GOODWE
固德威

User Manual

Hybrid Inverter

EHB Series
5.0-9.99kW

V1.3 -2025 -06-06

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01 Safety and Warning

1.1 Symbol Conventions

DANGER!	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING!	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION!	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTE	NOTE does not indicate any hazardous situation. It supplements description and explanation only.

This manual applies to the listed inverters below:

- GW5K-EHB-AU-G11
- GW8.6K-EHB-AU-G11
- GW9.99K-EHB-AU-G11

General safety cautions:

- The documentation may be updated from time to time due to product upgrades or other reasons. Unless otherwise specified, information in the documentation do not replace safety cautions in the labels. All descriptions in the documentation are used for guidance only.
- Please read the user manual carefully to acquire knowledge about product features and safety precautions before installing the equipment. GOODWE will not be liable for any equipment damages or personnel injuries caused by failure to install, operate or configure the inverter in accordance with this document or corresponding user manual.
- Please follow local laws and regulations, and safety cautions in this manual during the installation, operation, and maintenance. Improper operation or misuse may result in personal injuries or property losses.
- All installation, operation, and maintenance must be carried out by trained professionals who meet the following requirements:
  - read through this manual
  - be familiar with various safety precautions
  - operate properly
  - acquaint with local laws, regulations, and standards.
- To ensure safety, please use insulated tools and wear personal protective equipment when operating the equipment.
- Always comply with electrostatic protection rules. To protect the inverter from being damaged, please wear anti-static gloves, wrist strap and clothes when touching printed circuit board or other electrostatic sensitive components during operation.

Operation Safety Precautions:

- The equipment can get hot during operation. Touching the hot surface can result in burn injuries.
- Do not plug or pull DC/AC terminals when the equipment is running.
- PV negative (PV-) and battery negative (BAT-) on inverter side is not grounded by default.

Connecting PV- or BAT- to EARTH is strictly forbidden.

- PV modules used on the inverter must have an IEC61730 class A rating, and the total open-circuit voltage of PV string/array is lower than the maximum rated DC input voltage of the inverter. Any damage caused by PV over-voltage is beyond warranty.
- When the inverter leakage current to ground is ≥ 6mA, it can be detected by the built-in RCMU function. The type A RCD can be connected to the inverter for protection according to the local laws and regulations. Recommended specifications: 300mA.
- In Australia, the inverter internal switching does not maintain neutral integrity, which must be addressed by external connection arrangements like in the system connection diagram for Australia.
- In Australia, output of Back-Up side in switchbox should be labeled “Main switch UPS supply”, the output of normal load side in switch box should be labeled “main switch inverter supply”.
- Power off the equipment before any cable connection or electrical operation.
- Residual high voltage exists after the equipment is powered off. To avoid electric shock, please wait for 5minutes for the equipment to discharge to safe voltage.
- Destroying the labels without authorization will void the guarantee of corresponding modules.
- If the equipment is not to be installed immediately, put it inside the original package with the desiccant. If the equipment is unpacked but not put into use immediately, seal all unused terminal ports to prevent dust and water vapor corrosion.
- Ensure the component frames and the bracket system are securely grounded.
- 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=maximum input voltage/ 30mA).

Warranty Declaration:

- The equipment damage caused by following reasons are not covered by warranty:
- Exceed the guarantee period.
- Improper installation, alteration, transportation or operation.
- The installation or operation environment is beyond the requirements of this manual or local laws and regulations.
- Force majeure (lightening, earthquake, fire disaster, storm or volcanic eruption etc.)
- Unauthorized replacement, dismantle, maintenance or modification of software code.
- Failure to comply with local laws and regulations, and safety precautions in this manual.
- For more warranty conditions, please visit https://en.goodwe.com.

1.2 Symbols Explanation

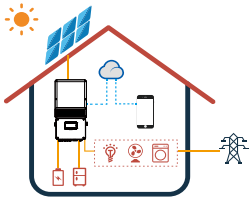
The hybrid or bidirecational solar inverter strictly comply with related safety rules for product design and testing. Please read and follow all the instructions and cautions on the hybrid inverter or user manual during installation, operation or maintenance, as any improper operation might cause personal injury or damage.

	Caution! Failing to observe a warning indicated in this manual may result in injury.
	Danger of high voltage and electric shock!
	Danger of hot surface!
	Components of the product can be recycled.
	This side up! The package must always be transported, handled and stored in such a way that the arrows always point upwards.
	No more than six (6) identical packages being stacked on each other.
	Product should not be disposed as household waste.
	The package/product should be handled carefully and never be tipped over or slung.
	Refer to the operating instructions
	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	Inverter will be touchable or operable after minimum 5 minutes of being turned off or totally disconnected, in case of any electrical shock or injury.
	CE Mark

02 Product Introduction

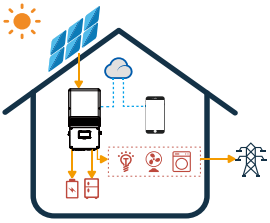
2.1 Operation Modes Introduction

The hybrid or bidirecational solar inverter applys to solar system with participation of PV, battery, loads and grid system for energy management. The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be exported to the grids. Battery shall discharge to support loads when PV power is insufficient to meet self-consumption. If both PV power and battery power is insufficient, the system will take power form grid to support loads.



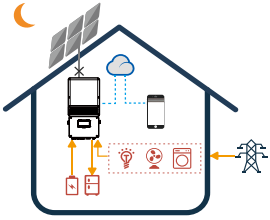
Note: The introduction describes a general behavior of the hybrid or bidirecational solar inverter system. The operation mode can be adjusted on SolarGo APP based on the system layout. Below are the general operation based on the system layout. Below are the general operation modes for the hybrid or bidirecational solar inverter system.

The solar inverter system normally has the following operation modes based on your configuration and layout conditions.



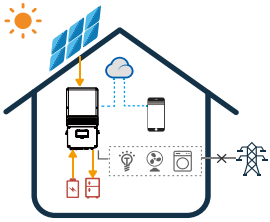
Mode I

The energy produced by the PV system is used to optimize self-consumption.The excess energy is used to charge the batteries, then exported to gird.



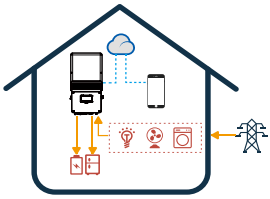
Mode II

When there is no PV, and the battery is sufficient , It can supply the load with the grid together.



Mode III

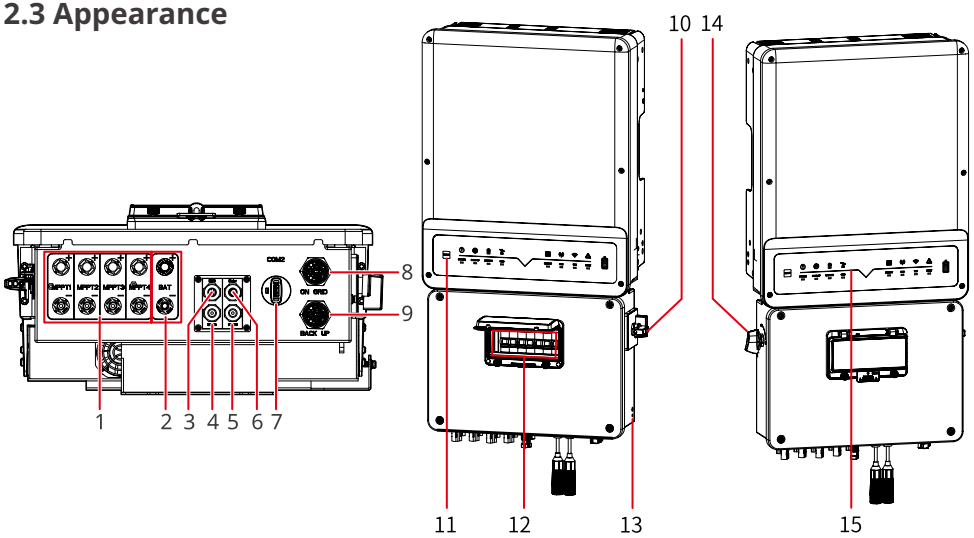
When grid fails , the system automatically switches to Back-Up mode, the Back-Up load could be supported by PV and battery.



Mode IV

Battery could be charged by grid, and charge time/ power could be set flexibly on SolarGo APP.

2.3 Appearance



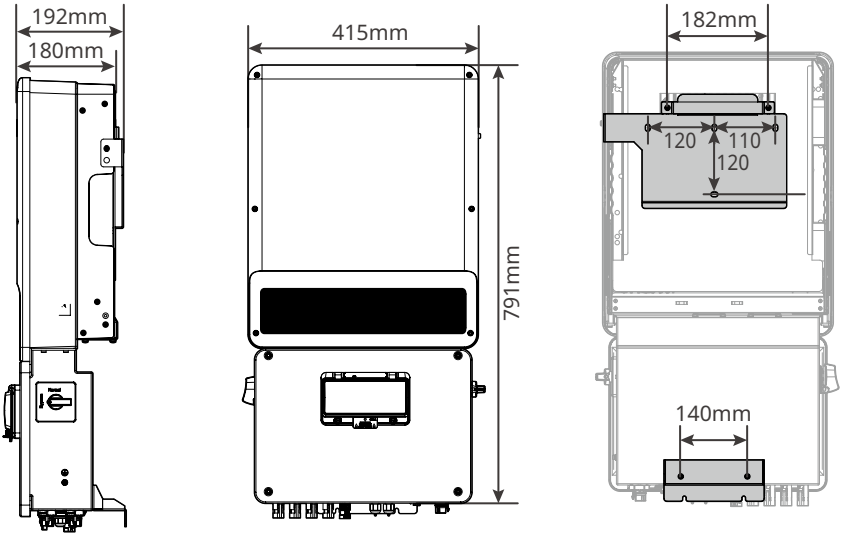
No.	Part	Description
1	MPPT input port	To connect PV strings.
2	Battery input port	To connect the battery.
3	BMS port	To connect the BMS communication part of the battery.
4	DRED communication port	To connect to DRED for communication.
5	RS485 port	To connect data monitor devices. When the LG RESU 10H-Type R battery is applied, it's used to connect the enable signal port of the battery.
6	METER port	To connect the meter.
7	Communication port	To install the communication module.
8	ON-GRID port	To connect to the power grid.
9	BACK-UP port	To connect the BACK-UP load. The BACK-UP port of the inverter is designed with uninterruptible power supply function. The inverter will supply power to the load to keep them working when the power grid is disconnected.
10	Bypass switch	Turn the switch to "bypass" when the inverter fails to work. The power grid will supply the BACK-UP load.
11	COMM Reset	For WiFi reset.
12	Breaker	• Disconnect the inverter from the grid by ON-GRID breaker. • Disconnect the inverter from the BACK-UP load by BACK-UP breaker. • Disconnect the inverter from the battery by battery breaker.

No.	Part	Description
13	Grounding point	To connect PE cable.
14	DC switch	Shutdown the PV system in an emergency. Or switch it off for quick disconnection.
15	Indicator	To indicate the status of the inverter

2.4 LED Indicators Explanation

INDICATOR	COLOR	STATUS	EXPLANATION
SYSTEM			ON = System is ready
			BLINK = System is starting up
			OFF = System is not operating
BACK-UP			ON = Back-up is ready / power available
			OFF = Back-up is off / on power available
BATTERY			ON = Battery is charging
			BLINK 1 = Battery is discharging
			BLINK 2 = Battery is low / soc is low
			OFF = Battery is disconnected / not active
GRID			ON = Grid is active and connected
			BLINK = Grid is active but not connected
			OFF = Grid is not active
ENERGY			ON = Consuming energy from grid / buying
			BLINK 1 = Supplying energy to grid / zeroing
			BLINK 2 = Supplying energy to grid / selling
			OFF = Grid not connected or system not operating
COM			ON = BMS and meter communication ok
			BLINK 1 = Meter communication ok, BMS communication fail
			BLINK 2 = BMS communication ok, meter communication fail
			OFF = BMS and meter communication fail
WiFi			ON = WiFi connected / active
			BLINK 1 = WiFi system resetting
			BLINK 2 = WiFi not connect to router
			BLINK 4 = WiFi server problem
			OFF = WiFi not active
FAULT			ON = Fault has occurred
			BLINK1 = Overload of back-up / Output / reduce load
			BLINK4 = CT wiring fault
			OFF = No fault

2.5 Product Dimension

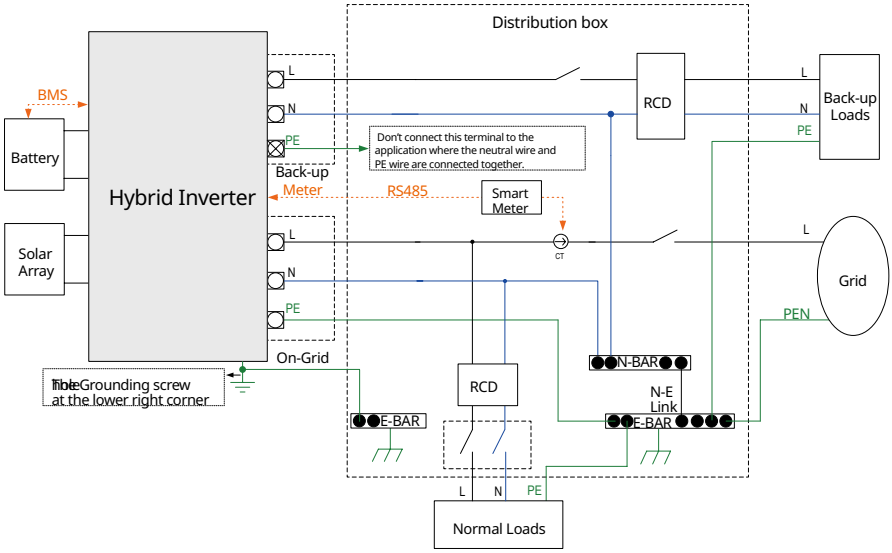


2.6 System Connection Diagrams

WARNING!

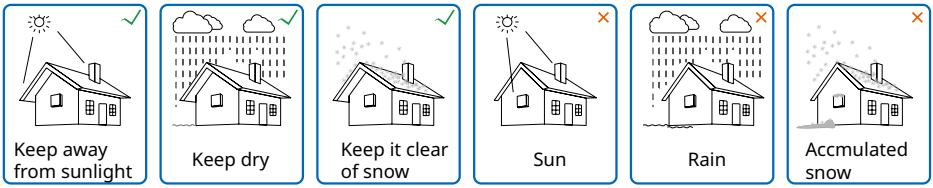
- For Australia safety country, the neutral cable of On-Grid side and Back-Up side must be connected together, otherwise Back-Up function will not work.
- When the inverter is working tied to the grid with its backup function enabled, it will automatically switch to the backup mode if the grid suddenly disconnected. Please confirm that the backup mode is normal.

The diagram is an example for application that Neutral connects together with PE in distribution box.
Such as: Australia, New Zealand, etc(Please follow local wiring regulations)



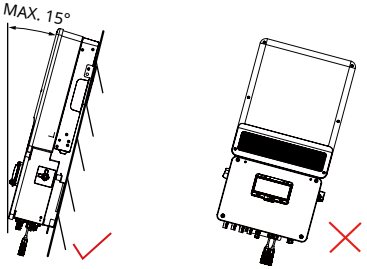
3.1 Environment Requirements

- Any part of this system shouldn't block the switch and breaker from disconnecting the inverter from DC and AC power.
- Inverter should be installed at eye level for convenient maintenance.
- Inverter should be installed on a solid surface, where it is suitable for inverter's dimensions and weight.
- Ambient temperature should be lower than 45°C. The temperature and humidity at the installation site should be within the appropriate range (60 °C for outdoor unconditioned with solar effects).
- It is recommanded that the installation of the inverter should be prevented from direct sunlight, snow, rain and other negative influences which may effect product function or lifetime.
- Product label on inverter should be clearly visible after installation. Do not damage the lable.

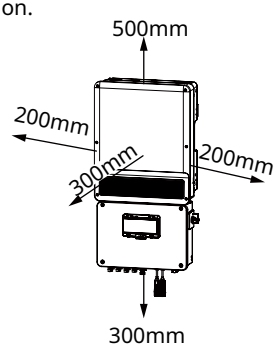


3.2 Installation Angle Space Requirements

Inverter should be installed vertically or lie on a slope by a max of 15°.

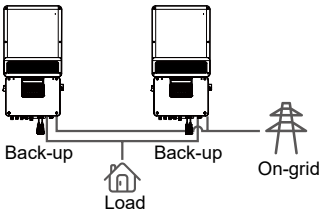


Leave enough space around the inverter according to the below figure for natural heat dissipation.

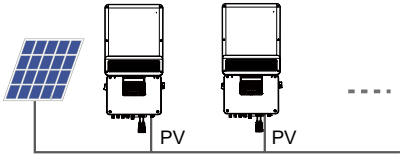


3.3 Improper Installation Mode

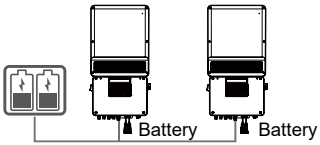
The inverter is not tested to AS/NZS 4777.2:2020 for multiple inverter combinations and/or multiple phase inverter combinations so that combinations should not be used.



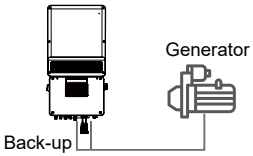
No parallel connection of the back-up is allowed in general application. Please contact the Service Center first for advanced application.



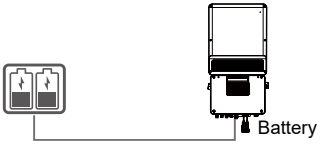
Single PV string cannot be connected to multiple inverters.



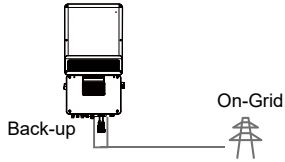
Single battery bank cannot be connected to multiple inverters.



On-Grid or back-up side cannot be connected to any AC generator.



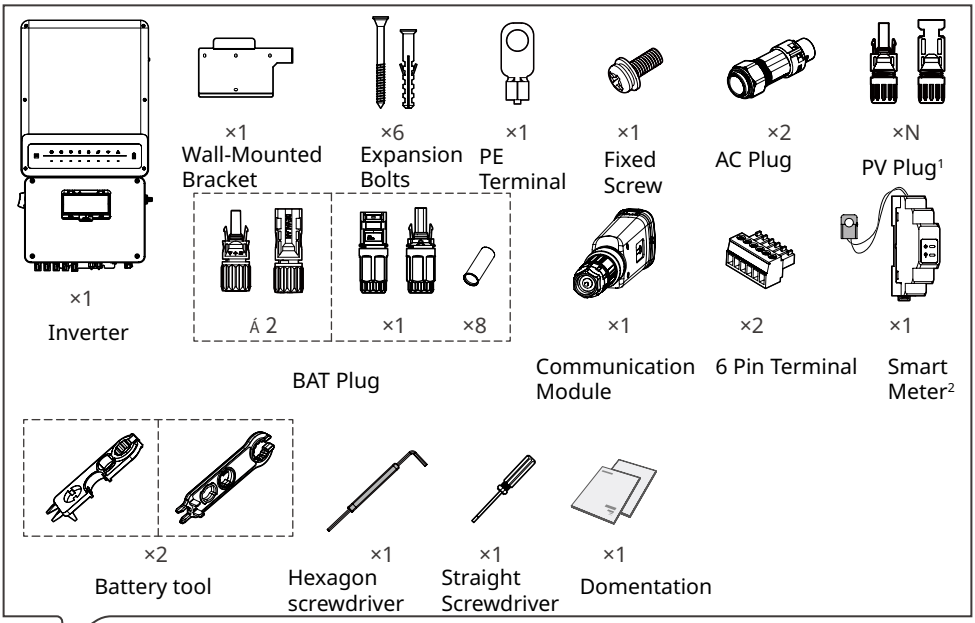
Battery without official compatible statement cannot be connected to inverter.



Back-up side cannot be connected to grid.

04 Installing the Inverter

4.1 Packing List



NOTE

[1]: Supplied according to PV port numbers.
[2]: Smart meter model is GMK110 by default, and GMK 110D is optional.

4.2 Installing the Inverter

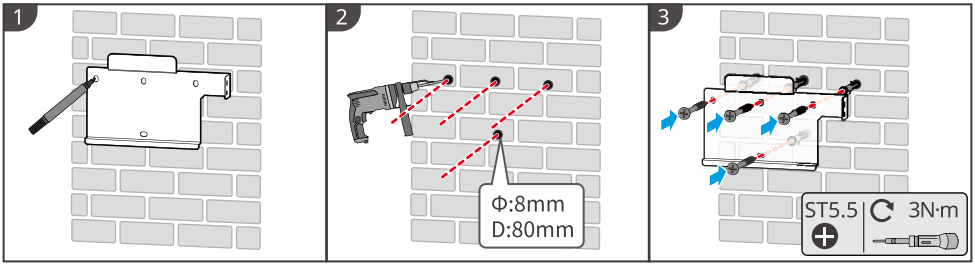
Move the inverter to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.

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

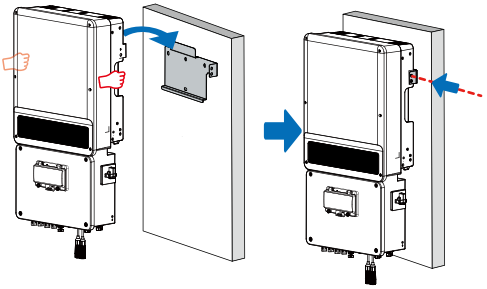
CAUTION!

- Do not install the inverter when it is snowing or raining. If you have to, pay attention to the waterproof and moisture-proof of the inverter and distribution box.
- Avoid drilling holes in walls which with cables inside or on the back.

1. Mark the holes for drilling on the wall and drill holes.
2. Install the wall-mounted bracket.



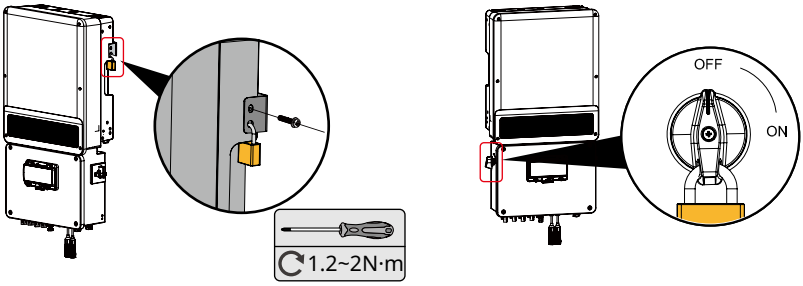
3. Install the inverter.



WARNING!

- Do not use force beyond the heatsink sides to avoid damage to the inverter.
- The connection unit cannot lift holding.
- Avoid holding and lifting the connection unit, keep balance of the inverter during moving.

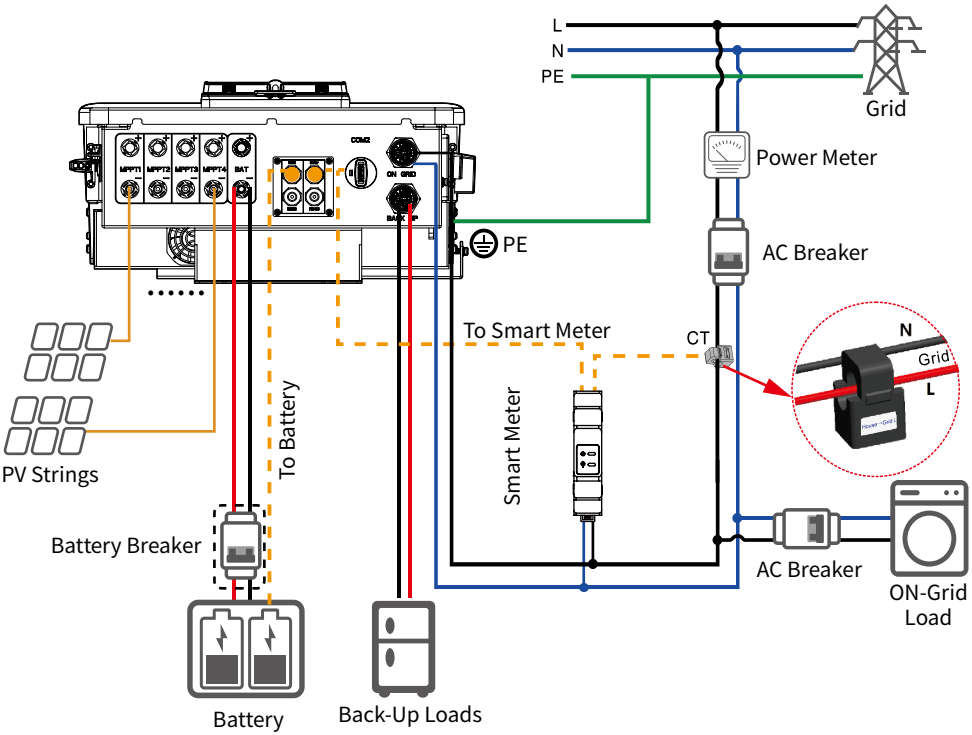
4. Secure the inverter with a lock.
5. Ensure that the switch is on "OFF" position and locked during installation and maintenance. (Applicable in Australia and New Zealand)



05 Electrical Connections

CAUTION!

- During wiring connection, the operator should always wear proper PPE.
- The wiring installation must strictly observe correct specification. Otherwise, it may bring waterproof and electrical problems.
- Direction of the CT cannot be connected in reverse, please follow House(K)→Grid (L) direction to do the connection.
- The back-up port is connected to the load and cannot export power to the grid.

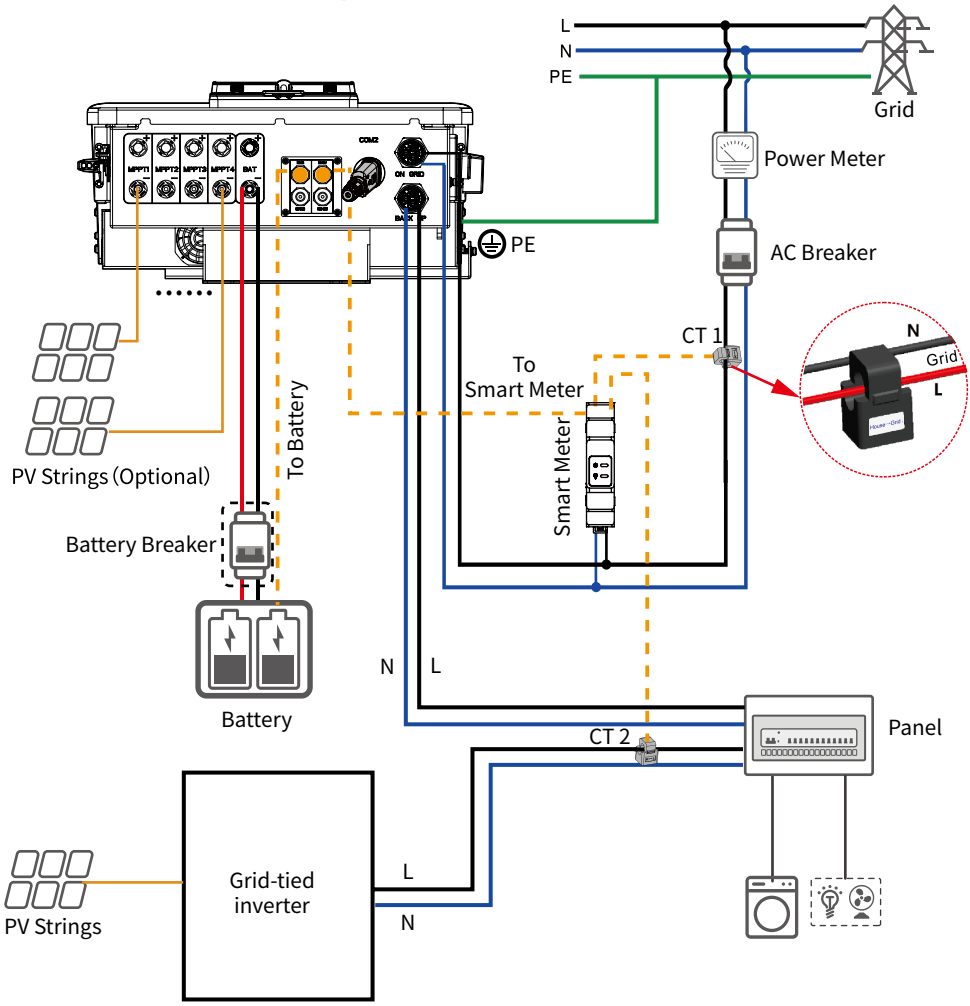


Please connect the CT from House (K) to Grid (L).
The AC breaker specification depends on actual loads.
The Battery breaker: Nominal voltage ≥ 600Vdc, Nominal current ≥ 63A. The Battery breaker shall meet the requirements according to AS/NZS 5139.

Cable Specifications

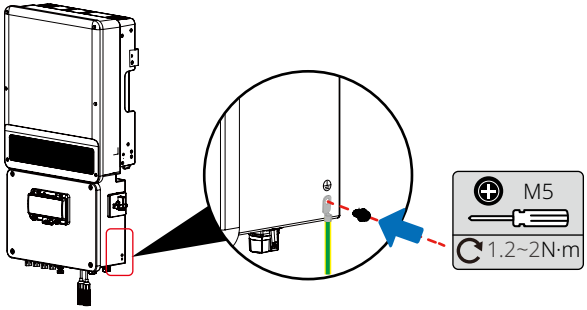
Model	PV Cable	BAT Cable	AC Cable	PE Cable
GW5K-EHB-AU-G11	4-6mm²	10mm²	10-12mm²	10-12mm²
GW8.6K-EHB-AU-G11	4-6mm²	10mm²	10-12mm²	10-12mm²
GW9.99K-EHB-AU-G11	4-6mm²	10mm²	10-12mm²	10-12mm²

5.1 Whole Home Backup Connections



When grid power fails, Inverter creates a micro grid, and the weight of the load determines whether PV energy flows into the load or charges the battery.

Ground cable shall be connected to ground plate on grid side.

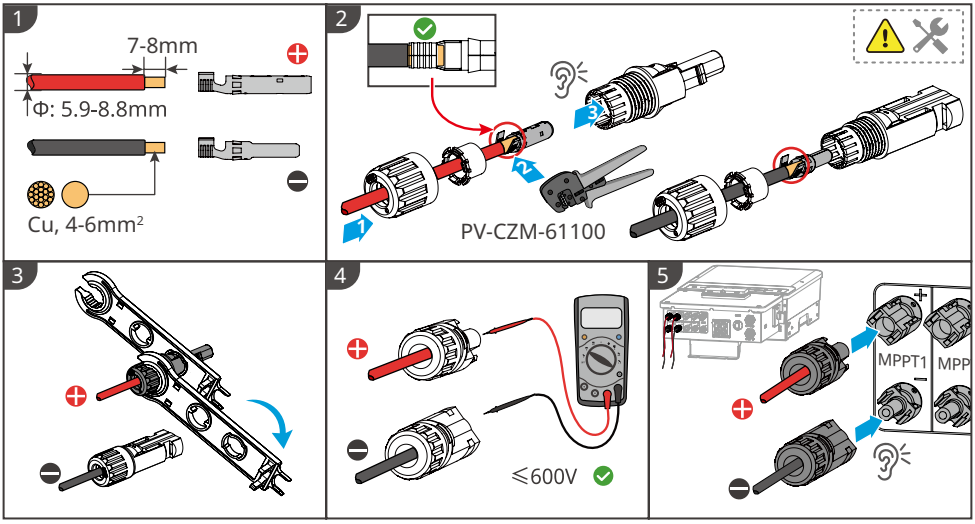


5.2 Connecting PV Cables

CAUTION!

- The total short-circuit current of PV string must not exceed inverter's max DC current.
- The minmum isolation resistance to ground of the PV string must exceed 19.33kΩ in case of any shock hazard.
- The polarity of PV strings or on the inverter cannot be connected by reversely, otherwise inverter could be damaged.
- PV strings could not connect to earth/grounding conductor.
- Use the right PV plugs in the accessory box. (BAT plugs are similar with PV plugs, please confirm before use it.)
- There will be MC4 or Amphenol plugs in accessory box.

1. Prepare PV cables and PV plugs.
2. Connect PV cable to PV connectors.
3. Screw the cap on and plug onto inverter side.



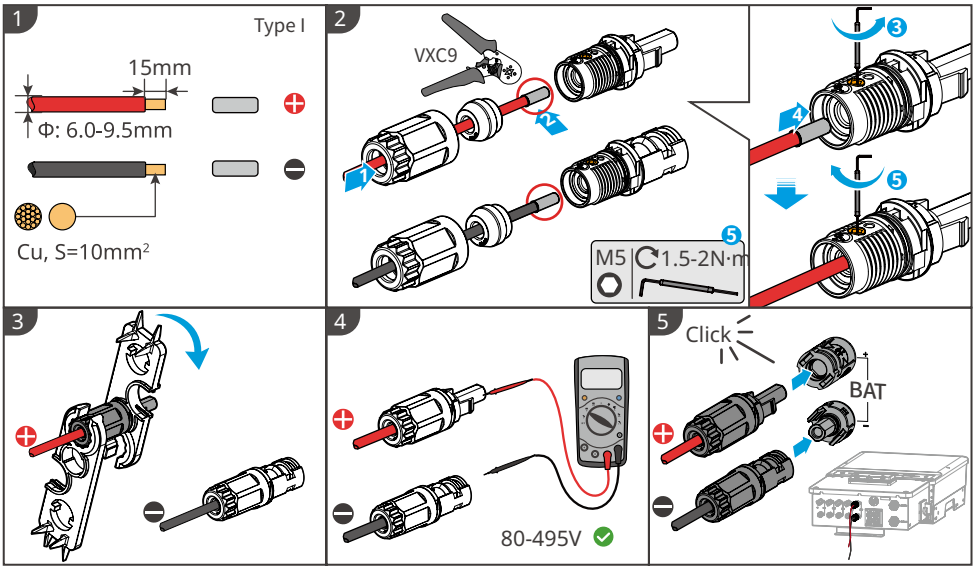
NOTE

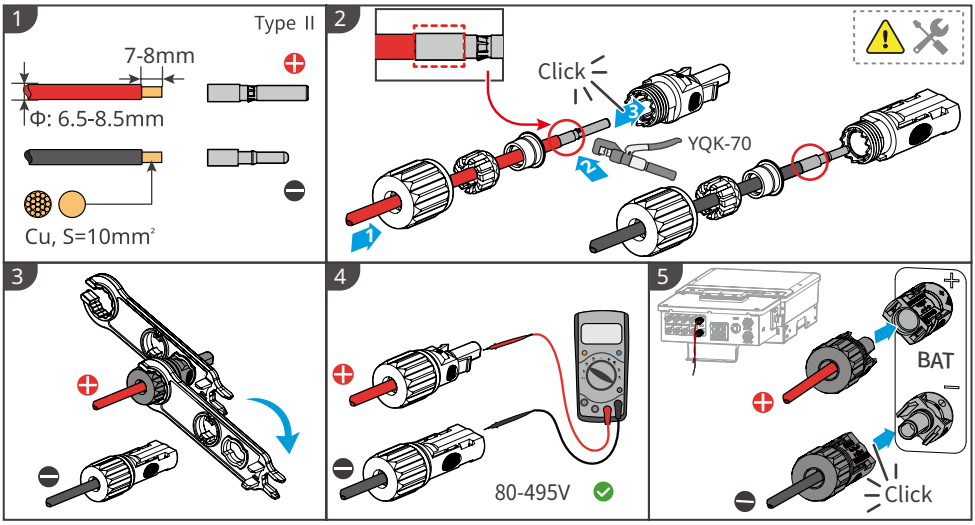
- PV cable must be tightly crimped in to the connectors.
- For Amphenol connector, the limit buckle cannot be pressed.
- There will be a click sound if connectors are inset correctly into PV plugs.

5.3 Connecting Battery DC Cables

CAUTION!

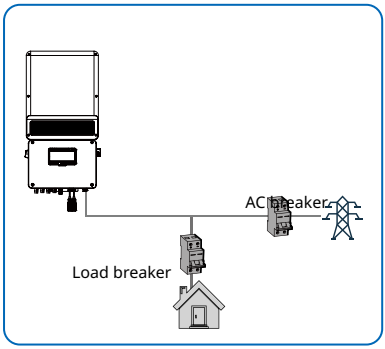
- Make sure battery breaker is off and battery nominal voltage meet the Hybrid Inverter specification before connecting battery to inverter and make sure inverter is totally isolated from PV and AC power.
- Please be careful against any electric shock or chemical hazard.
- Please following Cments and steps bellow strictly. Use improper wire may cause bad contact and high impedance, which is dangerous to the system.
- Use the right BAT plugs in the accessory box.
- Use the tin-plated cables with a conductor cross section of 12 to 13 mm² because the maximum battery current is 50A.





5.4 Connecting AC Cables

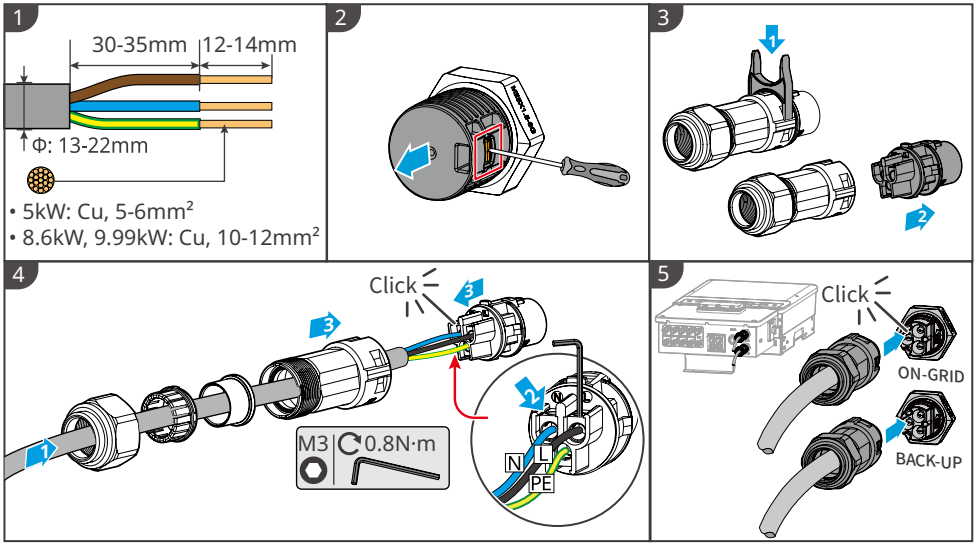
AC circuit breakers shall be installed on the grid side and the load side. Select the AC breaker according to the actual load.



Requirements of AC cable connected to On-Grid and Back-Up side.Recommended AC circuit breakers: 63A.

WARNING!

1. Make sure inverter is totally isolated from any DC or AC power before connecting AC cable.
2. The choice of AC cable needs to meet both the outside diameter and conduct core section requirements. Please refer to the table for selecting the AC cable.
3. Neutral cable shall be blue, line cable is black or brown (preferred) and protective earth cable yellow-green.
4. For AC cables, PE cable shall be longer than N&L cables, so that if in any case AC cable slips or taken out, the protecting earth conductor will be the last to take the strain.



Declaration For Back-Up Function

The below statement lays out the general policies governing the hybrid inverter.

1. For hybrid inverters, the standard PV installation typically consists of the connection of the inverter with both panels and batteries. In case of systems not connected to the batteries, the Back-Up function is strongly not advised to use. GOODWE shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.
2. Under normal circumstances, the Back-Up switching time is less than 10 ms (the minimal condition to be considered as the UPS level). However, some external factors may cause the system to fail on Back-Up mode. As such, we recommend the users to be aware of conditions and follow the instructions as below:
   - Do not connect loads if they are dependent on a stable energy supply for a reliable operation.
   - Do not connect the loads which may in total exceed the maximum Back-Up capacity.
   - Try to avoid those loads which may create very high start-up current surges such as Inverter Air-conditioner, high-power pump etc.
   - Due to the condition of battery itself, battery current might be limited by some factors including but not limited to the temperature, weather etc.

Micro-grid system configuration:

When Inverter detects the charging power in off-grid mode, it will turn on micro-grid mode. In order to

ensure the stability of a micro-grid, the system configuration must meet the following rules.

1. The rated power of the PV inverter should be less than the rechargeable power of the energy storage system.
2. If the PV panel and PV inverter have been installed, when you select the capacity of Inverter and battery, please satisfy the following constraint formula.

$$P_{Inverter} > P_{PVinverter} [1]$$

$P_{Inverter}$:Rated Power of Inverter

$P_{PVinverter}$:Rated Power of the PV Inverter

In micro-grid mode, UPS switching cannot be achieved.

Declaration For Back-Up Loads

The hybrid inverters are able to supply over load output at its' Back-Up. For details please refer to the technical parameters of the hybrid inverter. And the inverter has self-protection derating at high ambient temperature.

Accepted loads as below:

- Inductive Load:
  1. For GW5K-EHB-AU-G11, a 1.5P non-frequency conversion air-conditioner can be connect to back-up side.
  2. For GW8.6K-EHB-AU-G11 and GW9.99K-EHB-AU-G11, a 2P non-frequency conversion air-conditioner can be connect to back-up side.
  3. The uninterrupted power supply of the inverter will become unstable if the air conditioner is connected beyond required.
- Capacitive Load:
  - Total power <= 0.6 x nominal power of model. (Any load with high inrush current at start-up is not accepted.)
  - For complicated application, please contact the Service Center.

Declaration For Back-Up Overload Protection

Inverer will restart itself as overload protection happens. The preparation time for restarting will be longer and longer (max one hour) if overload protection repeats. Take following steps to restart inverter immediately.

- Decrease Back-Up load power within max limitation.
- On SolarGo APP, choose "Advanced Setting "→ "Reset Back-Up Overload History".

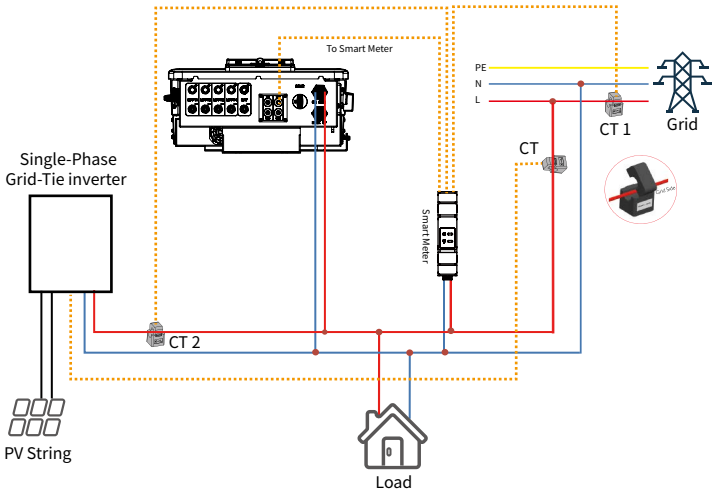
5.5 Connecting Communication Cables and Installing CT

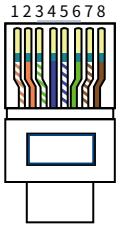
- The Smart Meter with CT in product box is compulsory for the hybrid inverter system installation, used to detect grid voltage and current direction and magnitude, further to instruct the operation condition of the hybrid inverter via RS485 communication.
- Choose standard network cables and RJ45 terminals only for communication.

CAUTION!

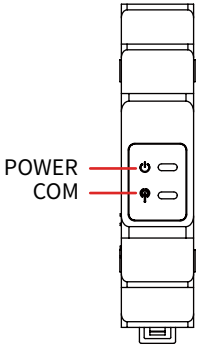
1. Make sure AC cable is totally isolated from AC power before connecting Smart Meter & CT.
2. The Smart Meter and CT is well configured, please do not change any setting on Smart Meter.
3. One Smart Meter can only be used for one hybrid inverter.
4. CT must be connected on the same direction as the CT indicated.

- CT cable is 3m as default, could be extended to max 5m.
- Choose standard network cables and RJ45 terminals only for communication.
- Communication cables of Smart Meter can expand to 100m to ensure normal communication. Normally, BMS communication cables are 3~5M.





NO.	Color	BMS Function	Smart Meter Function
1	Orange&White	485_A2	N/A
2	Orange	N/A	N/A
3	Green&White	485_B2	485_B1
4	Blue	CAN_H	N/A
5	Blue&White	CAN_L	N/A
6	Green	N/A	485_A1
7	Brown&White	N/A	485_B1
8	Brown	N/A	485_A1



Smart Meter LED Indications

	OFF	ON	Blinking
POWER	Not working	Working	N/A
COM	Blink one time when it transfer data to inverter.		

BMS Connection

BMS is used to communicate with the connected compatible lithium battery. There is a communication cable marked "To Battery" on the inverter.

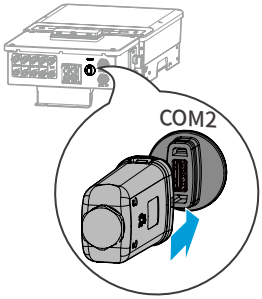
Connection steps:

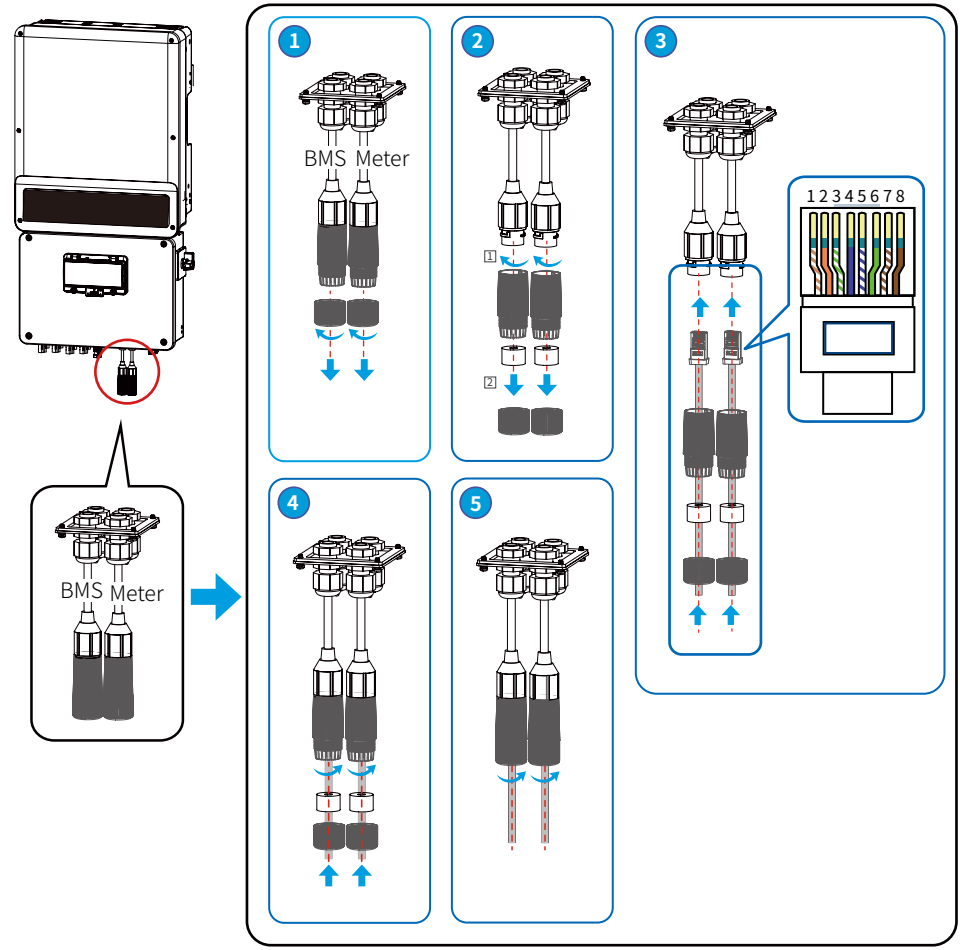
1. Confirm that the battery and inverter power cables are connected (refer to 5.4 Connecting Battery DC Cables).
2. Connect the BMS communication cable of the inverter to the communication interface of the lithium battery.
3. Select the corresponding battery via the APP (please refer to the user manual of the Storage Mate app).

5.6 Installing the Communication Module

NOTICE

- 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 Bluetooth module, WiFi module, LAN module, or 4G module. Set inverter parameters, check running information and fault information, and observe system status in time via the smartphone or web pages.
- Refer to the delivered communication module user manual to get more introduction to the module. For more detailed information, visit www.goodwe.com.





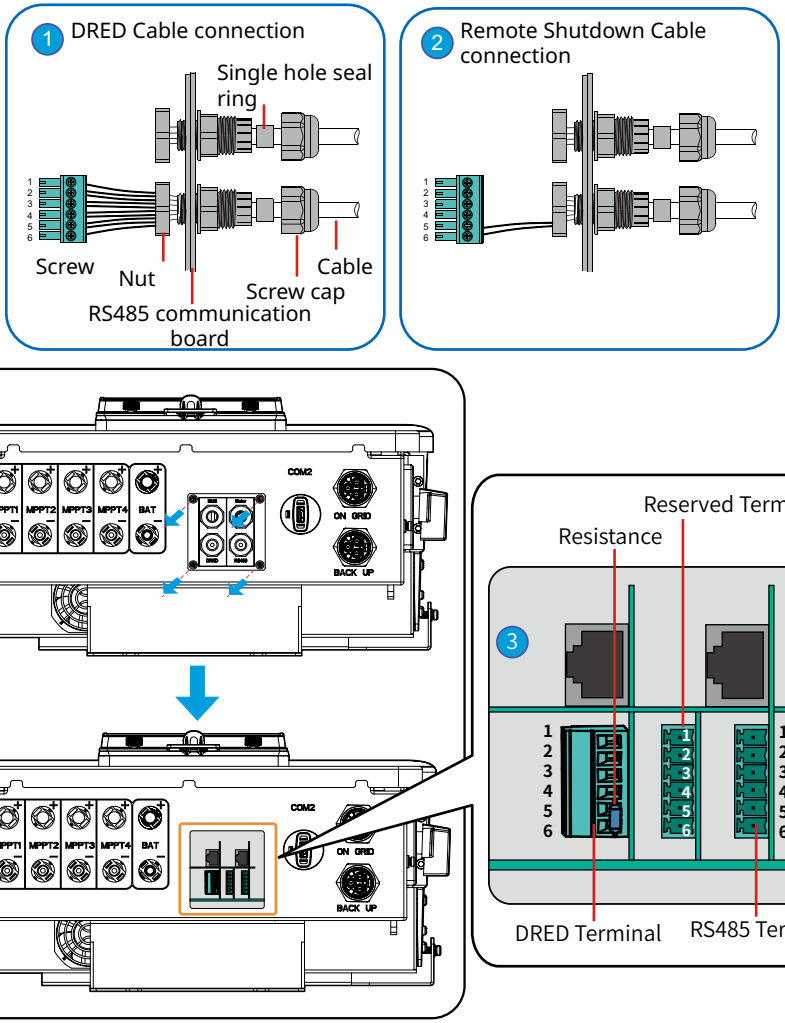
5.7 DRED and Remote Shutdown Connection

DRED is used for Australia and New Zealand installation (also used as remote shutdown function in European countries), in compliance with Australia and New Zealand safety requirements (or European countries). And DRED device is prepared by the customer.

NO.	DRED port definition	Reserved port definition	RS485 port definition
1	DRM1/5	CANL2	RS485_B2 [2]
2	DRM2/6	CANH2	RS485_A2 [2]
3	DRM3/7	GND-S	LG_EN- [3]
4	DRM4/8	12V-S	LG_EN+ [3]
5	REFGEN/Remote Shutdown[1]	NODE-	RS485_B1[4]
6	COM/DRM0/Remote Shutdown[1]	NODE+	RS485_A1[4]

CAUTION!

- [1]: Please connect to 5/6PIN of DRED port if Remote Shutdown is applied.
- [2]: Connect BMS to this port if a battery with RS485 port is selected.
- [3]: For LG RESH10-TypeR battery, connect the BMS cable to RS485_A2/B2 port and connect the enable cable to LG_EN+ and LG_EN-.
- [4]: Used to connect the data monitoring device.
- The RS485 port shall be connected in the same way as the DRED port.
- If the DRED and Remote Shutdown functions are not used, make sure that the Resistance is inserted into the DRED Terminal.



5.8 Earth Fault Alarm Connection

The inverter complies with IEC 62109-2 13.9. Fault indicator LED on inverter cover will light up and the system will email the fault information to customer.
Inverter should be installed at eye level for convenient maintenance.

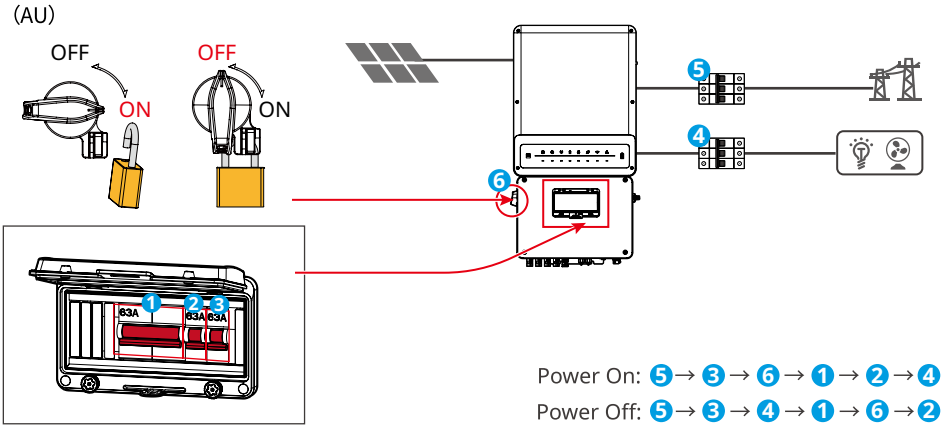
5.9 Startup/shutdown Procedure

DC switch is used to cut off MPPT input power while the breaker equipped on the battery is used to cut off battery power.
When you want to shut down the inverter during an event, you shall turn off the inverter DC switch and the battery DC breaker.
When you want to start-up the inverter after rectification, you shall turn on the inverter DC switch and the battery DC breaker.

5.9.1 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.

5.9.2 Power ON & Power OFF



5.9.3 Indicators

INDICATOR	COLOR	STATUS	EXPLANATION
 SYSTEM			ON = System is ready
			BLINK = System is starting up
			OFF = System is not operating
 BACK-UP			ON = Back-up is ready / power available
			OFF = Back-up is off / on power available
 BATTERY			ON = Battery is charging
			BLINK 1 = Battery is discharging
			BLINK 2 = Battery is low / soc is low
			OFF = Battery is disconnected / not active
 GRID			ON = Grid is active and connected
			BLINK = Grid is active but not connected
			OFF = Grid is not active
 ENERGY			ON = Consuming energy from grid / buying
			BLINK 1 = Supplying energy to grid / zeroing
			BLINK 2 = Supplying energy to grid / selling
			OFF = Grid not connected or system not operating
 COM			ON = BMS and meter communication ok
			BLINK 1 = Meter communication ok, BMS communication fail
			BLINK 2 = BMS communication ok, meter communication fail
			OFF = BMS and meter communication fail
 WiFi			ON = WiFi connected / active
			BLINK 1 = WiFi system resetting
			BLINK 2 = WiFi not connect to router
			BLINK 4 = WiFi server problem
			OFF = WiFi not active
 FAULT			ON = Fault has occurred
			BLINK1 = Overload of back-up / Output / reduce load
			BLINK4 = CT wiring fault
			OFF = No fault

06 Parameter Configuration

6.1 Checking Before Turning On AC Power

1. Battery Connection: Confirm the connection between inverter and battery, polarity (+/-) are not reversed.
2. MPPT Input Connection: Confirm the connection between inverter and PV, polarity (+/-) are not reversed.
3. On-Grid & Back-Up Connection: Confirm ON-GRID connection to power grid and Back-Up to loads, polarity (L/N are in sequence) not reversed.
4. Smart Meter & CT Connection: Make sure Meter & CT are connected correctly, keep the sign on CT points to grid.

6.2 SolarGo App Operation

6.2.1 Basic Settings

SolarGo is an external monitoring and configuration application for hybrid inverters and is used on smart phones or tablets for both Andriod and iOS systems. The main functions are listed as below:

1. Configure the system to customize functions by the user.
2. Monitor and check the performance of the hybrid system.
3. Access and change the regional settings.
4. Check the inverter firmware version.
5. Set export power limit.

Search SolarGo in Google Play or Apple App Store, or scan the QR code to download the app.
Operation steps are the same for Android system and iOS system although the two interfaces are slightly different.
For more detailed opertaion instructions, please refer to SolarGo user manual.

SolarGo APP

SolarGo APP
User Manual

NOTE

If you need to change the configuration parameters, please refer to the SolarGo user manual.

WiFi Reset & Reload

WiFi Reset & Reload function is only used when:

1. WiFi lost connection to internet or cannot connect to SolarGo App successfully.
2. Cannot find “Solar-WiFi signal” or have other WiFi configuration problem.
3. Please do not use this button if WiFi monitoring works well.

- WiFi Reset means restarting WiFi module, WiFi settings will be reprocessed and saved automatically. Short press RESET button (0.5-3s), WiFi LED on inverter will blink for a few seconds.You can reset WiFi by short press RESET button on WiFi module or the inverter.
- WiFi Reload means setting WiFi module back to default factory setting. Short press RELOAD button (0.5-3s), the WiFi module will restart, long press RELOAD button (longer than 3s), WiFi settings will be recovered to default factory setting.

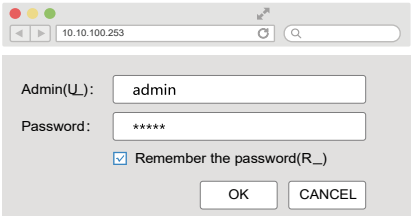
6.2.2 WiFi Configuration

This part shows the configuration using a web page.
Wi-Fi configuration is absolutely necessary for online monitoring and maintenance.

Preparation:
1. The inverter must be powered up with battery or grid power.
2. A router with internet access to the website https://www.semsportal.com is required.

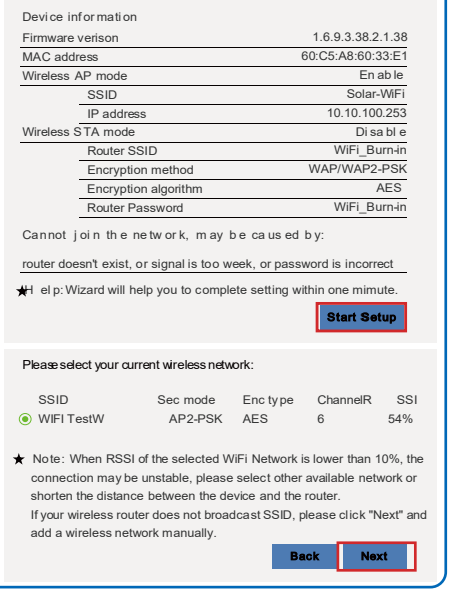
Step 1

1. Connect Solar-WiFi* to your PC or smart phone (* means the last 8 characters of the inverter serial No.) Password:12345678.
2. Open browser and login 10.10.100.253; Admin (U): admin; Password: admin
3. Then click “OK”



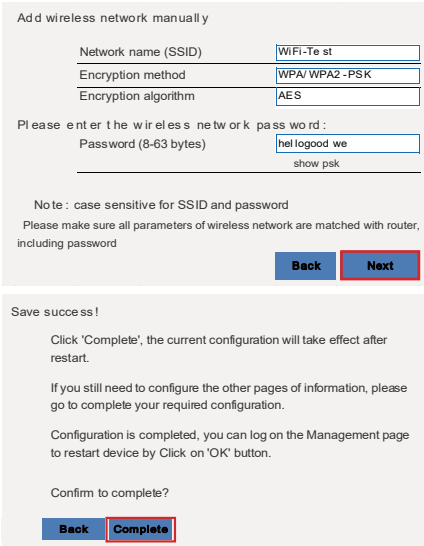
Step 2

1. Click "Start Setup" to choose your router.
2. Then click "Next".



Step 3

1. Fill in the password of the router, then click "Next".
2. Click "Complete".



NOTE

Please make sure the password, Encryption Method/Algorithm is right the same with the router’s.
If everything is right well, the WiFi LED on inverter will change from double blink to quartic blink then to solid status, which means WiFi is connected to the inverter Portal successfully.
WiFi configuration could also be done on Power Sight app, details please check on Power Sight app.

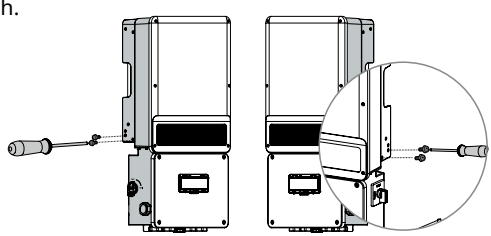
07 Maintenance

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
Fan	Check the fan for proper working status, low noise, and intact appearance.	Once a year

The fans should be cleared yearly. Before clearing or replacing the fans, turn off all switches including battery switch and AC breaker switch.

Step 1

Rotate DC switch in “OFF” position.
Remove 4 screws by cross screwdriver.



Step 2

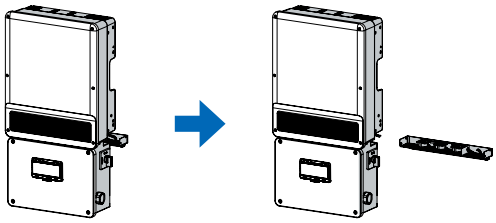
Separate the plug terminal by pressing the buckle.

Step 3

Clean the ventilation grid and the fan with soft brush, paint brush, or compressed air.

Reassemble the fans into the cabinet.

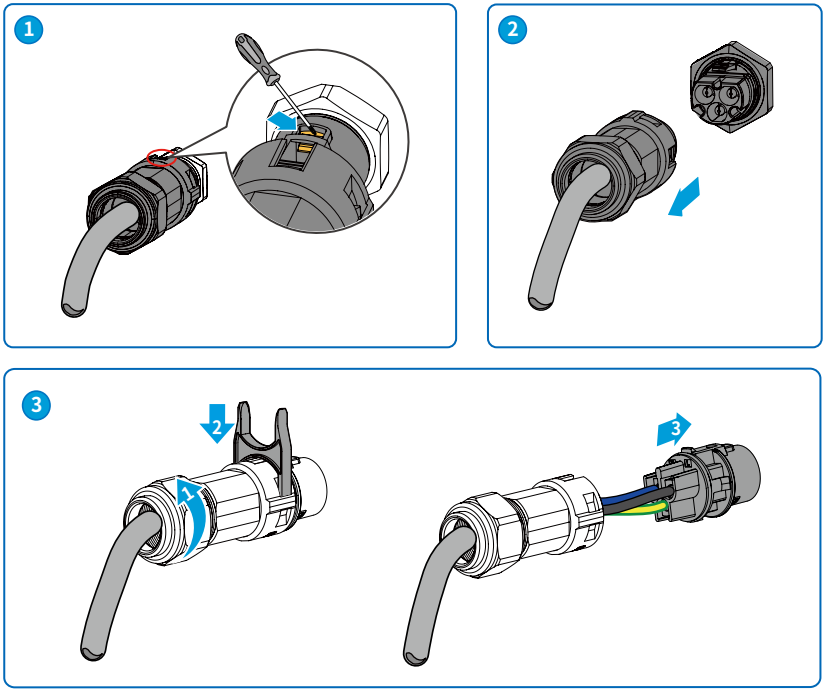
If there is something wrong with the fan and need to be repaired or replaced, disassemble the fans following the above steps.



Remove AC and ON-GRID terminals

CAUTION!

1. Disconnect all electrical connections of the inverter.
2. Ensure that the inverter is powered off.
3. When operating the inverter, please wear personal protective equipment.



08 Troubleshootings

8.1 Error Message

The error message below will be displayed on SolarGo APP or reported by Email if the error really happens.

Error Message	Explanation	Reason	Solutions
Utility Loss	Public grid power is not available (power lost or on-grid connection fails)	Inverter does not detect the connection of grid	1. Check (use multi-meter) if AC side has voltage . Make sure grid power is available. 2. Make sure AC cables are connected tightly and well. 3. If all is well, please try to turn off AC breaker and turn on again in 5 mins.
VAC Failure	Grid voltage is not within permissible range	Inverter detects that AC voltage is beyond the normal range required by the safety country	1. Make sure safety country of the inverter is set right. 2. Check (use multi-meter) if the AC voltage (Between L & N) is within a normal range (also on AC breaker side) a. If the AC voltage is high, then make sure the AC cable complies with that required on user manual and the AC cable is not too long. b. If the voltage is low, make sure the AC cable is connected well and the jacket of the AC cable is not compressed into the AC terminal. 3. Make sure the grid voltage of your area is stable and within normal range.
FAC Failure	Grid frequency is not within permissible range	Inverter detects that the grid frequency is beyond the normal range required by the safety country	1. Make sure the safety country of the inverter is set right. 2. If safety country is right, then please check on the inverter display if AC frequency (Fac) is within a normal range. 3. If FAC failure only appears a few times and is resolved soon, it should be caused by occasional grid frequency unstability.
PV Over Voltage	PV voltage is too high	The total voltage (open-circuit voltage) of each PV string is higher than the max DC input voltage of the inverter.	Check if PV string Voc is lower than Max MPPT input voltage of the inverter.If Voc of PV string is high, please decrease panels to make sure Voc is within the max DC input voltage of the inverter.

Error Message	Explanation	Reason	Solutions
Over Temperature	Temperature inside of the inverter is too high	The inverter's working environment leads to a high temperature condition	1. Try to decrease surrounding temperature. 2. Make sure the installation complies with the instruction on inverter user manual. 3. Try to close the inverter for 15 mins, then start up again.
EEPROM R/W Failure	N/A	Caused by a strong external magnetic field etc.	Try to restart the inverter,check if it still occurs.If not,it is just an occasional situation.Otherwise, contact after-sales immediately.
SPI Failure	Internal communication failure	Caused by a strong external magnetic field etc.	Try to restart the inverter,check if it still occurs.If not,it is just an occasional situation.Otherwise, contact after-sales immediately.
DC Bus High	BUS voltage is over-high	N/A	Try to restart the inverter,check if it still occurs.If not,it is just an occasional situation.Otherwise, contact after-sales immediately.
Back-Up Over Load	Back-up side is over loaded	Total back-up load power is higher than the back-up nominal output power	Decrease back-up loads to make sure the total load power is lower than back-up nominal output power (please refer to page 24).
AC HCT Check Failure	The inverter's AC HCT check failure.	Inverter hardware current sensor failure.	Try to restart the inverter, check if it still occurs. If not, it is an occasional situation. Otherwise , contact after-sales immediately.
AFCI Fault	AFCI module detected a failure.	AFCI self-test is abnormal or an arc occurs on the PV terminal of the inverter.	1. If it is the first time this problem has occurred, clear arc fault by App and restart the inverter. If not, it means it is caused by an occasional situation. 2. If the problem persists, check whether connectors or cables in a PV system are improperly connected or are damaged. Unplug all the wires and reconnect or replace the damage cable, Then restart the inverter. If the fault still occurs, contact after-sales.
GFCI Device Check Failure	GFCI Device Check Failure	GFCI device failure	Try to restart the inverter. Check if the fault still occurs. If not, it means it is caused by an occasional situation, or contact after-sales.

Error Message	Explanation	Reason	Solutions
Isolation Failure	Ground insulation impedance of PV string is too low	Isolation failure could be caused by multiple reasons like that the PV panels are not grounded well, DC cable is broken, PV panels are aged or surrounding humidity is comparatively heavy, etc.	1. Use multi-meter to check if the resistance between earth & inverter frame is close to zero. If it's not, please ensure that the connection is well. 2. If the humidity is too high, isolation failure may occur. 3.Check the resistance between PV1+/ PV2+/PV3+/PV4/+BAT+/PV- to earth. If the resistance is lower than the minimum isolation resistance shown in the table(chapter 2.4.2) , check the system wiring connection. 4. Try to restart the inverter.Check if the fault still occurs. If not, it means it is caused by an occasional situation, or contact after-sales.
Ground I Failure	Ground leakage current is too high	Ground failure could be caused by multiple reasons like that the neutral cable on the AC side is not connected well or the surrounding humidity is comparatively heavy, etc.	1. Check whether the resistance of the PV string to PE exceeds 100kΩ. If no, check the short circuit point. 2. The ground fault alarm of the battery is included in the battery system. For detailed information, please refer to the battery user manual. 3. Check whether the PE cable is connected correctly. 4. 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.
Relay Check Failure	Self checking of relay failure	Neutral & ground cables are not connected well on AC side or just an occasional failure	Check (use multi-meter) if there is high voltage (normally should be lower than 10V) between N & PE cable on the AC side. If the voltage is higher than 10V, it means the Neutral & ground cable are not connected well on AC side or restart inverter.

Error Message	Explanation	Reason	Solutions
DC Injection High	N/A	The inverter detects a higher DC component in AC output	Try to restart the inverter,check if it still occurs.If not,it is just an occasional situation.Otherwise, contact after-sales immediately.
CT Connection Error	CT is incorrectly connected	CT is not tightened or is connected incorrectly	1. Cut power supply. 2. Check if CT1 and CT2 are in the correct position, CT1 needs to be stuck between load and power grid, pointing towards the grid. CT2 needs to be stuck at the output port of the PV inverter.

8.2 FAQ

NO.	Problems	Solutions
1	The inverter does not start up with battery only.	Make sure the voltage of battery is higher than 100V, otherwise battery cannot start inverter up.
2	The inverter not started up with PV only.	1. Make sure the voltage of PV is highter than 100V (need 200V to enter on-grid mode). 2. Make sure the connection between Inverter and PV panels: polarities are (+/-) not reversed.
3	The inverter doesn't discharge or output without PV or when PV is lower than load power.	1. To check whether the CT is installed correctly, Meter test can be performed in SolarGo. 2. Make sure load power is higher than 100W. • Battery will not discharge continuously unless load power is higher than 100W. • If battery does not discharge when Meter power is higher than 100W, please check CT connection and direction. 3. Make sure SOC (State of charge) is higher than 1-DOD (Depth of discharge). Or if battery discharges to below 1-DOD, battery will only discharge again when SOC charged to (20%+1-DOD)/2 (if the battery discharge is needed immediately, the user should restart battery). 4. Check on App whether the charge time has already been set, as during charge time, battery will not discharge (battery will charge in priority during coincident time of charge/discharge).
4	Battery does not charge when PV power higher than load power.	1. Check the discharge time setting on App. 2. Check if battery is fully charged or not, or if battery voltage reaches "charge voltage" or not.
5	High power fluctuation on battery charge or discharge.	1. Check if there is a fluctuation on load power. 2. Check if there is a fluctuation on PV power.
6	Battery does not charge.	1. Make sure BMS communication is OK on SolarGo App. 2. Check if CT is connected in the right position and connected to right direction .
7	Why cannot search Solar-WiFi signal on smart phone?	Normally Solar-WiFi signal could be searched right after inverter powered up. But Solar-WiFi signal will disappear when the inverter connected to internet. If need to change settings, can connect to the router to change. If cannot see WiFi signal even not connect to router, then please try to reload WiFi.
8	Why cannot connect Solar-WiFi signal on my phone?	It is the character of the WiFi module that it can connect to only one device at a time. If the signal is connected to another device at the time for some reason, then you cannot connect to the signal.

NO.	Problems	Solutions
9	Why battery does not discharge when grid is not available, while it discharges normally when grid is available?	On APP, Off-Grid output and Back-Up function should be turned on to make battery discharge under Off-Grid mode.
10	Why there is no output on Back-Up side?	For Back-Up supply, the “Back-Up Supply” on SolarGo App must be turned on. Under Off-Grid mode or grid power is disconnected, “Off-Grid Output Switch” function must be turned on as well. Note: As turn “Off-Grid Output Switch” on, don’t restart inverter or battery, otherwise the function will switch off automatically.
11	On Portal, why battery SOC has a sudden jump up to 95%?	This normally happens on when BMS communication fail on lithium. If battery enter float charge, SOC will be reset to 95% compulsively.
12	Why battery cannot be fully charged to 100%?	Battery will stop charge when battery voltage reaches charge voltage set on SolarGo APP.
13	Why battery switch always trip when starts it up (Lithium battery)?	The switch of lithium battery normally trips for following reasons: 1. BMS communication fails. 2. Battery SOC is too low, battery trips to protect itself. 3. An electrical short-cut happened on battery connection side. Or other reasons please contact the Service Center for details.
14	Which battery should I use for the hybrid inverter?	For the inverter, it could connect lithium batteries which have compatibility with the inverter with nominal voltage from 80V to 495V. Compatible lithium batteries can see on battery list in SolarGo App.
15	Why Cannot save settings on SolarGo App.	This could be caused by losing connection to Solar-WiFi . 1.Make sure you connected Solar-WiFi (make sure no other devices connected) or router (if connected Solar-WiFi* to router) and on APP home page shows connection well. 2.Make sure restart inverter 10mins later after you do some settings because inverter will save settings every 10 mins under normal mode. We recommend you change setting parameters when inverter under waiting mode.
16	On the App, why the data on the homepage and Param page is different, like charge/discharge, PV value, load value or grid value?	As the data on APP is from inverter and on home page and Param page, the data refresh frequency is different, so there will be a data inconformity between different pages on APP as well as between that on portal and APP.
17	On App, some columns show NA, like battery SOH, etc. why is that?	NA means App does not receive data from inverter or server, normally it is because communication problem, such as battery communication, and communication between inverter and the APP.

NO.	Problems	Solutions
18	How to Act Output Power Limit function?	For the hybrid inverter system, the function could be realized by: 1. Make sure Smart Meter connection and communication well. 2. Turn on Export Power Limit function and set the max output power to grid on APP. Note: If out-put power limit set as 0W,then there might still have deviation max 100W exporting to grid.
19	Why there is still power exporting to grid after I set power limit as 0W?	Export limit could theoretically to minimum 0W, but there will have a deviation of around 100W for the hybrid inverter system.
20	Can I use other brand Meter to take over Smart Meter in the hybrid inverter system or change some settings on Smart Meter?	No, because the communication protocol is inset between inverter and Smart Meter, other brand Meter cannot communicate. Also any manual setting change could cause Meter communication failure.
21	What is the max current allowed going through CT on Smart Meter?	The max current for CT is 120A.
22	Is there a quick way to make the system work?	The shortest way, please refer to EHB Series Quick Installation Guide.
23	Whether the warranty of the inverter still valid if the installation or operation does not follow the user manual instructions, for some special conditions when we cannot 100% follow them?	Normally if any problem caused by disobeys the instructions on user manual, we can provide technical support to help to solve the problem, but cannot guarantee a replacement or returns. So if there is any special conditions when you cannot 100% follow the instructions, please contact the Service Center for suggestions.
24	The PV inverter in a micro grid system has no output power.	1. Confirm that Inverter outputs normal AC voltage. 2. Confirm whether the PV inverter has the anti-reverse function turned on. Once it is turned on, there may be no power output. You can temporarily turn off the anti-reverse function at this time, and turn off this function after the utility grid is restored.
25	In off-grid mode, if the PV energy is sufficient but the battery SOC is low and the Inverter cannot output AC volteage,what should I do?	Turn off the household load below 200W, turn on the microgrid forced wakeup function on APP, and wait for the PV inverter to work to charge the battery.

If there's any problem cannot be solved by the above solutions, contact the Service Center for help.

09 Technical Parameters and Certificates

Technical Data	GW5K-EHB-AU-G11	GW8.6K-EHB-AU-G11	GW9.99K-EHB-AU-G11[*6]
Battery Input Data			
Battery Type	Li-Ion (BYD HVM&HVS, LG RESU 10H-Type R&Prime, GOODWE LX F&LX F G2)		
Nominal battery voltage (V)	350	350	350
Battery Voltage Range (V) [*1*9]	80~495		
Number of Battery Input	1		
Max. Continuous Charging Current (A)	50		
Max. Continuous Discharging Current (A)	50		
Max Charge Power (W)	5,000	8,600	10,000
Max Discharge Power (W)	5,250	9,030	10,500
PV String Input Data			
Max. Input Power (W)*[8]	10,000	17,200	20,000
Max. Input Voltage (V)*[2]	600		
MPPT Operating Voltage Range (V)[*3]	80~550		
MPPT Voltage Range at Nominal Power (V)	160~550	180~550	200~550
Start-up Voltage (V)	95		
Nominal Input Voltage (V)	380		
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
No. of MPP Trackers	3	4	4
No. of Strings per MPPT	1	1	1
AC Output Data (On-grid)			
Nominal Output Voltage (Vac)	230		
Output Voltage Range (V)	0~300		
Nominal AC Grid Frequency (Hz)	50		

Technical Data	GW5K-EHB-AU-G11	GW8.6K-EHB-AU-G11	GW9.99K-EHB-AU-G11[*6]
AC Grid Frequency Range (Hz)	45~55		
Nominal Output Power (VA)	5,000	8,600	9,990
Nominal Apparent Power Output to Utility Grid (VA)	5,000	8,600	9,990
Max. Apparent Power Output to Grid (VA)[*4]	5,000	8,600	9,990
Nominal Apparent Power from Utility Grid (VA)	5,000	8,600	9,990
Max. Apparent Power from Utility Grid (VA)	5,750	11,500	11,500
Max. AC Current Output to Utility Grid (A)	21.7	37.4	43.4
Max. AC Current From Utility Grid (A)	25	50	50
Max. Output Fault Current(peak and duration) (A)	60(@10us)	105(@10us)	105(@10us)
Inrush Current(peak and duration) (A)	60(@10us)	105(@10us)	105(@10us)
Nominal Output Current (A)	21.7	37.4	43.4
Maximum Output Overcurrent Protection (A)	56.5	95.0	95.0
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
Max. Total Harmonic Distortion	<3%		
AC Output Data (Back-up)			
Nominal Output Voltage (V) (Vac)	230 (±2%)		
Nominal Output Frequency (Hz)	50 (±0.2%)		
Output THDv (@Linear Load)	<3%		
Nominal Apparent Power (VA)	5,000	8,600	9990
Max. Output Apparent Power (VA) [*4]	5,250	9,030	10,500
Max. Output Apparent Power with Grid (VA)[*10]	5,750	11,500	11,500
Nominal Output Current (A)	21.7	37.4	43.4
Max. Output Current (A)	22.8	39.3	45.7
Max. Output Current with Grid (A)[*10]	25	50	50

Technical Data	GW5K-EHB-AU-G11	GW8.6K-EHB-AU-G11	GW9.99K-EHB-AU-G11[*6]
Max. Output Fault Current(peak and duration) (A)	60(@10us)	105(@10us)	105(@10us)
Inrush Current(peak and duration) (A)	60(@10us)	105(@10us)	105(@10us)
Maximum output overcurrent protection (A)	56.5	95.0	95.0
Efficiency			
Max. Efficiency	97.6%		
CEC Efficiency	97.0%		
European Efficiency	97.0%		
Max. Battery to AC Efficiency	96.5%		
MPPT Efficiency	99.9%		
Protection			
PV Insulation Resistance Detection	Integrated		
Residual Current Monitoring	Integrated		
PV Reverse Polarity Protection	Integrated		
Battery Reverse Polarity Protection	Integrated		
Anti-islanding Protection	Integrated		
AC Over Current Protection	Integrated		
AC Short Circuit Protection	Integrated		
AC Over Voltage Protection	Integrated		
DC Switch	Integrated		
AC Switch	Integrated		
DC Surge Protection	Type II		
AC Surge Protection	Type II		
AFCI	Optional		
Rapid Shutdown	Optional		
General Data			
Operating Temperature Range(°C)	-35~+60		
Operating Environment	Outdoor		
Relative Humidity	0~95%		
Operating Altitude (m)	4000		

Technical Data	GW5K-EHB-AU-G11	GW8.6K-EHB-AU-G11	GW9.99K-EHB-AU-G11[*6]
Cooling	Smart Fan Cooling		
Noise Emission(dB)	≤40		
User Interface	LED, WLAN+APP		
Communication with BMS	RS485, CAN		
Communication with Meter	RS485		
Communication with Portal	WiFi, LAN, 4G		
Weight	29.5	33	33
Dimension (Width*Height*Depth mm)	415 * 791 * 180		
Mounting	Wall Mounted		
Protection Degree	IP65		
Self Consumption at Night (W)[*5]	<20		
Topology	Non-isolated		
DC Connector	MC4		
AC Connector	ADAPTER WIELAND		
Protective class	I		
Environmental Category	4K4H		
Storage Environments(°C)	-40~+85°C		
Pollution Degree	III		
Overvoltage Category	DC II / AC III		
The Decisive Voltage Class (DVC)	Battery: C PV: C AC: C Com: A		
Active anti-islanding method	AFDPF+ AQDPF[*7]		
Type of electrical supply system	Single phase TN/TT system		
Country of Manufacture	China		
Certifications & Standards			
Grid Standards	AS/NZS 4777.2; ABNT NBR 16149:2013 ABNT NBR 16150:2013 ABNT NBR IEC 62116:2012; EN50549-1, IEC61727, IEC62116		
Safety Regulation	IEC62109-1&-2		

Technical Data	GW5K-EHB-AU-G11	GW8.6K-EHB-AU-G11	GW9.99K-EHB-AU-G11*6
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12		

*1: Battery discharge/charge power limited by voltage.
*2: Inverter will not work when PV input voltage ≥585V.
*3: When there is no battery connected, inverter starts feeding in only if string voltage is higher than 200V.
*4: Can be reached only if PV and battery power is enough.
*5: No Back-up Output.
*6: The model name does not represent the rated power, please refer to the marked parameters for details.
*7: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
*8: The system will fully use total 150% PV energy to charge battery and turn to AC.
*9: When EHB is in microgrid application, the maximum battery voltage is 405V.
*10: “With girid”means backup output under bypass application

10 Appendix

Other Tests
For Australian requirements, in the THDi test, Zref should be added between the inverter and mains.
RA, XA for the line conductor
RN, XN for the neutral conductor
Zref:
RA = 0, 24, XA = j0,15 at 50Hz
RN = 0, 16, XN = j0,10 at 50Hz

Protection category definition

Moisture location category definition

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

Environment category definition

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

Overvoltage category definition

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

Pollution degree definition

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

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