

Hybrid Inverter

Single Phase Hybrid Inverter GEN2

User Manual



SHE-3.6kW

SHE-4.6kW

SHE-5kW

SHE-6kW

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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 here are for guidance only.

CHANGE HISTORY

Changes between documents are cumulative. The latest document contains all the updates made in previous versions.

- V1.0 2026-2-10: First Issue.

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1 NOTE ON THIS MANUAL

1.1 Applicable Model

This manual applies to the listed system models below:

Single Phase Hybrid Inverter GEN2:

- SHE-3.6kW
- SHE-4.6kW
- SHE-5kW
- SHE-6kW

It describes the information, installation, electrical connection, commissioning, and maintenance and troubleshooting of the product. Please read it carefully before operating.

1.2 Target Group

This manual applies to qualified electricians. The qualified electricians have to be familiar with the product, local standards, and electric systems. The tasks described in this manual should only be performed by qualified electricians.

1.3 Symbols in the Manual

Important instructions contained in this manual should be followed during installation, operation and maintenance.



DANGER

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



WARNING

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



CAUTION

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



NOTICE

Indicates a situation that, if not avoided, could result in equipment or property damage.

1.4 Explanation of Labels

The follow types of warning and safety symbols appearing on the product are

described below:



Caution

Failing to observe warnings indicated in this manual may result in injury.



Danger to life due to electric shock

The product operates at high voltages. All work on the product must be carried out by qualified persons only.



Risk of burns due to hot surfaces

The product can get hot during operation. Avoid contact during operation. Allow the product to cool down sufficiently before carrying out any work.



Heavy objects. Life with care.



Keep the battery from open fire or ignition sources.



Recyclable product components.



This side up. The package must always be transported, handled, and stored upright, with the arrows pointing upwards.



Do not stack more than five identical packages on top of each other.

WEEE designation



Do not dispose of the product together with the household waste but in accordance with the locally applicable disposal regulations for electronic waste.



Handle the package/product with care, and do not tip it over or throw it.



Observe the documentation

Observe all documentation supplied with the product.



Keep dry

The package/product must be protected from excessive humidity and stored covered.



Wait at least 5 minutes after turning off the inverter before touching or using it to prevent electrical shocks or injuries.



CE mark of conformity

The product complies with the requirements of the applicable EU

directives.

2 SAFETY



WARNING

Please strictly follow these important instructions in the manual and the label on the products during the Installation, communication, operation and maintenance. Incorrect operation or work may cause:

- Injury or death to the operator or a third party.
- Damage to the product and other properties

The safety instructions in this manual are only supplements and cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions. When installing, operating, and maintaining the product, comply with local laws and regulations. The safety precautions in this manual are only supplements to local laws and regulations.



NOTICE

WHES shall not be held liable for any damage caused by violation of general safety operation requirements, general safety standards, or any safety instruction in this manual.

Operations on the product, including but not limited to, handling, installing, wiring, powering on, maintenance, and use of the product, must not be performed by unqualified personnel. WHES shall not be held liable for any damage to the product resulting from operations done by unqualified personnel.

2.1 Safety Instructions

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

- The hybrid inverter must only be installed or operated by qualified electricians in compliance with local grid or power company standards, wiring rules, and requirements.
- Disconnect all batteries and AC power sources from the hybrid inverter for at least 5 minutes before connecting any wires or conducting any electrical work to ensure the inverter is totally isolated and to avoid electric shocks.
- The surface of the hybrid inverter may exceed temperatures of 60°C during operation. Please make sure the inverter has cooled down before touching it, and make sure that the hybrid inverter is out of the reach of children.
- The hybrid inverter must be used and operated as described in this user

manual, or safety features may not work as intended, and the warranty for the hybrid inverter will be voided.

- Your hybrid inverter warranty will be voided if you open the hybrid inverter cover or change any component without WHES's authorization.
- Care must be taken to protect the inverter from static damage. The WHES Limited Warranty does not cover any damage caused by static.
- This hybrid inverter features a built-in residual current device (RCMU).
- If the external RCD must be installed according to the local regulations, a type A RCD of action current 30mA or higher is sufficient. If local regulations explicitly require a type B RCD, a type B RCD shall be installed.
- This hybrid inverter features active anti-islanding protection, and inverter frequency is shifted away from nominal conditions in the absence of a reference frequency (frequency shift).
- This hybrid inverter is a multimode inverter designed to be used in unconditioned outdoor shaded environments. The maximum operating ambient temperature is 60°C.
- An error message will be sent to the ECOS app in the event of a ground fault, and the status indicator on the product will turn red.

3 INTRODUCTION

3.1 Product Overview

Single Phase Hybrid Inverter GEN2 is a high-quality hybrid inverter which can convert solar energy to AC energy and store energy into battery. The hybrid inverter can be used to optimize self-consumption, store in the battery for future use or feed-in to public grid. Work mode depends on PV energy and user's preference. It can provide power for emergency use during the grid lost by using the energy from battery and hybrid inverter (generated from PV).

This manual contains important instructions for Single Phase Hybrid Inverter GEN2 that should be followed during installation and maintenance.

This manual applies to the listed system models below:

Single Phase Hybrid Inverter GEN2:



- SHE-3.6kW
- SHE-4.6kW
- SHE-5kW
- SHE-6kW

Model description

SHE-6kW

1 2 3

No.	Referring to	Description
1	Equipmet Type	SH: Single Phase Hybrid
2	Version Code	E: Second version
3	Rated Power	6kW: the rated power is 6kW

3.2 Features

Powerful:

- Supports 2 times PV over-sizing access.
- Ultra-wide MPPT voltage range captures every ray of light from dawn to dusk,

maximizing energy collection.

- Supports 2 times rated output power @10s when off-grid.

Safe:

- Supports AFCI and RSD for enhanced system safety.

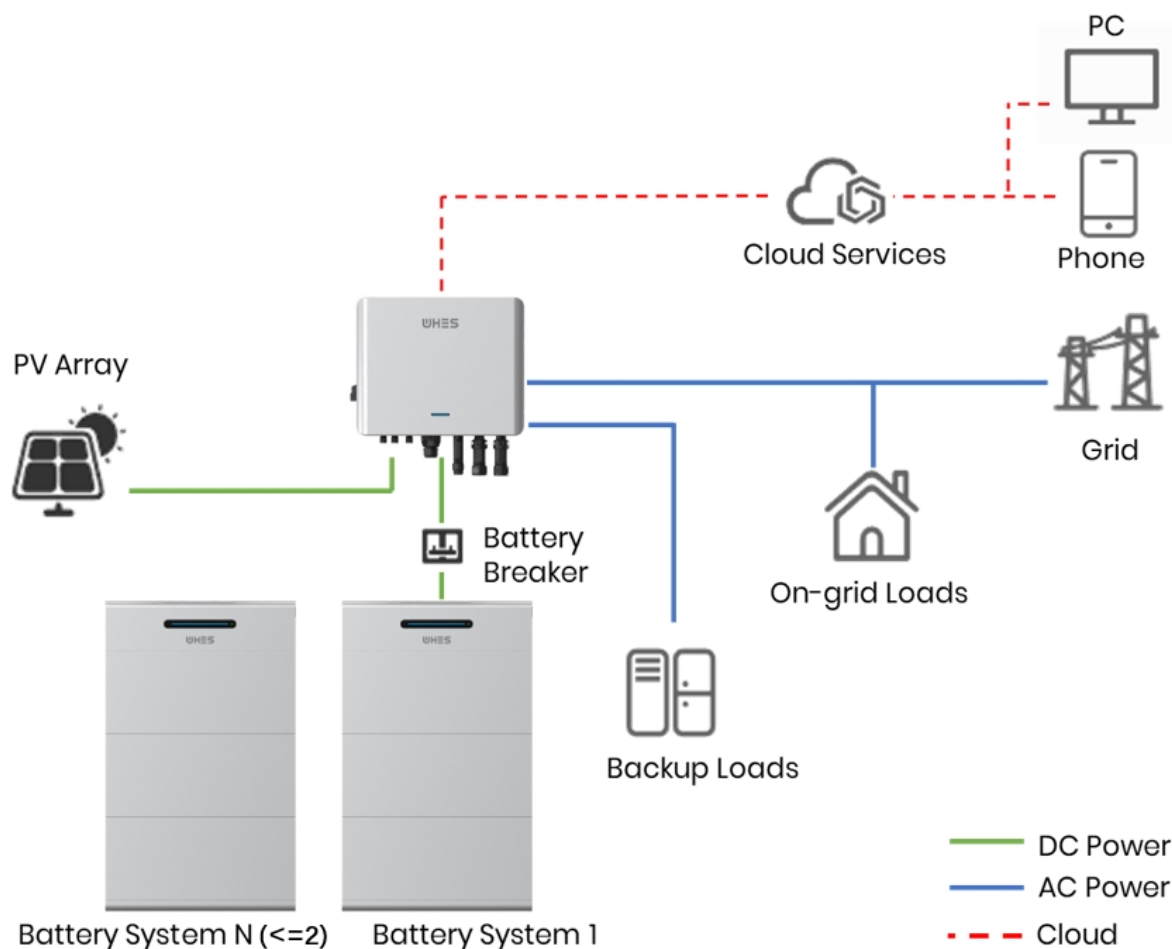
Smart:

- Optimizes battery usage based on dynamic tariffs, maximizing self-consumption and energy cost savings.
- Enable seamless integration with VPP operators across the world.
- Work within HEMS ecosystems, coordinating with EV chargers, heat pumps, diesel generators and other distributed energy assets.

Friendly:

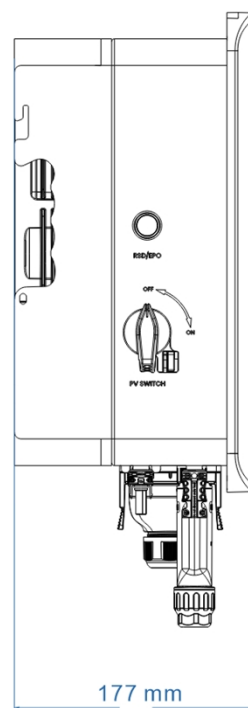
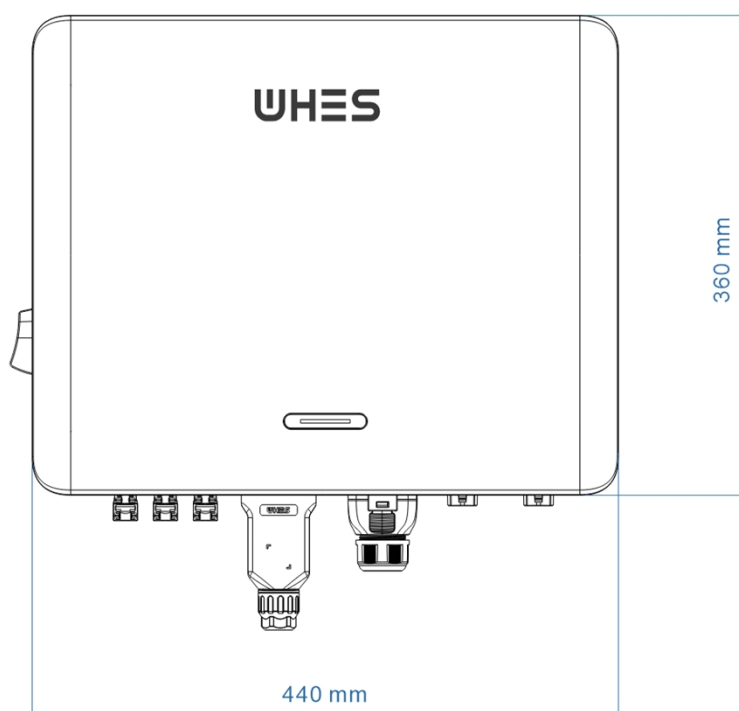
- IP66, indoor or outdoor application.
- < 25dB, no noise pollution.

3.3 Application Scenarios



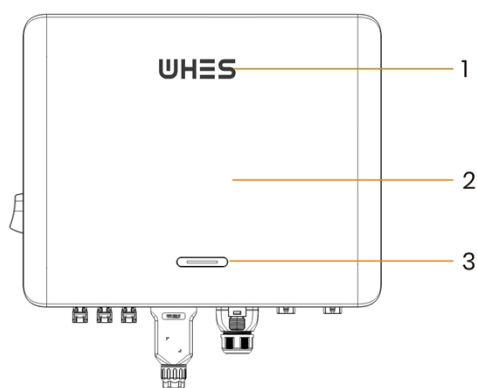
- Please refer to WHES Approved Battery Options Statement. Only batteries listed officially are allowed to be connected to Single Phase Hybrid Inverter GEN2.
- To achieve optimal performance on the battery side, the Battery Box (DC/DC Series) is recommended.

3.4 Dimensions



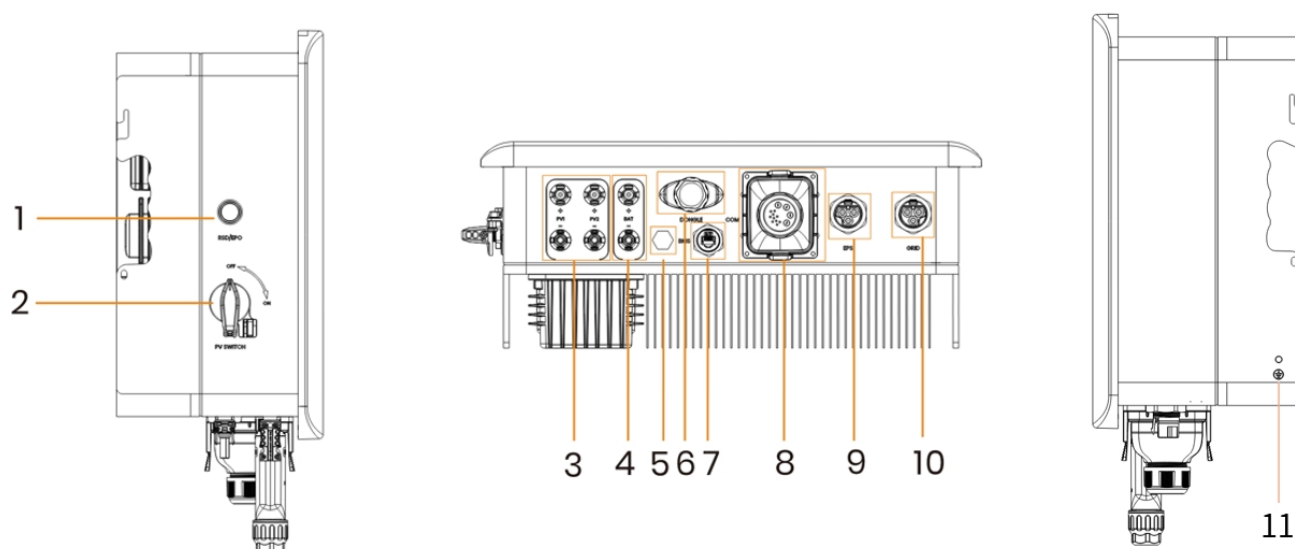
3.5 Indicator Status and Communication Port

- Hybrid Inverter appearance



NO.	Parts
1	Logo
2	Hybrid Inverter
3	Indicator light

- Ports definition



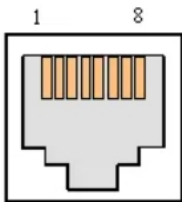
No.	Name	Definition	Decisive voltage class
1	RSD/EPO	PV/AC emergency shutdown	-
2	PV SWITCH	Disconnect the PV DCinput when necessary.	-
3	PV connectors	PV DC connection to the inverter	DVC-C
4	Battery connectors	Battery DC connection to the inverter	DVC-C
5	Vent valve	Pressure equalization and anti-condensation	-
6	Dongle	Monitoring of the system on ECOS	DVC-A
7	BMS terminal	Communication between the inverter and the battery	DVC-A
8	Communication terminal	Inverter communication with meter and other HEMS	DVC-A
9	EPS connector	Inverter AC connection to the backup subpanel	DVC-C
10	Grid connector	Inverter AC connection to the distribution box	DVC-C
11	Grounding hole	Grounding conductors for the system	-

● LED Indicator

Status	LED Indicator	
Standby		Flashing blue LED, 2-second intervals
Checking		Flashing blue LED, 0.5-second intervals
Normal		Solid blue LED

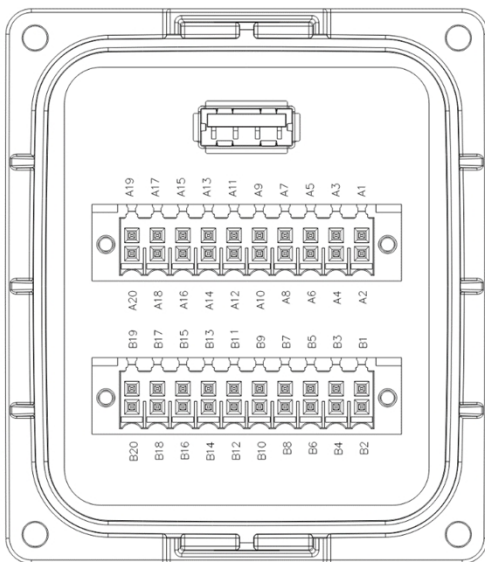
DSP fault		Solid red LED
Battery COM fault		Flashing red LED, 2-second intervals
Meter COM fault		Flashing red LED, 0.5-second intervals
Copying files		Flashing magenta LED, 0.5-second intervals
Program update		Flashing red and blue (alternating) LED, 1-second intervals

- BMS RJ45 Socket



Pin	Definition
1	RS485A
2	RS485B
3	CANL
4	CANH
5	GND
6	Undefined
7	GND
8	GND

- COM definitions



Pin	Definition	Pin	Definition
A1	M_485A	B1	RSD+
A2	M_485B	B2	RSD-
A3	COM_485A	B3	RLY1_O
A4	COM_485B	B4	RLY1_O
A5	PAR_485A	B5	RLY2_O
A6	PAR_485B	B6	RLY2_O
A7	D_CANH	B7	RLY3_O
A8	D_CANL	B8	RLY3_O
A9	CAN_120Ω	B9	IN1+
A10	CAN_120Ω	B10	IN1-
A11	SYNC1	B11	IN2+
A12	GND_COM	B12	IN2-
A13	D_485A	B13	CT1-
A14	D_485B	B14	CT1+
A15	COM/DRM0	B15	CT2-
A16	REFGEN	B16	CT2+
A17	DRM1/5	B17	+12V_COM
A18	DRM2/6	B18	GND_COM

A19	DRM3/7	B19	+5V_COM
A20	DRM4/8	B20	GND_COM

3.6 Product identity definition

Hybrid inverter nameplate:

WHES	
Hybrid Inverter	
Model	SHE-3.8kW
PV INPUT	
Max PV input power	7380 W
Max input voltage	600 Vd.c.
MPPT voltage range	40...560 Vd.c.
Max input current	21 A.d.c.*2
Isc PV	26 A.d.c.*2
BATTERY	
Battery type	LFP
Battery voltage range	80...500 Vd.c.
Max (Rated) charge/discharge current	35/35 A.d.c.
AC GRID	
Nominal voltage	1/N/PE 220/230/240 Vac.
Nominal frequency	50/60 Hz
Nominal output power	3680 W
Max (Rated) apparent output power	3680 VA
Max (Rated) output current	16 A.d.c.
Max (Rated) input power	7380 VA
Max (Rated) input current	32 A.d.c.
Power factor range	1(-0.8...+0.8 adjustable)
EPS	
Nominal voltage	1/N/PE 220/230/240 Vac.
Nominal frequency	50/60 Hz
Max (Rated) apparent output power	3680 VA
Max (Rated) output current	16 A.d.c.
Power factor range	1(-0.8...+0.8 adjustable)
OTHERS	
Ingress protection	IP66
Operation temperature range	-35...+60 °C
Inverter topology	Non-isolated
Over voltage category	III (AC), II (DC)
Protective class	Class I
DRM0 DRM1 DRM2 DRM3 DRM4 DRM5 DRM6 DRM7 DRM8	
☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	
         	
Weiheng Intelligent Technology Co., Ltd. Address: Sheng Xiang, Yaxi Community, Luoshe Town, Huishan District, 214000, Wuxi City, Jiangsu Province www.whes.com Made in China	

3.7 Technical Data

Model	SHE-3.6KW	SHE-4.6KW	SHE-5KW	SHE-6KW
PV Input				
Max. PV Input Power	7360 Wp	9200 Wp	10000 Wp	12000 Wp
Max. Input Voltage	600 V			
Rated Input Voltage	360 V			
Start-up Voltage ¹	50 V			
MPPT Voltage Range	40~560 V			
Max. Input Current	42 A (21 A * 2)			
Max. Input Short Circuit Current	52 A (26 A * 2)			
No. of MPPT	2			
No. of PV Strings per MPPT	1			
Max. inverter backfeed current to the array	0A			
General Data				
Battery Type	LFP			
Battery Voltage Range	80...500 V			
Max. Charging/Discharging Current	35A / 35 A			
No. of Battery Input	1			
AC Input/Output				
Rated Input/Output Power	7.36 kW / 3.68 kW	9.2 kW / 4.6 kW	10 kW / 5 kW	12 kW / 6 kW
Max. Apparent Input/Output Power	7.36 kVA / 3.68 kVA	9.2 kVA / 4.6 kVA	10 kVA / 5 kVA	12 kVA / 6 kVA
Rated Input / Output Current	32 A / 16 A	40 A / 20 A	43.5 A / 21.8 A	52.2 A / 26.1 A
Max. Input / Output Current	32 A / 16 A	40 A / 20 A	43.5 A / 21.8 A	52.2 A / 26.1 A
Inrush current	8 A peak, 3.6 ms			
Maximum output fault current	78.3 A peak, 0.02 ms			
Maximum output overcurrent protection	116 A peak,			
Rated Output Voltage	220/230/240 V, L/N/PE			
Rated Frequency	50/60 Hz			
Power Factor	1 (−0.8...+0.8 adjustable)			
EPS Output				
Rated Output Power ²	3.68 kW	4.6 kW	5 kW	6 kW
Peak Apparent Output Power	2times @ 60s			
Rated Output Voltage	220/230/240 V, L/N/PE			
Rated Output Current	16 A	20A	21.8A	26.1A
Rated Frequency	50/60 Hz			
Back-up Switch Time	<10 ms			
Power Factor	1 (−0.8...+0.8 adjustable)			
Total Harmonic Distortion (THDi)	<2%			
Efficiency				
PV Max. Efficiency	98%			
PV Europe Efficiency	97.3%			
Protection				
AFCI (optional), RSD (optional), Over/Under Voltage Protection, DC Isolation Protection, DC Injection Monitoring				

	Residual Current Detection, Active anti-islanding method(Frequency Shift), Over Load Protection, Battery Input Reverse Polarity Protection, PV Reverse Polarity Protection, Surge Protection, Over Heat Protection
General Data	
Topology	Non-isolated
Dimensions (W*D*H)	440*177*360
Weight	18 kg
Operating Temperature Range	-35°C...60 °C
Relative Humidity	0%-100%
Altitude	4000m (derating@3000 m)
Cooling	Natural Convection
Protective class	Class I
Noise	< 25 dB
Standby Power Consumption	< 10 W
Ingress Protection	IP 66
Display	LED / APP
Communication	RS485, CAN, DI/DO, Dry Contact
Installation	Wall-mounted
Standard ³	IEC 62019, IEC 61000, AS/NZS 4777.2, EN 50549-1/-10, G98/G99, CEI 0-21

PV Switch:

Model: PEDS150H-HM63R-3F

Manufacturer: PROJOY

- (i) rated insulation voltage: 1500V
- (ii) rated impulse withstand voltage: 8000V
- (iii) suitability for isolation: D.C. Isolator
- (iv) rated operational current: 63A
- (v) utilization category and/or PV utilization category: DC-PV2
- (vi) rated short-time withstand current I_{cw} : 780A
- (vii) rated short-circuit making capacity I_{cm} : 1200A
- (viii) rated breaking capacity: 252A

*1 With battery.

*2 Depends on the input power of the photovoltaic and batteries.

*3 For all standards refer to the certificates category on the WHES website.

AFCI Protection circuitry and Controls

SHE series offers AFCI as an optional feature to meet relevant codes and standards. Arc Fault Circuit interrupter AFCI: The arc-fault circuit interrupter (AFCI) integrated into WHES's inverters identifies genuine DC arcs by targeting a specific medium-frequency band. Once AFCI is activated in an inverter, the PV system continuously monitors for electrical arcs. If any current signature characteristic of an arc fault is detected, the inverter immediately stops the feed in operation. After each power restoration following a power outage, the device will automatically perform a self-test prior to operation. If manual restart is selected: After detecting an arc fault, the inverter will not restart until the fault is manually cleared. If automatic restart is selected: After detecting an arc fault, the inverter will restart with a minimum delay of 5 minutes.

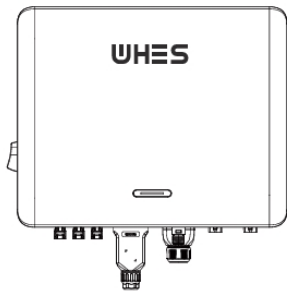
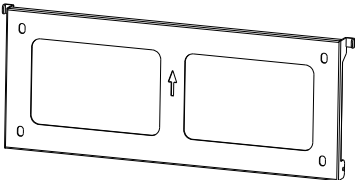
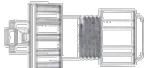
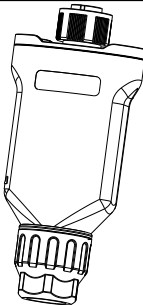
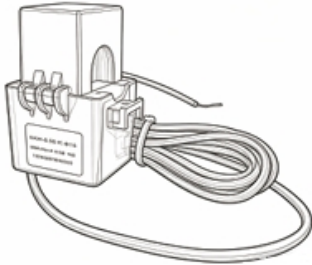
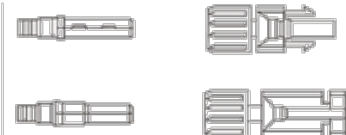
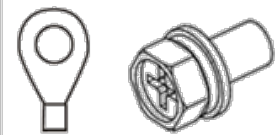
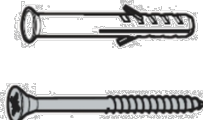
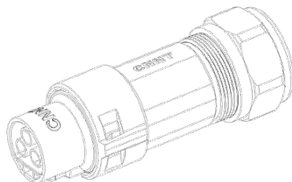
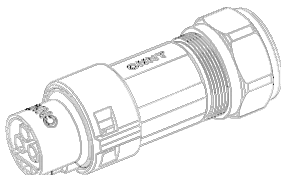
If arc fault interruptions are triggered 5 times within a 24-hour period, the inverter may only be reset manually.

The ARC function is in accordance with the IEC 63027 standard, and the product category is: (3.6-6kW): F-I-AFPE-1-2-1

- - Full coverage
- - Integrated
- - AFPE
- -1 monitored string per input port
- -2 input ports per channel
- -1 monitored channel

4 INSTALLATION

4.1 Packing List

Hybrid Inverter		
		
1 x Hybrid Inverter	1 x Backplane	1 x RJ45 Connector
		
1 x Wi-Fi Module	1 x CT (15m)	2x Positive PV Connector 2x Positive PV Connector
		
1 x Positive DC Connector 1 x Positive DC Connector	1 x OT5-5 Terminal 2x M4*14 Hexagonal Screws	4x $\Phi 10*60$ Expansion Bolts
		

1 × EPS Connector	1 × GRID Connector	1 × GND Number Tube
		
1 x Quick Installation Guide	1 x Quality Certificate	1 x Warranty Card

ⓘ: DC Connectors brand is Stäubli. Positive connector model is PV-KBT4-EVO ST/10X, Negative connector model is PV-KST4-EVO ST/10X.

4.2 Installation Location and Environment

4.2.1 General

Install the equipment on a surface that is solid enough to bear the product weight. Please evaluate the load-bearing capacity. The installation location should be well-ventilated and away from flammable or explosive materials.

The hybrid inverter is rated for outdoor installation and can be installed both indoors and outdoors. The hybrid inverter is naturally ventilated. The installation location must be clean, dry, and adequately ventilated. Enough space should be left for unrestricted access to the unit for installation and maintenance purposes, and the system panels should not be obstructed.

The hybrid inverter should not be installed in the following locations:

- ◆ Habitable rooms;
- ◆ Ceiling or wall cavities;
- ◆ On roofs not suited for the purpose;
- ◆ Access/exit areas or under stairs/access passages;
- ◆ Places where freezing temperatures can occur, such as garages, carports, or other places such as wet rooms;
- ◆ Humid or salty environments;
- ◆ Seismic-prone areas—additional safety measures are needed;
- ◆ Sites higher than 2000 meters above sea level;

- ◆ Explosive atmospheres;
- ◆ In direct sunlight or places susceptible to significant changes in ambient temperature.

4.2.2 Location Restrictions

The hybrid inverter should not be installed:

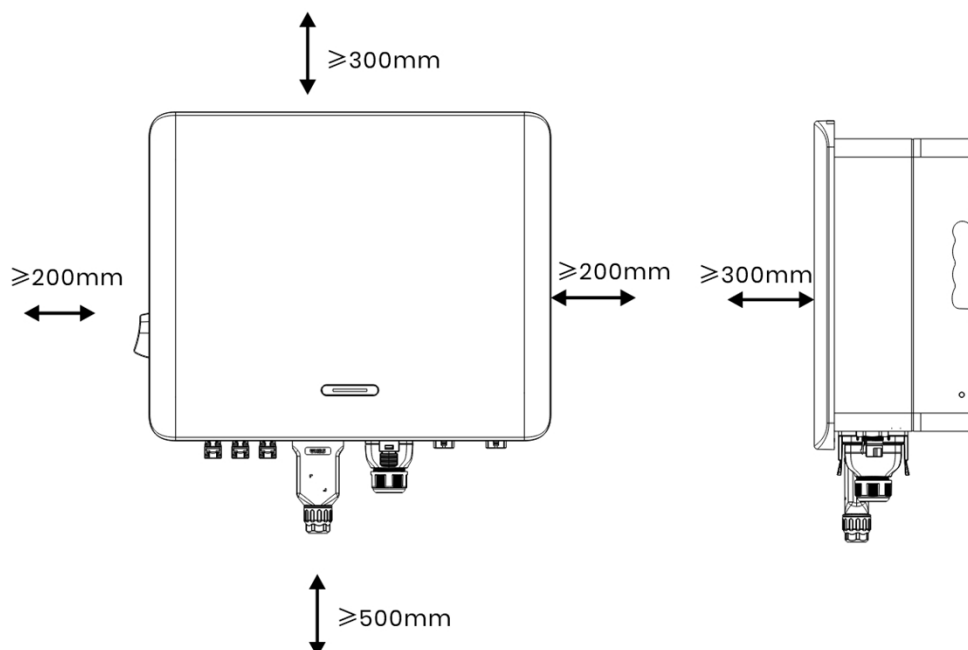
- (1) Within 600 mm of any heat source, such as hot water units, gas heaters, air conditioning units, or any other similar appliances;
- (2) Within 600 mm of any exit;
- (3) Within 600 mm of any window or ventilation opening;
- (4) Within 900 mm of access to 120/240 VAC connections;
- (5) Within 600 mm of the side of any other device.

Leave at least 1 meter of clearance between the battery box and any emergency exits when installing the device in corridors, lobbies, or hallways to ensure a safe exit.

4.2.3 Barriers to Habitable Rooms

Ensure a suitable non-combustible barrier is set up between the hybrid inverter and any installation walls or structures when installing the hybrid inverter on a wall or structure connected to a living space to protect against the spread of fire to living spaces. A non-combustible barrier should be installed between the hybrid inverter and the surface of the wall or structure it is being mounted to if the surface itself is not made out of a suitable non-combustible material. Increase the distance between the hybrid inverter and any other nearby structures or objects if there is less than 30 mm between the hybrid inverter and the wall or structure separating it from living spaces.

The following spaces around the hybrid inverter must remain empty:



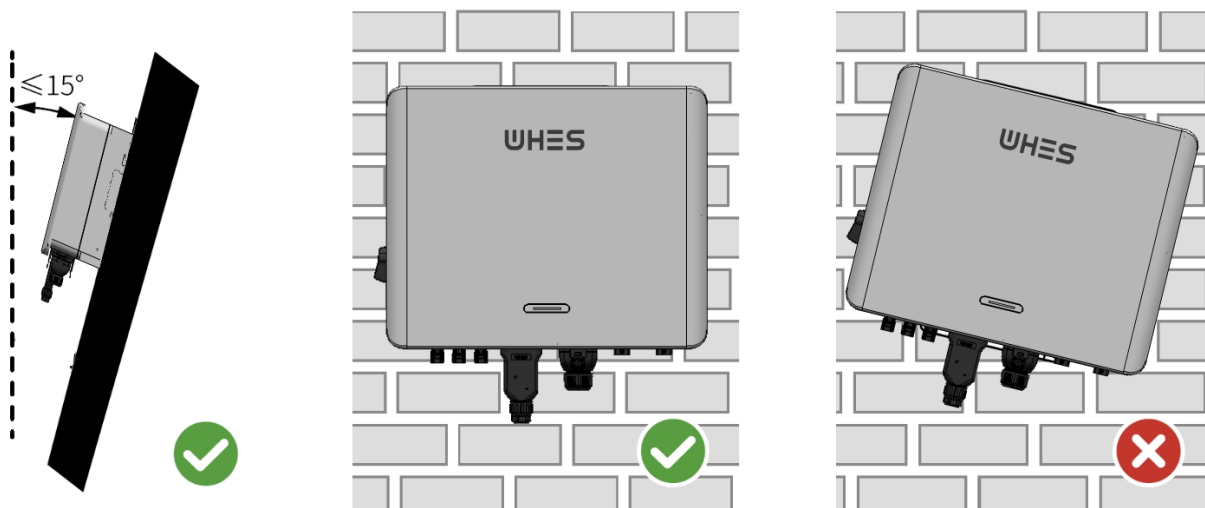
4.2.4 Choosing an Installation Location



NOTICE

Carefully select an appropriate installation location based on the following rules to protect the hybrid inverter and facilitate maintenance.

Rule 1. Do not install the system at forward tilted, back tilted, side tilted, horizontal, or upside down positions.

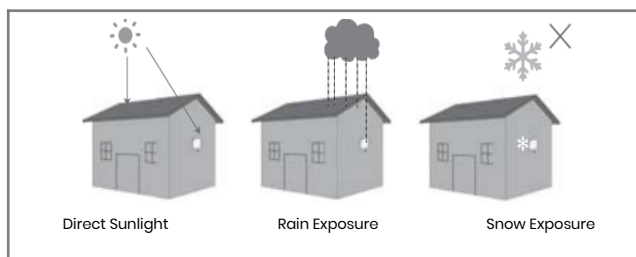
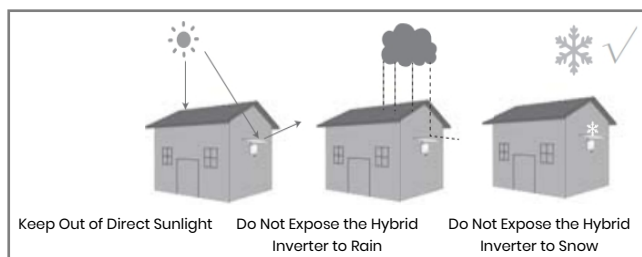


Rule 2. Install the system on a solid brick-concrete structure or concrete wall or floor. If other types of walls and floors are used, they must be made of fire-retardant materials and meet the load-bearing requirements of the equipment.

Rule 3. During installation, ensure that there is no other equipment (except related Weiheng equipment and awnings) or flammable or explosive materials around the system. Reserve sufficient clearances for heat dissipation and safety isolation.

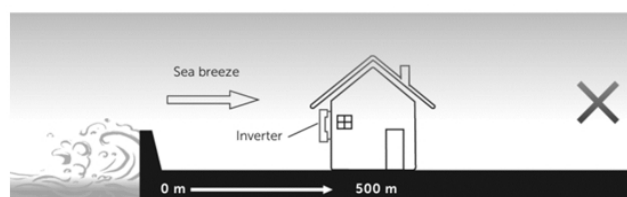
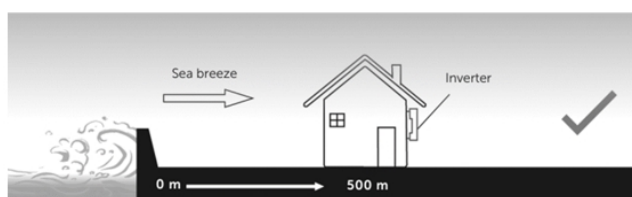
Rule 4. The temperature and humidity at the installation site should be within the appropriate range.

Rule 5. The system installation location should be protected from direct sunlight or bad weather like snow, rain, or lightning.



Rule 6. Installing the system at eye level will make maintenance more convenient.

Rule 7. Install the system at least 500 meters away from the coast and avoid sea breeze directly hit.



Rule 8. The product label should be clearly visible after installation.

Rule 9. Do not install the system in the snow or rain. If installation in the snow or rain is unavoidable, ensure the system and distribution box are protected and kept dry.

Install the system away from strong magnetic fields to avoid electromagnetic interference. When installing the system next to radio or wireless communication equipment operating below 30 MHz: 1. Install the system at least 30m away from the wireless equipment. 2. Attach a low-pass EMI filter or a multi-winding ferrite core to the system DC input cable or AC output cable.

4.2.5 Installation Steps

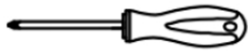


WARNING

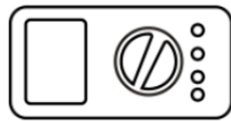
The system must not be installed near flammable or explosive materials or near equipment with strong electromagnetic fields.

The system should only be installed on concrete or other non-combustible surfaces.

Installation Tools:



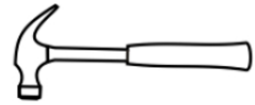
Screwdriver



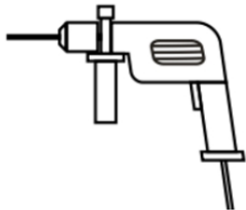
Multimeter



Wire stripper



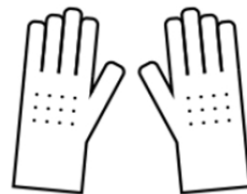
Claw hammer



Hammer drill



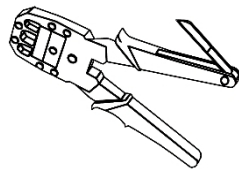
Diagonal plier



Insulating gloves



Protective gloves



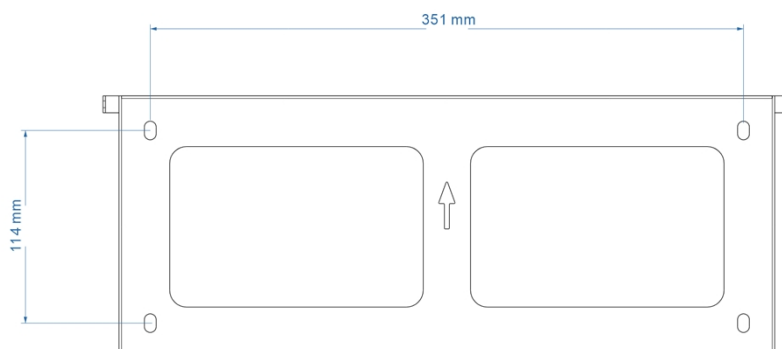
Crimping pliers



CAUTION

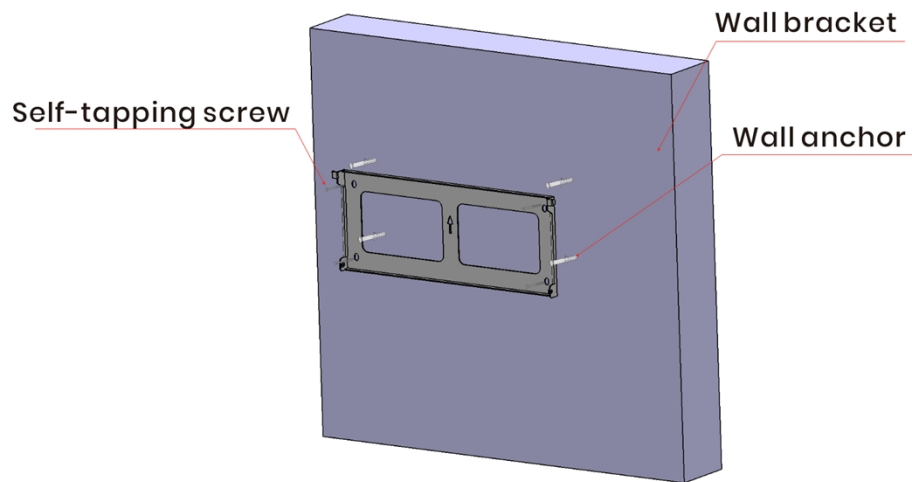
- Follow local electric safety and installation policy, a suitable breaker between battery system and inverter is required.
- All installation and operation must follow local electric standard and requirements.

Step1: Please use the mounting bracket as a template and drill 4 holes in the right positions.



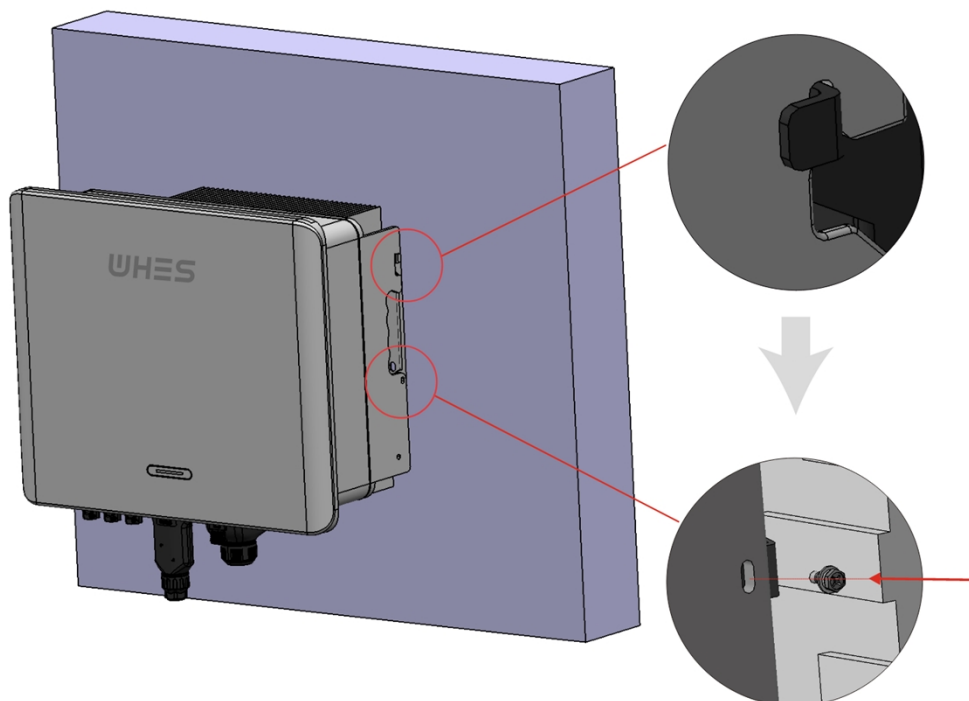
Step2 : Use the included wall anchors in the accessory box to secure the mounting bracket onto the wall.

NOTE: The wall must have a load-bearing capacity of more than 120 kg to ensure it can support the inverter.



Step3: Hold the inverter from both sides of the heatsink and attach it to the mounting bracket.

NOTE: Make sure the inverter heat sink is properly aligned with the mounting bracket joint.

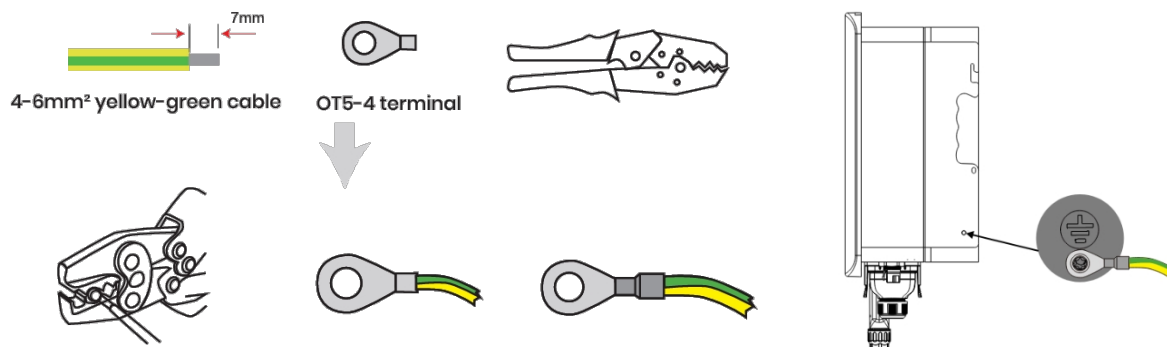


4.2.6 PE Connections

NOTE

The PE screw has been pre-installed on the hybrid inverter in advance.

- **PE cable** connection process is as below:



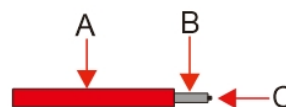
4.2.7 PV Connections

Please make sure you fulfill all the requirements below before connecting PV panels/strings to the inverter:

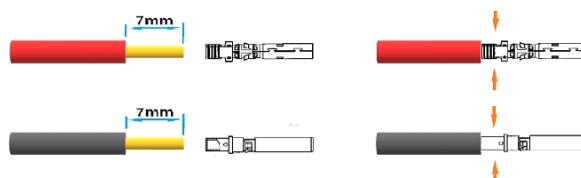
- The total short-circuit current of a single PV string must not exceed the inverter's max DC current rating.
- Do not connect PV strings to earth/ground conductors.
- Use the appropriate PV connectors in the included accessory box. (BAT connectors look similar to PV connectors. Please double-check before using them.)

Follow the below PV cable requirements.

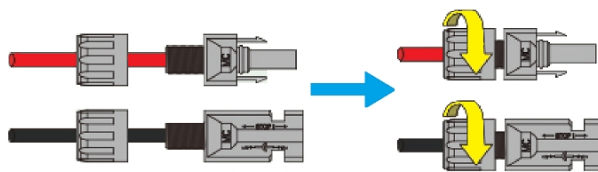
Legend	Description	Value
A	Outside Diameter	5.5–8.0 mm
B	Insulated Cable Length	7 mm
C	Conductor Core	4-6 mm ²



1. Crimp the terminal;



2. Insert the terminal into the connector and lock the nut;



Torque 2.0 N·m

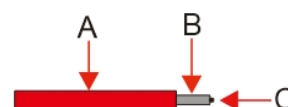
Note: The connectors will make a clicking sound when inserted correctly into the PV plugs.

4.2.8 BAT Connections

- Please be mindful of any electric shock or chemical hazards. Always connect an external DC breaker (40 A , 500 V) when working with batteries without built-in DC breakers.
- Do not use lead-acid batteries with the inverters without the necessary permissions.
- Use the appropriate BAT connectors in the included accessory box. (PV connectors look similar to BAT connectors. Please double-check before using them.)

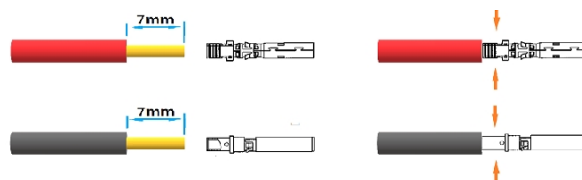
Follow the below battery cable requirements.

Legend	Description	Value
A	Outside Diameter	5.5–8.0 mm
B	Insulated Cable Length	7 mm
C	Conductor Core	6 mm ²

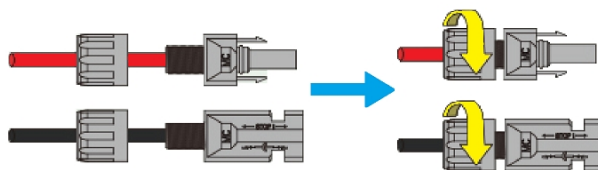


Battery wiring connection steps:

1. Crimp the terminal;



2. Insert the terminal into the connector and lock the nut;



Torque 2.0 N·m

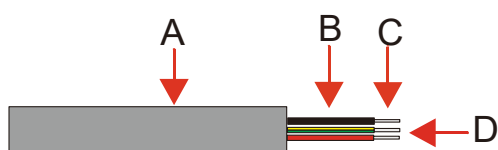
4.2.9 EPS Connections

Note: The connectors will make a clicking sound when inserted correctly into the BAT plugs.

NOTE

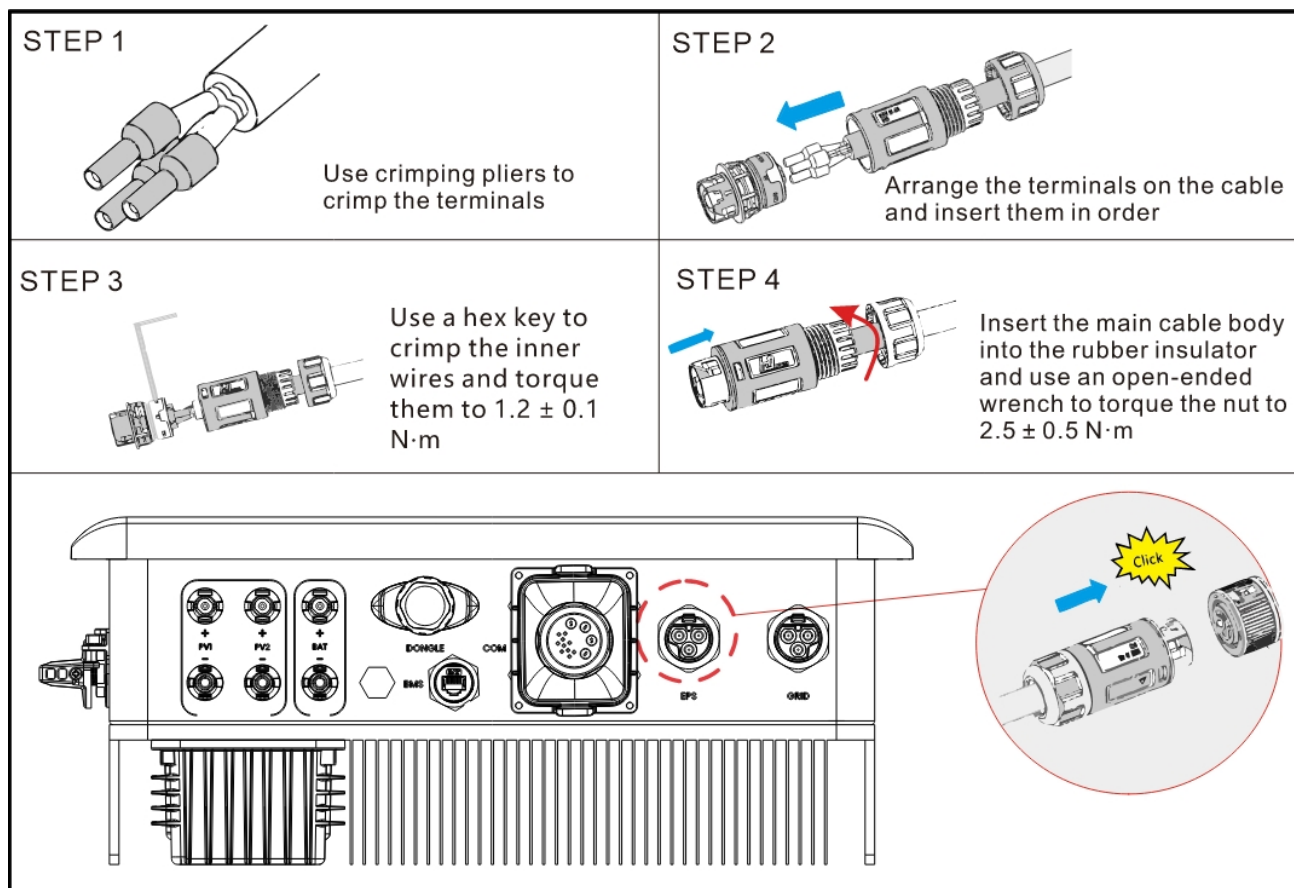
1. Some external factors may cause the backup switching time to exceed 10 ms, and loads reliant on a constant stable energy supply should not be connected.
2. Very high inrush current surges from loads such as fixed-frequency air conditioners and high-power pumps may cause the inverter to switch to the overload protection state.
3. Ensure the EPS load power rating is within the EPS output rating, or the inverter may shut down and give an “overload” warning.
4. Adjust the load power when facing an “overload” warning to one within the EPS output power range, then turn the inverter back on.
5. Make sure the input surge current for any nonlinear loads is within the EPS output power range.

Follow the below EPS cable requirements.



Legend	Description	Value
A	Outside Diameter	8-11 mm
B	Individual Cable Length	25-30 mm
C	Insulated Cable Length	10 mm
D	Conductor Core	6 mm ²

EPS connection process is as below:



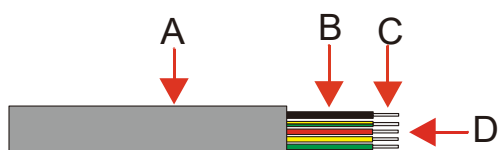
4.2.10 GRID Connections

An external AC breaker is needed for On-Grid connection to isolate the hybrid inverter from the utility grid when necessary.

NOTE

Electrical short-circuits on the Back-Up side may damage the inverter if an AC breaker is not installed on the Back-Up side.

- Follow the below GRID cable requirements.

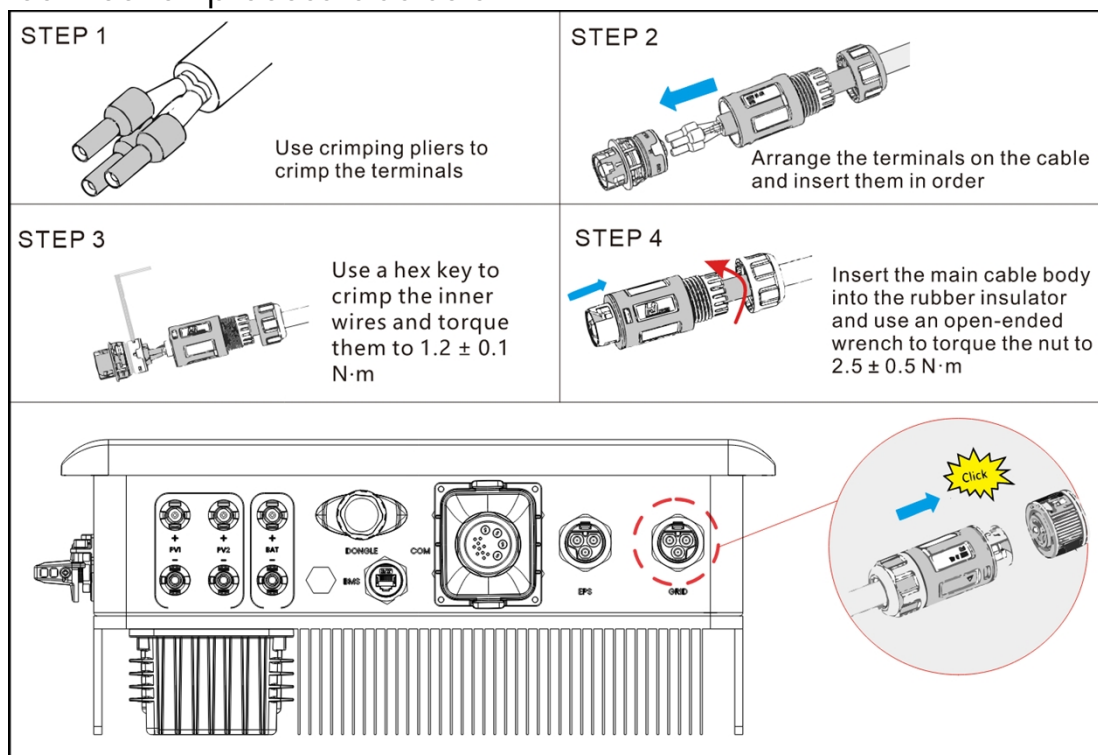


Legend	Description	Value
A	Outside Diameter	15–20 mm
B	Individual Cable Length	25–30 mm
C	Insulated Cable Length	15–17 mm
D	Conductor Core	10–16 mm ²

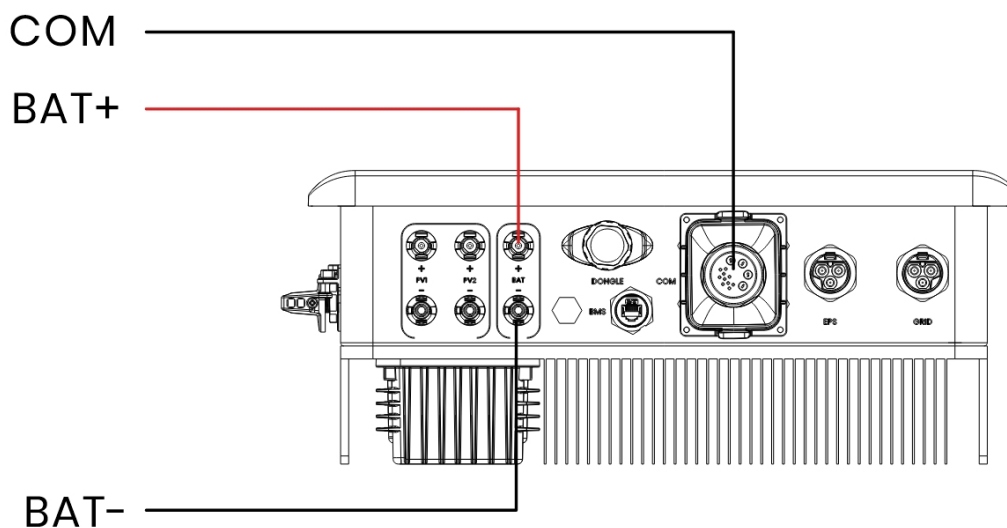
NOTE

Use a black wire to indicate the neutral conductor, a red wire (preferred) or a brown wire for the line conductor, and a yellow-green wire for the protective earth bonding line.

- **Grid** connection process is as below:



4.2.11 Inverter and Battery Box Connections



NOTE

1. Make sure that any batteries selected are included on the WH-THA list of approved batteries before purchase, or the system may not work as intended. Please contact your installer or the WHES service team for confirmation if you're not sure whether your chosen battery is an approved battery.
2. This section mainly describes cable connections on the inverter side. Refer to the instructions supplied by the battery manufacturer for battery side connections and configurations.

4.3 Communication Connections

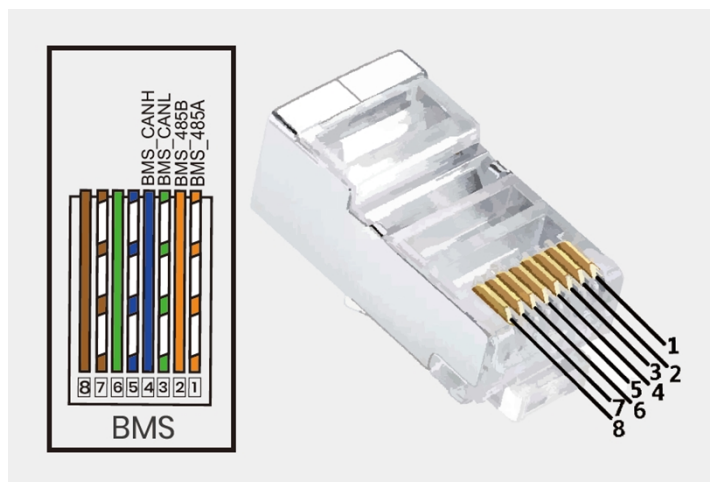
4.3.1 BMS Connections

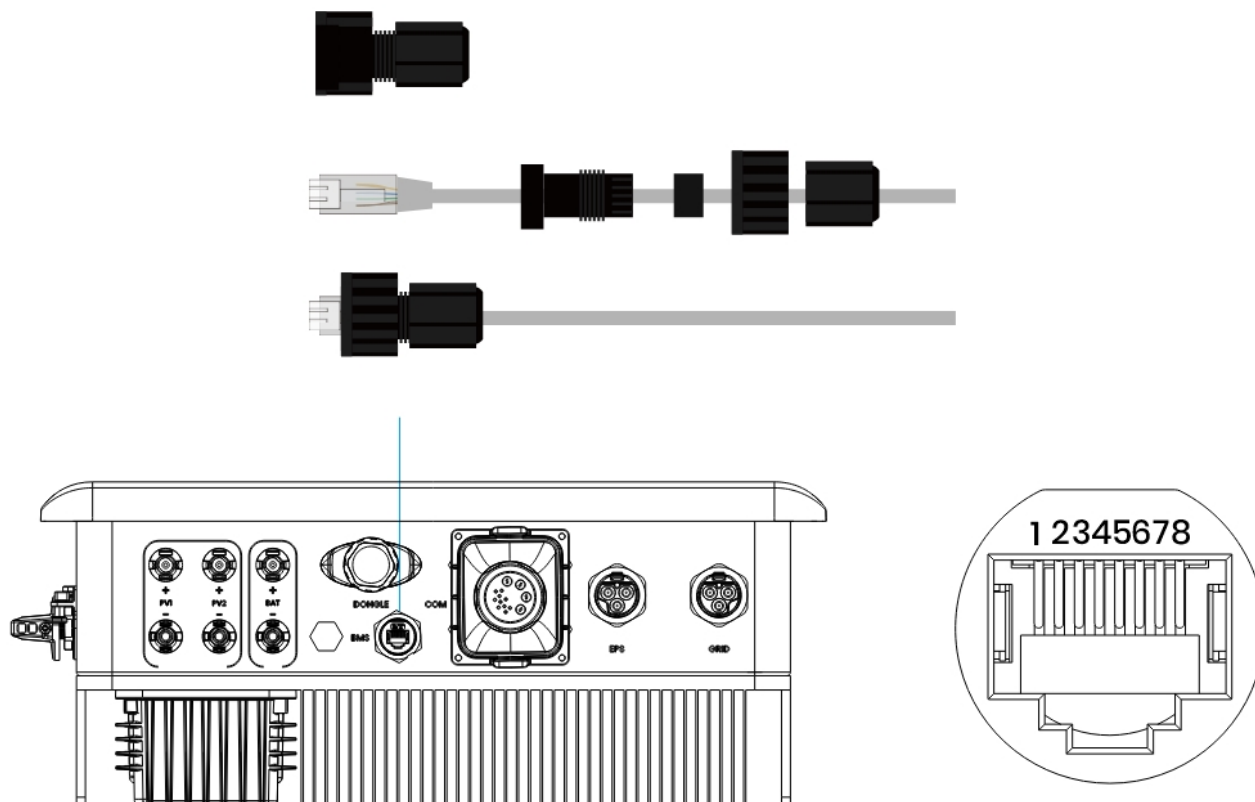
The BMS is used to communicate with connected compatible lithium batteries.

Connection Steps

1. Confirm that the battery and inverter power cables are connected.
2. Connect the inverter BMS communication cable to the lithium battery communication port.

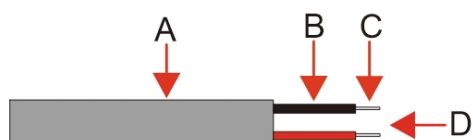
The BMS cable uses 568B standard crimping.



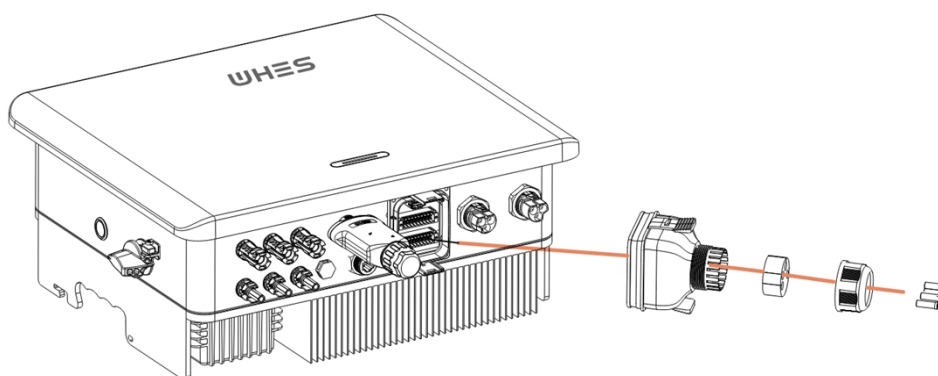


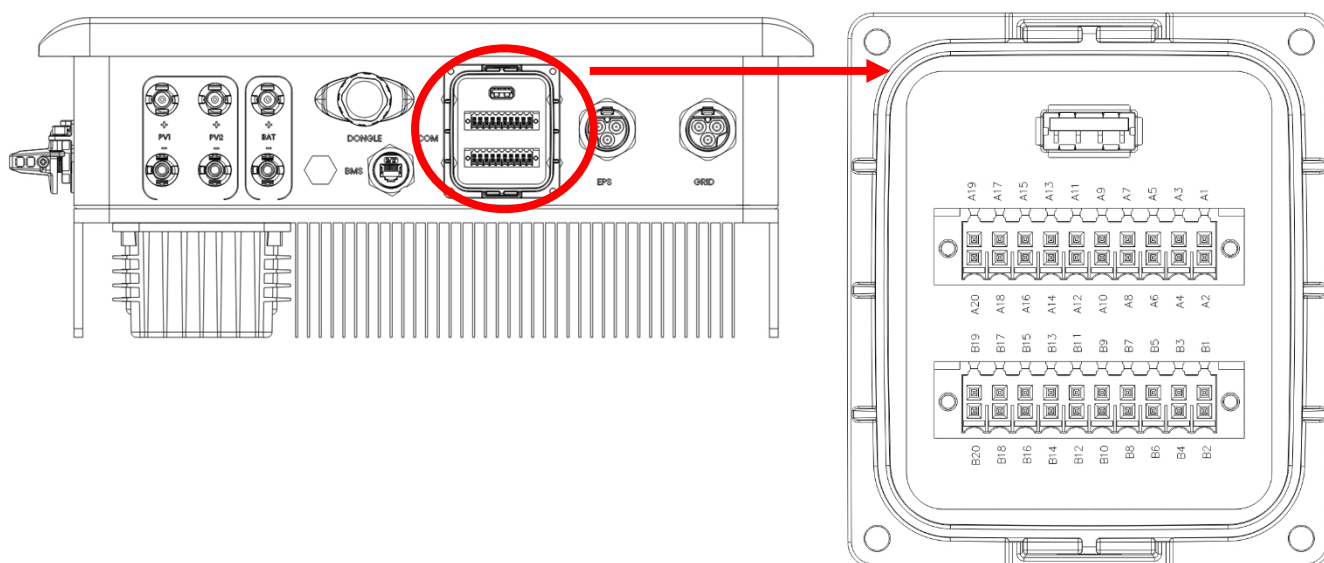
4.3.2 COM Connections

COM cable requirements as below.



Legend	Description	Value
A	Outer Diameter	5-6mm
B	Individual Cable Length	22-32mm
C	Insulated Cable Length	7-8mm
D	Conductor Core	0.5mm ²





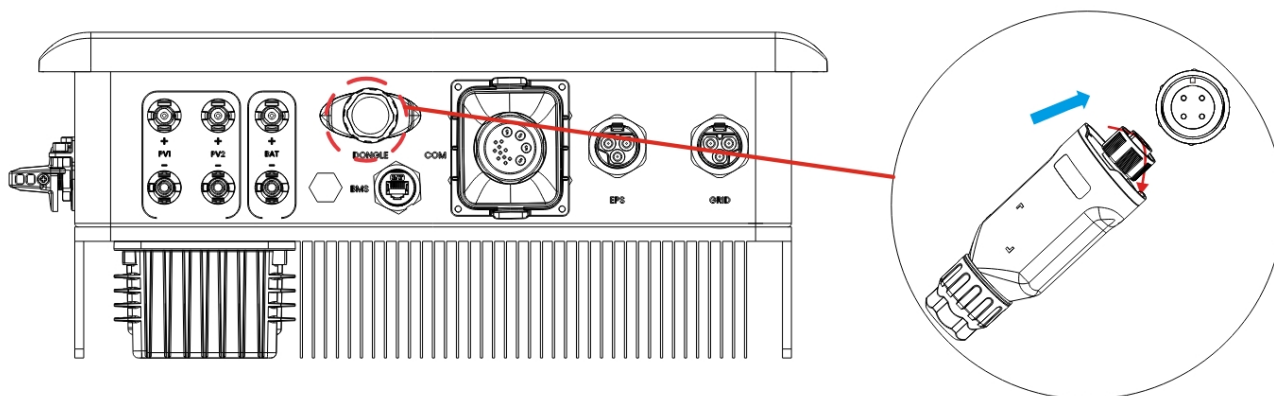
COM definitions below:

Pin	Definition	Pin	Definition
A1	M_485A	B1	RSD+
A2	M_485B	B2	RSD-
A3	COM_485A	B3	RLY1_O
A4	COM_485B	B4	RLY1_O
A5	PAR_485A	B5	RLY2_O
A6	PAR_485B	B6	RLY2_O
A7	D_CANH	B7	RLY3_O
A8	D_CANL	B8	RLY3_O
A9	CAN_120Ω	B9	IN1+
A10	CAN_120Ω	B10	IN1-
A11	SYNC1	B11	IN2+
A12	GND_COM	B12	IN2-
A13	D_485A	B13	CT1-
A14	D_485B	B14	CT1+
A15	COM/DRM0	B15	CT2-
A16	REFGEN	B16	CT2+
A17	DRM1/5	B17	+12V_COM
A18	DRM2/6	B18	GND_COM
A19	DRM3/7	B19	+5V_COM
A20	DRM4/8	B20	GND_COM

4.3.3 Dongle Connections

Insert the Wi-Fi dongle included in the accessory package into the base and tighten the plastic nut.

Torque 2.5 N·m



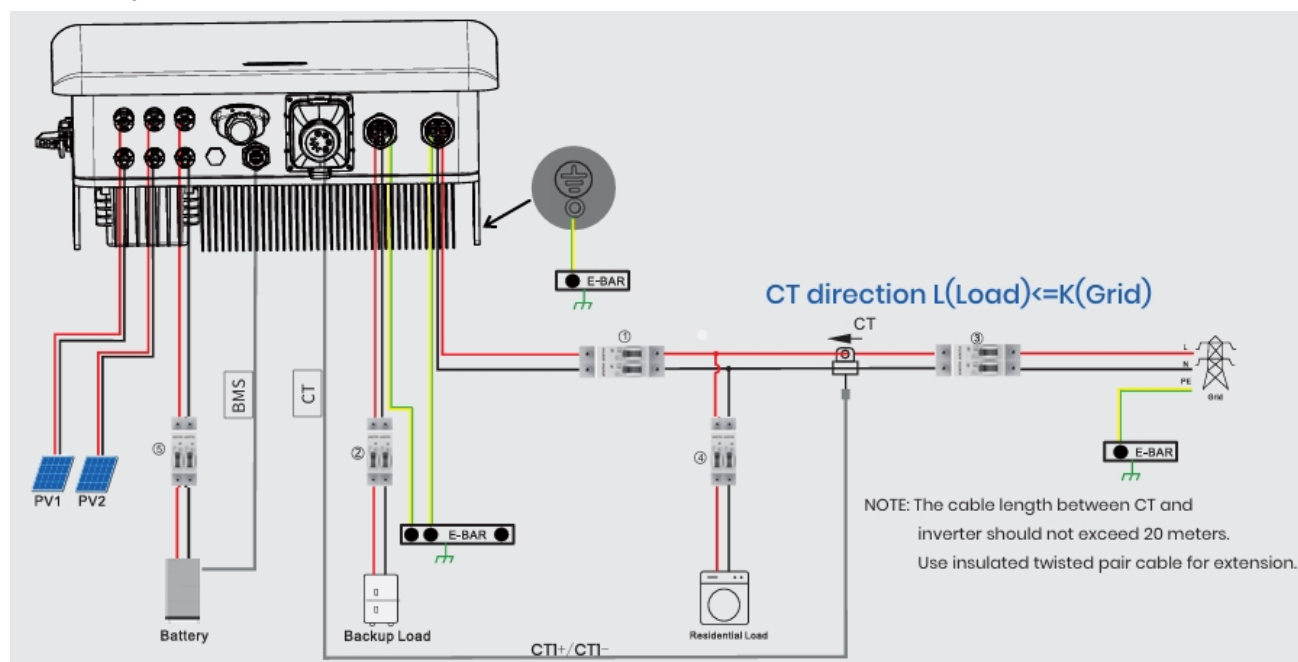
4.4 System Wiring Diagram

Please use an appropriate breaker based on the following specifications:

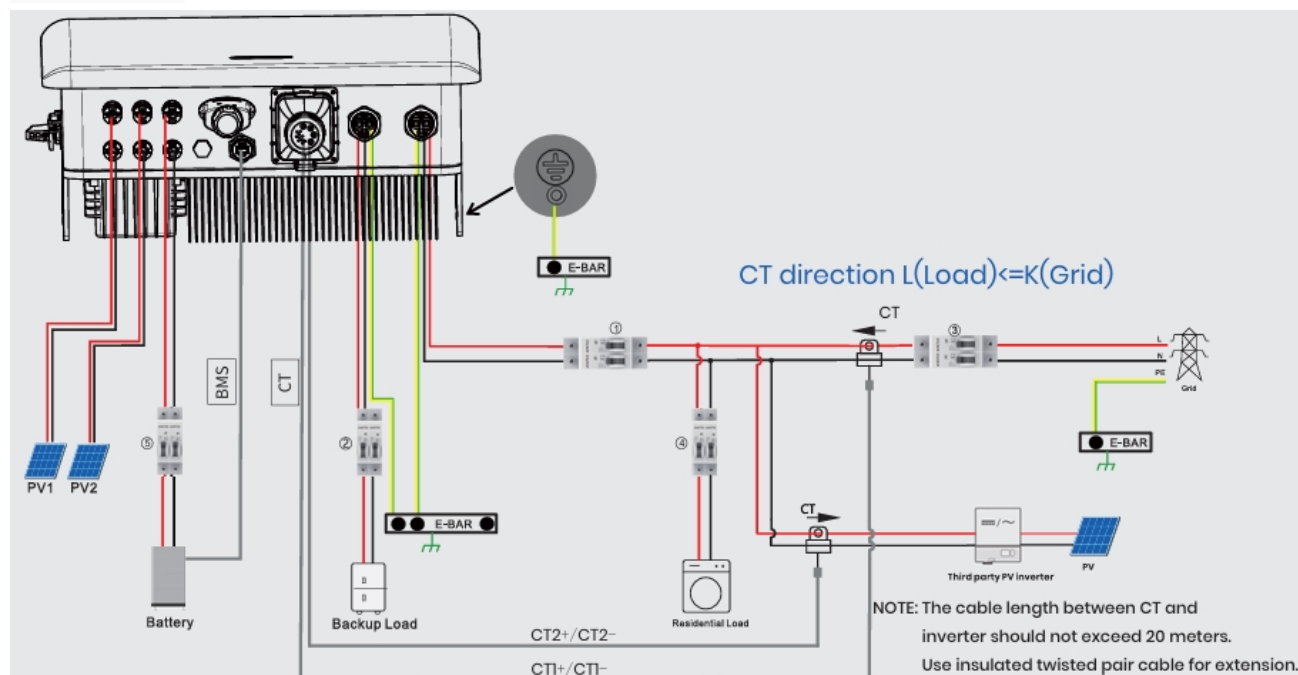
NOTE

1. Electrical short circuits on the grid side will damage the inverter if an AC breaker is not installed.
2. This diagram illustrates the wiring diagram for Copia series hybrid inverters, not the electrical wiring standards.

DC Couple:



AC Couple:



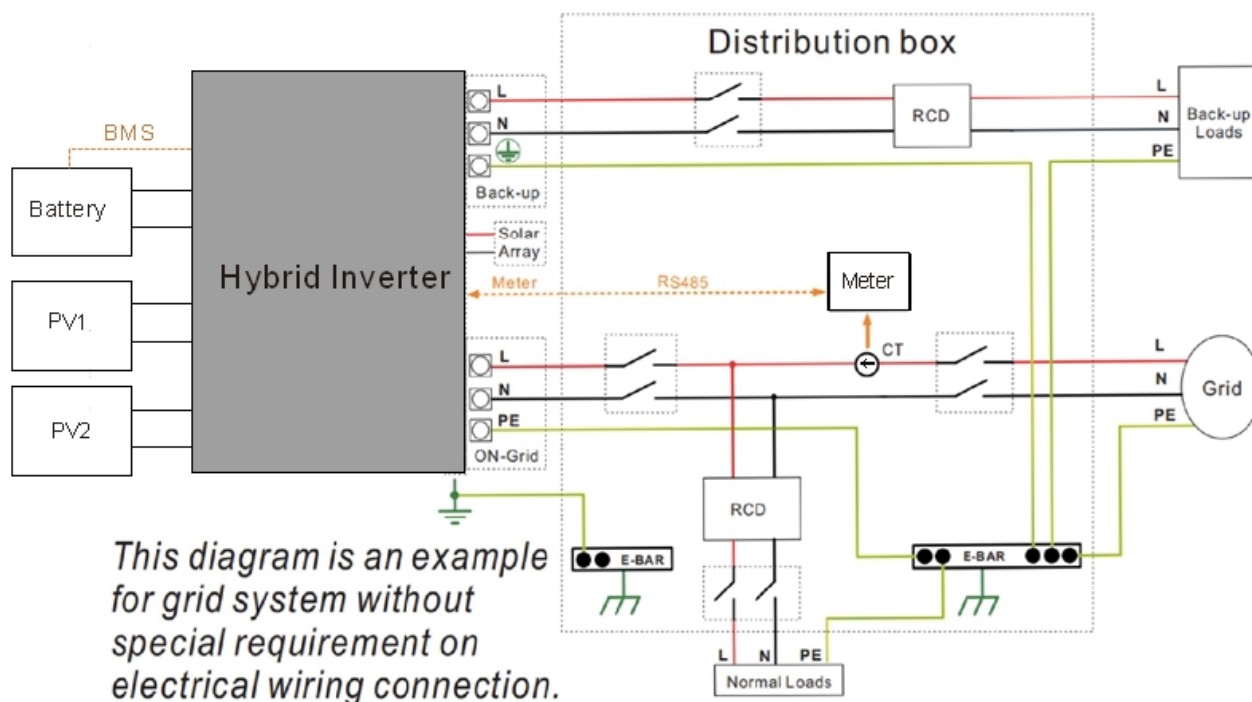
Choose the correct breaker:

Model	①	②	③ ④	⑤
SHE-3.6kW	50 A/230 V AC breaker	32 A/230 V AC breaker		

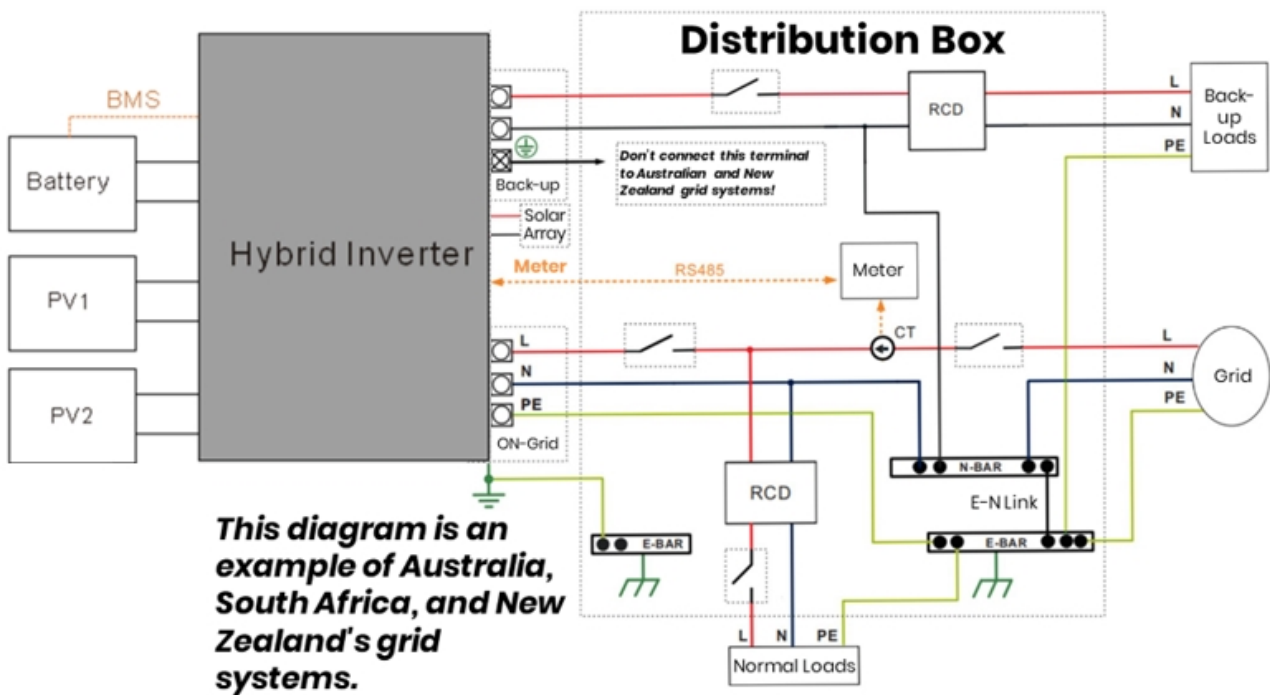
SHE-4.6kW	50 A/230 V AC breaker	32 A/230 V AC breaker	According to residential load (generally already installed in the grid distribution box)	40 A/750 V DC breaker (no external DC breaker is necessary when using battery systems with existing breakers)
SHE-5kW	63 A/230 V AC breaker	32 A/230 V AC breaker		
SHE-6kW	63 A/230 V AC breaker	40 A/230 V AC breaker		

● System Connection Diagrams

The following diagram illustrates an example use case where the neutral wire is separate from the PE in the distribution box. Please follow local wiring regulations.



Note: Under Australian safety standards, the On-Grid and Back-Up neutral wires must be connected together, or the Back-Up function will not work.



5 EMERGENCIES

5.1 Emergency Procedures

Turn off the main grid breaker directly feeding the inverter and turn off all inverter switches if the WH-SHC inverter appears to be malfunctioning. Please immediately contact WHES for detailed instructions.

WARNING: Do not open the inverter upper cover plate by yourself.

5.2 First Aid Procedures

Avoid touching any liquid or gas leaking out of battery modules. Immediately do the following upon exposure to leaked battery liquids or gases:

Skin contact: Remove any contaminated clothes and rinse the affected area with plenty of water or run it under a shower for at least 15 minutes. Seek medical attention immediately.

Eye contact: Immediately flush the eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention immediately.

Inhalation: Cover the victim in a blanket, move them into the fresh air, and keep them calm. Seek medical attention immediately. Begin artificial respiration immediately in the event of shortness of breath or difficulty breathing, or asphyxia (choking).

Ingestion: Give the patient at least 2 glasses of milk or water to drink. Induce vomiting unless the patient is unconscious. Seek medical attention immediately.

5.3 Firefighting Measures

Extinguishing media: Dry powder, sand, carbon dioxide (CO₂), or water. Fire precautions and protective measures:

Flammable properties: Lithium-ion batteries contain a flammable liquid electrolyte that may vent, ignite, or produce sparks when subjected to high temperatures ($> 150^{\circ}\text{C}$) or when damaged or improperly used (e.g., mechanical damage or overcharging). Burning cells can ignite other batteries close by.

Explosion data: Severe mechanical abuse may rupture batteries. Batteries may explode when exposed to fire.

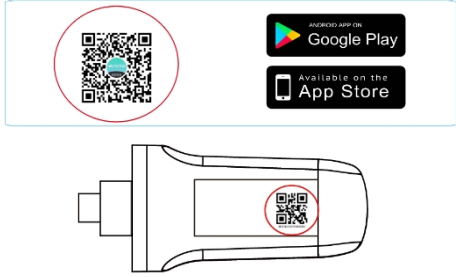
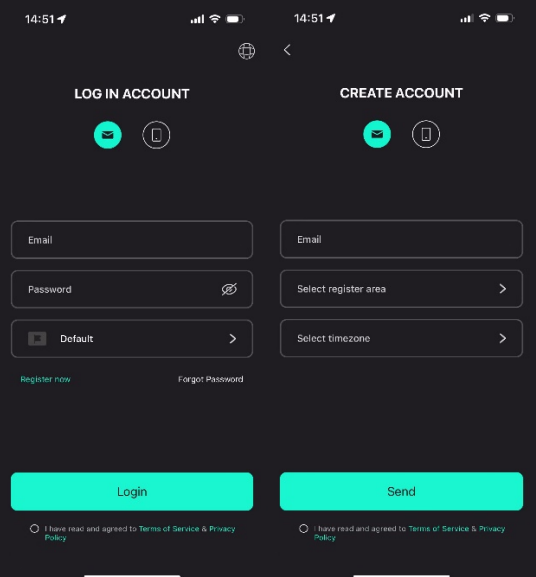
Special protective equipment for firefighters: Wear full protective gear and self-contained breathing apparatus with a full face mask in a pressure-demand or other positive pressure mode in case of fire.

6 CONFIGURATION & WI-FI RELOAD

- This part demonstrates the configuration step by step.
-

6.1 Preparations

1. The hybrid inverter must be connected to PV power only.
2. A router connected to the Internet is required to connect to the ECOS application center.
3. Android or iOS smartphone.

STEP 1 1. Scan the QR code on the front of the device to install the Android or iOS version of the ECOS app, depending on your operating system.	
STEP 2 1. Open the ECOS app and tap the sign-up button to register a new user account. 2. Follow all the instructions given during the sign-up process to successfully connect the device to ECOS. 3. The product ID QR code required for connection can be found on the included Wi-Fi dongle installed on the right side of the device.	

NOTE

1. Please ensure the correct router password is entered.
2. Make sure that the Wi-Fi dongle's wireless network connection is strong.
3. If everything is set up properly, the Wi-Fi LED on the inverter will change from slowly flashing to quick flashing and then become solid, indicating that the device has successfully connected to the Wi-Fi network.

6.2 Wi-Fi Reset & Restore

Wi-Fi Reset: Reconfigure the Wi-Fi dongle, and Wi-Fi settings will be reprocessed and saved.

Wi-Fi Restore: Restore the Wi-Fi dongle settings back to the default factory settings.

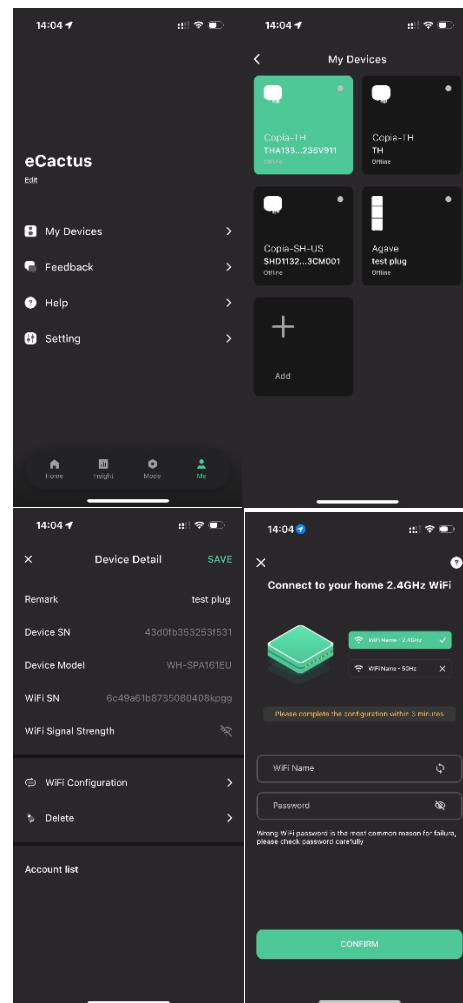
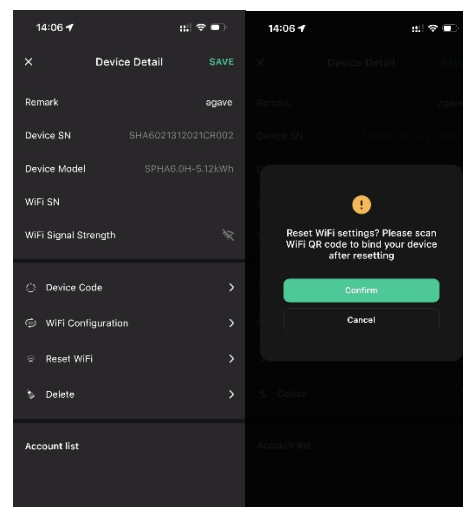
Wi-Fi Reset:

Please use your ECOS app to reset the Wi-Fi configuration.

Navigate to Settings and My Devices, access the Wi-Fi Configuration page, and follow the instructions to complete the Wi-Fi process.

Wi-Fi Restore:

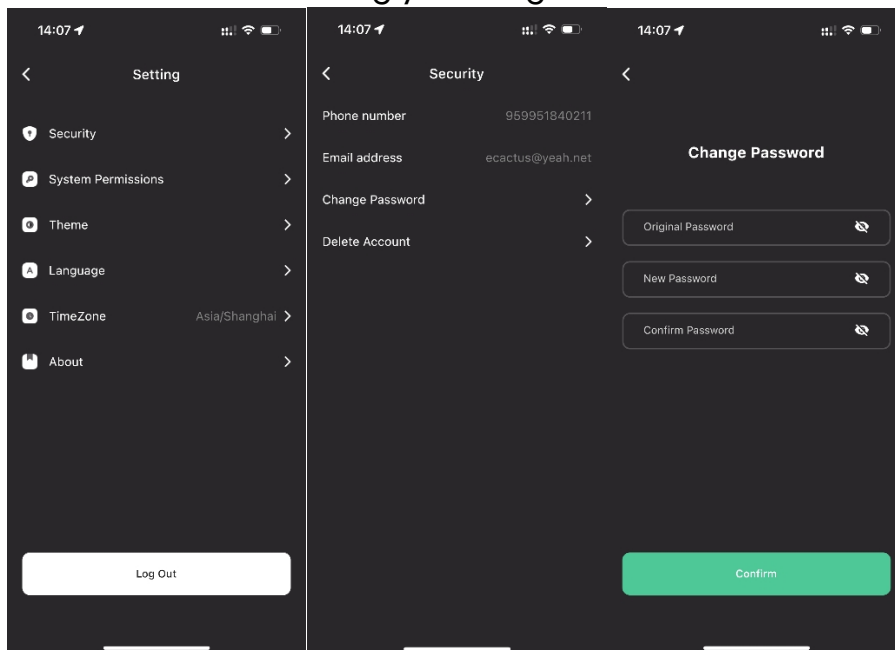
You also need to configure Wi-Fi network after set Wi-Fi dongle back to factory setting.

Wi-Fi Reset:**Wi-Fi Restore:**

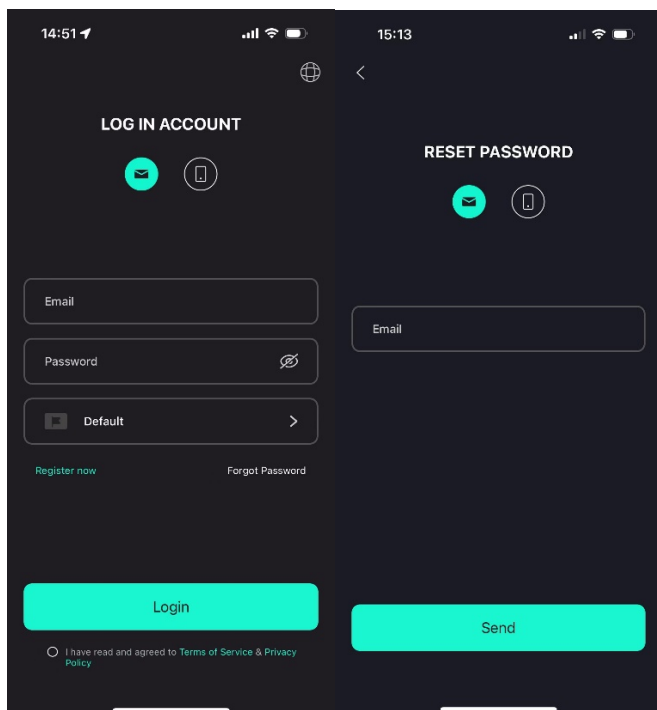
6.3 Change Password & Delete Account

Change Password

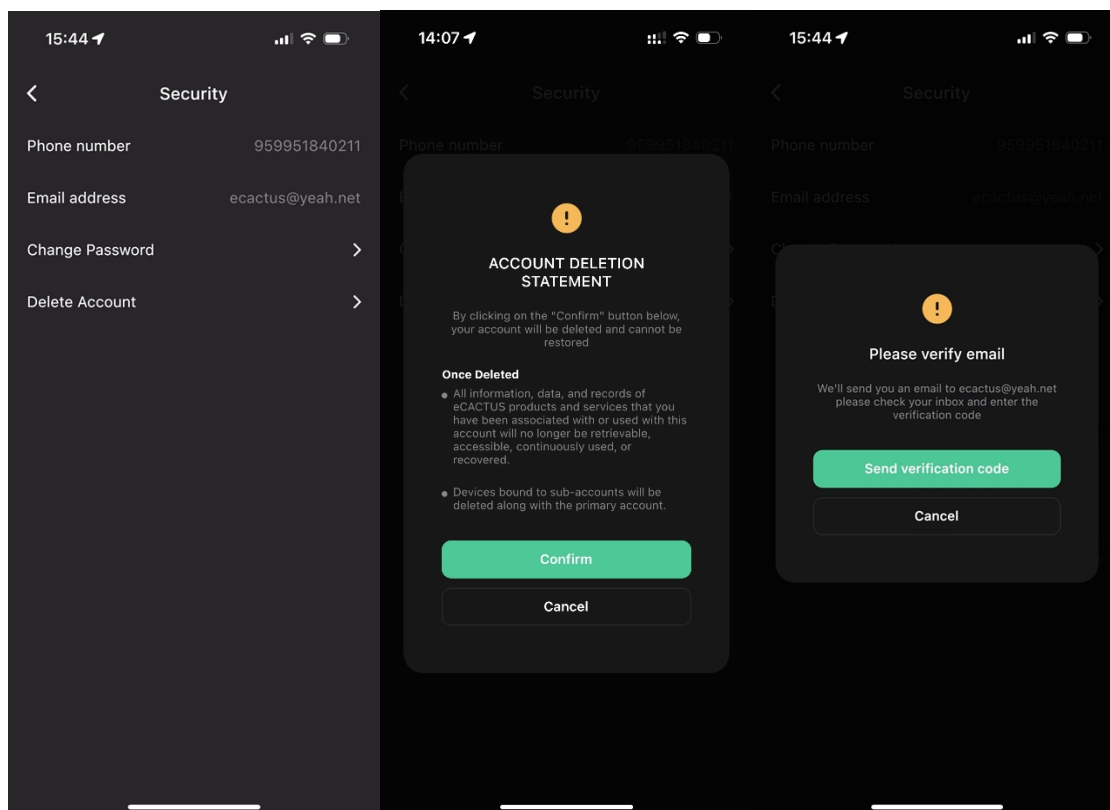
You can change your password by navigating to “**Settings**” >> “**Security**” >> “**Change Password**” and entering your Original Password to set a new password.



If you forget your password, you can reset your password by tapping “**Forgot Password**” on the login page and entering the verification code sent to your email address.



Delete Account



You can delete your account and data by navigating to “**Settings**” >> “**Security**”>> “**Delete Account.**” Please read the statement carefully before deleting your account.

Notice: You have 7 days to log back in and cancel your deletion request. Once deleted, your account and all associated data will be erased and cannot be recovered. When complete, we will send an email to your ECOS account to inform you that your account has been successfully deleted.

1. EMS CONFIGURATIONS

Energy management system (EMS) configurations can be set via the ECOS app or online website.

Three working modes can be configured:

2. Self-Powered:

EMS will manage residential power to minimize power grid reliance.

3. Load Shifting:

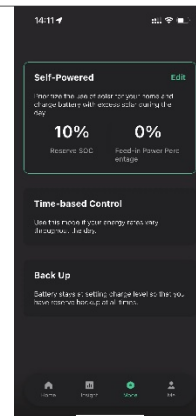
Batteries will be charged and discharged as configured.

4. Backup:

EMS will not discharge the battery unless the power grid is off. When this happens, EMS will provide residential power through the batteries.

Working Modes:

Navigate to the Customize tab and select one of the three operation modes via the ECOS app.



7 TROUBLESHOOTING

	Issue	Solution
1	Red LED flashing every 0.5 seconds	Meter Communication Fault. Please check whether the power supply & communication cables are properly connected in accordance with local standards.
2	Red LED flashing every 2 second	Battery Communication Fault. Please check whether the PCS is properly connected to the battery box and make sure that the battery switch and breaker are both in the ON position.
3	Abnormal Ecos Energy Flow Monitoring	Please check whether the power supply and CT have been properly installed according to the installation manual.
4	All the LEDs are off	Please check whether the voltage at each port is within the normal range.
5	SOC mis-indicates and fluctuates after initial installation	Do nothing, and the device will self-correct itself as soon as the battery is fully charged or discharged.
6	Battery completely depleted	We highly recommend disconnecting the battery ASAP during installation or when the device is on standby to avoid serious depletion and damage caused by extreme power consumption over a long period of time. Please contact after-sale services for technical support in the event of serious battery depletion.
7	Code DSP_1	PV1 overvoltage. Please check whether the open circuit voltage is within the normal voltage range.
8	Code DSP_2	PV1 overcurrent. Please check whether PV1 is correctly connected.
9	Code DSP_3	PV2 overvoltage. Please check whether PV2 is within the rated voltage range.
10	Code DSP_4	PV2 overcurrent. Please check whether PV1 is correctly connected.
11	Code DSP_9	Please check whether PV is within the normal voltage range.

12	Code DSP_10	No grid power. Please check whether the grid voltage is normal.
13	Code DSP_11	Grid voltage fault. Please check whether the grid voltage is within the normal range.
14	Code DSP_12	Grid current fault. Please check whether the EPS load power is within the normal range.
15	Code DSP_13	Grid frequency fault. Please check whether the grid frequency is within the normal range.
16	Code DSP_14	Overheat fault. Please check whether the cooling system is working properly.
17	Code DSP_16	Current over-leak fault. Please check the solar panel and device wiring.
18	Code DSP_17	Isolation resistance fault. Please check the solar panels and wiring system.
19	Code DSP_26	Battery voltage fault. Please check whether the battery voltage is within the normal range.
20	Code DSP_37	EPS voltage fault. Please check whether the EPS load power is within the normal range.
21	Code DSP_38	EPS current fault. Please check whether the EPS load power is within the normal range.
22	Code DSP_39	EPS overload fault. Please check whether the EPS load power is within the normal range.
23	Code DSP_40	EPS short circuit fault. Please check whether the EPS load power is within the normal range.
24	Code DSP_41	Earth & Neutral wire fault. Please check whether the earth and neutral wires are properly wired in line with standard requirements.
25	What should I do if I forget my Ecos password?	Please visit the Ecos website or use the app, tap "Forgot Password," enter your email address for verification, and follow the instructions to reset your password.
26	How can I change my Ecos password?	Log into Ecos and navigate to "Settings" >> "Security" >> "Change Password" to enter your new password.
27	How can I delete my device account?	Log into Ecos, then navigate to "Security" >> "Delete Account." Complete email verification to request Account Deletion. Deletion requests can be canceled by logging in within 7 days after

		requesting account deletion. All account data will be deleted and will not be recoverable. Please think twice before deleting your account.
28	How can I share my Ecos account with my family members?	The first Ecos registered will be recognized as the master account, and others can scan the device code shared by the master account. Please navigate to "Settings" >> "My Device" >> "Device code" to share the code.
29	Why is there no data on the home page?	The device may be offline. 1- Check whether your Wi-Fi is working; 2- Check whether the LED is on; 3- Check whether the Wi-Fi dongle is properly connected; Data may take a while to upload, after which Ecos will be bound to the device. Poor mobile phone reception. Check whether the internet is working properly and try to restart Ecos.
30	Adding multiple devices to Ecos	Log in to the Ecos app and tap the "+" on the top left of the home page. Scan the QR code on the Wi-Fi dongle to add new devices. Or navigate to "Setting" >> "Devices" and tap the "+" to add more devices.
31	How can I delete my device account?	Log in to Ecos and navigate to "Setting" >> "My Devices," select the device account, and tap the top right of the screen to delete the device.
32	Why is the device offline	There are many possible reasons for the device to be offline. 1. Check whether the Wi-Fi network is working properly 2. Check whether the LED is on 3. Check whether the LED on the Wi-Fi dongle is on
33	Why can't I search for and find the Wi-Fi dongle hotspot?	1. Check whether the LED is on 2. Check whether the LED on the Wi-Fi dongle is on 3. Restart or reconnect the Wi-Fi dongle
34	Why is no internet connection found	Disconnect your mobile phone from the WLAN and reconnect it to your home Wi-Fi or your

	when returning to other interfaces after configuring Ecos via WLAN?	mobile network after successfully configuring WLAN.
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8 CLEANING AND MAINTENANCE

Power off the system before cleaning or performing any maintenance.

- **Shut down procedures:**

Step 1: Disconnect the backup load where applicable and then turn off the backup breaker.

Step 2: Turn off the grid breaker.

Step 3: Turn off the PV switch.

8.1 Cleaning

Power off the system before cleaning the inverter. Only clean the battery case with a soft, dry brush or vacuum cleaner to remove dirt. Do not use any solvents, abrasives, or corrosive liquids to clean the case.

8.2 Maintenance

The inverter requires periodically maintenance, details as below:

NOTE: Make sure inverter is totally isolated from all DC and AC power for at least 5 mins before maintenance

Heat sink: please use clean towel to clean up heat sink once a year

Torque: please use torque wrench to tighten AC and battery wiring connection once a year