,000

Technical data	GW10K-ET-20	GW12K-ET-20	GW15K-ET-20
Max. Apparent Power from Utility Grid (VA)	20,000	20,000	20,000
Nominal Output Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE
Output Voltage Range (V)	170~290	170~290	170~290
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~65	45~65	45~65
Max. AC Current Output to Utility Grid (A)* ⁴	14.5	17.4	21.7
Max. AC Current From Utility Grid (A)	26.1	26.1	26.1
Nominal Output Current (A)	14.5	17.4	21.7
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)
Max. Total Harmonic Distortion	<3%	<3%	<3%
AC Output Data (Back-up)			
Back-up Nominal Apparent Power (VA)	10,000	12,000	15,000
Max. Output Apparent Power (VA)	10,000	12,000	15,000
Max. Output Apparent Power (Back-up) (VA)* ⁵	10,000 (18000 at60sec)	12,000 (18000 at60sec)	15,000 (18000 at60sec)
Max. Output Current (A)	21.7 (26.1at60sec)	21.7 (26.1at60sec)	21.7 (26.1at60sec)
Nominal Output Voltage (V)	400/380	400/380	400/380
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Output THDv (@Linear Load)	<3%	<3%	<3%
Efficiency			
Max. Efficiency	98.2%	98.2%	98.2%
Max. Battery to AC Efficiency	97.5%	97.5%	97.5%
Protection			
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
AFCI Protection	Integrated	Integrated	Integrated

Technical data	GW10K-ET-20	GW12K-ET-20	GW15K-ET-20
Residual Current Monitoring	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II
General Data			
Operating Temperature Range (°C)	-35 ~ +60	-35 ~ +60	-35 ~ +60
Storage Temperature (°C)	-40~+85	-40~+85	-40~+85
Relative Humidity	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000
Cooling Method	Natural Convection	Natural Convection	Natural Convection
User Interface	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP
BMS Communication	RS485 / CAN	RS485 / CAN	RS485 / CAN
Communication with Meter	RS485	RS485	RS485
Weight (kg)	25	25	25
Dimension (W×H×D mm)	496*460*221	496*460*221	496*460*221
Noise Emission (dB)	<30	<45	<45
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)*6	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66
DC Connector	MC4 (4~6mm ²)	MC4 (4~6mm ²)	MC4 (4~6mm ²)
AC Connector	Feed-Through Terminal Blocks UW10	Feed-Through Terminal Blocks UW10	Feed-Through Terminal Blocks UW10
Environmental Category	4K4H	4K4H	4K4H

Technical data	GW10K-ET-20	GW12K-ET-20	GW15K-ET-20
Pollution Degree	III	III	III
Overvoltage Category	DC II/AC III	DC II/AC III	DC II/AC III
Ingress Protection Rating	I	I	I
The Decisive Voltage Class (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid
Certification*7			
Grid Standards			
Safety Regulation	IEC62109-1&2		
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4		
*1: Max input power: 1.6 times nominal power and non continuous. *2: For a 1000V system, the maximum operating voltage is 950V. *3: According to local power grid standards. *4: The Max AC current output to the grid connected load is 13A, 17.4A, 21.7A, 21.7A, and 21.7A, respectively. *5: This power can only be output when the PV and battery power are sufficient. *6: Does not include Back-up output. *7 Not all certificates and standards are listed here, please refer to the official website for more accuracy.			

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11.1 Abbreviations

Abbreviation	English
Ubatt	Nominal battery voltage (V)
Ibatt,max (C/D)	"Max. Continuous Charging Current Max. Continuous Discharging Current "
UDCmax	Max.Input Voltage (V)
UMPP	MPPT Operating Voltage Range (V)
IDC,max	Max. Input Current per MPPT (A)
ISC PV	Max. Short Circuit Current per MPPT (A)
PAC,r	Nominal Output Power (W)
Sr (to grid)	Nominal Apparent Power Output to Utility Grid (VA)
Smax (to grid)	Max. Apparent Power Output to Utility Grid (VA)
Sr (from grid)	Nominal Apparent Power from Utility Grid (VA)
Smax (from grid)	Max. Apparent Power from Utility Grid (VA)
UAC,r	Nominal Output Voltage (V) ON Grid
fAC,r	Nominal AC Grid Frequency (Hz)
IAC,max(to grid)	Max. AC Current Output to Utility Grid (A)
IAC,max(from grid)	Max. AC Current From Utility Grid (A)
P.F.	Power Factor
Sr	Back-up Nominal apparent power (VA)
Smax	Max. Output Apparent Power (VA)
IAC,max	Max. Output Current (A)
UAC,r	Nominal Output Voltage (V) back-UP
fAC,r	Nominal Output Frequency (Hz)
TOperating	Operating Temperature Range (°C)
PF	Power Factor
THDi	Total Harmonic Distortion of Current
THDv	Total Harmonic Distortion of Voltage
C&I	Commercial & Industrial
SEMS	Smart Energy Management System
MPPT	Maximum Power Point Tracking
PID	Potential-Induced Degradation

Abbreviation	English
Voc	Open-Circuit Voltage
PLC	Power-line Commucation
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol
Modbus RTU	Modbus Remote Terminal Unit
SCR	Short-Circuit Ratio
EV charge	Electric Vehicle Charge
UPS	Uninterruptable Power Supply
TOU	Time of Use
ESS	Energy Stroage System
PCS	Power Conversion System
RSD	Rapid Shut Down
EPO	Emergency Power Off
SPD	Surge Protection Device
DRED	Demand Response Enabling Device
RCR	Ripple Control Receiver
GFCI	Ground Fault Circuit Interrupter
RCMU	Residual Current Monitoring Unit
HVRT	High Voltage Ride Through
LVRT	Low Voltage Ride Through
EMS	Energy Management System
BMS	Battery Management System
BMU	Battery Measure Unit
BCU	Battery Control Unit
SOC	State of Charge
SOH	State of Health
DOD	Depth of discharge



GoodWe Website

GoodWe Technologies Co., Ltd.

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

 www.goodwe.com

 service@goodwe.com



Local Contacts